

Wild Springs Solar Project

*Final Environmental Assessment
Pennington County, South Dakota*



**Western Area
Power Administration**

DOE/EA-2068

September 2021

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Acronym List

Acronym	Definition	Acronym	Definition
AC	alternating current	SDDENR	South Dakota Department of Environment and Natural Resources
Basin Electric	Basin Electric Power Cooperative	SDDOT	South Dakota Department of Transportation
BCC	Birds of Conservation Concern	SDGFP	South Dakota Department of Game, Fish, and Parks
BMP	best management practice	SGCN	South Dakota Department of Game, Fish, and Parks Species of Greatest Conservation Need
CEQ	Council on Environmental Quality	SHFC	U.S. Fish and Wildlife Service Species of Habitat Fragmentation Concern
DC	direct current	SHPO	State Historic Preservation Office
EA	Environmental Assessment	SPP	Southwest Power Pool
EPA	U.S. Environmental Protection Agency	SWPPP	Stormwater Pollution Prevention Plan
FEMA	Federal Emergency Management Agency	THPO	Tribal Historic Preservation Officer
kV	kilovolt	TCP	Traditional Cultural Property
MW	megawatt	TCS	Traditional Cultural Survey
NEPA	National Environmental Policy Act	UDP	Unanticipated Discovery Plan
NHD	National Hydrography Dataset	USDA	U.S. Department of Agriculture
NLCD	National Land Cover Database	USFWS	U.S. Fish and Wildlife Service
NLEB	northern long-eared bat	USGS	U.S. Geological Survey
NRHP	National Register of Historic Places	VMP	Vegetation Management Plan
NRCS	Natural Resources Conservation Service	WAPA	Western Area Power Administration
O&M Project	operations and maintenance Wild Springs Solar Project	Wild Springs Solar	Wild Springs Solar, LLC
Project Boundary	Approximately 1,499-acre area of privately-owned land for which Wild Springs Solar, LLC has leases and purchase options to allow siting and construction of the Project.	WNS	White-Nose Syndrome
Project Footprint	Approximate 1,108-acre area where Wild Springs Solar, LLC proposes to build the Wild Springs Solar Project facilities		
PV	Photovoltaic		
SCADA	Supervisory Control and Data Acquisition		

Chapter 1: Introduction and Background

The Western Area Power Administration (WAPA) is one of four power marketing administrations within the U.S. Department of Energy. WAPA's mission is to market and deliver clean, renewable, reliable, cost-based federal hydroelectric power and related services. WAPA's vision is to continue to provide premier power marketing and transmission services to WAPA customers, as well as contribute to enhancing America's energy security and sustaining the nation's economic vitality. WAPA's customers include Federal and state agencies, cities and towns, rural electric cooperatives, public utility districts, irrigation districts and Native American tribes. They, in turn, provide retail electric service to millions of consumers in the West. Transmission capacity in excess of the amount WAPA requires for the delivery of long-term firm capacity and energy to current contractual electrical service customers of the Federal Government is offered in accordance with its Open Access Transmission Service Tariff (Tariff). Since October 2015, WAPA's Upper Great Plains Region (WAPA-UGP) has been a transmission owner member of Southwest Power Pool (SPP), having placed its qualifying facilities under the functional control of SPP. The provision of excess transmission capacity on and interconnection to WAPA-UGP's facilities is in accordance with the SPP Open Access Transmission Service Tariff (SPP Tariff).

Wild Springs Solar, LLC (Wild Springs Solar) proposes to construct and operate the Wild Springs Solar Project (Project) on 1,499 acres of privately-owned land in Pennington County, South Dakota (Project Boundary), approximately one-half mile south of New Underwood, South Dakota (Figure 1 – Project Location). In May 2017, Wild Springs Solar submitted an interconnection request to SPP to connect the Project to WAPA-UGP's transmission system at its New Underwood Substation. WAPA's decision to grant or deny the interconnection request is considered a federal action under the National Environmental Policy Act (NEPA). Therefore, this Environmental Assessment (EA) was prepared to analyze the impacts of the Project. The interconnection request is one of several permits required for the Project; the Project received a Conditional Use Permit from Pennington County in August 2020 and a Facility Permit from the South Dakota Public Utilities Commission in December 2020.¹

1.1 Purpose and Need for WAPA's Federal Action

WAPA must consider and respond to Wild Spring Solar's interconnection request in accordance with the SPP Tariff (WAPA is a member of SPP) and the Federal Power Act.

1.2 Wild Springs Solar's Purpose and Need

The purpose of the Project is to generate and distribute solar photovoltaic (PV) energy to meet future demands, as projected in the Basin Electric Power Cooperative (Basin Electric) 2018 annual report. Wild Springs Solar has entered into a Power Purchase Agreement with Basin Electric, who is taking the entire output of the Project for 15 years, starting in 2022.

¹ The Wild Springs Solar Public Utilities Commission docket is [EL20-018](#).

Chapter 2: Proposed Action and Alternatives

This chapter describes the respective actions WAPA and Wild Springs Solar propose to take (the Proposed Action), as well as practical alternatives to the actions.

2.1 No Action Alternative

Under the No Action Alternative, WAPA would not enter into an interconnection agreement with Wild Springs Solar and would not allow the Project to interconnect to WAPA's transmission system. Although the Project could pursue an interconnection with a private utility, for comparison purposes, this alternative assumes the Project would not be built. Current conditions would likely continue, including farming (cultivated crops), and livestock grazing, which are the primary land uses in the Project Boundary.

2.2 Alternatives Considered but Eliminated from Further Study

Wild Springs Solar considered several project sites based on four key factors: (1) landowner interest; (2) securing contiguous parcels; (2) proximity to the New Underwood Substation (i.e., adjacency); and (4) sufficient development area to allow construction and operation of a 128 megawatt (MW) solar facility. Figure 2 (Project Boundary Refinement) displays the chronology of the Project Boundary alternatives.

2.3 Proposed Action

The Proposed Action is for Wild Springs Solar to:

1. Construct and operate the Project,
2. Enter into a generator interconnection agreement with WAPA and SPP to connect the Project to WAPA's existing New Underwood Substation. WAPA would make any necessary design or equipment changes to WAPA-owned facilities, as specified in the Interconnection Agreement, to accommodate the interconnection.

Wild Springs Solar would construct, operate, and maintain the 128-megawatt (MW) Project, which would include the following components:

- Solar panels and racking,
- Electrical collection system
- Inverter/Transformer skids,
- Access roads,
- Security fencing and cameras,
- Laydown areas,
- Collector substation,
- Operations and maintenance building (O&M building),



- Up to three weather stations (up to 20 feet tall),
- Parking,
- Stormwater drainage basins, and
- Less than 1 mile of new overhead 115-kilovolt (kV) transmission line.

In total, the footprint of the facilities described above is expected to total approximately 1,100 acres. A detailed breakdown of each facility and its anticipated footprint is shown in Table 1. The preliminary Project design is displayed on Figures 3 and 4a-d (Preliminary Project Layout and Detailed Preliminary Project Layout, respectively). Wild Springs Solar selected the Project location and refined the siting of facilities within the Project Area based on factors including voluntary easements with private landowners, proximity to transmission interconnection availability, cultural resources, a prairie dog colony, wetlands and waterbodies, residences, zoning, and land cover/land use, including grasslands.

Shifts in Project facilities may be necessary as a result of geotechnical evaluations, landowner input, or to avoid newly identified environmental resources. If shifts become necessary, WAPA would determine whether additional analysis is necessary.

Project Facilities¹	Acres
Solar Arrays (fenced area)	1037.5
Access Roads	40.0
Laydown Areas (to be restored)	13.2
Collection lines outside the fence	9.6
Laydown Area (to be converted to parking lot)	5.7
Inverters	0.9
Stormwater Basin	0.6
Collector Substation	0.5
O&M Building	0.1
Project Total	1108.1

¹ Weather Stations occupy a footprint of approximately 10 square feet. The footprint for up to three weather stations is < 0.1 acre and is therefore not included in this table.

2.4 Solar Panels and Racking

The Project would utilize PV panels with tempered glass varying in size between approximately 4 to 7 feet long by 2 to 4 feet wide, and 1 to 2 inches thick. The panels would be installed on a tracking rack system made of galvanized steel and aluminum with a motor that allows the panels to rotate their angle. The panels and tracking rack system would be generally aligned in rows north and south with the PV panels facing east toward the rising sun in the morning, parallel to the ground during mid-day, and then west toward the setting sun in the afternoon. The rotating rack system would allow the PV panels to track the solar resource throughout the day.

Each tracking rack would contain multiple panels. On the tracking rack system, panels would be up to 20 feet in height from the ground to the top of the panels when at a 45-degree angle.

Ground clearance to the bottom of the panels when at a 45-degree angle is approximately 32 inches depending on topography and vegetation constraints. Image 1 below shows solar panels oriented at a 45-degree angle.

The tracking rack system would be mounted on top of steel piers that are typically driven into the ground, without a need for excavation or concrete to install the piers. Piers are typically installed at eight to fifteen feet below the surface, pending site-specific conditions that would be determined through geotechnical borings prior to construction.

Image 1 Tracking Rack System and Solar Panels at 45-Degree Angle



2.5 Electrical Collection System

The electrical collection system would contain two components: direct current (DC) connecting the panels to the inverter/transformer and alternating current (AC) connecting the inverter/transformer to the collector substation. The electrical collection system would be installed below-ground or would use a hybrid of below-ground and above-ground installation. In the below-ground electrical collection system, both the DC and AC electrical lines would be buried. In the hybrid electrical collection system, the DC electrical lines would be above-ground, strung under the panels and the AC collection lines would be buried. All below-ground collection lines would be installed in trenches or ploughed into place at a depth of at least four feet below grade. During all trench excavations the topsoil and subsoil would be removed and stockpiled separately. Once the cables are laid in the trench, the area would be backfilled with subsoil followed by topsoil.

2.6 Inverter/Transformer Skids

Regardless of the collection system configuration (below-ground or hybrid), the Project would utilize central inverter/transformer skids at locations throughout the Project Footprint and include a transformer to which the inverters would feed electricity. The Project's preliminary design has

proposed 89 central inverter skids (one inverter is required for every 2-3 MW). These skids would provide the foundation for the inverter, transformer, and Supervisory Control and Data Acquisition (SCADA) system. The skids would be placed atop concrete slab or pier foundations and would typically measure 10 feet wide by 25 feet long, with a structure height of approximately 12 feet above grade. Concrete foundations would be poured onsite or precast and assembled off-site.

The inverters would be located within the interior of the Project along access roads.

2.7 Access Roads

The Project would construct up to 20 miles of new graveled access roads that lead to the Project facilities. These roads would be up to 16 feet wide along straight portions of the roads and approximately 45 feet wide at curves and intersections. There would be ten access points to the Project from existing county roads. These entrances would have locked gates.

During construction, the access road area will be graded, compacted, and 4 to 12 inches of gravel would be added.

2.8 Fencing & Cameras

Permanent security fencing would be installed along the perimeter of the Project Footprint. Permanent fencing is designed to enclose eight blocks of panels, not surround the entire Project Footprint with a single fence. Additionally, the collector substation would have its own perimeter fencing. In both cases, the fencing would consist of a chain link fence and would extend approximately 6 feet above grade with additional one foot of barbed wire to comply with the National Electric Code, and to provide security and safety. Additional prairie dog exclusionary fencing options may be utilized in portions of the Project such as chicken-wire below the chain link fence extending below grade.

The Project would also have security cameras and down-lit security lighting at the entrances. The typical pole height would be ten feet and lights would be manual by switch as well as motion activated if an intrusion is detected. Additional lights at each inverter would be down-lit and switch controlled for repair purposes.

2.9 Laydown Areas

Wild Springs Solar would utilize ten temporary laydown areas within the Project Footprint, totaling 15.9 acres. These areas would serve both as a parking area for construction personnel and staging areas for Project components during construction. After construction, nine of the laydown areas would be reseeded as described in the Land Use and Land Cover section; the laydown area adjacent to the collector substation and O&M building would become the permanent parking lot (see Figures 4a-d).

2.10 Collector Substation

The collector substation would be a 34.5/115 kV step-up substation with metering and switching gear required to connect to the transmission grid. The area within the substation would be

graveled to minimize vegetation growth and reduce fire risk. The substation's area would be approximately 150 feet by 150 feet.

The collector substation would contain a single, industry-standard main power transformer, which would require a Spill Prevention, Control, and Countermeasures Plan. Other onsite storage at the O&M building may include hydraulic oil stored in a plastic or poly tote or 55-gallon drums on secondary containment pallets and potentially a double-walled fuel tank with additional secondary containment for maintenance vehicles.

One of two methods would be used to install substation foundations. A small rubber tire backhoe would be used to dig out major foundations prior to pouring the concrete slabs. An auger/drill type machine would be used to dig for minor foundations.

2.11 Operation and Maintenance Building

An O&M building would be located adjacent to the collector substation. The Project would obtain a building permit for the O&M building from Pennington County in the 3rd quarter of 2021, prior to construction. The O&M building would measure approximately 60 feet long by 40 feet wide and would be made of metal (similar to a pole barn). It would contain an office for the onsite Plant Manager, a technician room, restroom, and storage area for equipment to operate and maintain the Project. Equipment stored at the O&M building would include a SCADA cabinet, spare panels, spare parts for the substation and equipment to operate the substation, as well as safety equipment for working with live electricity.

2.12 Weather Stations

The Project would include up to three weather stations up to 20 feet in height. The weather stations would be located within the Project Boundary; the final locations would be determined following final engineering in the 3rd quarter of 2021.

2.13 Parking

A parking lot would be located adjacent to the O&M building and would be approximately 500 square feet with the final size being determined in accordance with the Pennington County Zoning Ordinance in the 3rd quarter of 2021. The parking lot would be gravel or paved.

2.14 Stormwater Drainage Basins

According to the Pennington County Stormwater Quality Manual, stormwater drainage basins may be needed for stormwater runoff mitigation. While the vegetation that would be planted between the arrays would likely be sufficient to meet the stormwater best management practice (BMP) requirements, Wild Springs Solar has preliminarily designed one drainage basin in the southwest portion of the Project Footprint that covers 0.6-acre (see Figures 3 and 4a-d). No facilities would be placed in the drainage basin, which is located in an existing low area. This area would be vegetated with a wet seed mix that would help stabilize soils after rain events.

2.15 Transmission Line

The exact transmission line routing to interconnect the Project into the substation has not yet been determined; however, it would be located within a corridor of the Project's leased lands until it crosses into the New Underwood Substation parcel. Additionally, the gen-tie transmission line will be routed such that it does not cross existing transmission lines. The gen-tie routing area is displayed on Figure 3.

2.16 Construction Activities

Construction of the Project would take as many as twelve months beginning as early as fall of 2021 and would be completed by the end of 2022. The construction workforce required to complete the Project would be up to 150 workers at peak construction.

