Wild Springs Solar

Storm Water Pollution Prevention Plan (SWPPP)

Pennington County, South Dakota

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1 Introduction

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the construction activities associated with the construction of access roads, ground-mounted solar arrays, various pads for electrical equipment, overhead and underground electrical circuits, O&M facility, substation, and construction support at Wild Springs Solar by National Grid Renewables. Ames is the general contractor and primary operator that will have day-to-day control over the project construction activities and will be responsible for compliance with this SWPPP.

This SWPPP includes the necessary elements required to comply with the U.S. Environmental Protection Agency's (EPA) baseline national permit and the Administrative Rules of South Dakota (ARSD), Article 74:52, Statewide Construction General Permit No. SDR100000 administered by the South Dakota Department of Environment and Natural Resourses (SDDENR) and South Dakota Surface Water Discharge System (SDSWDS) in accordance with the National Pollution Discharge Eliminations System (NPDES). Standard Conditions of the SDDENR CGP No. SDR100000 are listed in Section 2 of the CGP (**Appendix B** of this report). The Notice of Intent (NOI) for Wild Springs Solar was filed 09/12/2022. The General Permit Authorization Number received from SDDENR is SDR100000. The permit is effective on 04/01/2018 and expires on 03/31/2023.

The intent of this SWPPP is to provide construction guidelines to limit to the extent practicable the pollutants and sediment originating from the construction site from transferring to nearby surface waters. The report contains recommended best management practices (BMPs) for construction activities, as well as inspection and maintenance procedures to be used throughout construction. It is required that the SWPPP report be on site at all times during construction, with all records kept on site throughout the duration of the project. Upon submittal of the notice of termination all records associated with the implementation of the SWPPP and construction must be kept for 3 years.

1.1 NPDES Regulatory History

The history of federal and state regulation of stormwater discharges dates back to 1972 when Congress passed the Clean Water Act (CWA). The overall goal of the CWA was to protect the quality of the surface and groundwater across the nation. It is in the CWA that the National Pollutant Discharge Elimination System (NPDES) was authorized. The NPDES program's original focus was to eliminate the pollutants that enter the water system through industrial and municipal wastewater. In the NPDES's effort to control the industrial and municipal wastewater it determined that during rain or snow falls, water runoff from urban streets, parking lots and construction sites was carrying oil, grease, sediment and other pollutants, either directly or indirectly through storm drains, into surface waters. Stormwater is one of the leading causes of pollution to our nation's waters today.

The purpose of the construction stormwater program is to protect the waters of the State from contamination. Owners or operators of any project or combination of projects who engage in construction activities which will disturb one (1) or more acres must have authorization to discharge stormwater runoff under the SDDENR CGP No. SDR100000. Anyone who disturbs less than one acre may require authorization to discharge stormwater runoff when the SDDENR believes the water quality impact warrants consideration. All Municipal Separate Storm Sewer System (MS4) operators previously exempt from construction stormwater permitting requirements must now also apply for authorization to discharge stormwater runoff from construction activities under the requirements of this general NPDES permit.

Application for the construction stormwater permit is made by completing a Notice of Intent (NOI) form which needs to be submitted electronically at least 15 days prior to commencing construction activities. The primary requirement of the general permit is for the permittee to develop and implement a SWPPP. When the soil disturbing activities are completed and final stabilization of the site is achieved, the permittee must submit a Notice of Termination (NOT) to the SDDENR in accordance with **Appendix B** of this report.

2 Site Evaluation, Assessment, and Planning

2.1 General Project information

Table 2.1: General Project Information

Project Name:	Wild Springs Solar
Owner:	National Grid Renewables
General Contractor:	Ames
State:	South Dakota
County:	Pennington
Nearest Town:	New Underwood
Latitude:	44° 4'26.39" N
Longitude:	102°49'51.13" W

Ames Construction (Ames), as the primary operator, will have day-to-day responsibility to install and maintain BMPs, revise the site map when needed, maintain the SWPPP, and perform inspections and retain records during construction.

Additionally, Ames will maintain operational control over the construction plans and specifications and is responsible for final modifications of the SWPPP after construction. Ames will transfer responsibilities to operations once construction is complete. National Grid Renewables will be responsible for filing the Notice of Termination (NOT) once final stabilization occurs. The contact information for team members associated with this project is listed in Table 3.2.

The transfer of operators shall comply with all requirements listed in Section 2.5 of the SDDENR CGP No. SDR100000.

2.2 Discharge Information

Are there any surface waters that are located within 25 feet of your construction disturbances?

☐ Yes ☒ No

Table 2.2: Names of Receiving Waters

Name(s) of the first surface water that receives stormwater directly from your site and/or from the MS4 (note: multiple rows provided where your site has more than one point of discharge that flows to different surface waters)
1. Boxelder Creek

Table 2.3: Impaired Waters / TMDLs (Answer the following for each surface water listed in Table 2.2 above)

Receiving Water	Is this surface water listed as "impaired"?	If you answered yes, then answer the following:			
		What pollutants (s) are causing the impairment?	Has a TMDL been completed?	Title of the TMDL document	Pollutants for which there is a TMDL
1. Boxelder Creek	☐ YES ☒ NO	N/A	☒ YES ☐ NO	THE 2022 SOUTH DAKOTA INTEGRATED REPORT FOR SURFACE WATER QUALITY ASSESSMENT	N/A

Describe the method(s) you used to determine whether or not your project/site discharges to an impaired water:

South Dakota Department of Agriculture and Natural Resources, Watershed Protection in South Dakota Site 2022 Integrated Report (found at https://danr.sd.gov/Conservation/WatershedProtection/ReportsPublications/SDDANR_2022_IR_approved.pdf) was reviewed. The 305(b)/303(d) Integrated Report is published every two years with 2020 – 2022 public notice being the most current. After thorough review of these publications, it was determined that discharges from the Wild Springs Solar will enter the above streams, but not before passing through project BMPs and/or sufficient vegetative buffers.

Table 2.4: Tier 2, 2.5. or 3 Waters

Receiving Water	Is this surface water designated as a Tier 2, Tier 2.5, or Tier 3 water?	If you answered yes, specify which Tier (2, 2.5, or 3) the surface water is designated as?
1. Boxelder Creek	☐ YES ☒ NO	N/A

2.3 Existing Conditions - Environmental

Wild Springs Solar is located in Pennington County, South Dakota on predominantly cropland and grassland with current land uses consisting of animal grazing and agricultural.

The project area contains several wetlands and waterbody features as defined by the United States Army Corps of Engineers (USACE) in the Level 2 Wetland Delineation Report prepared February 2020. The delineation report may be found in Appendix K of this report. Base flow within the ravines is seasonal, with high flow during the rainy season and run dry during the dry period of the season. The stream on the north side of the project area Box Elder Creek contain water throughout the year. Care shall be taken by the contractor to keep at least 50' buffer around the streams and be cautious of soft soil conditions surrounding them.

3 Project Information

3.1 Project Operator Information

Table 3.1: Contact Information for SWPPP Operator

Operator Contact Information	Operator Responsibility Information
Company: Ames Construction	Primary Operator ☒ YES ☐ NO
Contact Name: Patrick Fairl	Shared SWPPP ☐ YES ☒ NO
Title: Project Executive	Secondary Operator ☐ YES ☒ NO
Address: 2500 County Road 42 West, Burnsville MN 55337	Operational Control of SWPPP Compliance? ☒ YES ☐ NO
Phone: 612-760-4606	Operation Control of Subcontractors? ☒ YES ☐ NO
Email: PatrickFairl@amesco.com	Operation Control over Plans/Specifications? ☒ YES ☐ NO

Table 3.2: Contact Information for SWPPP Operator

Title	Company	Name	Contact Information
Project Manager	Ames Construction	Patrick Fairl	PatrickFairl@amesco.com (612)-760-4606
Facility NPDES Permit and SWPPP Contact	South Dakota Department of Agriculture and Natural Resources	Jordan Bryant	Jordan.bryant@state.sd.us (800)-737-8676
Primary Operator	Ames Construction	Thomas Piersch	ThomasPiersch@amesco.com (907)-440-6961
Compliance Contact / Site Inspector / 24-hr Contact	Assistant Director, Pennington County Planning and Zoning Department	Jason Theunissen	Jason.Theunissen@pennco.org (605)-394-2186
SWPPP Preparer	Ulteig Engineering	Travis Berends	Travis.Berends@Ulteig.com (701)-280-8533
Engineer of Record (QCP)	Ulteig Engineering	Brandon Bucholz	Brandon.Bucholz@Ulteig.com (701)-280-8533

3.2 Site Map

The site map can be found in Appendix A.

3.3 Construction Activity

3.3.1 General Description of Project

Wild Springs Solar is located in Pennington County, South Dakota on agricultural and grassed land. The closest community to the project is New Underwood, located 1 mile north of the project limits. The project consists of the construction of a total of 128 MWDC of PV modules mounted on NEXTracker Horizon, above ground and trenched DC collections, trenched AC collections, 34 PV inverters, site access roads, substation, solar energy facility, O&M building & storage yard, and laydown

yard. The primary objective of completing the Wild Springs Solar Project will be to generate and sell electricity under a power purchase agreement (PPA).

3.3.2 Size of Construction Project

Wild Springs Solar will be constructed predominantly on grass and cropland in Pennington County, South Dakota. The construction of the PV arrays, inverter stations, site access roads, substation, solar energy facility, O&M building & storage yard, and laydown yard is expected to disturb 925 acres of which approximately 24 acres will be permanently disturbed upon completion of the project.

Table 3.3: Disturbed Areas

Temporary Disturbance Type	Acreage	Notes
Fenced Areas / PV Array	915.4	Assumed all areas (excluding the mineral right areas) within the fence have the potential to be disturbed.
Laydown Yards / Staging (outside of fenced area)	6.4	Laydown Yard outside of fenced area. All Laydown Yards to be removed post construction.
Collection Line Trenches (outside of fenced area)	14.7	Outside of fenced areas, assumed 20' corridor
Substation	3.6	Substation buffer and grading
Proposed Access Road (outside of fenced area)	1.0	Section of proposed access road outside of fence. Does not include road improvements.
Transmission Line	0.4	Potential disturbance within T-Line ROW during construction
Water Quality BMPs (outside of fence area)	N/A	Basins/swales located outside of the fenced areas
Total Temporary Disturbance:	**941.5**	
Permanent Disturbance Type	**Acreage**	**Notes**
New Access Roads	20.54	Does not include where an existing road is to be improved
PV Array Areas	0.28	Assume piles with 0.25 ft^2 Cross Sectional Area
Inverter Stations	0.53	5' buffer pad around edge of inverters (34)
Substation, Battery, O & M Building and parking	2.91	Substation, Battery, O & M Building and parking
Total Permanent Disturbance:	**24.26**	

3.3.2.1 PV Array Components and Foundation

The solar array will be supported by a driven pile system with solar panels mounted on rails affixed to a motor-driven torque tube to allow for daily rotation to track the sun and maximize solar energy generation. The final design will utilize the geotechnical report and site-specific pile head loads to finalize steel section, elevation above ground, and embedment of driven piles.