During construction, equipment and work vehicles would travel to and from the site. Construction would involve using typical construction equipment such as scrapers, dozers, dump trucks, watering trucks, motor graders, vibratory compactors and pile drivers, pickup trucks, and backhoes. Specialty construction equipment that may be used during construction would include:

- skid steer loader;
- medium duty crane;
- all-terrain forklift;
- concrete truck and boom truck;
- high reach bucket truck; and
- truck-mounted auger or drill rig.

An overview of construction activities follows.

2.16.1 Geotechnical

Geotechnical and pull testing studies would be performed to determine the topsoil and subsoil types, and the mechanical properties of the soils. These variables would be used to engineer the solar array foundation system.

2.16.2 Site Clearing & Vegetation Removal

Depending on timing of the start of construction, residual row-crop debris from the 2021 harvest season may need to be cleared. Alternatively, and depending on construction timing, Wild Springs Solar may plant a cover crop in Spring 2021 that is compatible with the Project's Vegetation Management Plan (VMP). This cover crop would stabilize soils if row crops are not planted that year.

2.16.3 Earthwork

During grading, topsoil and organic matter would be stripped and segregated from the subsoil (depending on the depth of grading cut). Some grading would be required to provide a more level workspace and maintain soil stability in areas with a slope greater than five percent (approximately 25 percent of the Project Boundary, however the areas that would be graded

would be less as grading activities would be limited to the final development area). Topsoil shall have temporary and permanent erosion control and soil stabilization measures established in accordance with the Project's Stormwater Pollution Prevention Plan (SWPPP). The earthwork activities would be completed using typical civil construction equipment – scrapers, bulldozers, front-end loaders, backhoes, or skid-steers.

2.16.4 Restoration

Following construction, areas that would not contain permanent facilities (area under the arrays and the laydown yards that would not be converted into permanent parking for operations) would be stabilized with sediment stabilization and erosion control measures such as silt fence and biologs and re-vegetated according to the VMP. The site would be seeded with site specific seed mixes developed in coordination with the South Dakota U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) and includes seed mixes specific to clay and loam soils and plant species that are adapted to the semi-arid climate.

The VMP outlines two vegetation maintenance strategies that may be implemented at the Project: mowing and grazing. Mowing would take the form of traditional mowing once vegetation reaches a height of 18-24 inches during the growing season. Alternatively, Wild Springs Solar may decide to use grazing with sheep as a long-term vegetation management technique.

2.17 **Operation**

The Project would be professionally maintained and operated by Wild Springs Solar, an affiliate, and/or a contractor. Primary tasks include scheduled annual inspection(s) of electrical equipment and vegetation management, as well as snow removal on access drives.

The expected service life of the Project is 20 to 30 years, and Wild Springs Solar estimates that the Project would result in up to four full-time permanent positions to operate and maintain the Project facilities. A maintenance plan would be created for the Project to ensure the performance of the solar facilities. The frequency of maintenance inspections varies by task and range from annually to monthly.

Once construction is complete, the solar facility would see one to two trucks on site daily.

2.17.1 Supervisory Control and Data Acquisition System

The solar arrays would communicate directly with the SCADA system for remote performance monitoring, energy reporting and troubleshooting. The SCADA system provides data on solar generation and production, availability, meteorology, and communications. The SCADA system allows monitoring of, and communications with, the Project and relays alarms and communication errors. All the monitored data would be managed by Wild Springs Solar on-site in addition to a qualified subcontractor that would remotely monitor the site 24 hours a day, 7 days a week through the SCADA system.

2.17.2 Facility Maintenance

Housekeeping of the Project facilities would include road maintenance, vegetation maintenance (method is to be determined; either traditional mowing or sheep and/or lamb grazers would be utilized), fence and gate inspection, lighting system checks, and PV panel washing, if required. However, minimal to no washing is anticipated to be needed at Project facilities. Panel manufacturers do not require washing panels for regular product maintenance, and any soiling on the panels (such as dust or bird droppings) would be removed by only a tenth of an inch of precipitation. Given the amount of historical rainfall in the area, Wild Springs Solar does not anticipate that panels will need to be washed, however in the unlikely scenario that panels would need to be washed, water will be brought in by truck from a municipal water source in New Underwood, Box Elder, or Rapid City, and cleaned with a pressure washer. Approximately 20 gallons of water per megawatt hour would be required for panel washing. For comparison, a typical family uses approximately 20,000 gallons each year, which is more than the amount of water needed per MW of solar generation capacity (Solar Energy Industries Association, 2021). No chemicals would be used that would create waste or require the collection or disposal of the water. Lastly, any panel washing would occur in targeted and specific areas rather than the whole Project Footprint.

2.18 Decommissioning and Reclamation

At the end of the Project's useful life (estimated useful life is 20 to 30 years), Wild Springs Solar would either take necessary steps to continue operation of the Project (such as re-permitting and retrofitting) or would decommission the Project and remove the facilities. In accordance with Section 317-A-15 of the Pennington County Zoning Ordinance (July 10, 2019), decommissioning activities would include:

- Dismantling and removing all Project-related equipment, foundations, and ancillary equipment to a depth of forty-two (42) inches below grade. Any soil disturbance associated with decommissioning would include topsoil segregation.
- Removing the operation and maintenance facility and access roads, unless the landowners request in writing that all or any portion of the facility and/or access roads remain in place. Access road restoration would include removal of surface road material and restoration of the roads to substantially the same physical condition that existed immediately before construction of the Project.
- Restoration of the Project site, including: decompaction; revegetation (in accordance with NRCS guidance or landowner request); and to the extent possible, reclamation to the approximate original topography and original or better topsoil quality that existed immediately prior to construction of the Project.
- Executing haul road agreements, as needed addressing the Project's use, improvement, and post-decommissioning restoration and repair of existing, maintained roads, including any associated road restoration and repair costs.
- Standard decommissioning practices would be utilized, including dismantling and repurposing, salvaging/recycling, or disposing of the solar energy improvements.
- In accordance with County and State requirements, Wild Springs Solar would provide a financial assurance instrument to cover the costs of decommissioning.

2.18.1 Removal and Disposal of Project Components

The removal and disposal details of the Project components are found below:

- Panels: Panels would be inspected for physical damage, tested for functionality, and removed from racking. Functioning panels would be packed and stored at the O&M building for reuse (functioning panels may produce power for another 25 years or more). Non-functioning panels would be packaged and sent to the manufacturer or a third party for recycling or another appropriate disposal method.
- Racking: Racking would be uninstalled, sorted, and sent to metal recycling facility.
- Steel Pier Foundations: Steel piles would be removed and sent to a recycling facility.
- Wire: below ground wire would be abandoned in place at depths greater than four feet. Wire at depths less than four feet would be removed and packaged for recycling or disposal.
- Conduit: Above-ground conduit would be disassembled onsite and sent to recycling facility.
- Junction boxes, combiner boxes, external disconnect boxes, etc. would be sent to a recycling facility.
- Inverter/Transformer: Remaining operation life would be evaluated for resale or to send to manufacturer and/or electronics recycler.
- Concrete pad(s): Concrete pads would be sent to a concrete recycler.
- Fence: Metal portions of the fence would be sent to a recycling facility and the wooden posts for the agricultural fence would be properly disposed.
- Computers, monitors, hard drives, and other components: Nonfunctioning parts would be sent to an electronics recycler, while any functioning parts would be reused.

Recycling of solar panels and equipment is rapidly evolving and can be handled through a combination of sources such as some manufacturers, PVCycle (an international program that some of the silicon manufactures participate in) or waste management companies.

2.18.2 Restoration/Reclamation of Facility Site

After all equipment is removed, the facility site would be restored to the agricultural production that existed prior to construction of the solar facilities. Holes created by steel pier foundations and fence poles, concrete pads, reclaimed access road corridors and other equipment would be filled in with subsoil, the site would be reclaimed approximately to the original topography that existed immediately prior to construction of the Project. Topsoil would be replaced (with original or better-quality topsoil), and the site would be seeded.

Chapter 3: Affected Environment and Environmental Consequences

This chapter describes the existing environment and the expected environmental consequences of the Proposed Action and the No Action Alternative. The affected environment for each resource is characterized based on a review of existing data, and the results of field investigations are included for some resources.

3.1 Geology and Soils

Based on South Dakota Department of Environment and Natural Resources (SDDENR) water rights well completion reports, it appears that bedrock is typically encountered anywhere from three to sixteen feet below ground (SDDENR, Undated).

There are nine unique soils within the Project Boundary; Table 2 lists the four most prevalent soil types within the Project Boundary and presents the total acres of each of these soil types.

The majority of soils within the Project Boundary range from clay to clay loam and are not susceptible to erosion by wind or water. The exception is Pierre clay, which is susceptible to erosion by water when found on slopes of greater than 6 percent; within the Project Boundary, there are 14.5 acres of this soil type on slopes greater than 6 percent.

The geological and soil types have a low potential for paleontological resources.



Table 2: Soil Series Characteristics within the Project Boundary

Soil Series	Landscape Location	Texture	Wind Erosion Rating	Water Erosion Rating	Farmland Classification ¹	Acres in Project Boundary	Percent of Project Boundary
Kyle clay	Nearly level to strongly sloping on uplands and colluvial fans; 0 to 6% slopes	Clay	Not highly wind erodible	Not highly water erodible	Not prime farmland	735.7	49.1
Pierre	Hillslopes on uplands; 2 to 20% slope	Silty clay to clay	Not highly wind erodible	Highly water erodible (when slope is > 6%) ¹	Not prime farmland	250.2	16.6
Nunn	Terraces or alluvial fans, or in drainageways; 0 to 6% slopes	Clay loam	Not highly wind erodible	Not highly water erodible	Prime Farmland if Irrigated	195.4	13.0
Hisle	Nearly level to moderately sloping on uplands; 0 to 6% slopes	Silt loam	Not highly wind erodible	Not highly water erodible	Not prime farmland	182.0	12.1

¹ Of the 250.2 acres of Pierre clay within the Project Boundary, only 14.5 acres are found on slopes of greater than 6 percent.

Source: Soil Survey Staff, Natural Resources Conservation Service, U.S. Department of Agriculture, 2020

3.1.1 Environmental Impacts: Proposed Action

The average depth to bedrock within the vicinity of the Project ranges from three to sixteen feet; some Project infrastructure may be installed at eight to fifteen feet below the surface. These components include:

1. If the under-ground collection system is used and shallow bedrock is encountered, there may be some areas where collection lines would be buried less than four feet from the ground surface to avoid impacting bedrock.
2. If the steel piers for the tracking rack system encounter bedrock, engineering solutions such as helical screws would be used to avoid blasting. Installation of the steel piers with helical screws to the bedrock is not expected to affect the structure integrity of the bedrock.

About 234 acres of soils would be temporarily impacted during construction. Of these 234 acres of soils, about 84 acres are classified as prime farmland, if irrigated, and about 7 acres are Pierre clay with greater than 6 percent slopes (Pierre clay soils are susceptible to erosion by water when found on slopes of greater than 6 percent, as noted above). Soils would be disturbed via activities like grading, trenching, and vegetation removal. These types of activities can lead to increased runoff, compaction, and mixing of soil layers. In the remaining 874 acres within the Project Footprint, no soil disturbance would occur during construction and existing vegetation would be left in place to maintain soil stability. The Project would not impact prime farmland.

Nearly 48 acres of soils would be permanently impacted by Project operation and long-term infrastructure, for example, the O&M building, collector substation, parking areas, and roads. These new solid-surface features would reduce the ability of soils to infiltrate precipitation to groundwater, potentially increasing the volume and rates of stormwater runoff.

No impacts to paleontological resources are anticipated.

To minimize impacts on geology and soils, the following BMPs would be used:

- Utilize the existing landscape (e.g., slope, drainage, use of existing roads), and avoid placing solar arrays within low-lying drainages, to minimize or avoid grading work and land disturbance.
- Develop and implement a SWPPP for the Project.
- Use appropriate silt fences, mulching, and temporary seeding to minimize soil exposure and to prevent eroded soil from leaving the disturbed area.
- Strip topsoil and organic matter, keeping topsoils segregated from subsoil. Temporary and permanent stabilization measures would be installed in areas of stripped topsoil, in accordance with the Project's SWPPP. Topsoil and subsoil would be replaced in the order they were removed, and the grade would be blended with existing topography, after grading is complete.
- Work during dry conditions, whenever possible, to minimize rutting, erosion, and runoff.
- Disturbed areas would be regraded to approximate original contours and revegetated with a native plant community in order to establish stable ground cover successfully, reduce erosion, reduce runoff, and improve infiltration.



3.1.2 Environmental Impacts: No Action Alternative

Under the No Action Alternative, no new impact on soil or geology resources would occur. Existing impacts to soils, such as incremental compaction and erosion due to grazing and farming are likely to continue.

3.2 Air Quality and Emissions

The nearest air quality monitoring station is approximately 11 miles west of the Project Boundary in Rapid City, Pennington County (SDDENR, 2016). In general, air quality in Pennington County is good and all of South Dakota is in attainment with national air quality standards (EPA, 2020). The primary emission sources that exist within the Project Boundary include agriculture and farming equipment and vehicle use along Interstate 90.

3.2.1 Environmental Impacts: Proposed Action

Construction activities could release air emissions of criteria pollutants, volatile organic compounds, greenhouse gas emissions (e.g., carbon dioxide), and small amounts of hazardous air pollutants. Air emissions would include:

- increase in fugitive dust emissions due to truck and equipment traffic.
- emissions from diesel trucks and construction equipment.

The Wild Springs Solar construction team will monitor dust from construction traffic. Standard industry practices would be implemented to control dust including mulching exposed soils, wetting exposed soils, maintaining vegetative cover (both cover crops and permanent vegetation), and reduced speed limits. Emissions from construction vehicles would be minimized by keeping construction equipment in good working order. As described above in the Geology and Soils Section (Table 2), the soils in the Project Boundary are not highly wind erodible, so wind erosion of soils is not anticipated.

Long term, negligible amounts of dust, vehicle exhaust emissions, and combustion-related emissions from diesel emergency generators would occur during maintenance activities. Operation of the collector Substation would produce minute amounts of ozone and nitrogen oxides emissions as a result of atmospheric interactions with the energized conductors and the use of sulfur hexafluoride-filled circuit breakers. Sulfur hexafluoride is a greenhouse gas, and therefore, equipment leaks could contribute to air quality impacts. Wild Springs Solar's O&M staff would also conduct monthly inspections of the collector substation to detect any equipment leaks in compliance with the National Electric Code.

3.2.2 Environmental Impacts: No Action Alternative

No impact on air quality would occur under the No Action Alternative and current emissions would be expected to continue at a similar rate. Presently, dust emissions occur annually during farming activities such as haying and harvesting.

3.3 Land Use and Land Cover

Land within the Project Boundary is privately owned (except for WAPA’s substation parcel) and predominantly used for livestock grazing and agricultural production. Cattle is the top livestock raised in Pennington County (USDA, 2017), and both forage crops and pasture land support cattle and other livestock operations in the area. As described further below, much of the land cover within the Project Boundary is used for livestock grazing (i.e., pasture land). The top crops grown in Pennington County (in acres) include forage (hay, haylage, grass silage, and greenchop), followed by wheat (predominantly winter wheat), corn, and sunflowers.

Commercial and utility developments include several existing transmission lines that tie into the New Underwood Substation and an existing railroad line that runs along the northern boundary of the Project Boundary. Additionally, Garrett Road, 161st Avenue, and 230th Street bisect portions of the Project Boundary. Solar panels are setback 30 feet from public road rights-of-way, per the Pennington County Ordinance.

There are no irrigated lands, major industries, or areas zoned for residential or commercial land uses in the Project Boundary. In addition, there are no recreation lands, tribally-owned lands (tribal trust lands, allotted trust lands, and fee lands), cemeteries, existing places of historical significance, or other public facilities within or adjacent to the Project Boundary.

Table 3 presents the total acres of various land cover types within the Project Boundary. Site visits and field studies are summarized in Appendix A. The predominant land cover types are herbaceous land and cultivated cropland (see Figure 5 – Land Use).

NLCD Category	Field Observations	Total Acres	Percent of Total
Cultivated Crops	Alfalfa, hay, and wheat (dryland)	320.7	21.4
Open Water	Delineated wetland	1.3	0.1
Emergent Herbaceous Wetlands	Delineated wetland	0.4	< 0.1
Herbaceous	Includes pasture, hay, and fallow grassland areas	1,130.8	75.5
Barren Land	Associated with the WAPA substation – gravel pad	6.0	0.4
Shrub/Scrub	Associated with the WAPA substation – no shrubs observed	1.5	0.1
Developed, All Categories	Generally, roads bisecting the Project Boundary	37.9	2.5
	Total	1,498.6	100

Source: MRLC, 2016

Dominant or co-dominant grass species observed in lands classified as Herbaceous include western wheat grass, crested wheatgrass, blue grama, buffalograss, and *Poa* spp. (bluegrass). In general, areas with less-intensive grazing and on ridgetops with shallow soils are dominated by the native shortgrass species blue grama and buffalograss, whereas the more heavily grazed and disturbed areas are dominated by the non-native crested wheat grass or bluegrass. Observations made during field surveys indicate that cattle have seasonal access to graze these areas, and

much of the acreage modeled as herbaceous land appears to be seasonally hayed. However, most areas of herbaceous land are highly fragmented by fences and existing transmission lines and roadways, which limits the available grazing areas to noncontiguous parcels of 80 acres or less. No rare plants were observed during field surveys.

Field verification efforts noted that dryland cultivated cropland is predominantly used to produce annual crops such as alfalfa, hay crop, and wheat and also includes all land being actively tilled. Cultivated cropland is predominately in the northwestern portion of the Project Boundary.

The Emergent Herbaceous Wetland NLCD category includes areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetation cover and the soil is periodically saturated with water. Within the Project Boundary, emergent herbaceous wetlands are associated with Boxelder Creek. Field observations noted few wetland communities within the Project Boundary. These few wetland communities were found within small drainage swales or around embanked ponds and typically contain a small fringe component of sedge or cattails depending on wetland type.

Areas categorized as developed (all types) by the NLCD data are primarily associated with roads bisecting the Project Boundary, the developed area around the WAPA substation, and the existing transmission lines throughout the area. In addition, the Rapid City, Pierre & Eastern Railroad runs parallel to the northern boundary of the Project Boundary.

Vegetation in the developed and barren landcover categories generally lack diversity, consisting largely of invasive and noxious species, or lack vegetation all together (MRLC, 2016). The existing WAPA substation is classified as barren and shrub/scrub cover types.

The Open Water category includes embanked wetlands and stock ponds in the Project Boundary, and generally exhibit less than 25 percent vegetative cover. As such, this category is not discussed further in this section and instead, can be found in the Water Resources section.

Invasive plant species observed onsite include Canada thistle (located primarily along roadsides, disturbed areas, and wetland perimeters), Russian thistle, Russian olive, cheatgrass, and Japanese brome. Canada thistle is the only species on the State noxious weed list; however, cheatgrass, an annual invasive grass that is native to Europe and eastern Asia, is a broad concern across all western rangelands and contributes to increased wildfire frequency and risk, reduced soil health (due to its shallow root systems), and less diverse native plant communities.

3.3.1 Environmental Impacts: Proposed Action

Table 4 provides the total impacts on existing land cover within the Project Footprint based on the preliminary design. No open water, emergent herbaceous wetlands, or barren land is within the Project Footprint; therefore, these NLCD categories are not included in Table 4.

Project Facilities	NLCD Category				
	Cultivated Crops (acres)	Herbaceous (acres)	Shrub/Scrub (acres)	Developed, All Categories (acres)	Total (acres)
Solar Arrays (fenced area)	280.0	755.2	0.3	1.9	1037.4
Access Roads	7.6	32.1	--	0.3	40.0
Laydown Areas (to be restored)	0.7	12.0	--	0.5	13.2
Collection lines outside the fence	0.2	8.5	--	0.9	9.6
Laydown Area (to be converted to parking lot)	--	5.5	--	0.2	5.7
Inverters	0.2	0.7	--	--	0.9
Stormwater Basin	--	0.6	--	--	0.6
Collector Substation	--	0.5	--	--	0.5
O&M Building	--	0.1	--	--	0.1
Project Total	288.7	815.2	0.3	3.8	1,108.1

Source: MRLC, 2016

While the precise route of the gen-tie transmission line is pending, it would be located within a corridor of the Project's leased lands until it crosses over into the New Underwood substation parcel (see Chapter 2). Based on review of the NLCD land cover types shown on Figure 5 (Land Use), construction and operation of the gen-tie transmission line would impact herbaceous and developed land cover types. These impacts would occur as a result of the 4-5 transmission pole structures, which typically have a footprint of 5-10 foot diameter per the structure footing, for a total of less than .01 acre for all poles (or approximately 393 square feet).

There are a total of 288.7 acres of cultivated cropland within the Project Footprint and construction and operation of the Project would remove these lands from production for the life of the Project (Table 4) and convert their use to developed land. Areas of cultivated cropland within the Project Footprint would be reseeded with a native seed mix that is similar to the surrounding herbaceous landscape for the life of the Project.

Similarly, construction of the Proposed Action would also remove 815.2 acres of herbaceous land currently being used for grazing and convert its use to developed for the life of the Project. While a solar facility is considered a developed land use, most of the land cover within the Project Footprint would be herbaceous with the exception of the access roads, Project substation, O&M building, parking lot, and inverters.

Construction of the solar facilities would not require removal of all vegetation within the Project Footprint. Rather, ground disturbance and vegetation clearing would be limited to some areas with greater than 5 percent slope and permanent facilities such as access roads, Project substation, O&M building, parking lot, and inverters. These facilities would permanently convert 47.3 acres total to impervious surfaces for the life of the Project: cultivated cropland (7.8 acres), herbaceous land (38.9 acres), and developed land (0.5 acre).

Wild Springs Solar would install fencing around the Project Footprint to prevent livestock from entering the solar facility during construction or operation and would work with landowners on the following issues: installation of gates and cattle guards where access roads cross existing fence lines, access control, signing of open range areas, and traffic management (e.g., vehicle speed management).

No lands used for recreation are present within the Project Boundary; therefore, the Proposed Action would not affect recreational land or public use of recreational land.

After construction of the solar facility is complete, Wild Springs Solar would revegetate the disturbed areas using a seed mix that includes recommendations provided by the NRCS and a cover crop. Approximately 96 percent of the land in the Project Footprint would be restored as open, herbaceous (i.e., within the racking area) rangeland cover (1,060.8 acres). Roughly 4 percent (47.3 acres) would be permanently converted to developed land with impervious surfaces (i.e., the substation and O&M building, inverter skids, parking areas, and access roads).

Additionally, Wild Springs Solar would remove up to five isolated willow trees in the western portion of the Project Boundary.

Wild Springs Solar developed a VMP that prescribes procedures and seed mixes that would be used during site restoration and ongoing vegetation management during operation of the solar facility. The VMP provides a guide to site preparation, reseeding, management of invasive species and noxious weeds, and control of erosion/sedimentation. Post-construction restoration work would continue for three years. Vegetation restoration targets are defined for each of the first three years of implementation of the VMP. A copy of the VMP is provided in Appendix B.

Seed mixes were designed to be native, blend with the surrounding landscape, and were developed in coordination with the NRCS to design a mix that would establish stable ground cover successfully, reduce erosion, reduce runoff, and improve infiltration. Many species in the seed mixes are similar to existing vegetation within the Project Boundary such as, blue grama grass and Western wheatgrass.

Construction of the Project has the potential to introduce or spread noxious and invasive species into areas where these species previously did not exist. For example, vehicles traveling from one area to another could inadvertently spread noxious and invasive species from roadside ditches or disturbed areas. Construction equipment will be cleaned prior to arriving at the work site to avoid the spread of weeds when traveling within the Project Footprint.

Additionally, the VMP outlines noxious weed and invasive plant control measures that Wild Springs Solar would implement during operation of the Project, which includes the following:

- Identifying and treating areas of noxious weeds or invasive plants and applying herbicidal treatments and
- Annual mowing to avoid invasive plants adding new seeds to the soil.



The U.S. Department of Agriculture, Natural Resource Conservation Service requested a Farmland Protection Policy Act review of the Project. Based on this review, the Project would not impact prime or unique farmland.

3.3.2 Environmental Impacts: No Action Alternative

Under the No Action Alternative, existing land uses would not change and no new impacts on vegetation would be expected. Existing impacts on land uses and vegetation, including livestock grazing and agricultural activities, would continue.

3.4 Water Resources

Groundwater

The Project Boundary is located within the Northern Great Plains aquifer system. The aquifer system extends more than 300,000 square miles, underlying most of North Dakota and South Dakota, and parts of Montana and Wyoming (USGS, 1996). According to the U.S. Geological Survey (USGS) Ground-Water Resources in the Black Hills Area, South Dakota, the principal aquifers within the Project Boundary listed by depth are the Deadwood, Madison, Minnelusa, Minnekahta, and Inyan Kara aquifers (USGS, 2003). Recharge of all five aquifers is primarily from infiltration of precipitation and lateral inflow but the Minnekahta and Minnelusa aquifers receive a substantial amount of recharge from stream flow losses. The water quality is good in all aquifers with the only large difference being an abrupt increase in concentrations of dissolved sulfate in the Minnelusa aquifer farther from outcrops. Well depth to these aquifers is typically at least 40 feet but can reach depths up to several thousand feet (Northern State University, undated).

Surface Waters

The Project Boundary is located within the Cheyenne River Basin. The Cheyenne River Basin consists of sub-region, basin, and sub-basin drainages. The Project Boundary is within the Cheyenne Sub-Region, Cheyenne Basin, and the Middle Cheyenne-Elk Sub-Basin (USGS, 2020).

The National Hydrography Dataset (NHD) represents U.S. drainage networks and related features, such as rivers, streams, canals, lakes, ponds, glaciers, coastlines, dams, and stream gauges (USGS, Undated). A review of this dataset identified one NHD basin and seven intermittent waterbodies within the Project Boundary (Figure 6 – Waterbodies, Wetlands, and Floodplains).

Five intermittent streams cross through the Project Boundary and flow into Boxelder Creek. Although Boxelder Creek is located outside of the Project Boundary, it is worth noting the creek's designation as an Impaired Water. As described in section 303(d) of the Clean Water Act (CWA), Impaired Waters do not meet established water quality limits. Boxelder Creek is listed as Impaired due to e. coli (SDDENR, 2020).

Wetlands

There are 9.5 acres of wetlands in the Project Boundary, including 2.4 acres of palustrine unconsolidated bottom wetland; 6.9 acres of palustrine emergent wetland; and 0.2 acre of riverine wetland (see a summary of the wetland review, including desktop and delineation work in Appendix A – Natural Resource Strategy).

Floodplains

Inside the Project Boundary, there are 135.2 acres within a 100-year floodplain, as designated by the Federal Emergency Management Agency (FEMA) (FEMA, 2013); see Figure 6 – Waterbodies, Wetlands, and Floodplains.

3.4.1 Environmental Impacts: Proposed Action

Groundwater

During Project construction, disturbances to soil and vegetation such as grading, clearing, trenching, or compaction could alter surface drainage and groundwater recharge patterns. To minimize impacts on groundwater during construction, Wild Springs Solar would install temporary and permanent erosion control and soil stabilization measures in accordance with the procedures outlined in the Project's SWPPP. Construction-related disturbance would occur above the water table of the aquifers in the Project Boundary; as such, no impacts on aquifers are expected.

Surface Waters

Based on aerial photography and the wetland delineation data, the Project design avoids three of the five intermittent streams that bisect the Project Boundary (see Figures 4a-d – Detailed Preliminary Project Layout maps). Of the two waterways that could not be avoided:

- One would be crossed by two access roads in the northwestern portion of the Project Footprint. Wild Springs Solar would utilize low water crossings and culverts to reduce impacts.
- The second waterway is along 230th Street in the southeastern portion of the Project Footprint. Wild Springs Solar would either bore collection lines beneath the waterway or utilize a Nationwide Permit, which is necessary for work in streams, wetlands, and other waters of the United States under Section 404 of the CWA.

Additionally, Wild Springs Solar would create a 0.6-acre stormwater basin in the southwest portion of the Project Footprint. The size and location of this basin were determined based on a review of drainage in the Project Boundary and the need for stormwater runoff mitigation. The basin is planned in an existing low area and would be vegetated with a wet mix that would help stabilize soils after rain events.

Wetlands

Of the 9.5 acres of wetland in the Project Boundary, 0.7-acres would be impacted by Project facilities and the remaining 8.8 acres would be avoided. The 0.7-acres of disturbance would

occur along 230th Street in the southeast portion of the Project Footprint, where collection lines would either be bored beneath the wetland/waterbody or a Nationwide Permit for dredge and fill within waters of the U.S. under Section 404 of the CWA would be utilized.

Floodplains

The Project Footprint overlaps with 82 acres of 100-year floodplain. Wild Springs Solar completed an initial assessment to determine if the Project would result in any adverse upstream impacts to the base flood elevation. The initial assessment suggests that the floodplain extents are significantly less than indicated by FEMA's effective mapping, and that adverse upstream impacts are very unlikely. Wild Springs Solar has coordinated with Pennington County and plans to seek a Letter of Map Revision (LOMR) from FEMA. Wild Springs Solar submitted the LOMR application on November 23, 2020. Wild Springs Solar is currently coordinating with FEMA on the LOMR. Assuming the mapping revision is granted, a Floodplain Permit would not be required. Alternatively, if the mapping revision is not granted, Wild Springs Solar would seek a Floodplain Permit through Pennington County.

3.4.2 Environmental Impacts: No Action Alternative

No new impacts on water resources are anticipated under the No Action Alternative.

3.5 Federally Listed Threatened and Endangered Species

Whooping Crane, Black-Footed Ferret, northern long-eared bat (NLEB), and Rufa Red Knot, are the four federally listed threatened and endangered species that may occur within the Project Boundary (USFWS, 2019a). A detailed description of these four species follows.