3.3.2.2 Access Road

Wild Springs Solar will consist of the construction of new access roads and the improvement of private roads. The overall project will require that a total of 8.85 miles of new access permanent roads to be constructed for the Wild Springs Solar

Project. The delivery route to the site will use 161st Avenue as the primary delivery route with access points to be constructed for component deliveries and construction traffic.

During the construction phase of the project, the access roads will be constructed to widths of 16-30 feet to allow for safe movement by construction traffic on the roads and to provide adequate drainage.

3.3.2.3 Communications and Collection System

The communications and collection system are both vital components to the operation of the solar project, as the communications system controls when the system is operational, and the collection system is needed to transmit the power collected throughout the solar arrays to the project substation. The collection system will run from panel to panel ultimately tying into the project substation which will provide power to the electric grid. The construction required to install the communications and collection system of the project will require a total of approximately 12.5 miles of 1.5 foot wide by 4-foot-deep trenching for MV cable and a total of approximately 14.27 miles of variable width 3 ft depth DC cable. Some of the MV cable length will be bored.

3.3.2.4 Collector Substation

The project collector substation will be designed and constructed to collect power from 34.5kV feeders and convert the voltage to the required115kV interconnecting transmission line voltage. The collector substation will be constructed and owned by National Grid Renewables. The substation will be designed and constructed to industry standards, as well as incorporating any additional standards from National Grid Renewables. The project collector substation will be secured using a chain-link fence with gate access. The substation will also utilize a copper ground grid installed below the substation with crushed rock surface layer to maintain the safety of personnel by reducing the level of step and touch potentials.

3.3.2.5 O&M Facility

An Operations and Maintenance (O&M) building will be built on the Wild Springs Solar Project. The O&M building will be constructed on roughly 1 acre of land and consist of a building structure and parking lot surrounded by a security chain link fence.

3.3.2.6 Transmission System

Once the generated electricity has been converted from 34.5kV to 115kV at Wild Springs Solar, it is transmitted to the Point of Interconnect (POI) through transmission lines. Wild Springs Solar will consist of a single structure between collector substation and interconnection switchyard which is located immediately to the northwest.

3.4 Sequence and Estimated Dates of Construction Activity

The construction of Wild Springs will be completed in blocks with multiple concurrent activities in different areas of the site. Major construction phases of Wild Springs are listed below. In the event that the construction phases change or need to be altered, the contractor should contact Ulteig to update this plan before construction proceeds.

Begin Civil Activities - Construction of Access Roads, Site Fence and Preparation of Laydown Yard – Approximately 10/03/2022

Construction activities:

A. Identify and flag off areas to be protected, such as 50 ft buffer zones adjacent to wetland and drainage features.
B. Apply BMP's for temporary stabilization and perimeter sediment control for project site, access roads, and laydown yard areas.

C. Stripping and stockpiling of topsoil either side of road.
D. Complete grubbing in areas were deemed necessary.
E. Begin installation of site fence.
F. Mass grade and compact subgrade.
G. Install gravel base (where part of structural section) and grade per grading plans.
H. Install permanent and temporary intersection improvements.
I. Install permanent and temporary culverts.
J. Install remaining BMP's required for following phase of project.
K. Maintain BMP's throughout phase.

Construction of PV Array, Inverter Stations, and Substation – Approximately 12/07/2022

Construction activities:

A. Identify and flag off areas to be protected, such as 50 ft buffer zones adjacent to wetland and drainage features.
B. Apply BMP's for temporary stabilization and perimeter sediment control for PV Array areas.
C. Perform final clear and grub of array areas.
D. Disc and Roll areas of site where such ground finish is shown on the plans.
E. Perform bare earth RTK survey to confirm PV array mass grading extents.
F. Strip, mass grade and stockpile topsoil in PV array and Substation areas.
G. Stage steel piles and racking components along site roads and throughout PV array areas.
H. Predrill pile locations and drive steel piles by means of hydraulic impact hammer.
I. Stage PV modules, wire, and any remaining tracker components along site roads and throughout PV array areas.
J. Construct Substation flatwork, cable and conduit trenching, drilled shaft foundations, and ground grid.
K. Perform mechanical assembly of PV Array structures and related equipment.
L. Maintain BMP's throughout phase.

Install AC and DC Collection System/Commission Inverters – Approximately 03/08/2023

Construction activities:

A. Apply BMP's for temporary stabilization and perimeter sediment control for trenching outside PV array.
B. Excavate and stockpile backfill material for collection system cables.
C. Install below ground DC and MV collection system cables and conduit runs and sweeps.
D. Backfill and compact collection trenching.
E. Install above ground DC cables, combiner boxes, and other supporting hardware.
F. Commission inverters, tracker controllers, and other active plant infrastructure.
G. Maintain BMP's throughout phase.

Reclamation of construction site – Approximately 08/11/2023

Construction activities:

A. De-compact soils in construction areas that are to be restored to pre-construction conditions.
B. Permanently stabilize disturbed soil with approved seed mixes and methods
C. Remove temporary intersection improvements and restore to preconstruction conditions.
D. Remove and restore laydown areas to preconstruction conditions except for spare part storage areas.
E. Remove remaining BMP's not necessary for site stabilization after project completion.
F. Coordinate with local government personnel to close any open permits for the project.

4 Documents of Compliance with Other Federal Requirements

4.1 Endangered Species Protection

Project specific information on endangered species can be found in Appendix K of this document. Reports provided include Wetlands and Waters of the U.S. Delineation Report, Natural Resource Strategy Report (this should not be part of the SWPPP).

4.2 Historic Preservation

In the event that historical preservation measures should be taken in areas of the project boundaries, specific BMPs and construction practices will be suggested in this SWPPP.

5 Erosion and Sediment Controls

5.1 Allowable Non-Stormwater Discharges

All sources of non-stormwater discharges shall be controlled with appropriate pollution prevention measures adequate for the flows. These discharges, including water removed from excavations and erosion control structures, should be filtered or otherwise processed by contractors to remove soil, silt, and other contaminants prior to discharge into receiving waters. Refer to Sections 1.0 and 2.3.2 and of the SDDENR CGP No. SDR100000.

Table 5.1: Non-Stormwater Discharges and Appropriate BMPs

Anticipated Non-stormwater Discharge	Discharge and Erosion Management BMPs
Discharges from firefighting activities	No discharges expected.
Fire hydrant flushing	No discharges expected.
Waters without detergents used to spray off loose solids from vehicles.	Designated washing stations with sediment/discharge control (e.g. silt fence, fiber rolls, berms). Locate washing stations away from surface waters to limit to the extent practicable no direct discharge into waters.
Water for dust control	No discharge expected with proper construction practices.
Potable water sources such as waterline flushing.	No discharges expected.
Landscape irrigation water and drainage	No discharges expected.
Routine external building washdown provided no detergents are used.	No discharges expected.
Pavement washwaters that do not contain detergents, leaks, spills of toxic or hazardous materials.	No discharges expected.
Uncontaminated air conditioner or compressor condensate	No discharges expected.
Spring water	No discharges expected.
Foundation or footing drain flows that are not contaminated with process material such as solvents.	No discharges expected.
Noncontaminated ground water associated with dewatering activities as described in Part 3.4	No discharges expected.

5.2 Discharges Not Allowed Under this SWPPP

Refer to Section 2.3 of the SDDENR CGP No. SDR100000 for a description of discharges not covered by the SWPPP or the project permit. Potential discharges not allowed on this project include but not limited to the following:

- Discharges that are mixed with sources of non-stormwater unless such stormwater discharges are:
  - In compliance with a separate NPDES permit, or
  - Determined by the Department not to be a contributor of pollutants to waters of the State.
- Discharges currently covered under another NPDES permit
- Discharges from coal/metallic mining, dry processing, wet processing, and areas associated with these activities
- Wastewater from washout of concrete, unless managed by an appropriate control
- Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds, and other construction materials

- Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance
- Soaps or solvents used in vehicle and equipment washing
- Discharges from dewatering activities, including discharges of ground water or accumulated stormwater from dewatering of trenches, excavations, foundations, vaults, or other similar points of accumulation, unless managed by appropriate controls
- Discharges to surface waters from sediment basins or impoundments, unless an outlet structure that withdraws water from the surface, unless infeasible, is utilized
- Discharges where the turbidity of such discharge will cause or contribute to a substantial visible contrast with the natural appearance of the receiving water
- Discharges where the turbidity of such discharge will cause or contribute to an increase in the turbidity of the receiving water by more than 50 NTUs above background
- Discharges of any pollutant into any water for which a total maximum daily load (TMDL) has been finalized or approved by EPA unless the discharge is consistent with the TMDL
- Discharges to waters listed on the most recently approved 303(d) list of impaired streams unless the discharge will not cause or contribute to the listed impairment; and 14. Toxic or hazardous substances from a spill or release
- Toxic or hazardous substances from a spill or release.

5.3 Sediment and Erosion Controls

Sediment and erosion controls should be installed prior to any construction activities on-site. All BMP's and specifications shown are included within Site Civil Plans (Appendix C) and shall be installed in compliance with the SDDENR CGP No. SDR100000. See Section 3.2 of the SDDENR CGP No. SDR100000 (Appendix B) for state specific guidance, manuals, and requirements of stormwater controls to reduce pollutants.

5.3.1 Natural Buffers

When feasible, natural buffers should be utilized for sediment and erosion control. Appropriate measures should be taken by the contractor not to disturb natural buffers during construction activities. All disturbed buffers should be restored to their pre-construction condition upon project completion. See Section 3.10 of the SDDENR CGP No. SDR100000 for state buffer zone guidance. Note that disturbance must be minimized within buffer zones by using hand held or other low-impact equipment.

5.3.1.1 Buffer Compliance Alternatives

The proposed site design avoids PV array construction within 50 feet of all significant wetlands, however the access road and electrical collections design include several water crossings. Due to this, it is infeasible to provide a natural buffer of any size to control sediment runoff in these locations. Appropriate BMP's shall be installed and maintained in such areas to limit to the extent practicable stormwater runoff pollution of these waters. Inspections of the BMP's shall occur at the SDDENR approved intervals described in Section 7 of this report.

Are there any surface waters within 50 feet of your project's earth disturbances? ☒ YES ☐ NO
Check the compliance alternative that you have chosen:

- ☐ I will provide and maintain a 50-foot undisturbed natural buffer.
- ☐ I will provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by additional erosion and sediment controls, which in combination achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

☒ It is infeasible to provide and maintain an undisturbed natural buffer of any size, therefore I will implement erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

- Contractor to utilize temporary sediment control devices described in Table 5.2. Any use of alternative sediment control devices may require updates to the current SWPPP and site plans and shall be reviewed prior to implementation.
- Maintenance of sediment control devices to follow guidelines listed in Table 5.3 - BMP Maintenance Requirements in Section 5.3.4.

5.3.2 Soil Stabilization / Sediment and Erosion Controls

Soil Stabilization through sediment/erosion controls are required to be implemented immediately in disturbed areas where construction activity has temporarily or permanently ceased for more than fourteen (14) days. Final stabilization shall be initiated on any site where construction activities have been suspended or have otherwise stopped for more than 180 days, consistent with Section 3.18 of the SDDENR CGP No. SDR100000 (Appendix B of this report). The term "immediately" is intended to mean as soon as practicable, but no later than the end of the next workday. The erosion controls must be properly maintained throughout construction and reinstalled as necessary until replaced with permanent erosion controls and/or restoration is complete. Where possible, existing vegetation shall be preserved during all construction phases to aid in sediment control and soil stabilization. All stabilization and sediment controls must meet requirements found in Section 3.0 of the SDDENR CGP No. SDR100000 (Appendix B of this report).

Table 5.2 below lists the proper sediment and erosion control measures proposed for Wild Springs Solar.

Table 5.2: Sediment and Erosion Controls on Proposed Project

Sediment and Erosion Controls			
Area of Potential Erosion	**BMPs**	**Temporary / Permanent**	**Notes**
Stream Crossing	Culverts, Rip-Rap, Erosion Blankets, Silt Fence	Temporary and Permanent Applications	• Downstream erosion control depends on velocity of storm water through culvert (9 ft/s and above requires rip-rap). • Refer Civil Site Plans for details. • Contractor to field verify use of all erosion control measures. • Minimize stream bed disturbance to greatest extent possible during culvert installation.
Slope Erosion	Slope Breaker: • Berms • Silt fence • Staked hay/straw bales • Rock check dam • Sandbag check dams • Erosion control blankets • Surface Roughening	Temporary and Permanent Applications	• Intended use to reduce runoff velocity and divert water from site and ROW • Outfall of slope breakers should be directed to stable, well vegetated areas and or an energy dissipating structure such as a rock apron or rip rap. • Install per manufactures recommendations on spacing, overlapping lengths, and staking requirements. • Refer to Civil Site Plans for details and spacing specifications.
Sediment Runoff	• Silt fence • Staked hay/straw bales • Fiber rolls • Sandbags • Mulching • Seeding • Vegetated Swales • Sediment Basins	Temporary Applications	• Silt fence and fiber rolls are the primary sediment barriers to be used on the project. • Install at base of slopes adjacent to road crossings until disturbed vegetation has been reestablished. • Install in locations in danger of silt infiltration into water bodies and/or wetlands in or near the construction area • Must be inspected and maintained until permanent revegetation measures are successful or the upland areas adjacent to wetlands, water bodies, or roads are stabilized
Sediment Runoff	• Peripheral native vegetation • Replanting of native grasses on disturbed soils • Vegetated Swales • Sediment Basins	Permanent Applications	• Existing native vegetation may be used as buffers to catch sediment. • Inspections must be conducted to ensure buffers are not overloaded with sediment and no permanent harm is occurring to vegetation • Upon construction completion, natural buffers should be returned to pre-construction conditions

5.3.3 Soil Stabilization / Sediment and Erosion Controls – Frozen Conditions

In the event that immediate vegetative stabilization is not feasible due to frozen conditions, non-vegetative controls must be implemented until vegetative stabilization can be properly installed.

5.3.4 Maintenance Schedule of Sediment Control BMPs

SDDENR CGP No. SDR100000 maintenance requirements, Ames, as the primary operator of this SWPPP shall adhere to the following maintenance schedule listed in Table 5.3. The inspection schedule described in Section 7 of this SWPPP must also be implemented during the project's duration. Reference Section 3.1 and Section 3.18 of the SDDENR CGP No. SDR100000 (Appendix B of this report) for state specific guidance, requirements, and manuals.

Table 5.3: BMP Maintenance Requirements

BMP	Condition	Maintenance
Sediment Controls ▪ Berms, Silt Fence, Staked Hay or Straw Bales, Sandbags, Fiber Rolls, Vegetated Swales, Sediment Basins	-BMP half full of sediment deposits. -BMP has been reduced to half of the original height. -Sediment Basin no longer has at least one-half of design capacity due to sediment buildup	-Remove accumulated sediments -Install secondary sediment control structure up or down stream of current structure as needed to control sediment run-off. -Maintenance/repair to occur within twenty-four (24) hours of observed issue.
Perimeter Sediment Control ▪ Berms, Silt Fence, Staked Hay or Straw Bales, Sandbags, Fiber Rolls	-BMP is half full of sediment deposits. -BMP has been reduced to half of the original height.	-Remove accumulated sediments. -Install secondary sediment control structure up or down stream of current structure. -Maintenance/repair to occur within twenty-four (24) of observed issue.
Sediment Track-out Control ▪ Tracking Pad	-Significant track-out of sediment material onto paved public roads. -Significant buildup of sediment material on track-out pad minimizing its effectiveness of eliminating/reducing material track-out off project site.	-Water truck to be used to clean sediment material off of paved surfaces. -Adhere to all state and federal regulations while working on public roads and highways. -Maintenance/repair to occur within twenty-four (24) of observed issue.

5.3.5 Perimeter Controls

Operators are required to install sediment controls along those perimeter areas of the site that will receive stormwater from earth-disturbing activities. Controls shall be installed before dirt work activities begin on the project site. The contractor shall utilize perimeter control BMPs listed in Table 5.3, silt fence should not be installed closer than 2 feet from an existing public roadway. Inspections and maintenance of the BMP's shall occur at the SDDENR approved intervals described in Section 7 of this report. Specifications of the perimeter control BMPs can be referenced in Appendix C.

5.3.6 Sediment Track-Out Controls

Track-out control measures will be implemented to reduce/eliminate the track-out of material from the project site onto public roads and highways and be consistent with Section 3.6 of the SDDENR CGP No. SDR100000 (Appendix B of this report). Controls shall be installed before dirt work activities begin on the project site. The contractor shall utilize track-out control

BMPs listed in Table 5.3. Inspections and maintenance of the BMP's shall occur at the SDDENR approved intervals described in Section 5.3.4 of this report. Specifications of the track-out control BMPs can be referenced in Appendix C.

5.4 Stockpiled Soil

During the construction of roads and foundations the stockpiling of topsoil and subsoil will be necessary. Stockpiles will require specific BMPs and proper grading to limit their erosion and sediment removal. Perimeter controls should be implemented to manage run-off and erosion of stockpiles. The contractor shall utilize perimeter control BMPs listed in Table 5.2. Inspections and maintenance of the BMP's shall occur at the SDDENR approved intervals described in Section 5.3.4 of this report. Specifications of the perimeter control BMPs can be referenced in Appendix C. Stockpiles that are inactive for more than 14 days should be stabilized to limit to the extent practicable erosion and sediment transfer. Reference Section 5.16 of this report for stabilization requirements.

5.5 Dust Control

Dust control may be necessary on all dirt/gravel roads, excavations, and laydown areas on the project site. The contractor should utilize a water truck or other similar accepted dust control measures throughout construction activities to minimize dust as needed.

5.6 Minimize the Disturbance of Steep Slopes

Steep slopes will require erosion control during construction. Both temporary and permanent erosion control will be required on Wild Springs Solar. The contractor shall use steep slope erosion control BMPs listed in Table 5.2. Inspections and maintenance of the BMP's shall occur at the SDDENR approved intervals described in Section 5.3.4 of this report. Specifications of the steep slope erosion control BMPs can be referenced in Appendix C.

5.7 Topsoil

Topsoil should be separated and stored away from subsoils to enable topsoil reapplication at the end of the construction process. Topsoil stockpiling should be utilized during all dirt work that will require restoration upon the completion of the project. Stockpiles should use the erosion BMPs discussed in Section 5.3.2 of this report. The contractor should stockpile material as close as practically possible from its point of origin to ensure adequate redistribution during site restoration activities.

5.8 Soil Compaction

Soil compaction shall be avoided as practically as possible during construction activities. During reclamation of the project area, de-compaction of soil shall be completed by contractor before reseeding.

To minimize soil compaction the contractor shall utilize the following recommendations:

- Minimize construction traffic:
  - Contractor to minimize construction traffic on soils to be restored post construction.
  - Route changes and management shall be utilized by contractor to reduce compaction of soils.
- De-compaction of soils
  - Contractor to rip/scarify soils during restoration and reseeding of project.
  - The contractor's discretion is to be used when specifying equipment to be used for soil de-compaction.

5.9 Storm Drain Inlet

At the time of completion of this SWPPP it was not anticipated that any storm drain inlets would be present and/or effected by the construction activities of Wild Springs Solar. In the event that it is found that storm drains inlets will be affected by the construction activities, the contractor shall consult with Ulteig before resuming construction.

5.10 Constructed Stormwater Conveyance Channels (Vegetated Swales)

At the time of completion of this SWPPP it was not anticipated to have constructed stormwater conveyance channels on Wild Springs Solar. In the event that constructed stormwater conveyance channels are encountered/installed on the project site the contractor shall consult with Ulteig before resuming construction.

5.11 Sediment Basins

If a sediment basin is used to control the discharge of sediment from the site, the requirements must be met according to Section 3.5 of the SDDENR CGP No. SDR100000 (Appendix B of this report).

5.12 Chemical Treatment

Chemical treatment as a flocculant and soil tackifier is recommended on as as-needed basis for the Wild Springs Solar project. See notes in the Site Civil Plans for appropriate use (Appendix C). All chemicals are to be per state and manufacturer guidelines.

5.13 Dewatering Practices

Contractor shall comply with the EPA's CGP Part 2.1.3.4 Dewatering Practices. These approved practices consist of the following:

- Do not discharge visible floating solids or foam.
- Use an oil-water separator or suitable filtration device (such as a cartridge filter) that is designed to remove oil, grease, or other products if dewatering water is found to contain these materials.
- To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. In no case will surface waters be considered part of the treatment area.
- At all points where dewatering water is discharged, reduce water velocity as much as feasibly possible.
- Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specification.