Whooping Crane

The U.S. Fish and Wildlife Service (USFWS) defined both a national and South Dakota state-specific migration corridor, which contain 95 percent of the whooping crane observations documented during migration from the early 1960s through 2007 (Tacha et al., 2010). This corridor includes a large portion of the prairie pothole region that is characterized by abundant wetlands interspersed with cropland that provides suitable migration stopover habitat (feeding in agricultural fields and resting in wetland complexes). The Project is located within the outer limits of the USFWS state-specific corridor, and over 45 miles west of the USFWS national corridor. The Project is located approximately 13 miles west of the more recent USGS corridor.

The closest documented observation of a whooping crane is approximately 11 miles west of the Project Boundary (from available data through Spring of 2018; USFWS Cooperative Whooping Crane Tracking Project, 2018). The Project Boundary contains 75 percent herbaceous cover and generally lacks the abundant wetlands interspersed with cultivated cropland that whooping cranes prefer (21.4 percent of the Project Boundary is cultivated crops; 0.1 acre is open water or emergent herbaceous wetlands; see Table 3). Generally speaking, more abundant suitable habitat occurs outside the Project Boundary.

Black-Footed Ferret

Black-footed ferrets have been reintroduced into Badlands National Park, Buffalo Gap National Grasslands, Cheyenne River Sioux Reservation, Lower Brule Sioux Reservation, Rosebud Sioux Reservation and Wind Cave National Park and therefore occur in Pennington County; however, this population is just under 30 miles from the action area and this species is not expected to occur within the Project. The closest historic record of black-footed ferret was about 20 miles away from the Project in 1913.

Black-footed ferret require black-tailed prairie dog colonies of at least 100 to 120 acres to support one ferret (Ulev, 2007). There are two black-tailed prairie dog colonies in the southwest corner of the Project Boundary. The colonies currently total 52 acres and, based upon previous years' satellite imagery (2011-2019), the colonies were once contiguous across a larger area totaling approximately 60 acres.

Northern Long-eared Bat

NLEB are tree-roosting bats that hibernate during winters in caves and mines. Over the last decade, hibernating bats have been susceptible to White Nose-Syndrome (WNS), a disease known to have killed millions of hibernating bats. The USFWS's White-Nose Syndrome (WNS) Zone map, dated July 25, 2019, shows Pennington County is within 150 miles of several known WNS-infected hibernacula (USFWS, 2019b). However, there are no documented hibernacula within the Project Boundary, and suitable habitat for the NLEB is not present. The species is forest-dependent and requires forested areas for roosting in summer, but no forested habitat was identified in the Project Boundary based on NLCD data. Aerial imagery analysis identified 0.19 acres of scattered patches of shrubs and trees within the Project Boundary that is not suitable for NLEB.

Further, desktop analysis and wildlife reconnaissance surveys for the Project did not identify features (i.e., caves or mines) that would provide suitable winter habitat. The nearest potentially suitable habitat are the forested areas along the riparian corridor of Boxelder Creek, located within one mile and to the northeast of the Project.

Rufa Red Knot

The occurrence of the federally-threatened rufa red knot in South Dakota is unpredictable. The number of migrating shorebirds documented in the interior can vary dramatically due to high inter-annual variability in water levels and habitat quality at mid-continental wetlands. There are less than 10 acres of wetlands with open water in the Project Boundary that could provide suitable stopover habitat (USFWS, 2014).

There is potential for this species to occur within Pennington County, but the red knot has not been documented in the Project Boundary and has rarely been observed in the surrounding region. The nearest detection records are east of Martin, SD, approximately 90 miles southeast of the Project and along the Missouri River corridor approximately 100 miles east of the Project (eBird, 2019; SDNHP, 2019).

3.5.1 Environmental Impacts: Proposed Action

Due to the low likelihood or frequency of federally listed species presence and lack of suitable habitat in the Project Boundary, no impacts on federally threatened and endangered species are anticipated. Based on the following information, WAPA has determined the Proposed Action would have “no effect” on federally listed threatened and endangered species.

Whooping Crane

The Project is located in an area with low potential for whooping crane use and higher suitability habitat is located outside of the Project Boundary (Niemuth et al., 2018). Of the 9.5 acres of potentially suitable habitat within the Project Boundary, temporary impacts to 0.7 acres of wetlands would not result in impacts to whooping crane stopover habitat because the functionality of the wetland would remain for the life of the Project.

The Project’s location, on the edge of the 95 percent state migration corridor and well outside the national corridor, greatly reduces the likelihood of whooping crane stopovers and associated potential impacts. The lack of wetlands suggests insignificant risk of disturbance or diversion impact. The potential for the panels to appear as a wetland to migrating whooping cranes resulting in mortality is discountable because cranes do not typically fly over the area. Further, significant water-obligate bird discoveries have not been reported at solar facilities (see Fish and Wildlife section). Given the Project Footprint has relatively low habitat suitability, and corresponding low likelihood of crane use, WAPA has determined the Proposed Action would have “no effect” on whooping cranes.

Black-Footed Ferret

The Project lacks suitable habitat for the black-footed ferret because the prairie dog colony, even in its larger former extent, is not large enough to meet the species’ life history requirements.

Additionally, black-tailed prairie dog towns in all of South Dakota are block-cleared by the USFWS Pierre Ecological Services Field Office, meaning the towns no longer contain any wild, free-ranging black-footed ferrets, and activities within these areas that result in the removal of the black-tailed prairie dogs and/or their habitat are not required to meet the USFWS survey guidelines for black-footed ferrets. Given this information, and due to the lack of occurrences outside of the reintroduced populations, it is unlikely this species would occur at the Project. Therefore, WAPA has determined the Proposed Action would have “no effect” on black-footed ferret.

Northern Long-eared Bat

There is no Project activity within 0.25 mile from known hibernacula, no clearing of maternity roost trees, and no tree clearing within 150 feet from known maternity roost trees during June and July. Up to five isolated trees would be cleared as a result of Project construction, but these trees are not considered suitable bat habitat due to their isolated nature and distance from suitable habitat that comprise connectivity buffers. Regardless, Wild Springs Solar would not remove trees between June 1 and July 31.

Therefore, WAPA has determined the Proposed Action would have “no effect” on NLEB.

Rufa Red Knot

There is limited suitable habitat (less than 10 acres of wetlands) within the Project Boundary. Furthermore, the red knot is a rare migrant in the spring and fall along the Missouri River corridor approximately 100 miles east of the Project. As such, the potential for the red knot to occur within the Project is minimal.

Given the limited habitat in the Project Boundary, the unpredictability of rufa red knots in South Dakota, and the absence of records within the Project Boundary, it is unlikely that rufa red knots would occur within the Project Boundary. Therefore, WAPA has determined the Proposed Action would result in “no effect” to Rufa red knot.

3.5.2 Environmental Impacts: No Action Alternative

Under this alternative, no action would be taken and there would be “no effect” on federally-listed threatened and endangered species.

3.6 Fish and Wildlife

Project-specific wildlife surveys began in April 2017 and are summarized in Table 5. Of the 28 species on the Birds of Conservation Concern (BCC) list, the golden eagle and lark bunting warrant special attention in this Project Boundary (USFWS, 2019a). In addition, prairie grouse, lark bunting, burrowing owl, grassland birds, waterbirds, and raptors are species of interest with regard to the Project. Prairie dogs, swift fox, bats, and other mammals are also discussed in detail herein in order to provide a basis for the determination of if and how they may be affected by the Project.

Survey Type	Dates
Sharp-tailed Grouse and Greater Prairie Chicken Lek Surveys	April 10-14, 2017 April 2020
Ground-based Raptor Nests Surveys	April 2017 October and November 2019 April 2020
Breeding Bird Survey	May and June 2020 Years 2 and 4 Post-Construction
Prairie Dog Colony Assessment, including swift fox den suitability and presence/absence surveys for burrowing owls	May and June 2020 Pre-construction 2021

Sharp-Tailed Grouse & Greater Prairie-Chicken (Prairie Grouse)

Greater prairie-chickens are likely absent from Pennington County, while sharp-tailed grouse leks are known to occur within the County (SDGFP, 2017). Prairie grouse populations have declined due to a combination of habitat conversion and destruction stemming from agricultural

practices and cattle grazing (SDGFP, 2017; Johnson et al., 2011; Connelly et al., 1998). Prairie grouse use heterogeneous habitats throughout their life stages, including native prairie with tall grass and medium grass components, field edges, croplands, and grasslands with thick residual growth (Johnson et al., 2011; Connelly et al., 1998).

Herbaceous land within the Project Boundary has the potential to be used by prairie grouse. Therefore, there are 1,130 acres of potential lek habitat in the Project Boundary. Surveys for greater prairie-chicken and sharp-tailed grouse leks were conducted throughout the 2017 Project Boundary, and no leks were documented. A second lek survey was conducted in April 2020, and no leks were documented in the current Project Boundary. Six prairie grouse were recorded during surveys, but there was no observed lekking behavior and a lack of concentrated sign of presence that would suggest groups of grouse repeatedly use the area (Area M, 2017).

Lark Bunting

Lark buntings have been sighted within one mile of the Project as recent as 2014, but were not observed incidentally during field visits in 2017 and 2019. During breeding bird surveys, lark bunting was frequently observed. Sixty-five individual lark bunting observations were recorded over the three breeding bird survey visits both within the Project Boundary and in the reference areas located immediately adjacent to the Project Boundary (Table 5; Pardieck et al; Appendix A). Fifty-two of these observations were within the Project Boundary. These observations were primarily of calling males, and some observations were likely repeat sightings of the same individuals over the course of the breeding season. A coarse, preliminary analysis estimated at least 18 breeding pairs within the Project Boundary.

Within the Project Boundary, lark buntings were observed within both cultivated areas (planted in alfalfa) and grasslands. Both the consistent presence of this species throughout the breeding season and the territorial behavior observed suggests this species is likely breeding both within the Project Boundary and in nearby areas.

Burrowing Owl

Burrowing owls are a BCC, as well as a species of greatest conservation need in South Dakota (SDGFP, 2014). These owls nest in mammal burrows and prefer habitat in prairie dog colonies or pastures (Drilling et al., 2018). Although Burrowing Owls frequently hunt within their selected prairie dog colonies, their home ranges often extend beyond the boundaries of prairie dog colonies, where other prey are available (Thiele et al., 2013; Butts 1973; Orth and Kennedy 2001; JPT, pers. obs.).

Three burrowing owls were incidentally observed during wetland delineations in Spring 2017 at a prairie dog colony in the Project Boundary. Two burrowing owl pairs were observed incidentally during the breeding bird surveys in 2020. The burrowing owl observations were incidental because they were seen outside of the 328-foot (100-meter) survey radius. One pair was observed on May 27 in the northeast portion of the larger prairie dog colony, approximately 131 feet (40 meters) south of the transmission line that bisects the central portion of the Project Area in an east-west direction. . A second observation of a pair was made during surveys on June 23, also in the northeast portion of the larger prairie dog colony, approximately 263 feet (80



meters) south of the transmission line. These pairs were over 656 and 984 feet (200 and 300 meters) from the observer, respectively, so behavior could not be directly observed. It was not clear if this is one or more pairs based on the locations. However, observations of one or two burrowing owl pairs within a prairie dog colony during the nesting season suggests burrowing owls are likely breeding in prairie dog colonies within or adjacent to the Project Area. Any potential burrowing owl nest would likely be found within burrows associated with prairie dog colonies.

Prairie Dogs

During general wildlife reconnaissance surveys in 2019, surveyors documented two black-tailed prairie dog colonies in the southwest corner of the Project Boundary. The colonies are approximately 44 acres and 8 acres in size and likely associated with satellite colonies based on satellite imagery which shows that the colonies were contiguous in previous years across a larger area (approximately 60 acres, based on aerial photography). Prairie dogs are not a protected species, but their colonies may provide habitat for other sensitive wildlife, such as burrowing owl, swift fox, and black-footed ferret.

Swift Fox

The swift fox is a state threatened species, reflecting its declining abundance. This fox is known to occur in Pennington County, but the nearest occurrence records are 20 miles away in Buffalo Gap National Grasslands and Badlands National Park. It prefers warm season grass/shrub conditions and there are prairie dog colonies that may provide suitable habitat for swift fox in the Project Boundary. In May and June 2020, Wild Springs Solar field-evaluated the 2019 mapped prairie dog colonies for suitable swift fox dens, which are larger than the prairie dog holes and typically measure 7-8 inches wide and 8-9 inches tall. None of the prairie dog burrows within the 2019 mapped colonies are large enough to suggest swift fox dens use has or would occur.

Grassland & Migratory Birds

Migratory birds are protected under the Migratory Bird Treaty Act ([MBTA]; 16 U.S. Code [USC] 703-711). The MBTA, as amended, prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, or nests unless authorized under a USFWS permit. On December 22, 2017 the Department of the Interior Solicitor's Office Released Opinion M-37050 (M-Opinion) which determined that the legal scope of the MBTA applies only to an intentional "take" of migratory birds and concluded that an incidental "take" is not prohibited when the underlying purpose of that activity is not to take birds. A final regulation defining the scope of the MBTA (i.e., adopting the conclusion of the M-Opinion), was published in the Federal Register on January 7, 2021 and went into effect on March 8, 2021. However, also on March 8, 2021, the Department of Interior issued a Memorandum permanently revoking and withdrawing the M-Opinion. To date, the final regulation effective on March 8, 2021 is still in place; however, based on the Department of Interior's subsequent withdrawal of the M-Opinion, additional changes to the regulation are anticipated. Regardless of ruling, DOE commitments under the MBTA explicitly define "take" to include both intentional and unintentional (incidental) action and obligations to minimize incidental take of migratory birds under E.O. 13186 would remain unchanged.

Eleven grassland bird species of fragmentation concern may occur in the Project Boundary (Bakker, 2020; SDGFD, 2020) across the approximately 1,131 acres of herbaceous land or potential habitat. These species include burrowing owl, upland sandpiper, long-billed curlew, western meadowlark, lark bunting, sharp-tailed grouse, grasshopper sparrow, northern harrier, Sprague’s pipit, chestnut-collared longspur, and savannah sparrow. The herbaceous areas include potentially untilled lands used for grazing, hay production, and fallow areas. Therefore, local grassland birds are presumably somewhat adapted to a degree of disturbance from grazing cattle and agricultural equipment. Additionally, there are about 38 developed acres that are generally in the form of roads bisecting the project, so there is existing fragmentation.

The species observed during grassland breeding bird surveys conducted during May and June of 2020 are summarized in Table 6, below. Eighteen grassland bird species were observed, as well as one unidentified sparrow, and no federally or state-threatened or endangered species were recorded during surveys within the Project Boundary and two adjacent reference sites. Most of the grassland species observed within the Project area are considered common and do not have special protections in South Dakota. Three species are designated as BCC: lark bunting, marbled godwit, and upland sandpiper (USFWS, 2008). Lark bunting and marbled godwit are also listed as species of greatest conservation need in South Dakota (SDGFP, 2014). Additionally, lark bunting, marbled godwit, savannah sparrow, upland sandpiper, and western meadowlark are designated as species of habitat fragmentation concern in South Dakota (Bakker, 2020). One species, western meadowlark, has been found occurring within (and as fatalities at) operating solar PV in the western U.S. (Kosciuch et al., 2020). Although these eighteen grassland species were observed during this survey, not all of these were confirmed to be breeding within the Project site. In fact, species such as the red-winged blackbird and yellow-headed blackbird are unlikely to nest in the areas that will be disturbed by Project construction. This is because the 9.5 acres of wetlands within the Project Boundary is a relatively low amount to support blackbird breeding and only 0.7 acre will be temporarily impacted during construction. After construction, the 9.5 acres of wetlands within the Project Boundary will have their functionality, including habitat for birds.