5.13.1 Dewatering Practices

The contractor should utilize the following dewatering practices during construction activities. Specifications and details of these practices can be found in the Site Civil Plans (Appendix C of this report). Guidance is also provided in Table 5.4 below.

Table 5.2: Dewatering BMPs

BMP	Notes
Filter Bag	General Notes: ▪ Filter bags to be used to remove sediments from dewatering hose before discharge. ▪ Use filter bag when temporary sediment basins are not available or practical during dewatering activities. ▪ When feasible, use filter bag in conjunction with sump pit for further sediment removal. Installation/Maintenance: ▪ Contractor to refer to manufactures specification when sizing filter bags. ▪ Discharge from bag should be on well vegetated area or otherwise stabilized area. ▪ Where necessary, install silt fence or fiber rolls down slope from filter bags to reduce erosion of surrounding area. ▪ Contractor to inspect filter bag during use to ensure adequate sediment removal. ▪ Filter bag and sediment to be disposed offsite or on-site as directed by owner.
Velocity Dissipation	General Notes: ▪ During dewatering practices velocity dissipation shall be utilized to reduce erosion and scouring of soils. ▪ Velocity dissipation is a practical means of reducing sediment transfer during dewatering practices Installation/Maintenance: ▪ Install rip rap or geotextile fabric where pumped water will be discharged. ▪ Stake fabric to ground to ensure no movement during use. ▪ Clean/replace velocity dissipation material when half-full of sediment. ▪ Properly dispose of sediment during maintenance.
Sump Pit	General Notes: ▪ During dewatering practices sump pits shall be utilized to collect water before pumped out of excavation or to another location. ▪ Sump pits are a practical means of reducing sediment transfer during dewatering practices. Installation/Maintenance: ▪ Water pumped from sump pit shall be through filter bag or other appropriate BMPs when found necessary for erosion and sediment transfer control. ▪ Where feasible and practical, install 12”-24” perforated standpipe in center of sump pit to collect water. ▪ Where feasible and practical, install 12” of 2” aggregate at bottom of sump pit and place around perforated standpipe. ▪ Contractor shall inspect sump pits daily during use. Excessive sediment build-up to be removed from sump pit when found to limit pumping capacity.

5.14 Concrete Truck Wash-out Area

Concrete trucks should only wash out in specified areas on the project site. The contractor is responsible for specifying concrete truck wash-out areas on-site. Wash-out area locations, details, and specifications can be found in Appendix C.

In general, concrete wash-out areas should include impermeable liners (geotextiles, plastic coverings, or compacted clay), and should implement the following:

- Structural controls prevent direct discharge, such as:
  - Berms
  - Shallow pits
  - Storage tanks with slow rate release
- Areas with minimal slope that allow infiltration and filtering of wash-out water

Concrete trucks are prohibited from washing out in areas with direct discharge to surface water or storm sewers, or in areas where groundwater contamination is a concern.

5.15 Site Stabilization

Site stabilization must be implemented and maintained throughout construction activities. Soil Stabilization through sediment/erosion controls are required to be implemented immediately in disturbed areas where construction activity has temporarily or permanently ceased for more than fourteen (14) days. Final stabilization shall be initiated on any site where construction activities have been suspended or have otherwise stopped for more than 180 days, consistent with Section 3.18 of the SDDENR CGP No. SDR100000 (Appendix B of this report). At times the permittee shall minimize the size of disturbance and durance of disturbance consistent with the requirements outlined in Section 3.10 of SDDENR CGP No. SDR100000 (Appendix B of this report). Stabilization methods can be found in Table 5.5. Stabilization details can be found within Site Civil Plans and Vegetation Management Plan (Appendix C and Appendix L of this report). Upon completion of the project, the stabilization requirements listed in Table 5.5 below will be the responsibility of the SWPPP operator.

During mass grading activities, a grading and stabilization log shall be filled out and kept up to-date by the contractor. This log can be found in Appendix H.

Table 5.3: Site Stabilization Requirements

Area Type	Corresponding Site Areas	Vegetative Stabilization Requirements	Non-Vegetative Stabilization Requirements
All areas (excluding arid, semi-arid, drought-stricken, and agricultural lands)	Low-lying areas with significant flow accumulation and moderate soil fertility	70% established uniform coverage Perennial coverage established	Adequate non-vegetative erosion control applied to open areas during establishment of perennial cover
Arid, semi-arid, and drought-stricken areas	Hill, ridge, and other high-lying areas of the site with sparse existing vegetation and low soil fertility	70% established uniform coverage established within 3 years Perennial coverage established	Adequate non-vegetative erosion control applied to provide cover for at least 3 years without active maintenance. Properly anchored mulch, soil binders or matting must be employed.
Agricultural Land		Land to be brought to pre-construction condition	Land to be brought to pre-construction condition

6 Pollution Prevention Standards

6.1 Potential Sources of Pollution

The potential sources of pollution on the project site must be considered and properly managed. Potential sources of pollution include construction waste and materials, cement and concrete admixtures, petroleum products, and sanitation waste. Proper storage and housekeeping will be essential to mitigate the possibility of spills and pollution issues. Storage of potential pollutants should be in original container with proper labeling of health risks and mitigation recommendations and stored in the smallest quantiles possible to reduce spill risks. Storage areas should also be covered and secured from the elements and unauthorized personnel. A copy of all SDS of pollutants shall be kept on site at all times.

Proper installation and maintenance of BMPs should mitigate risks of stormwater discharge from site. A site specific SPCC shall be developed for sites that have the capacity to store more than 1,320 gallons of petroleum products. The SPCC shall be implemented and maintained per plan specifications at all times, and personnel trained to properly manage and mitigate pollution risks due to spills. Spill kits should be present and available as outlined in the plan.

Ensure that the proper authority's numbers are listed on site in the event that a spill or discharge of a hazardous material of a reportable quantity has occurred**. In the event of a reportable incident, contact the South Dakota Department of Agriculture and Natural Resources Emergency Response at 605.773.3296 and the National Response Center within 24 hours of the spill at 1.800.424.8802.** For additional information on spill response and reportable quantities, reference https://danr.sd.gov/Agriculture/Inspection/Spills/default.aspx and the online reporting tool for the NRC at http://www.nrc.uscg.mil/.

Table 6.1: Reportable Pollutant Spill Quantities

Pollutant	Location of Discharge	Reportable Spill Quantities
Hazardous Substance	Land	Refer to Table 302.4 at https://www.gpo.gov/fdsys/pkg/CFR-2004-title40-vol26/pdf/CFR-2004-title40-vol26-sec302-4.pdf
Petroleum Product	Land	When hazardous condition is created
Petroleum Product	Water	Enough to create a sheen on water
Other materials that may cause pollution if discharged into water	Water	100 lbs. or when hazardous condition is created

Table 6.2: Potential Site Pollutants

Pollutants or Pollutant Constituents (that could be discharged if exposed to stormwater)	Location on Site	Control Measure
Gasoline	Vehicle/Equipment/Fuel Tanks	Secondary Containment/Drip Pan/ Routine Inspection
Diesel Fuel	Vehicle/Equipment/Fuel Tanks	Secondary Containment/Drip Pan/ Routine Inspection
Grease	Vehicle/Equipment	Secondary Containment/Drip Pan/ Routine Inspection
Hydraulic Oils/Fluids	Vehicle/Equipment	Secondary Containment/Drip Pan/ Routine Inspection
Mineral Oil	Inverter Stations	Secondary Containment/Drip Pan/ Routine Inspection
Cleaning Solvents	Contractor	Secondary Containment/Covered Storage/ Routine Inspection
Portable Toilets	Site Wide	Toilets Properly Secured by Service Provider/ Routine Inspection
Trash/Construction Debris	Site Wide	Dumpster with covers/ Routine Inspection
Paints	Contractor	Secondary Containment/Covered Storage/Routine Inspection
Glues and Adhesives	Contractor	Secondary Containment/Covered Storage/ Routine Inspection
Concrete Admixtures	Concrete Trucks/Wash Out	Secondary Containment/Covered Storage/Wash Out Area/ Routine Inspection
Concrete	Concrete Trucks/Wash Out	Secondary Containment/Covered Storage/Wash Out Area
Grout (Epoxy/Cementitious)	Contractor	Secondary Containment/Covered Storage/Wash Out Area/ Routine Inspection
Sediment	Site wide – exposed/disturbed areas	Erosion, Tracking, and Runoff Control BMPs/ Routine Inspection
Landscaping Materials/Fertilizer	Contractor	Secondary Containment/Covered Storage

6.2 Spill Prevention and Response

A site-specific Spill Prevention, Control, and Countermeasure (SPCC) plan will be completed for the Wild Springs. Site specific spill prevention and response BMPs shall be referenced from the SPCC and implemented on the project.

6.3 Fueling and Maintenance of Equipment or Vehicles

When fueling and maintenance of equipment and vehicles will take place on site, proper pollution prevention standards and mitigation practices shall be implemented to reduce pollution potentials. All on-site crews should be properly trained on proper practices and procedures for fueling and maintaining equipment on site. This training should be incorporated into the project specific orientation given to all on-site crews. When possible and feasible, complete all maintenance of vehicles and equipment offsite at an approved maintenance facility.

Specific Pollution Prevention Practices

1. Comply with the Spill Prevention Control and Countermeasures (SPCC) requirements pertaining to fueling and maintaining equipment and vehicles on site.
2. Ensure adequate supplies are available at all times to handle spills, leaks, and disposal of used liquids.

3. Use drip pans and absorbents under or around leaky vehicles.
4. Dispose of or recycle oil and oily wastes in accordance with federal, state, and local requirements.
5. Clean up spills or contaminated surfaces immediately, using dry clean up measures where possible. Control the source of any spills to limit to the extent practicable a discharge or a furtherance of an ongoing discharge.
6. Do not clean surfaces by hosing the area down.

6.4 Washing of Equipment and Vehicles

In the event that equipment and vehicle washing is required, all washing shall occur within the main project laydown area. Proper BMPs, such as sediment basins, and containment areas should be implemented. Contaminated water should be contained, pumped, and removed from site for proper disposal at a wastewater facility. In the event that equipment or vehicle has a visible leak of hazardous material, no washing shall occur on site until the leak is properly repaired and cleaned. Degreasing of engine shall not be done on site. When possible and feasible, all equipment and vehicle washing with detergent should be done offsite at an approved washing facility.

If detergents will be stored on-site, proper storage must be provided including (1) proper covers (e.g., plastic sheeting or temporary roofs) to prevent potential discharges from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from the storage area.

6.5 Storage, Handing, and Disposal of Construction Products, Materials, and Wastes

Construction materials should be stored, handled, and disposed of in an approved way at all times during the project. All federal, state, and local regulations must be followed during storage and disposal of construction materials. Refer to requirements outlined in Section 3.21 of the SDDENR CGP No. SDR100000.

6.5.1 Storage and Handling

- Construction materials should be stored in covered containers. Containers should be properly secured from unauthorized personnel and vandalism.
- Original containers with proper safety labels should be used for storage of hazardous materials.
- SDS information of all materials shall be available on site in a central location.
- All spills and leaks should be contained and cleaned up immediately. Spill kits should be located in convenient and available locations to be accessed in an easy and timely manner in the event of a spill. Contractor should refer to manufacture's recommendations on proper cleanup of materials.
- All leaks should be repaired as soon as possible. Equipment found to have leaks of hazardous material should be taken out of service until properly repaired.
- Storage areas of hazardous materials shall not be within 200 ft of identified critical areas and/or known water ways.
- Effort should be made to store only necessary amounts of material on site. Storage of excess hazardous materials is discouraged.
- All portable toilets and sanitation waste should be contained in approved units and adhere to all federal, state, tribal, and local regulations pertaining to storage and treatment of human waste.
- Storage and disposal of pesticides, herbicides, insecticides and fertilizers should be done in accordance with all federal, state, tribal, and local regulations.

6.5.2 Disposal

- Used material shall be removed from site on a regular basis and sent to an approved disposal facility. Storage of used/unnecessary materials on site for extended amounts of time is prohibited.

- Sewage should be pumped from site at a frequency to maintain the facilities in all portable toilets and sewage containers. Waste should be brought to an approved disposal facility offsite.
- Dumpsters should be placed in a central location for collection of construction and domestic wastes. Dumpsters should be inspected and replace when necessary to discourage excess waste build up.
- Construction and domestic waste should be removed from site and disposed of at an approved facility. All waste disposal facilities should adhere to all applicable federal, state, and local regulations.
- Covers shall be used on dumpsters.

7 Inspection and Corrective Action

7.1 Inspections

A consistent inspection schedule should be planned and adhered to throughout the duration of the project. The inspection schedule must meet the minimum requirements listed in the Table 7.1 below. Inspections must adhere to requirements identified in Section 4.0 of the SDDENR CGP No. SDR100000. The inspector shall be qualified and familiar with the construction activities on the project and the requirements of the site specific SWPPP and SDDENR CGP No. SDR100000.

Inspections must consist of inspection of the following areas:

- Disturbed areas (cleared, graded, or excavated) of the construction site that do not meet the requirements of final stabilization in this general permit.
- All locations where stabilization measures have been implemented.
- Areas of construction support activities covered under this SWPPP (i.e. concrete batch plant).
- Stormwater controls (including pollution prevention controls) for evidence of, or the potential for, discharge of pollutants.
- Areas where stormwater typically flows within the construction site.
- Points of discharge from the construction site. Inspect the receiving water bodies for evidence of new erosion and/or the introduction of newly deposited sediment or other pollutants.
- Areas used for storage of materials exposed to precipitation

Inspection reports shall be completed within 24 hours following the inspection. Reports shall be kept with this SWPPP. Reference Section 4.6 of the SDDENR CGP No. SDR100000 (Appendix B of this report) for state specific guidance.

Changes to the inspection schedule shall only be made at the beginning of each calendar month. This includes the change of status from “active construction areas” to “stabilized areas.” All changes in the inspection schedule must be documented in the inspection forms, including the reason for the changes. An inspection form can be found in Appendix D. Alterations to the inspection form are permissible upon review and approval from Ulteig.

Table 7.1: SWPPP Inspection Schedule Requirements

Site Activity	Inspection Interval Required	Notes
Active Disturbance Area	• At least once every 7; or • Once every 14 calendar days and within 24 hours of precipitation that exceeds 0.25 inches or greater or snowmelt that generates runoff	• Properly maintained rain gauge required on site for documenting rainfall • Rain amount should be documented daily
Temporarily/Permanently Stabilized Areas/Frozen Conditions	• At least once per month until coverage is terminated • For frozen conditions, weekly inspections must resume no later than March 1st until coverage is terminated • Inspect mulch areas weekly	• Areas where work is complete and bare ground has been stabilized using appropriate ground cover
Arid, Semi-arid, and Drought-stricken Areas	• At least once per month • Within 24 hours of precipitation that exceeds 0.25 inches or greater or snowmelt that generates runoff	• Note in SWPPP approximate beginning and ending dates of drought conditions

7.2 Corrective Action

In the event that deficiencies are found during inspections, the primary operator is required to take adequate corrective actions to remedy the deficiencies. Corrective action should be taken to:

- Repair, modify, or replace any stormwater control used at the site;
- Clean up and properly dispose of spills, releases, or other deposits; and
- Remedy a permit violation.

Corrective actions must be made immediately upon discovery of non-compliance to pollution control measures designed in this SWPPP. "*Immediate action*" implies corrective actions to be done on the day in which deficiencies are found. When immediate actions are not feasible due to weather, time, or safety restriction, corrective actions must be taken the following workday. A log of corrective actions taken should be updated throughout the project. The log can be found in Appendix E.

7.3 Delegation of Authority

A designated representative of the contractor must sign the Delegation of Authority Form found in Appendix J. The designated person will be responsible for reviewing and signing reports done concerning the stormwater pollution prevention plan on site, ensuring all regulations are met and that all necessary correctly actions are completed when deficiencies are found on-site. The name and title of the designated person is also listed in Section 3 of this SWPPP.

8 Training

EPA requires personnel training for employees responsible for implementing any component of the SWPPP. Specific training requirements are listed below in Table 8.1. The EPA's Construction General Permit (CGP) Part 6 as well as documents listed within Section 5.3.2 of the SDDENR CGP No. SDR100000 should also be referenced for training requirements. The inspector shall complete the required training in stormwater construction management as identified in Section 5.3.2 of the SDDENR CGP No. SDR100000.

If personnel will be taking course training, a course completion tracking form may be found in Appendix I to track completion of this training.

Table 8.1: Training Requirements

Personnel	Requirements

• Personnel responsible for SWPPP:
  ○ Design
  ○ Installation
  ○ Maintenance
  ○ Repair
  ○ Inspections
• Personnel responsible for taking corrective actions
	• Personnel shall be trained in:
	  ○ Location of all stormwater controls on the site
	  ○ Proper Maintenance of BMPs
	  ○ Proper procedures to follow with respect to the permit's pollution prevention requirements
	  ○ When and how to conduct inspections
	  ○ When and how to take corrective actions

Employees that have completed the required training should be tracked in a training record and kept on site with this SWPPP.

Table 8.2: Documentation for Completion of Training

Name	Date Training Completed

9 Certification and Notification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name:	_____	Title:	_____
Signature:	_____	Date:	_____
Name:	_____	Title:	_____
Signature:	_____	Date:	_____

[Repeat as needed for multiple construction operators at the site.]

10 SWPPP Amendments/Notice of Change (NOC)

This SWPPP may need to be amended during the project duration depending on changing conditions, regulations, and requirements. Amendments will need to be made when any of the following occurs:

- Significant design changes that will affect stormwater discharge and may add to pollution of surface waters.
- Changing site conditions, including changing contractual scopes of contractors and owners that may affect the stormwater discharge on the project.
- Results from inspections done by governmental agencies or third parties.

In the event that amendments are deemed necessary to be made to the SWPPP or Site Civil Plans, they must be documented and tracked in the SWPPP Amendment Log found in Appendix F. All necessary modifications to the SWPPP shall be made within seven (7) calendar days following an inspection. If existing practices need to be modified, implementation shall be completed before the next storm event whenever practicable. Refer to Section 5.5 in the SDDENR CGP No. SDR100000 (Appendix B of this report).

If relevant information provided in the NOI changes, when an alteration or addition could significantly change the nature or increase the quantity of pollutant discharged, or could result in noncompliance with permit conditions, the operator that has submitted the NOI must notify the SDDENR as soon as possible.

A Notice of Termination shall be submitted to the SDDENR when final stabilization has been achieved on all portions of the site for which the permittee is responsible, another permittee has assumed control over all areas of the site that have not been finally stabilized, or coverage under an individual SDDNER permit has been obtained.

Refer to Section 2.6 in the SDDENR CGP No. SDR100000 for state specific guidance on coverage termination.

Appendix A Site Maps

Topographic Maps

Overall Site Plan

Existing Drainage Map

Existing Land Use Map

Existing Slopes Map

Hydrologic Soil Group Map

WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
A	09/12/2022	EXISTING TOPOGRAPHY	TLB

nationalgrid renewables

8400 NORMANDALE LAKE BLVD,
SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction

Legend

- Existing Contours - 2ft
- Project Boundary
- Access Road - 16ft
- Access Road - 25ft
- Chainlink Fence
- MV Collection
- Edge of Water
- PV Array
- Inverter
- Quarry
- Wetlands
- Substation
- O&M Building
- Laydown Yard

N

0 500 1,000 Feet

NSRS 2011 SOUTH DAKOTA STATE PLANES, SOUTH ZONE, US FOOT

PRELIMINARY
NOT FOR CONSTRUCTION

Ulteig
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3350 38th Avenue South
Fargo, North Dakota 58104
Phone: 701.280.8500
Fax: 701.237.3191
www.ulteig.com
FIRM LICENSE: 34814

Design By: C. GREVE
Drawn By: J. DREYER
Approved By: T. BERENDS
Project Number: 22.11742

EXISTING TOPOGRAPHY

REVISION: A

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WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
A	09/12/2022	OVERALL SITE PLAN	TLB

nationalgrid renewables

8400 NORMANDALE LAKE BLVD,
SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction

Legend

- Project Boundary
- Access Road - 16ft
- Access Road - 25ft
- Chainlink Fence
- MV Collection
- Edge of Water
- PV Array
- Inverter
- Quarry
- Wetlands
- Substation
- O&M Building
- Laydown Yard

N

0 500 1,000 Feet

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Approved By: T. BERENDS
Project Number: 22.11742

OVERALL SITE PLAN

REVISION: A

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
A	09/12/2022	EXISTING DRAINAGE	TLB

nationalgrid renewables

8400 NORMANDALE LAKE BLVD,
SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction

Legend

- Project Boundary
- Drainage Area
- Access Road - 16ft
- Access Road - 25ft
- UG P — MV Collection
- O — Chainlink Fence
- Edge of Water
- PV Array
- Inverter
- Quarry
- Wetlands
- Substation
- O&M Building
- Laydown Yard