Common Name	# Groups	# Individuals	Status	Breeding Behavior Observed¹
American robin	2	2	-	Yes – young observed
barn swallow	1	1	-	Yes
Bobolink	9	9	-	Yes
brown-headed cowbird	51	101	-	Yes
cliff swallow	1	1	-	Yes
common nighthawk	10	10	-	Undetermined
horned lark	11	13	-	Yes
Killdeer	18	23	-	Yes
lark bunting	61	65	BCC, SGCN, SHFC	Yes
marbled godwit	1	1	BCC, SGCN, SHFC	Yes
mourning dove	16	21	-	Yes – nest observed

Table 6: Summary of Grassland Bird Species Observed during Breeding Bird Surveys

Common Name	# Groups	# Individuals	Status	Breeding Behavior Observed ¹
red-tailed hawk	1	1	-	No
red-winged blackbird	102	160	-	Yes
Savannah sparrow	114	114	SHFC	Yes
unidentified sparrow	1	1	-	No
upland sandpiper	58	63	BCC, SHFC	Yes
western meadowlark	158	170	SHFC	Yes – young observed
yellow warbler	1	1	-	Yes
yellow-headed blackbird	1	1	-	Yes

BCC = USFWS Birds of Conservation Concern, SGCN = SDGFP Species of Greatest Conservation Need, SHFC = USFWS Species of Habitat Fragmentation Concern

¹Behavior such as territory defense, material carry, food carry, nest observed, or young observed would be considered breeding behavior.

As shown in Table 6, the grassland bird community in the Project Boundary and adjacent reference sites contains a diverse group of grassland bird species. Nearly 75 percent of observations were of western meadowlark, red-winged blackbird, savannah sparrow, and brown-headed cowbird. Other species were observed less frequently due to either fewer individuals present, territory size relative to the survey areas (i.e., only one breeding pair of red-tailed hawks would be expected to occupy the Project Boundary, or lack of breeding behavior observed on subsequent surveys (i.e., a yellow warbler may have been observed singing on territory during the first survey, but not on subsequent visits). All species except red-tailed hawk, common nighthawk, and unidentified sparrow demonstrated breeding behavior such as territory defense, material carry for nest building, food carry, and/or nest or young observed. Because many species had multiple observations, it's likely that some individuals were observed during multiple survey visits; that is, there are not 170 individual western meadowlarks within the Project Boundary and two reference sites.

Waterbirds

Waterbirds (including waterfowl, shorebirds, seabirds, and wading birds,) may make use of the 9.5 acres of existing wetlands in the Project Boundary, (including 2.4 acres of palustrine unconsolidated bottom wetland; 6.9 acres of palustrine emergent wetland; and 0.2 acre of riverine wetland). Based on preliminary data from the three rounds of breeding bird surveys, nine species classified as either waterbirds, waterfowl, or grebes were observed. Seven of these species were observed within the Project Boundary (great blue heron, American wigeon, blue-winged teal, Canada goose, gadwall, mallard, and northern pintail), with the remaining two species only observed in nearby reference plots (pied-billed grebe, green-winged teal).

Direct evidence of nesting within the Project Boundary was not observed; however, there was evidence of nesting observed in the general area. For example, a blue-winged teal hen was observed with a brood of six outside of the Project site, just south of the easternmost parcel. Observing these species relatively late in the waterfowl nesting season, regardless of behavior, suggests these species are breeding in the general area.

Interior least tern was recently delisted by USFWS (USFWS, 2021). The species is only known to nest on sandbars along the Missouri and Cheyenne Rivers in South Dakota (SDGFP, 2005). Similarly, this species uses sandbars for stopover habitat during migration. The Cheyenne and Missouri Rivers are approximately 20 miles and 100 miles east of the Project Boundary, respectively.

Raptors

During ground-based surveys in 2017, 2019, and 2020, nine raptor stick nests (3 red-tailed, 2 great-horned, remainder unoccupied) were located within about 1 mile from the current Project Boundary. The remnants of one potential raptor nest was found, but it was no longer functional at the time it was documented and as of early April 2020, there were no raptor nests within the Project Boundary. Seven species of raptors were observed incidentally in the general Project area including: red-tailed hawks, northern harriers, American kestrels, Swainson's hawks, short-eared owls, rough-legged hawks, and burrowing owls.

State Listed Threatened and Endangered Species

There are 11 state-listed threatened and endangered species that may be present in Pennington County, South Dakota. Potential presence of species that are also federally listed (NLEB, interior least tern, black-footed ferret, and whooping crane) are described above in the federally-listed species section. The Project Boundary lacks suitable habitat for the state-listed species that are water-dependent, including northern river otter, American dipper, osprey, sturgeon chub, and longnose sucker. Similarly, the absence of cliff ledges and few trees make it unsuitable for peregrine falcons. No state-listed species have been documented within the Project Boundary. Therefore, there would be no impacts to state-listed threatened or endangered species under the Proposed Action or No Action Alternatives and those species are not discussed in further detail.

Golden Eagle

Golden eagles have been sighted within one mile of the Project as recent as 2013, but sightings appear infrequent and primarily occur west of the Project near the Black Hills National Forest (eBird, 2018). During the period of 1995 to 2019, one golden eagle observation was recorded (2017) along the Railroad Butte Breeding Bird Survey Route (approximately 10 miles southwest of the Project Boundary). During the period between 1966 and 2014, ten observations of golden eagles were recorded along the Owanka Breeding Bird Survey Route (approximately 11 miles southeast of the Project Boundary). Beyond an unquantifiable reduction in prey availability or foraging habitat, the lack of presence suggests a lack of impacts, so no further discussion is provided.

Bats

Six bat species occur in eastern South Dakota: big brown bat, eastern red bat, hoary bat, little brown bat, silver-haired bat, and NLEB (Harvey et al. 2011). As described in the Land Use and Land Cover section, there is no forested habitat with the Project Boundary. Additional desktop analysis, using true-color aerial imagery, identified scattered patches of shrubs and trees within the Project Boundary. Bats require forested corridors or groups of trees within 1,000 feet of forested areas for roosting and foraging. The shrubs and tree patches within the Project Boundary



measure 0.19 acres and would likely not be suitable for the bat species listed above due to their isolated nature and lack of connectivity to larger forested patches. The nearest potentially suitable habitat is the forested corridor along Boxelder Creek, located less than one-mile northeast of the Project. The isolated trees and wetlands within the Project Boundary offer limited bat habitat for roosting and foraging, so bat use is likely to be low.

Other Mammals, Reptiles, Insects, & Fish

Mammals that may be present include white-tailed deer, mule deer, striped skunk, red fox, raccoon, badger, Virginia opossum, and coyote. In total, 8 mammals were detected during field surveys (Area M, 2019). Reptiles that may occur in the Project Boundary are plains garter snake, gopher snake, and prairie (eastern fence) lizard (SDGFP, Undated). Pollinator insects may be present in the Project Boundary including native bees, butterflies, and moths. Fish species are unlikely to be present in the Project Boundary given the small amount of open water (see the Water Resources section).

3.6.1 Environmental Impacts: Proposed Action

The following sections disclose the potential for wildlife impacts to result from Project implementation. First, a list of the Project's environmental commitments is provided. Then, a general overview of effects common to multiple species is disclosed according to project phase. Finally, individual species' specific impact analyses are provided.

Environmental Commitments

- Disturbance avoidance: Wild Springs Solar will site the Project so that the perimeter fence excludes the 2019 mapped extent of both prairie dog colonies.
 - Prior to construction, Wild Springs Solar will evaluate the active extent of the prairie dog colony. Should the extent of active burrows within the 2019 mapped colony decrease, Wild Springs may site project facilities within that area. If burrowing owls or Swift fox are observed during the nesting and denning seasons in the active colony, Wild Springs Solar would avoid construction within quarter mile of the nest or den until after the nesting and/or natal denning season. This measure is consistent with South Dakota Department of Game, Fish, and Parks (SDGFP) recommendations.
 - Prairie dog exclusionary fencing options may be utilized in portions of the Project such as chicken-wire below the chain link fence extending below grade.
 - After construction, Wild Springs Solar will implement USFWS and SDGFP recommendations about vegetative management to minimize the potential for colony expansion into the Project Footprint. This may mean maintaining vegetation near the prairie dog colonies at a taller height to deter prairie dogs from encroaching into the Project Footprint.



- Should the 2019 mapped extent of the prairie dog colony expand into the proposed fence line prior to construction, Wild Springs Solar will implement additional measures to deter nesting or denning within the Project Footprint:
 - Burrows that could be used by burrowing owls for nesting outside the 2019 mapped colonies' extent and within the fenceline would be collapsed after the breeding season (May 15 to August 15).
 - Larger burrows that could be used by larger mammals (e.g., badger or Swift fox) would be monitored for activity during the natal denning season (April 15 to July 1) and if not active during that timeframe, collapsed outside of the denning season.
 - Alternatively, if construction does not commence until the Spring of 2022, any existing burrows that could be used by burrowing owls for nesting or larger burrows that could be used by a badger or Swift fox would be collapsed outside of the nesting and denning season in the early Winter of 2021.
- Wild Springs Solar would fence the perimeter of the Project Footprint to prevent large mammal species from entering and would also ensure that no large mammal species are within the fence during construction.
- Above-ground Project facilities (solar panels, fencing, access roads, collector substation, and O&M building) would be sited no closer than 65 feet to wetlands within the Project Boundary.
- Grading would be minimized as the site conditions allow and all areas of temporary construction disturbance would be revegetated with a native grass mix. This would stabilize the soil and help to recover wildlife habitat.
- Wild Springs Solar's gen-tie transmission line would be constructed according to Avian Power Line Interaction Committee's recommendations on conductor spacing, line grounding, and transmission line configuration on the poles to minimize the risk of electrocution to birds.
- Wild Springs Solar would compare the pre-construction surveys and two years of post-construction breeding bird surveys to determine if any displacement or change in avian use has occurred.
- Wild Springs Solar would also implement a Wildlife Incident Reporting System to record avian carcasses that are discovered during routine operation and maintenance activities on an annual basis until the post-construction avian surveys are complete.
- Wild Springs Solar would consider other measures to enhance wildlife habitat such as American kestrel nest boxes or allowing beekeeping. Additionally, the native grass seed mix to be used for restoration will also include pollinator plants for bees and butterflies.
- Wild Springs Solar will limit traffic speeds on access roads to 25 mph.



- All South Dakota prohibited noxious weeds and other problem plants (identified in Appendix B - Vegetation Management Plan) will be treated repeatedly with herbicide and mowed where appropriate at a frequency sufficient to prevent seed set and to remove target weeds over time. Additionally, Wild Springs Solar will adhere to the Pennington County Noxious Weed Plan that has been incorporated into the Vegetation Management Plan.

Construction, Operations, & Decommissioning

Project construction, operations, and decommissioning activities would potentially impact wildlife, including disturbance, mortality, and habitat modification, fragmentation, or removal. The solar array, access road, and fence components of the project have the highest potential for ecological impacts.

During construction and decommissioning, highly mobile species of wildlife, including large mammals, raptors, and adult birds, are expected to divert to surrounding areas. Species with smaller ranges are most likely to experience disturbance from construction and decommissioning. Operations activities are expected to have relatively benign disturbance impacts on wildlife, but the increase in vehicle traffic for maintenance over the 30-year life of the Project will divert, deter, or kill some animals. BMPs lessen this potential, especially for species of concern. Construction is anticipated to last up to twelve months beginning in Fall 2021 and be complete by the end of 2022.

There is the potential for direct avian mortality at solar facilities due to collision with PV panels (Smith and Dwyer, 2016; Kagan et al., 2014). The solar arrays would occupy most of the Project Footprint for the 20 to 30 year operational duration of the facility. Specifically, the PV panels (up to 7 feet long, 4 feet wide and 20 feet high) would cover 1,037 acres within the 1,108 acre Project Footprint. Kosciuch et al. summarized avian fatality data associated with the only publicly available studies of PV utility-scale solar projects in 2020. This summary included fatality monitoring data from 13 studies at 10 PV solar facilities in the Southwestern U.S. located in the Sonoran and Mojave Deserts bird conservation regions, two studies in the Coastal California bird conservation region, and one study in the Great Basin bird conservation region. There are no publicly available studies in the northern Great Plains in which the Project is located. In two studies conducted in areas dominated by arid grasslands similar to the Project Footprint but in the Coastal California bird conservation region, no large fatality events were documented and the cause of bird death in a majority of cases was unclear (Kosciuch et al., 2020). In these two studies, the most commonly found dead birds were resident species common to those grassland areas, (mourning dove, horned lark, and western meadowlark), and water associate or water obligate birds were not found. Direct avian mortality due to access roads is not anticipated because Wild Springs Solar will implement speed limits within the Project Footprint to minimize collisions with construction, operations, and maintenance vehicles.

Habitat fragmentation would result from the permanent 7-foot high fence (6-foot chain link topped with one additional foot of barbed wire). The fencing would stretch 17.3 miles along the perimeter of the solar arrays, acting as a barrier to prevent large mammals (i.e., whitetail or mule deer, pronghorn) from using these portions of the Project Footprint. This permanent fencing would enclose blocks of panels, rather than surrounding the entire Project Footprint with a single fence (see Figures 3 and 4a-4d for fencing locations). Therefore, there are corridors through the

Project Boundary for ground-based wildlife to move around or between the fenced areas. Additionally, fencing could result in less habitat for swift fox and burrowing owls and less prey for raptors in portions of the Project because the current prairie dog colony would not be able to expand to encompass their former range. Wildlife species that would not be excluded by the fences (some small birds, small mammals, amphibians, reptiles) are expected to continue to use the Project area to some degree. Within the fence, the Project will utilize 20 miles of access roads that would contribute to the habitat fragmentation.

The PV panels would shade plants under the panels, resulting in habitat modification or removal of approximately 1,037 acres. Approximately 96 percent of the disturbed area would be revegetated with a rangeland seed mix composed of plant species similar to those observed during field surveys. The revegetation effort would use three seed mixes and is expected to result in “recovery” to open, herbaceous rangeland cover over 20 to 30 years, beginning in 2022. Whereas 47.3 acres of habitat the land in the Project Footprint would be completely removed due to gravel groundcover without reseeding. The wildlife community using the areas and PV panel array areas may change after the Project begins operations, as the habitat is altered, but the area is expected to host ongoing use by some groups of wildlife, especially those somewhat adapted to a degree of fragmentation and current land uses. The construction of approximately 20 miles of (16 to 45 foot wide along curves) graveled access roads would permanently remove all vegetation and wildlife habitat across 40 acres. Additionally, vegetation and habitat would be permanently removed across less than 18 acres for other project facilities (parking lot, outside fence collection lines, inverters, stormwater basin, substation, O&M Building).