N

0 500 1,000 Feet

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Project Number: 22.11742

EXISTING DRAINAGE

REVISION: A

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WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
A	09/12/2022	EXISITNIG LANDUSE	TLB

nationalgrid renewables

8400 NORMANDALE LAKE BLVD,
SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction

Legend

- Project Boundary
- Access Road - 16ft
- Access Road - 25ft
- Chainlink Fence
- MV Collection
- Edge of Water
- PV Array
- Inverter
- Wetlands
- Quarry
- Laydown Yard
- O&M Building
- Substation

Existing Landuse

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Herbaceous
- Hay/Pasture
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

N

0 500 1,000 Feet

NSRS 2011 SOUTH DAKOTA STATE PLANES, SOUTH ZONE, US FOOT

PRELIMINARY
NOT FOR CONSTRUCTION

Ulteig
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3350 38th Avenue South
Fargo, North Dakota 58104
Phone: 701.280.8500
Fax: 701.237.3191
www.ulteig.com
FIRM LICENSE: 34814

Design By: C. GREVE
Drawn By: J. DREYER
Approved By: T. BERENDS
Project Number: 22.11742

EXISTING LANDUSE

REVISION: A

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
A	09/12/2022	EXISTING SLOPES	TLB

nationalgrid renewables

8400 NORMANDALE LAKE BLVD,
SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction

Legend

- Project Boundary
- Access Road - 16ft
- Access Road - 25ft
- UG P — MV Collection
- O — Chainlink Fence
- Edge of Water
- PV Array
- Inverter
- Quarry
- Wetlands
- Substation
- O&M Building

Existing Slopes (%)

- 0.0 - 4.0
- 4.0 - 6.0
- 6.0 - 8.0
- 8.0 - 10.0
- >10.0

N

0 500 1,000 Feet

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EXISTING SLOPES

REVISION: A

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WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
A	09/12/2022	HYDROLOGIC SOIL GROUPS	TLB

nationalgrid renewables

8400 NORMANDALE LAKE BLVD,
SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction

Legend

- Project Boundary
- Access Road - 16ft
- Access Road - 25ft
- Chainlink Fence
- MV Collection
- Edge of Water
- PV Array
- Inverter
- Quarry
- Wetlands
- Substation
- O&M Building
- Laydown Yard

Hydrologic Soil Groups

- Unknown
- A
- B
- C
- C/D
- D

N

0 500 1,000 Feet

NSRS 2011 SOUTH DAKOTA STATE PLANES, SOUTH ZONE, US FOOT

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HYDROLOGIC SOIL GROUPS

REVISION: A

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Appendix B Copy of SDDENR CGP No. SDR100000

Permit Number: SDR100000

SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

General Permit Authorizing Stormwater Discharges Associated with Construction Activities Under the South Dakota Surface Water Discharge System

In compliance with the provisions of the South Dakota Water Pollution Control Act and the Administrative Rules of South Dakota (ARSD), Article 74:52, owners and operators of stormwater discharges from **construction activities**, located in the state of South Dakota are authorized to discharge in accordance with the conditions and requirements set forth herein.

This General Permit shall become effective on April 1, 2018.

General permit coverage for the [PERMITTEE] shall become effective [EFFECTIVE DATE].

This General Permit and the authorization to discharge shall expire at midnight, **March 31, 2023.**

Signed this **23rd** day of **March, 2018,**

Authorized Permitting Official

Steven M. Pirner
Secretary
Department of Environment and Natural Resources

Note: *This page will be replaced with a copy containing the assigned permit number once coverage has been authorized.*

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Appendix A – Notice of Intent (NOI) Form

Appendix B – Notice of Termination (NOT) Form

Appendix C – Contractor Authorization Form

Appendix D – Transfer of Permit Coverage Form

Appendix E – Noitce of Intent for Reauthorization Form

Appendix F – Two-year, Twenty-four Hour Precipitation Event Map

1.0 DEFINITIONS

ARSD – Administrative Rules of South Dakota.

Best Management Practices (**BMPs**) – the schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants from the construction site. BMPs also include treatment requirements, operating procedures, and practices to control construction site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Borrow Areas – the areas where materials are dug for use as fill, either onsite or offsite.

Commencement of Construction Activities – the initial disturbance of soils (or 'breaking ground') associated with clearing, grading, or excavating activities or other construction-related activities (e.g., stockpiling of fill material).

Construction Site – the land or water area where construction activities will occur and where control measures will be installed and maintained. The construction site includes construction support activities, which may be located at a different part of the property from where the primary construction activity will take place, or on a different piece of property altogether. The construction site is often a smaller subset of the lot or parcel within which the project is taking place.

Construction Site Washout – as used in this general permit, refers to any wash waters derived from the cleaning of construction trucks and/or equipment including, but not limited to, concrete, mortar, grout, stucco, form release oils, paints, curing compounds, and other construction materials.

Construction Support Activity – a construction-related activity that specifically supports the construction activity and can include activities associated with concrete or asphalt batch plants, equipment staging yards, materials storage areas, excavated material disposal areas, and borrow areas.

Construction Waste – discarded material including, but not limited to, packaging materials, scrap construction materials, masonry products, timber, steel, pipe, electrical cuttings, plastics, and Styrofoam.

Control Measures – as used in this general permit, refer to any best management practice or other method, including narrative effluent limits, used to minimize erosion and sedimentation, and thereby prevent or reduce the discharge of pollutants to surface waters of the state.

Corrective Action – as used in this general permit, refers to any action taken to (1) repair, modify, or replace any control measure used at the site; (2) clean up and dispose of spills, releases, or other deposits found on the site; or (3) remedy a permit violation.

Dewatering – the act of draining or pumping rain water, ground water, or surface waters from building foundations, vaults, trenches, and other areas of the construction site.

Discharge – the addition of any pollutant or combination of pollutants to surface waters of the state from any point source.

Earth-Disturbing Activities – as used in this general permit, means actions taken to alter the existing vegetation and/or underlying soil of a site.

Effective Operating Condition – as used in this general permit, means a control measure is kept in effective operating condition if it has been implemented and maintained in such a manner that it is working as designed to minimize pollutant discharges.

Final Stabilization – on areas not covered by permanent structures, means either (1) vegetation has been established that provides a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70 percent of the natural background vegetative cover, (2) permanent non-vegetative stabilization methods have been implemented to provide effective cover for exposed portions of the site, or (3) disturbed portions of a construction site on land used for agricultural purposes must be returned to pre-construction agricultural use.

Historic Property – any building, structure, object, district, area, or site that is significant in the history, architecture, archaeology, paleontology, or culture of the state, its communities or the nation as stated in SDCL 1-19A-2.

Infeasible – as used in this general permit, means not technologically possible or not economically practicable and achievable in light of best industry practices.

Larger Common Plan of Development or Sale – a contiguous area where multiple separate and distinct land disturbing activities may be taking place at different times, on different schedules, but under one proposed plan. "One plan" is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating construction activities may occur on a specific plot.

Minimize – to reduce and/or eliminate to the extent achievable using control measures that are technologically available and economically achievable and practicable in light of best industry practices.

Municipal Separate Storm Sewer System – a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) that is owned or operated by the state or a municipality and is designed or used for collecting or conveying stormwater. This definition does not include combined sewers or conveyances that are part of a publicly-owned treatment works, as defined by ARSD 74:52:01:01(36).

Municipality – a city, town, county, district, sanitary district, or other public body created by or under state law with jurisdiction over the disposal of sewage, industrial wastes, or other wastes.

Natural Buffer – as used in this general permit, means an area of undisturbed natural cover surrounding surface waters within which construction activities are restricted. Natural cover

includes the vegetation, exposed rock, or barren ground that exists prior to commencement of construction activities.

Nonpoint Source – a source of pollution that is not defined as a point source.

Non-Stormwater Discharges – discharges that do not originate from runoff events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, construction washout water, paint wash water, irrigation water, or pipe testing water.

Notice of Intent or **NOI** – the form (electronic or paper) provided by the Secretary required for authorization of coverage under this general permit (Appendix A).

Notice of Termination or **NOT** – the form (electronic or paper) provided by the Secretary required for terminating coverage under this general permit (Appendix B).

Operator – as used in this general permit and in the context of stormwater discharges associated with construction activity means any party associated with a construction project that meets either of the following two criteria:

1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
2. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the general permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the general permit).

The operator, along with the owner, is responsible for ensuring compliance with all conditions of this general permit and with development and implementation of the stormwater pollution prevention plan.

Pesticide – any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pests, or any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.

Note: drugs used to control diseases of humans or animals (such as livestock and pets) are not considered pesticides; such drugs are regulated by the Food and Drug Administration. Fertilizers, nutrients, and other substances used to promote plant survival and health are not considered plant growth regulators and thus are not pesticides. Biological control agents, except for certain microorganisms, are exempted from regulation as pesticides under FIFRA. (Biological control agents include beneficial predators such as birds or ladybugs that eat insect pests, parasitic wasps, fish, etc.)

Point Source – any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, animal feeding operation, or vessel or other floating craft from which pollutants are or may be discharge. Construction sites disturbing one (1) or more acres are point sources. Therefore, any

water flowing off the construction site constitutes a discharge and must be covered by a Surface Water Discharge permit.

Pollutant-Generating Activities – at construction sites, as used in this general permit, means those activities that lead to or could lead to the generation of pollutants, either as a result of earth-disturbance or a related construction support activity. Some of the types of pollutants that are typically found at construction sites are:

1. Sediment;
2. Nutrients;
3. Heavy metals;
4. Pesticides and herbicides;
5. Oil and grease;
6. Bacteria and viruses;
7. Trash, debris, and solids;
8. Treatment polymers; and
9. Any other toxic chemicals.

Prohibited Discharges – as used in this general permit, means discharges that are not allowed under this general permit, see Section 2.3.

Qualified Local Program – a municipal program for stormwater discharges associated with construction sites that has been formally approved by SDDENR to act in lieu of the state program.

Regulated Substance – the compounds designated by the department under South Dakota Codified Law §§ 23A-27-25, 34A-1-39, 34A-6-1.3(17), 34A-11-9, 34A-12-1 to 34A-12-15, inclusive, 45-6B-70, 45-6C-45, 45-6D-60, and 45-9-68, including pesticides and fertilizers regulated by the Department of Agriculture; the hazardous substances designated by the federal Environmental Protection Agency pursuant to section 311 of the Federal Water Pollution Control Act and Clean Water Act (33 United States Code sections 1251 to 1387, inclusive), as amended to January 1, 2011; the toxic pollutants designated by Congress or the Federal Environmental Protection Agency pursuant to section 307 of the Toxic Substances Control Act (15 United States Code sections 2601 to 2671, inclusive), as amended to January 1, 2011; the hazardous substances designated by the Federal Environmental Protection Agency pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (42 United States code sections 9601 to 9675, inclusive), as amended to January 1, 2011; and petroleum, petroleum substances, oil, gasoline, kerosene, fuel oil, oil sludge, oil refuse, oil mixed with other wastes, crude oils, substances, or additives to be utilized in the refining or blending of crude petroleum or petroleum stock, and any other oil or petroleum substance. This term does not include sewage and sewage sludge.

Runoff Event – a precipitation event or snowmelt that results in a measurable amount of surface runoff.

SDDENR – the South Dakota Department of Environment and Natural Resources.

Secretary – the Secretary of the South Dakota Department of Environment and Natural Resources, or an authorized representative.

Section 303(d) List or 303(d) List – a list of South Dakota's water quality-limited surface waters requiring the development of Total Maximum Daily Loads (TMDLs) to comply with Section 303(d) Report is available on the SDDENR website. A link to a map of 303(d) listed waters, waters with approved TMDLs is available on the SDDENR stormwater webpage.

Stormwater – means, for the purpose of this general permit, stormwater runoff, snowmelt runoff, or surface runoff.

Stormwater Associated with Construction Activity – means a discharge of pollutants in stormwater to surface waters of the state from areas where construction site or construction support activities occur.

Stormwater Associated with Industrial Activity – means stormwater runoff, snow melt runoff, or surface runoff and drainage from industrial activities as defined in 40 C.F.R. Section 122.26(b)(14) (July 1, 2016).

Stormwater Pollution Prevention Plan or **SWPPP –** means a site-specific, written document that, among other things: 1) identifies potential sources of stormwater pollution at the construction site; 2) describes control measures to reduce or eliminate pollutants in stormwater discharges from the construction site; and 3) identifies procedures the owner or operator will implement to comply with the terms and conditions of this general permit. See Section 5.0 for details on the requirements for a SWPPP.

Surface Waters of the State – lakes, ponds, streams, rivers, wetlands, and any other body or accumulation of water on the land surface that is considered to be waters of the state, but not waste treatment systems, including treatment ponds, lagoons, leachate collection ponds, or stormwater retention ponds designed to meet the requirements of the federal Clean Water Act.

Surface Water Quality Standards – water quality standards adopted pursuant to South Dakota Codified Law §§ 34A-2-10 and 34A-2-11 or actual existing beneficial uses, whichever is higher, and effluent standards adopted pursuant to SDCL § 34A-2-13 or pursuant to the best professional judgment of the Secretary, whichever is applicable. If waters have more than one designated beneficial use and criteria are established for a parameter that is common to two or more uses, such as pH, the more restrictive criterion for the common parameter applies.

Temporary Stabilization – means a condition where exposed soils or disturbed areas are provided a temporary vegetative and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb the area.

Total Maximum Daily Load or **TMDL** – means the sum of the individual wasteload allocations for point sources, load allocations for nonpoint sources, and natural background. TMDLs can be expressed in terms of mass per time, toxicity, or other appropriate measures.

Upset – an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

U.S. EPA – the United States Environmental Protection Agency.

Waters of the State – all waters within the jurisdiction of this state, including all streams, lakes, ponds, impounding reservoirs, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, situated wholly or partly within or bordering upon the state.

Work Day – means, for the purpose of this general permit, a calendar day on which construction activities will take place.

2.0 COVERAGE UNDER THIS GENERAL PERMIT

2.1 Eligibility Requirements

This general permit shall apply to stormwater discharges from construction sites located within the state of South Dakota. Only those projects that meet all of the following eligibility requirements may be covered under this general permit:

1. You are the owner or operator of the construction project for which discharge will be covered under this general permit. The owner must obtain coverage under this general permit and all operators at the site must comply with the permit conditions.

2. Your project:

    a. Will disturb one (1) or more acres of land; or

    b. Will disturb less than one (1) acre of land but is part of a larger common plan of development or sale that will ultimately disturb one (1) or more acres of land; or

    c. Is less than one (1) acre, but has construction support activities required to be covered and the total area exceeds one (1) or more acres of land; or

    d. Has been designated by the Secretary or the United States Environmental Protection Agency (U.S. EPA) as needing a permit.

3. You have complied with all applicable requirements imposed by the applicable county, city, or other local government entities.

4. If your project will encroach, damage, or destroy a historic property included in the national register of historic places or the state register of historic places located in South Dakota, you must have approval from the South Dakota State Historic Preservation Office prior to submitting the Notice of Intent (NOI). You must attach an approval letter from the State Historic Preservation Office with the NOI.

2.2 Discharges Authorized

The following discharges shall be authorized under this general permit:

1. Stormwater discharges from projects detailed in Section 2.1.2.

2. Stormwater discharges from construction support activities provided:

    a. The support activity is directly related to the construction site required to have permit coverage;

    b. The support activity does not continue to operate beyond the completion of the construction activity at the project it supports. If the support activity continues past the initial permitted project, you must obtain a separate permit for those activities;

c. The support activity is included in the SWPPP as required by Section 5.0; and

d. Control measures are implemented for discharges from the support activity area.

3. Stormwater construction discharges combined with discharges from an industrial source, as long as:

   a. The industrial source is located on the same site as your construction activity; and

   b. You may not combine stormwater discharges from industrial and construction activities unless each source is covered by its own permit, or are not required to obtain permit coverage.

4. Discharges to waters for which there is a total maximum daily load (TMDL) allocation for sediment, suspended solids, and turbidity are covered only if you develop a SWPPP that is consistent with the assumptions, allocations, and requirements in the approved TMDL. If a specific numeric wasteload allocation has been established that would apply to discharges from construction activity, the permittee must incorporate that allocation into the SWPPP and implement necessary steps to meet that allocation.

2.3 Discharges Not Authorized

The following discharges are not authorized by this general permit:

1. **Post-Construction Discharges**. This general permit is not designed to address post-construction discharges after you have completed construction activities and achieved final stabilization at the site. Stormwater discharges associated with industrial activities must obtain coverage under a separate stormwater permit.

2. **Discharges Mixed with Non-Stormwater**. This general permit does not authorize discharges of non-stormwater.

3. **Discharges of Fill Material**. This general permit does not authorize you to discharge fill material into surface waters of the state. You are required to obtain a Section 404 federal Clean Water Act permit from the U.S. Army Corps of Engineers.

4. **Discharges Threatening Water Quality**. This general permit does not authorize your discharge from a construction site if the discharge will cause, or have the reasonable potential to cause or contribute to, violations of Surface Water Quality Standards. In such cases, the Secretary may deny you coverage under the general permit or require you to obtain an individual Surface Water Discharge permit.

5. **Discharges Threatening Endangered Species**. This general permit does not authorize your discharge from a construction site if the discharge will not ensure the protection of species that are federally-listed as endangered under the federal Endangered Species Act.

6. **Discharges of Regulated Substances**. This general permit does not authorize you to discharge regulated substances, hazardous substances, or oil resulting from onsite spills. You are subject to the federal reporting requirements of 40 CFR Part 110, Part 117, and Part 302 relating to spills or other releases of oils or hazardous substances. You must report spills in excess of the reportable quantities as required in Section 7.1.

2.4 Requesting Permit Coverage

To request coverage under this general permit, you must submit a complete and accurate Notice of Intent (NOI) (Appendix A) to SDDENR at least **15 calendar days** prior to the commencement of construction activities at the site. ***The NOI must be signed by the owner of the property where construction activities will occur.***

1. You must identify the person(s) responsible for day-to-day operations at the construction site, if different from the owner. A Contractor Authorization Form, included in Appendix C, must be submitted to SDDENR as soon as a contractor is identified if the contractor was not identified on the NOI.

2. You are not prohibited from submitting a late NOI. When you submit a late NOI, your authorization to discharge is only for discharges that occur after SDDENR grants coverage. SDDENR reserves the right to take appropriate enforcement action for any unpermitted discharges that may have occurred between the commencement of construction activities and the time authorization for your discharge is granted.

3. SDDENR will not process incomplete NOIs.

4. You must submit a completed and signed NOI to SDDENR by emailing the NOI to stormwater@state.sd.us, or mailing the NOI to SDDENR at the address in Section 7.3.

5. SDDENR will review each complete NOI and make a decision to grant or deny coverage or request additional information. You will receive an authorization letter from SDDENR if permit coverage is granted for your project.

6. Upon the effective date of this general permit, the Secretary will terminate the existing general permit.

    a. If you are authorized under the existing general permit and you have submitted the Notice of Intent for Reauthorization Form (found in Appendix E) prior to permit expiration date, your coverage will automatically continue under the new general permit. Once the new general permit is issued, you will receive an authorization letter from SDDENR notifying you of the continued coverage.

b. Projects covered under the existing general permit must be in compliance with the conditions in the new general permit by **October 1, 2018.** You must still maintain compliance with all requirements in the existing general permit during the grace period. SDDENR may grant additional time on a case by case basis if necessary. To obtain such an extension, you must request it from SDDENR in writing.

2.5 Transferring Permit Coverage

If a new owner purchases a construction site or a portion of the site covered under this general permit, you are responsible for notifying the new owner(s) of the general permit requirements and communicating the importance of achieving final stabilization on the site. You must transfer permit coverage to the new owner. Appendix D includes a form for transferring permit coverage for all or a portion of a project or development to a new owner.

2.6 Terminating Permit Coverage

Until the Secretary terminates your coverage under this general permit, you are required to comply with all conditions and effluent limits in this general permit. To terminate coverage, you are required to submit a complete and accurate Notice of Termination (NOT), found in Appendix B, and signed in accordance with Section 7.4. You must submit the NOT within **30 calendar days** of meeting any one of the following conditions.

1. You have completed all earth-disturbing activities at your site and, if applicable, all construction support activities covered by this general permit, and you have met all the following requirements:

    a. You have met the stabilization requirements listed in Section 3.19 and have reached final stabilization for any areas disturbed during construction and over which you had control during the construction activities;

    b. You have removed and properly disposed of all temporary construction materials, waste and waste handling devices, and have removed all equipment and vehicles that were used during construction, unless intended for long-term use on the site following termination of your general permit coverage;

    c. You have removed and properly disposed of all temporary control measures, including silt fence, and of which you installed and maintained during construction, except those that are intended for long-term use following termination of your general permit coverage; and

    d. You have removed all potential pollutants and pollutant-generating activities associated with construction.

2. You have obtained coverage under an individual or alternative general permit that addresses the discharges from the construction site.

2.7 Reporting Requirements

On October 22, 2015, the U.S. EPA published in the federal register a rule that has made electronic reporting of permit and compliance monitoring information mandatory for all National Pollution Discharge Elimination System (NPDES) permits. These are referred to as Surface Water Discharge (SWD) permits in South Dakota. The final rule became effective December 21, 2015.