Construction and operation of the Project has the potential to introduce noxious and invasive species into areas where these species previously did not exist.

Sharp-Tailed Grouse

Sharp-tail grouse are sensitive to noise, so construction and decommissioning activities could disturb them. Risk of disturbance increases if there is an unknown lek within two miles of the Project Boundary and if these project activities were to occur from 1 March to 30 June (and during the 3 hours after sunrise and 1 hour before sunset). However, this risk is low, since lek surveys did not document breeding behavior and the construction and decommissioning timeframes are relatively short-term. This Project would contribute to incremental habitat conversion, which has been attributed to prairie grouse population decline. The Project would render the 1,130 acres of potential lek habitat unsuitable and could disturb individual grouse in the Project vicinity, outside of the Project Boundary. Impacts to breeding grouse are not anticipated because observations of prairie grouse in the Project Boundary have been of roosting, not breeding birds. Complete loss of grouse feeding, sheltering, and breeding habitat is expected across the 1,130 acres. The Project’s 17.3 miles of new permanent fencing would likely not increase collision mortality potential for grouse because chain link fencing is much more visible than 3-strand barbed wire where collision risk is well documented with some grouse species (i.e., greater sage-grouse). Sharp-tailed grouse are a species of habitat fragmentation concern, so “separation of their habitats into smaller blocks reduces connectivity such that the individuals in the remaining habitat segments may suffer from effects such as decreased survival, reproduction, distribution, or use of the area” (Bakker, 2020).



Lark Bunting

The Project's relative decrease in usability of grassland and shrubland by 815 acres would result in lark bunting habitat removal. This suggests a resulting decrease in lark bunting occurrence in the area post-construction because they are positively associated with percent coverage of grasslands and shrubland (Niemuth et al., 2017). The Project's resulting fragmentation effects on Lark bunting, include avoidance of fragmented areas or decreased density, survival, and/or reproduction in fragmented habitats.

Burrowing Owl

Burrowing owls would be impacted by the Project, especially since the proposed fence abuts the prairie dog colonies where at least one (assumed breeding) pair was observed. However, the environmental commitment to avoid construction within a quarter mile of a nest until after the nesting season (May 15 to August 15) would reduce the intensity of breeding impacts, and disturbance at nest and roost sites is not known to be a threat (Klute et al 2003).

Outside the nesting season, the commitment to collapse any newly formed burrows prior to construction would deter use by burrowing owls, therefore lessening the magnitude of potential for disturbance from construction activities.

The Project would result in foraging habitat removal and breeding habitat degradation, due to prairie dog control efforts which are a known threat to the species. The reduction in habitat quality and quantity may reduce reproductive success and/or the number of owls the area can support, due to reduction in prey availability or increase of inter-species competition. The Project could also result in incidental mortality, especially of less-mobile young.

Prairie Dogs

Project impacts on prairie dogs would be reduced by avoiding the 2019 mapped extent of the prairie dog colonies. However, the Project Footprint overlaps 8 acres of the prairie dog colony's former extent. This habitat would be permanently removed during construction.

Fencing, vegetation management, and burrow collapsing are intended to limit colony expansion and would prevent the potential of future prairie dog colony expansion and impact how prairie dogs use the area. Aerial imagery suggests the former colony also extended west of the Project Boundary, so it is possible colony expansion could reoccur in that direction. Individual prairie dogs could be killed by Project activities.

Swift Fox

No suitable swift fox dens were identified in the 2019 mapped prairie dog colony. However, if newly formed larger burrows (that could be used by larger mammals- e.g., badger or Swift fox within the fence line are identified prior to construction, they would be left intact but monitored for activity during the natal denning season (April 15 to July 1) and collapsed if not active. Alternatively, if construction does not commence until the Spring of 2022, any existing larger burrows that could be used by a badger or Swift fox would be collapsed outside of the denning season in the early winter of 2021. Collapsing burrows prior to construction should deter swift

fox from the Project area and lessen potential disturbance from construction activities. The mitigation measure to avoid construction within quarter mile of a den until after the natal denning season would further reduce impacts. Finally, risk of mortality due to vehicle collision would be reduced through access road speed limits being restricted to 25 mph.

Grassland & Migratory Birds

The Project's resulting decrease in productivity of grassland and shrubland by 815 acres would cause further fragmentation of grassland and migratory bird habitat during construction, operations, and decommissioning. Species of habitat fragmentation concern are impacted when larger areas of habitat are divided into smaller areas with reductions in habitat connectivity (USFWS, 2012). Four species of habitat fragmentation concern were observed at the Project: lark bunting, marbled godwit, savannah sparrow, and western meadowlark. One marbled godwit was observed but the other three species were some of the most observed species during breeding bird surveys (see Table 6).

The Project will eliminate some nesting opportunities for many species within the 1,136-acre Project Boundary. However, not all of the eighteen grassland species observed during surveys were confirmed to be breeding within the Project Boundary. Grassland and migratory bird species would also be deterred from the area due to fragmentation resulting from 20 miles of new access roads, 17-miles of 7-foot-tall fencing, and from the 1,108 acres that would be covered by the up to 20-foot-tall solar panels. As described in the land cover section, Wild Springs Solar would minimize vegetation removal; 38.9 acres of 815.2 acres of existing grassland/herbaceous cover would require grading. In 776.3 acres of existing grassland within the Project Footprint, the existing habitat would remain as ground cover with solar panels and tracking rack system installed above.

A review of 13 PV solar facilities in desert and grassland habitats of California and Nevada concluded that the average annual fatality rate at PV solar facilities is 1.82 bird fatalities per MW per year. Another study concluded that overall solar facility fatalities rates were 2.49 bird fatalities/MW/year. Using these two examples, the mortality rate is expected to range between 7,000 and 9,560 birds during the lifetime of the Project. The Project is not anticipated to experience a higher-than-average mortality, given the abundance of comparable habitat in close proximity.

Waterbirds

Few wetland- or water-dependent birds nest within the Project Boundary, likely because of the relatively small amount of existing water bodies. Additionally, most survey observations were of waterbirds flying over the Project site, or swimming in wetlands at reference points outside of the Project. No suitable sandbar habitat for nesting or stopover is present in the Project Boundary for the recently delisted interior least tern, so it is unlikely that the interior least tern would occur within the Project Boundary.

Some water-obligate species, including species of loons and grebes, have been found within solar projects located within the desert portions of the southwest U.S. (Western Ecosystems Technology, Inc. 2020 manuscript in prep). In total, 36 grebe, 13 loon, 24 coot, and 10 duck

deaths have been identified across 10 solar facilities. This suggests waterfowl are landing at facilities in this geography because, in flight, a large area of solar panels have a similar appearance as a waterbody (i.e., lake effect). Waterfowl that land at solar facilities may experience predation either due to panel-related impact trauma or stranding because several waterbird species have limited mobility on land and struggle to regain flight (Kagan et al., 2014). The fenced areas exclude wetlands but would include one 0.6-acre stormwater basin that would contain water during wet times of the year. Since wetlands would not be fenced, waterbirds could continue using the 9 acres of wetlands in the Project Boundary without becoming stranded.

While there is still uncertainty in the industry, the lack of reports or anecdotes of significant water-obligate bird fatalities at solar facilities suggest that solar projects are not a widespread or significant cause of waterbird mortality.

Raptors

The Project is not likely to result in raptor breeding disturbance since no raptor nests or nesting behavior has been observed. The Project would reduce, but not entirely eliminate, foraging opportunities. Red-tailed hawk, American kestrel, and Swainson's hawk) are raptor species that may use Project infrastructure, such as transmission poles and light poles, as a perch for hunting after construction. Other raptors, such as northern harrier and short-eared owl, that hunt in open grassland would have a reduction of available foraging habitat.

One study documented no use of constructed solar arrays by raptors (Smitt et al., 2013). A later study at the same facility documented higher raptor abundance pre-construction than post-construction, suggesting that raptors may avoid facilities once they are operational (Smith and Dwyer, 2016). These findings are consistent with the previously discussed study by DeVault et al. (2014), where large birds were also less common at PV arrays than nearby airfield sites. Therefore, a decrease in raptor presence in the Project Boundary is expected.

Bats

Forested areas with potential high bat activity do not exist in the Project, so the up to five small, isolated trees that will be cut should not result in bat impacts as they are not considered habitat. Bats are not known to collide with stationary objects and there are no known areas of potential high bat activity in the Project, as such, impacts to bats are not expected, so they are not analyzed further.

3.6.2 Environmental Impacts: No Action Alternative

No new impacts to wildlife are expected as a result of the No Action Alternative, although continued wildlife habitat loss, habitat fragmentation, and human disturbance is expected.

3.7 Cultural Resources

WAPA is the lead federal agency for complying with NEPA and Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulation (36 CFR Part 800). In accordance with these acts, WAPA initiated consultation regarding the Project on April 9, 2020 with the State Historic Preservation Office (SHPO) and with 12 tribes that might attach religious



and cultural significance to properties located in or near the Project. To assist in these consultation efforts, WAPA proposed that the Area of Potential Effect (APE) for physical effects be all areas of proposed ground disturbance, and also proposed the APE for visual and audible effects be areas within a half-mile of the proposed project location.

Archaeological Survey

A Level I Cultural Resources Inventory was conducted in 2017 and a Level III Cultural Resources Inventory conducted between 2017 and 2019. The Level I Cultural Resources Inventory identified two previously documented archaeological resources and 4 previously documented historic architectural resources within one-half mile of the Project boundary (Table 7). None of these resources are listed or considered eligible for listing on the National Register of Historic Places (NHRP).

Site Number / SHPO ID	Site Type	Cultural Affiliation	National Register of Historic Places Eligibility
39PN2578	Foundation, depression, artifact scatter	Euro-American	Unevaluated
39PN1976	Foundation	Euro-American	Not Eligible
PN00000672	Bridge	Euro-American	Not Eligible
PN00000673	Bridge	Euro-American	Not Eligible
PN00000341	Structure	Euro-American	Eligible
PN00000344	Structure	Euro-American	Not Eligible

The Level III Cultural Resource Inventory included a pedestrian survey of the Project boundary. This survey identified one previously unrecorded archaeological site. Site 39PN3777 is a prehistoric artifact scatter, located within crop and pastureland adjacent to Boxelder Creek. The artifacts were found on the ground surface. Shovel testing conducted at the site failed to identify artifacts in the subsurface or evidence of subsurface deposits. The site was recommended for avoidance and a 50-foot buffer was established around the site boundary. No additional archaeological resources or historic architectural resources were identified in the Project boundary.

On April 14, 2020, WAPA submitted a letter the report titled “Level I and Level III Cultural Resources Inventory for the Wild Springs Project”. On April 20, 2020, the SHPO requested additional clarification concerning the APE and the scope of the proposed Project. The same day, WAPA provided the requested clarification. On April 21, 2020, the SHPO sent a letter to WAPA concurring with WAPA’s determination regarding the effect of the proposed undertaking on the non-renewable cultural resources of South Dakota. The SHPO noted that one site (39PN3777) was recorded during the Level III Cultural Resource Inventory and that the Project has been modified to avoid impacting 39PN3777. Due to this avoidance, the SHPO concurred with the determination of “No Historic Properties Affected” in the April 21, 2020 letter.

The SHPO also noted the following: 1) If site 39PN3777 cannot be avoided by all ground-disturbing activities, the site should be evaluated for the listing on the NRHP and the determination of effects reassessed; 2) Activities occurring in areas not identified in WAPA's request will require the submission of additional documentation pertaining to the identification of historic resources; and 3) If historic properties are discovered or unanticipated effects on historic properties are found after WAPA has completed the Section 106 process, WAPA shall avoid, minimize, or mitigate the adverse effects to such properties and notify the SHPO and Indian tribes that might attach religious or cultural significance to the affected property with 48 hours of the discovery.

Architectural History Survey

On September 4, 2020, WAPA sent a letter to the SHPO recommending that an architectural history survey is not warranted for the proposed undertaking. The letter noted that the properties identified in the "Level I and Level III Cultural Resources Inventory for the Wild Springs Project" were outside the 0.5-mile buffer of the Project location (i.e., the APE for visual effects). On September 21, 2020, the SHPO responded to WAPA and agreed that no inventoried architectural resources were in the APE for visual effects; however, there appears to be six unevaluated properties in the APE for visual effects. The SHPO noted these as follows:

- Property at Bruns Road - Near intersection of 161st Avenue and Bruns Road (44.065390N, -102.825227W)
- 3 Properties on 229th Street - Near the intersection 229th Street and 161st Avenue
 - (44.082274N, -102.834801W)
 - (44.082232N, -102.833224W)
 - (44.080418N, -102.826663W)
- 2 Properties on 161st Avenue - Near the Intersection of 229th Street and 161st Avenue
 - 22910 161st Avenue (44.080301N, -102.827964W)
 - 22937-22941 161st Avenue (44.078603N, -102.821550W)

The SHPO requested that survey documentation and photographs of the aforementioned sites be entered into the SHPO's Cultural Resources Geographic Research Information Database CRGRID. The digital copies of the survey forms were submitted via the SHPO's CRGRID system on March 13, 2021 and the properties were assigned the following Identification Numbers: 68976, 68977, 68978, 68979, and 68980. None of the buildings and structures are recommended eligible for the National Register of Historic Places. On March 24, 2021, Tetra Tech, Inc. submitted a letter to the SHPO indicating that 5 properties were inventoried in the CRGRID and were recommended as not eligible for the National Register of Historic Places. The property located at 22937-22941 161st Avenue (44.078603N, -102.821550W) was found to be built in 2005 and therefore, not survey forms were completed. On April 6, 2021, the SHPO emailed WAPA and Tetra Tech and indicated concurrence with the determination of eligibility

for the five submitted structures. The SHPO indicated that a letter would be sent WAPA in the near future regarding the Project. WAPA received the SHPO letter on April 6, 2021, indicating that the evaluated structures at the 5 locations were not eligible for listing in the National Register of Historic Places and that SHPO concurred with our finding of “no historic properties affected” for this Project.

Tribal Cultural Survey

The Tribal Cultural Survey (TCS) within the APE for direct effects was lead by Wild Springs archaeological consultant Tetra Tech at the request of the Rosebud Sioux and Cheyenne River Sioux Tribes in October and November 2020 during two separate field efforts. Surveyors from Cheyenne River Sioux were unable to participate in the November survey due to COVID-19.

The TCS identified 130 resources, including 73 lithic isolated finds, 41 stone features, 9 quarries and lithic scatters, 5 stone features with associated lithic isolated finds, 1 quarry and lithic scatter with associated lithic isolated finds, and 1 mounded area. These resources were described in the report produced by Tetra Tech and submitted to the Cheyenne River Sioux Tribal Historic Preservation Officer (THPO) and the Rosebud Sioux THPO for review on February 4, 2021. The THPOs did not comment on the report. The identified lithic isolated finds are associated with the lifeways of Native Americans living on the Central Plains, but due to the limited amount of material and the largely non-diagnostic artifacts identified at the lithic isolated finds, they are unlikely to provide significant information on past behaviors and would not be eligible for listing in the NRHP under Criterion D. Additionally, some of the resource locations have been disturbed by agricultural activities and those resources would not retain integrity of location or association.

The TCS identified stone features, quarries and lithic scatters, and mounded area associated with the lifeways of Native Americans living on the Central Plains and their traditional beliefs, customs, and practices, which may be eligible for listing in the NRHP under Criterion A for their contributions to the broad patterns of Native American history. The stone features and mounded area also display the design, plan, and form distinctive of stone features and mounded area created by Native Americans on the Central Plains. Due to their embodiment of physical traits representative of stone features and mounded area on the Central Plains, the stone features and mounded area are eligible for listing in the NRHP under Criterion C. Future studies of the quarries and lithic scatters may yield significant information about Native American quarry sites on the Central Plains. Due to their information potential, the quarries and lithic scatters are eligible for listing in the NRHP under Criterion D.

For the purposes of Project design, Wild Springs Solar is treating the 41 stone features, 9 quarries and lithic scatters, 5 stone features with associated lithic isolated finds, 1 quarry and lithic scatter with associated lithic isolated finds, and 1 mounded area as Traditional Cultural Properties (TCP) and has sited Project facilities to avoid impacts to these resources. Additionally, Wild Springs Solar has placed a 50-foot avoidance buffer around these resources where no Project impacts are anticipated. Due to proximity, 14 solitary isolated finds, not eligible for listing on the NRHP, will be located within the 50-foot avoidance buffers and would not be impacted by proposed Project activities. The remaining 59 solitary isolated finds, which

are also not considered eligible for listing on the NHRP, may be impacted by proposed Project activities.

On May 21, 2021, WAPA submitted a letter of determination and finding along with the report titled “Traditional Cultural Survey, Wild Springs Project, New Underwood, Pennington County South Dakota”. On June 23, 2021, the SHPO requested additional clarification concerning the tribal consultation and eligibility determinations, submission of archaeological site forms for archaeological components for tribally-recorded properties to Archaeological Research Center, and subsurface potential at documented isolated finds. On June 25, 2021, WAPA provided clarification on the comments provided by the SHPO. On June 29, 2021, the SHPO sent a letter to WAPA indicating the SHPO continues to concur with WAPA’s project finding as well as the site eligibility determinations.

The SHPO provided the following comments and concurrence:

- The following newly-recorded properties of religious and cultural significance should be considered **Eligible** for listing in the National Register of Historic Places: WS001, WS002, WS003, WS004, WS005, WS006, WS007, WS011, WS012, WS013, WS014, WS015, WS016, WS018, WS020, WS021, WS022, WS023, WS024, WS025, WS037, WS040, WS047, WS066, WS067, WS068, WS069, WS078, WS079, WS080, WS081, WS082, WS083, WS084, WS085, WS086, WS091, WS096, WS099, WS100, WS101, WS103, WS104, WS107, WS110, WS111, WS113, WS114, WS115, WS121, WS122, WS123, WS124, WS125, WS126, WS129, WS131, WS132
- The following newly-recorded properties should be considered **Not Eligible** for listing in the National Register of Historic Places: WS008, WS009, WS010, WS017, WS019, WS026, WS027, WS028, WS029, WS030, WS031, WS032, WS033, WS034, WS035, WS036, WS041, WS042, WS043, WS044, WS045, WS046, WS048, WS049, WS050, WS051, WS052, WS053, WS054, WS055, WS056, WS057, WS058, WS059, WS060, WS061, WS062, WS063, WS064, WS065, WS070, WS071, WS072, WS073, WS074, WS075, WS076, WS077, WS087, WS088, WS089, WS090, WS092, WS093, WS094, WS095, WS097, WS098, WS102, WS105, WS106, WS108, WS109, WS112, WS116, WS117, WS118, WS119, WS120, WS127, WS128, WS130

Based upon the information provided, the SHPO, in the above referenced letter, concurred with WAPA’s determination of “No Historic Properties Affected” for the proposed undertaking, with the following stipulations:

- All Eligible properties of religious and cultural significance are avoided by all Project activities with an appropriate buffer, as indicated in WAPA’s letter dated May 21, 2021,
- Unevaluated archaeological site 39PN3777 is avoided by all Project activities, and
- Changes in the nature or location of Project activities will require the submission of additional documentation pertaining to the identification of historic properties as described in 36 C.F.R. § 800.4 and 36 C.F.R. § 800.11.



The SHPO also requested that completed Archaeological Site Forms and site boundary shapefiles for all properties with an archaeological component be submitted to the Records Coordinator at the Archaeological Research Center to obtain a Smithsonian Trinomial site number.

Consultation is expected to be ongoing in to Summer 2022 as discussions progress regarding the construction monitoring needs.

3.7.1 Environmental Impacts: Proposed Action

Wild Springs Solar has avoided directly impacting Site 39PN3777, and all stone features and quarry sites documented during the TCS. In addition, Wild Springs Solar has placed 50-foot buffers around these resources. Slight encroachments (1 to 3 feet) to the 50-foot avoidance buffers are expected at 7 resources identified during the TCS (these reduced buffers have been agreed upon by all consulting parties).

WAPA has determined that the 57 TCP resources described above and identified within the project APE are “Eligible” for the NRHP under Criterion C and D. The project will have no effect on these TCP resources as they will be avoided by construction activities and protected with appropriate buffers as described above. WAPA has made a finding of “No Historic Properties Affected” for this undertaking. SHPO concurrence was received on June 29, 2021.

Wild Springs Solar has developed an Unanticipated Discovery Plan (UDP) that will be implemented in the event of an inadvertent discovery of cultural resources or human remains during construction or operation of the Project. The UDP complies with the Native American Graves Protection and Repatriation Act, the Archaeological Resources Protection Act of 1979 (as amended), and all other pertinent legislation and implementing regulations. Should a discovery occur, work would be halted in the immediate area and the location secured and protected. WAPA shall be notified of the inadvertent discovery and shall, in turn, notify the SHPO and any THPOs whom have expressed interest in the Project. WAPA, through consultation with the SHPO and the appropriate THPOs, shall implement the appropriate next steps for treatment of the cultural resources per the UDP.

3.7.2 Environmental Impacts: No Action Alternative

No new impacts on historical properties or cultural resources would be expected under the No Action Alternative.

3.8 Socioeconomic Conditions and Environmental Justice

Socioeconomic information provided herein is based on data from the U.S. Census Bureau’s QuickFacts and Explore Census Data websites. Data is provided at the county level to characterize the socioeconomic environment in the Project Boundary and at the state level for the purpose of comparison. Socioeconomic information is summarized in Table 8.

Table 8: Existing Socioeconomic Environment in the Project Vicinity

	Population, Census, April 1, 2010 ¹	Per Capita Income 2014-2018 (U.S. 2018 Dollars) ¹	Unemployment Rate (%) ²	Persons Living Below the Poverty Level (%) ¹	Total Minority Population (%) ^{1,3}
South Dakota	814,180	29,801	3.5	13.1	18.6
Pennington County	100,948	30,518	3.8	13.3	20.0

¹ U.S. Census Bureau, 2019

² U.S. Census Bureau, 2018a

³ Total minority percentage equals the total population minus the population of white, non-Hispanic or Latino.

According to the 2010 Census data, the total population of Pennington County represents about 12 percent of the total population of South Dakota (U.S. Census Bureau, 2019). A majority of the population in Pennington County identifies as Caucasian and the total minority population in the county is about 20.0 percent; this is similar to the total minority population in South Dakota, which is about 18.6 percent. Of the minority population in Pennington County (20.0 percent), 10.1 percent identifies as American Indian and Alaska Native. At the state level, about 9.0 percent of the total minority population (18.6 percent), about 9.0 percent identifies as American Indian and Alaska Native, which is slightly lower than the county level.

The per capita income in Pennington County between 2014 and 2018 was \$30,518, which is similar to the state level (U.S. Census Bureau, 2019). The unemployment rate in Pennington County is similar to the state level, at 3.8 percent and 3.5 percent, respectively. Approximately 13 percent of the people in Pennington County are reported living at or below the poverty level, which is similar to the state level of 13.1 percent.

The top two employment industries in South Dakota and Pennington County are- (1) educational services, health care, and social assistance and (2) retail trade (U.S. Census Bureau, 2018a). The third highest employment industry in South Dakota is manufacturing, while in Pennington County arts, entertainment, and recreation and accommodation and food services is the third highest employment industry.

According to the 2018: American Community Survey 5-year Estimates, 4,553 vacant housing units exist in Pennington County. New Underwood City is the closest city, with a population of 720 (U.S. Census Bureau, 2019b). There are 80 vacant housing units in New Underwood City (U.S. Census Bureau, 2019c). In the nearest metropolitan area, Rapid City, South Dakota, approximately 11 miles away, there are 2,427 vacant housing units (U.S. Census Bureau, 2018b). In addition, according to the website visitrapidcity.com (visitrapidcity.com, Undated), approximately 49 hotels and motels, three bed and breakfasts, and four campgrounds are available in the greater Rapid City area.

3.8.1 Environmental Impacts: Proposed Action

The Project would primarily be socioeconomically beneficial to the landowners, local governments, and communities. The Project would provide a supplementary source of income for the rural landowners and farmers on whose land the Project would be sited. Landowner compensation would be established by voluntary leases agreements between the landowners and

Wild Springs Solar. Wild Springs Solar would also establish the Wild Springs Education Fund, to which Wild Springs Solar would contribute \$25,000 annually for the first 20 years of Project operation to the New Underwood school district. Wild Springs Solar's contributions to the Education Fund would begin once the Project is operational.

Construction of the Project would provide temporary increases in revenue through increased demand for lodging, food services, fuel, transportation and general supplies. The Project would also create new local job opportunities for various trade professionals that live and work in the area and it is typical to advertise locally to fill required construction positions. Opportunity exists for sub-contracting to local contractors for gravel, fill, and civil work. Additional personal income would also be generated by circulation and recirculation of dollars paid out by the Project as business expenditures and state and local taxes.

Construction of the Project is anticipated to generate over 150 jobs at peak demand. These numbers are estimates and would vary from the projections based on actual Project need. General skilled labor is expected to be available in Pennington County or South Dakota to serve the Project's basic infrastructure and site development needs. Specialized labor would be required for certain aspects of the Project. It may be necessary to import specialized labor from other areas of South Dakota or neighboring states because the relatively short construction duration often precludes special training of local or regional labor. Much of the workforce needed to construct a solar facility must be comprised of electricians licensed in South Dakota because most of the assembly and wiring work for solar installations is considered electrical work under the South Dakota state electrical code.

Effects on temporary or permanent housing are anticipated to be negligible. During construction, out-of-town laborers would likely use lodging facilities nearby communities such as Rapid City. Unless the construction laborers already live in the vicinity of the Project, it is not anticipated they would remain after Project construction is completed. The operations and maintenance of the facility would require approximately four full-time personnel with one position being a plant manager and the remaining three positions being technicians. These full-time staff are expected to live in the vicinity of the Project. Sufficient temporary lodging and permanent housing would be available within Pennington County, and within the Rapid City metropolitan area, to accommodate construction laborers and long-term personnel.

Executive Order 12898 (59 Federal Register 7629) requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of federal actions on minority or low-income populations. The U.S. Environmental Protection Agency's Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses (EPA Guidance; 1998) provides guidance for determining whether the percentage of minority population in an affected area is "meaningfully greater" than the percentage of minority population in the general population. The threshold for a "meaningfully greater" impact is whether minority population in the affected area exceeds 50 percent or is 10 percentage points higher than the county or state level. For the proposed Project, a comparison of minority populations at the state and county levels, as compared to the minority population in the nearest municipality to the Project, New Underwood City, is appropriate.

Minority populations in New Underwood City (23 percent; U.S. Census Bureau, 2019b) are slightly higher than the state level (18.2 percent) or county level (20 percent). However, the difference in total minority populations is within three to five percentage points, which is not meaningfully greater than the state or county levels. Furthermore, population density in Pennington County is relatively sparse at 36.4 persons per square mile (U.S. Census Bureau, 2019a). The Project is located in a rural area and no residences are located within the Project Boundary. There is no indication that any minority or low-income population is concentrated in any one area in the Project vicinity, or that the Project will be placed near an area occupied primarily by any minority population.

Another factor to consider in determining disproportionate impacts on environmental justice communities is income and poverty level. According to the EPA Guidance, an environmental justice community is present if the percent of low-income population within the affected area is greater than or equal to that of the county. As shown in Table 8, per capita income, unemployment rate, and total number of persons living below the poverty line in Pennington County is similar to the state levels for these same categories. By comparison, per capita income in New Underwood City is lower than the state and county levels at \$25,826, but the unemployment rate in New Underwood City is significantly lower than the state or county levels at 1.5 percent (U.S. Census Bureau, 2019d). The total number of persons living below the poverty level in New Underwood City (3.4 percent) is significantly lower (about 9 to 10 percent lower) than the state and county levels. Consideration of these factors does not indicate that an environmental justice community is present within the Project Area.

Based on analysis of minority population and income and poverty data, the Project will not have a disproportionate effect on environmental justice communities.

3.8.2 Environmental Impacts: No Action Alternative

Under the No Action Alternative, there would be no impacts on the socioeconomic conditions of Pennington County; population and employment rates would be expected to stay the same.

3.9 Visual Resources

The topography of the Project Boundary is undulating with elevations ranging from 2,840 to 3,020 feet above sea level. Land use within the Project Boundary is predominantly agricultural, with grazing and cultivated crops. Grazing pastures are generally about 80 acres in size and fenced to facilitate pasture rotations. The existing New Underwood substation is located within the Project Boundary. Additionally, there are six transmission lines that enter/exit the New Underwood substation and bisect the Project Boundary (see Figure 5 – Land Use). These transmission lines have wooden H-frame or metal lattice structures approximately 80 to 130 feet in height. Finally, there is a telecommunication tower adjacent to the New Underwood substation. The transmission lines, substation, and communication tower are the current man-made focal points around the Project Boundary.

There are no residences or businesses within the Project Boundary; there are six residences and several agricultural buildings on parcels adjacent to the Project Boundary (see Figure 5 – Land Use). The closest residence to the Project Boundary is 147 feet east of the northwestern portion

of the Project Boundary along Garret Road. This residence is within the New Underwood municipal boundary, which abuts the Project Boundary. There are additional residences along each of the three roads that bisect the Project Boundary (see Figure 5 – Land Use).

3.9.1 Environmental Impacts: Proposed Action

The Project would convert approximately 1,103 acres of herbaceous land and cultivated crops to a solar facility characterized by complex geometric forms, lines, and surfaces that may be divergent from the surrounding rural landscape. The solar facility would consist of rows of solar PV panels. To limit reflection, solar PV panels are constructed of dark, light-absorbing materials and covered with an anti-reflective coating. Today's panels reflect as little as two percent of the incoming sunlight depending on the angle of the sun and assuming use of anti-reflective coatings, which would be used for the Project.

In addition to the solar arrays, the electrical transformers and inverters, a substation and O&M building, and access roads would be present within the Project Boundary. Most of the facility, including the solar arrays, would be low-profile, up to 20 feet in height, in contrast to the many existing transmission structures in this area that range in height from approximately 80 to 130 feet tall. As noted in Chapter 2, the precise routing of the 115 kV gen-tie transmission line that would interconnect the Project with the New Underwood substation is pending. Structures for the gen-tie line would be similar in height and appearance to other existing transmission structures in the area; the structures would likely be made of wood and would be less than 150 feet tall. The collector substation would be of similar vertical profile as the existing New Underwood Substation.

The solar facility would be visible from adjacent roadways and parcels, but given its relatively low profile, it would not be visible from long distances. Wild Springs Solar has completed several visual renderings from various locations in the Project Boundary (see Appendix C – Visual Renderings). The renderings include the one area on the west side of the Project Boundary for which there would be solar panels on both sides of Garrett Road, a rendering near the closest residence, a rendering near the WAPA substation, and renderings from New Underwood.

Wild Springs Solar is coordinating with the closest adjacent residence to minimize aesthetic impacts and will have an agreement in place prior to construction. Mitigation could include installation of a privacy fence or vegetative screening and will be decided by the landowner and paid for by Wild Springs Solar.

The combination of topography in the area and low-profile arrays is such that most of the Project would not be seen from long distances. The gen-tie transmission line would be visible from longer distances but would be likely blend with the other existing transmission lines near the New Underwood substation. Visual impacts from the Project would be long-term and last for the duration of the Project.

3.9.2 Environmental Impacts: No Action Alternative

Under the No Action Alternative, there would be no new impacts to visual resources.

3.10 Roads and Traffic

In general, the existing roadway infrastructure in and around the Project Boundary is characterized by county roads. Garrett Road bisects the northwestern portion of the Project Boundary in an east-west direction, 161st Avenue bisects the central portion of the Project Boundary in a north-south direction, and 230th Street bisects the southeastern portion of the Project Boundary in an east-west direction (see Figure 3 – Preliminary Project Layout). The Project is located less than a mile south of Interstate 90. Traffic counts range from 14 vehicles per day on 230th Street to 268 vehicles per day on 161st Avenue, and 32 vehicles per day on 229 Street (Pennington County Highway Department, 2019).

3.10.1 Environmental Impacts: Proposed Action

Access to the Project site would be via existing county roads; once within the Project Footprint, access to the various Project components would be via access roads constructed as part of the Project. The roads used for access to the Wild Springs Solar Project are shown on Figure 3 (Preliminary Project Layout). During the construction phase, an increase in traffic and slow-moving construction vehicles is expected.

Traffic during construction is estimated to be approximately 75 to 100 pickup trucks, cars, and/or other types of employee vehicles onsite for most of the construction period. Approximately 10 to 20 semi-trucks per day would be used for delivery of facility components. Daily semi-truck delivery would vary depending on time of construction and equipment delivery timeline. Overweight or oversized loads are unlikely. Project personnel and contractors would be instructed and required to adhere to speed limits commensurate with road types, traffic volumes, vehicle types, and site-specific conditions to ensure safe and efficient traffic flow.

Increased construction traffic may be perceptible to area residents, but the slight increase in volume would not be expected to affect traffic function. Slow-moving construction vehicles may also cause delays on smaller roads, similar to the impact of farm equipment during planting or harvest. However, these delays would be minimal and limited to the period of construction. The Project would implement the following measures to minimize traffic impacts: improved roads to handle two-way traffic on adjacent roads, where necessary (i.e., 230th Street), during construction, proper signage, Project-based speed limits, follow state/local road requirements, dust control, and safety personnel on site.

After construction is complete, traffic impacts during the operations phase of the Project would be negligible. A small maintenance crew driving through the area in pickup trucks on a regular basis would monitor and maintain the facilities as needed, but traffic function would not be impacted as a result.

3.10.2 Environmental Impacts: No Action Alternative

Under the No Action Alternative, there would be no new or additional impacts to roads and traffic.



3.11 Greenhouse Gases and Climate Change

To assess the potential Project effects on greenhouse gas emissions and climate change, WAPA reviewed the Council on Environmental Quality's 2016 Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews (CEQ, 2016). The CEQ provides guidance to help federal agencies effectively consider greenhouse gas emissions and climate change in NEPA reviews.

3.11.1 Environmental Impacts: Proposed Action

As noted in the Air Quality and Emissions section, construction activities could release air emissions of criteria pollutants, volatile organic compounds, greenhouse gas emissions (e.g., carbon dioxide), and small amounts of hazardous air pollutants. Standard industry practices would be implemented to control dust and emissions from construction vehicles would be minimized by keeping construction equipment in good working order. Construction-related air emissions would be short-term, limited to the period of construction, and would cease after construction of the solar facility is complete.

Long term, negligible amounts of dust, vehicle exhaust emissions, and combustion-related emissions from diesel emergency generators would occur during periodic maintenance activities. Operation of the collector Substation would produce minute amounts of ozone and nitrogen oxides emissions as a result of atmospheric interactions with the energized conductors and the use of sulfur hexafluoride-filled circuit breakers. Sulfur hexafluoride is a greenhouse gas, and therefore, equipment leaks could contribute to greenhouse gas emissions. Wild Springs Solar's Operation & Maintenance staff would conduct monthly inspections of the collector substation to detect any equipment leaks in compliance with the National Electric Code. Routine inspections would minimize or avoid the likelihood that equipment leaks of sulfur hexafluoride would occur.

Another important consideration is the potential for the Project to offset greenhouse gas emissions generated by other energy generating facilities in the Project vicinity that rely on fossil fuels such as coal or natural gas. The Wild Springs Solar Project would provide a renewable source of energy that could offset approximately 200,000 metric tons of CO₂ of other greenhouse gas emissions, which is the equivalent of approximately 23,000 homes' energy consumption for one year.² Overall, this offset could contribute to a reduction of greenhouse gas emissions in the Project vicinity.

Conversely, changes in climate over the life of the Project are not anticipated to have a material impact on the Project's operation or production.

² Based on EPA Greenhouse Gas Equivalencies Calculator and 280,000,000 kWh annual production PVSYST model.

3.11.2 Environmental Impacts: No Action Alternative

Under the No Action Alternative, there would be no new or additional impacts to greenhouse gases or climate change. Ongoing emissions and changes in climate are expected to occur.

3.12 Cumulative Impacts

A cumulative impact is the impact on the environment that results from the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

According to the Planning and Zoning departments of Pennington County and the City of New Underwood, there are no planned development projects in the vicinity of the Project. According to the South Dakota Department of Transportation (SDDOT) website, no road construction projects are planned near the Project area (SDDOT, 2020).

Reasonably foreseeable actions include potential development of additional solar power facilities in Pennington County and within the western half of the state. According to the U.S. Energy Information Administration website, the entire state of South Dakota is considered to have moderate solar PV potential, with the greatest potential in the southwestern portion of the state (U.S. Energy Information Agency, 2020). However, to date, development of utility scale solar projects in this area remains limited. In 2019, South Dakota ranked 50th out of 50 states in installed solar capacity. Once constructed, Wild Springs Solar would be the largest solar facility in South Dakota. Along with the potential for additional utility scale solar development, the potential exists for additional electric transmission lines to be built to tie into the existing WAPA substation.

Continued development of utility scale solar facilities and electric transmission lines would contribute to incremental impacts on existing agricultural land uses (i.e., crop production and livestock grazing) and result in conversion of additional agricultural and herbaceous lands to developed uses. Incremental impacts on resources such as soils, groundwater, and herbaceous vegetation could also occur, if these developments result in increased impervious surfaces and a loss of vegetation. Conversion of existing herbaceous vegetation to developed uses could result in additional habitat fragmentation, as well. However, no other known major projects were identified in the area that should be evaluated in conjunction with this Project for cumulative effects at this time.

Chapter 4: Public Involvement and Coordination

This document was written by Merjent and Geronimo Energy, LLC and reviewed/revise by WAPA.

Name	Role/Section Prepared
Melissa Schmit	Wild Springs Solar, LLC; Permitting Director; Review of the EA
Brie Anderson	Merjent; Senior Project Manager; Chapters 1 and 2, Geology, Air Quality, Vegetation, Water Resources, Fish and Wildlife, Threatened and Endangered Species, Visual Resources, Roads and Traffic
Monika H. Davis	Merjent; Paleontology, Cultural Resources, Land Use, Socioeconomic Conditions, and Cumulative Impacts
Kate Mize	Merjent; Soils
Brian Schreurs	Merjent; Figures and GIS analyses
John Russell	WAPA; Environmental Manager
Christina Gomer	WAPA; NEPA Project Management
David Kluth	WAPA; Regional Archaeologist
Alyssa Fellow	WAPA; Biologist

4.1 Public Involvement

WAPA hosted a public scoping meeting on March 3, 2020, at the New Underwood Community Center. Approximately 30 members of the public attended the public scoping meeting. The meeting was advertised via letters mailed to private landowners in the vicinity of the Project, stakeholders, and local, state, and federal agencies. Announcements were also published in the Pennington County Courant on February 13, 20, and 27, 2020, prior to the meeting. WAPA received nine comments during the public scoping comment period, which ran between March 3 and April 4, 2020.

Additionally, WAPA distributed the draft EA for public review and comment between April 27, 2021 and June 1, 2021, by letters to individual landowners and interested agencies, and notices in the local newspapers. WAPA received four comments.

Table 10 provides a brief summary of comments received. Documentation of public outreach, including the full text of comments received, is provided in Appendix D.

Party	Comment Summary
South Dakota Department of Environment and Natural Resources, Surface Water Quality Program	State agency commented on surface water quality, including stormwater, surface water discharge, and waters of the State
United States Department of Agriculture, Natural Resources Conservation Service	Federal agency requested a Farmland Protection Policy Act review of the Project.

Party	Comment Summary
South Dakota Game, Fish, and Parks	The state agency commented on grasslands, grassland birds, Natural Heritage Database for rare species, pre- and post-construction surveys, bat habitat, and avian interactions with powerlines.
United States Fish & Wildlife Service	The agency commented on grassland birds, grassland fragmentation, migratory birds, northern long-eared bat, whooping crane, migratory birds, Section 7 consultation, birds of conservation concern, and habitat offsets.
Izaak Walton League of America	The organization commented on fragmentation, wildlife, pollinator habitat, water quality, historic and cultural resources, recreation, socioeconomics, and potential impacts from the weather station and O&M building.
Center for Rural Affairs	The organization recommends use of native vegetation for restoration. They recommend a robust rotational grazing plan, with sheep being the preferred livestock choice as they pose the lowest risk to equipment.
Bureau of Indian Affairs	The agency commented on applicable laws and regulations, tribal fee lands, and cultural resources.
Environmental Protection Agency	<p>The agency recommends that Wild Springs Solar and WAPA continue consultation to make a final determination on applicability of CWA Section 404 permit requirements to delineated wetlands. This is particularly important for Wild Springs Solar given that the South Dakota Department of Environment and Natural Resources' decision regarding the Project's CWA Section 401 Water Quality Certification is dependent upon whether a National CWA Section 404 Permit would be issued for the proposed Project.</p> <p>The agency recommends that the final EA describe how the Project would be affected by foreseeable changes from predictable trends to the affected environment, for instance, under a scenario of continued decreasing precipitation days, changing frequency of intense storms and related flood events, and enduring drought in the Project area.</p>
Anonymous	Commenter asks about recyclability of panels.
Individual	Commenter wrote about the public scoping meeting format and requested a link to the published Draft EA.
Individual	Commenter likely confused the South Dakota Public Utilities Commission permitting process with the NEPA process.

4.2 Tribal Consultation

In January 2020, WAPA initiated consultation with 12 federally recognized tribes who have an interest in the region via an information notice letter and consultation invitation dated January 27, 2020. The letters were sent to the following tribes:

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

- Fort Belknap Indian Community;
- Fort Peck Assiniboine & Sioux Tribes;
- Lower Brule Sioux Tribe;
- Oglala Sioux Tribe;
- Rosebud Sioux Tribe;
- Santee Sioux Tribe of Nebraska; and
- Standing Rock Sioux Tribe.

Two tribes responded to the January 2020 letter. On February 24, 2020, the Oglala Sioux Tribe responded and requested to be kept informed of the Project timeline. On February 25, 2020, the Fort Peck Assiniboine & Sioux Tribes responded and indicated that the Project would “have no adverse effect on historical or cultural properties significant to the Fort Peck Tribes.”

On March 13, 2021, WAPA sent a second information notice via email to the 12 tribes. Only one tribe responded to this notice. On March 13, 2020, the Cheyenne River Sioux Tribe responded and requested to participate in consultation.

On March 13, 2021, WAPA provided the 12 tribes with the final Level I and Level III Cultural Resource Inventory Report for the Project. The Cheyenne River Sioux Tribe again expressed interest in the Project and requested an opportunity to conduct a TCS at the proposed Project, with assistance from the Rosebud Sioux Tribe.

On March 18, 2021, Tetra Tech organized a call with WAPA, Cheyenne River Sioux THPO, Rosebud Sioux THPO, and Wild Springs Solar to discuss the proposed Project, tribal input on the TCS report, and next steps regarding avoidance and assistance with monitoring during constructions. A follow-up call was scheduled on April 1, 2020 to discuss the proposed Project facilities and avoidance. On March 26, 2021, Tetra Tech sent an email with a mapbook to WAPA, Cheyenne River Sioux THPO, Rosebud Sioux THPO, and Wild Springs Solar for their review prior to the call.

On April 1, 2021, WAPA, Rosebud Sioux THPO, Wild Springs Solar, and Tetra Tech were in attendance on the consultation call. The call was rescheduled as Rosebud Sioux THPO was the only tribal member able to attend. Rosebud Sioux THPO also requested that the Ogalala Sioux THPO be invited to the next call which was scheduled for April 8, 2021.

On April 8, 2021, WAPA attended the scheduled consultation call. No tribal representatives attended.

On April 23, 2021, WAPA’s Regional Preservation Officer (RPO) called the Rosebud Sioux THPO and discussed WAPA’s proposed TCP determinations and the overall project finding of “No Historic Properties Affected.” The Tribe did not raise any objection to WAPA’s findings.

On May 4, 2021, WAPA’s RPO called the Cheyenne River THPO and discussed WAPA’s proposed TCP determinations and the overall project finding of “No Historic Properties Affected.” The Tribe did not raise any objection to WAPA’s findings.

On May 21, 2021, WAPA provided the Rosebud and Cheyenne River THPOs, WAPA's official letter regarding TCP determinations of eligibility and overall project finding for review. No comments were received during the 30-day review period.

Consultation is expected to be ongoing in to Summer 2022 as discussions progress regarding construction monitoring needs.



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