Phase II of the final rule requires that authorized state NPDES programs begin electronically collecting, managing, and sharing construction stormwater permitting information by December 21, 2020. This includes general permit reports such as Notices of Intent (NOI), Notices of Termination (NOT), and all other remaining NPDES program reports. SDDENR is currently developing programs to meet this requirement and will notify facilities as they become available.

Electronic reporting will be required once SDDENR has fully developed an electronic reporting system. In the interim, all general permit reports must be submitted by email (stormwater@state.sd.us), or to the address listed in Section 7.3.

A hybrid approach will be available for owners/operators that do not expect to submit NOIs for multiple projects. This approach will provide users the ability to electronically submit the data for construction stormwater general permit reports without using the electronic signature verification process. Following electronic submittal of the reports, a hard copy of the Certification of Applicant with an original signature must be mailed to SDDENR.

2.8 Requiring an Individual Permit or an Alternative General Permit

SDDENR may either deny coverage or require you to apply for an individual Surface Water Discharge permit or an alternative general permit. In considering whether we deny coverage or require an alternative permit, the following will be taken into consideration:

1. You cannot comply with the conditions of this general permit;

2. There has been a change in the availability of demonstrated technologies or practices for the control or abatement of pollutants applicable to construction sites;

3. Effluent limitation guidelines are promulgated or revised for point sources covered by this general permit;

4. A water quality management plan is approved containing requirements applicable to your construction site;

5. Your discharge is a significant contributor of pollution to surface waters of the state or it presents a health hazard; or

6. You are discharging to an impaired water body and the best management practices are not sufficient to implement the assigned wasteload allocations in a Total Maximum Daily Load (TMDL) approved by the U.S. EPA.

2.9 Continuation of Coverage for Expired General Permit

If you wish to continue to be covered by this general permit after its expiration date, you must submit a Notice of Intent for Reauthorization (Appendix E). An expired general permit continues in full force and effect until a new general permit is issued. You will continue to have coverage under the current general permit until a new general permit is issued.

2.10 Requirement to Post Notice of Your General Permit Coverage

You must post a sign or other notice at a safe, publicly accessible location near the project site.

1. At a minimum, your notice must include the general permit tracking number (found on the cover page of your general permit and in the authorization letter) and a contact name and phone number for obtaining additional project information.

2. The notice must be located so that it is visible from the public road that is nearest to the active part of the construction site and must be readily viewed from a public right-of-way.

2.11 Property Rights

1. The Secretary's issuance of this general permit, adoption of design criteria, and approval of plans and specifications, does not convey any property rights of any sort, any exclusive privileges, any authorization to damage, injure or use any private property, any authority to invade personal rights, any authority to violate federal, state or local laws or regulations, or any taking, condemnation or use of eminent domain against any property owned by third parties.

2. The State does not warrant that your compliance with this general permit, design criteria, approved plans and specifications, and operation under this general permit, will not cause damage, injury or use of private property, an invasion of personal rights, or violation of federal, state or local laws or regulations. You are solely and severally liable for all damage, injury or use of private property, invasion of personal rights, infringement of federal, state or local laws and regulations, or taking or condemnation of property owned by third parties, that may result from actions taken under this general permit.

2.12 Reopener Provisions

SDDENR may reopen and modify this general permit to include appropriate conditions (following proper administrative procedures) if state or federal statutes or regulations change.

2.13 Severability

If any portion of the general permit is found to be void or is challenged, the remaining permit requirements shall remain valid and enforceable.

2.14 Permit Actions

This general permit may be modified, revoked and reissued, or terminated by the Secretary for cause. Any request for such changes does not stay any permit condition.

3.0 EFFLUENT LIMITS

You are required to comply with the following effluent limits for discharges from your construction site and/or from construction support activities representing the degree of effluent reduction attainable through the best practicable control technology currently available to minimize the pollutants present in the discharges. In order to achieve compliance with the conditions of this permit, you are required to address the following effluent limits by developing a Stormwater Pollution Prevention Plan (SWPPP) as required in Section 5.0. If you determine any of the following limits are infeasible, you must document your rationale in your SWPPP.

Stormwater discharges regulated under this general permit that may discharge to a surface water with an approved TMDL for sediment, total suspended solids, or turbidity must be consistent with the TMDL and any associated wasteload allocation (WLA) for construction or stormwater related discharges. In most cases compliance with this permit will be considered adequate, unless otherwise notified by the Secretary. The Secretary may require an individual permit, as referenced in Section 2.8, should compliance with this general permit be deemed insufficient to meet relevant WLAs.

3.1 Proper Operation and Maintenance

You must properly operate and maintain all sediment and erosion controls, best management practices, treatment systems, and any other control(s) used to achieve compliance with the conditions of this general permit in accordance with manufacturer's specifications, good engineering practices, and design specifications of the SWPPP.

3.2 Erosion and Sediment Control Requirements

1. You must design, install, and maintain effective erosion and sediment controls to minimize soil erosion and the discharge of pollutants during earth-disturbing activities. The stormwater controls must be designed to function properly and withstand a 2-year, 24-hour precipitation event. See Appendix F for instructions to determine your construction site's precipitation for a 2-year, 24-hour event.

2. You must account for the following factors when designing your erosion and sediment controls:

    a. The nature of resulting stormwater runoff and run-on at the construction site, including factors such as expected flow from impervious surfaces, slopes, and site drainage features. Controls must be able to control stormwater volume, velocity, and flow rates from a 2-year, 24-hour precipitation event across the construction site.

    b. Anticipated soil characteristics at the construction site, including soil type and range of particle sizes.

3.3 Installation Requirements

1. You must complete installation of down gradient erosion and sediment controls before any land disturbing activity takes place in order to control discharges.

2. You must install all other control measures planned for each phase of the project as described in your SWPPP as soon as conditions on the site allow.

3. You must install all control measures using good engineering practices and follow the manufacturer's specifications. Any departures from the manufacturer's specifications must reflect good engineering practices and must be explained in your SWPPP.

3.4 Perimeter Controls

You must have effective down gradient sediment controls, and controls for any side slope boundaries deemed appropriate for individual site conditions, to minimize pollutant discharges from the construction site.

3.5 Sediment Basins

If you use a sediment basin to control the discharge of sediment from the site, you must meet the requirements listed below.

1. Sediment basins must be designed, constructed, and operated in accordance with the requirements found in your local city or county drainage board.

2. Outlet structures must withdraw water from the surface of the sediment basin or impoundment to allow for proper sediment removal in the pond.

3. Erosion controls and velocity dissipation devices must be used to prevent erosion within the sediment basin as well as at inlets and outlets from the basin.

4. Sediment basins must be situated outside of surface waters and any natural buffers established under Section 3.10. The basins must be designed to avoid collecting water from wetlands and other water bodies.

3.6 Minimize Sediment Track-Out

You must minimize the track-out of sediment from the construction site where vehicles leave the site. To comply with this requirement, you must:

1. Restrict vehicle use to properly designated access points;

2. Use appropriate stabilization techniques at all construction site access point(s) so sediment removal occurs prior to vehicle exit.

3. Where sediment has been tracked out from your site onto offsite streets, other paved areas, and/or sidewalks, remove the deposited sediment by the end of the same work

day in which the track-out occurs. You must remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked-out sediment into storm drain inlet, surface waters of the state, or any stormwater conveyance unless the conveyance is connected to a sediment basin, sediment trap, or similar effective control. You must obtain approval from the owner of the sediment traps before hosing or sweeping sediment into those controls.

3.7 Remove Offsite Accumulation

If sediment escapes the construction site, you must initiate removal of the offsite accumulations to minimize impacts by the end of the same work day. You must revise your SWPPP and implement controls to minimize further offsite accumulation.

3.8 Minimize Dust

You must minimize the generation of dust at the construction site to avoid pollutants from being deposited into surface waters of the state. This can be accomplished through the appropriate application of water or other dust suppression techniques.

3.9 Minimize Run-on

You must minimize run-on to your construction site.

3.10 Provide Natural Buffers

You must comply with the following requirements if disturbed portions of the construction site are within fifty (50) feet of 1) a lake assigned immersion recreation or limited contact recreational beneficial uses in ARSD 74:51:02:02 and listed in ARSD 74:51:02:04; or 2) a river or stream assigned any of the warmwater or coldwater fish life propagation beneficial uses in ARSD 74:51:03:02 and listed in ARSD 74:51:03:04 to 74:51:03:27, inclusive.

1. Provide and maintain a 50-foot undisturbed natural buffer.

    a. When the natural buffer between the disturbed area(s) and surface waters of the state is less than fifty (50) feet, you must provide a combination of undisturbed buffer and supplemental erosion and sediment controls that achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

    b. When no undisturbed buffer can be provided between the disturbed area(s) and surface waters of the state, you must provide erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

    c. Document in your SWPPP how any undisturbed natural buffer and the supplemented erosion and sediment controls achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

2. Direct surface runoff to vegetated areas and maximize stormwater infiltration to reduce pollutant discharges.

3. Delineate and clearly mark all natural buffer areas with flags, tape, or other similar marking device. No construction or other activity should occur in the delineated buffer area.

4. **Exception.** You are not required to maintain a 50-foot undisturbed natural buffer or install additional controls if there is no discharge of stormwater to surface waters of the state through the area between your site and the surface waters. This includes situations where you have implemented control measures, such as a berm or other barrier, to prevent such discharges.

3.11 Preserve Topsoil

You must preserve native topsoil on your site, unless infeasible. Preserving topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed.

3.12 Minimize Steep Slope Disturbance

You must minimize the disturbance of slopes that are greater than a three horizontal to one vertical (3:1) slope, unless infeasible.

3.13 Protect Storm Drain Inlets

1. You must protect all storm drain inlets that receive stormwater flows from the construction site by using appropriate best management practices during construction to minimize the discharge of pollutants from the site.

2. You must maintain the inlet protection until you have permanently stabilized all sources that have the potential to discharge pollutants to the inlet. If local officials require you to remove the inlet controls during the winter, you must install alternative controls to prevent sediment from entering the storm drain inlet.

3.14 Erosive Velocity Control

1. You must use erosion controls and velocity dissipation devices where necessary along the length of stormwater conveyance channels and outlets to minimize erosion of the channel, adjacent stream bank, slope, and downstream waters.

2. You must provide energy dissipation BMPs prior to connecting pipe or culvert outlets to surface water.

3. You must control the stormwater discharges, including both peak flowrates and total stormwater volume, to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points.

3.15 Minimize Soil Compaction

In areas of your site where final vegetative stabilization or infiltration will occur, you must either:

1. Restrict vehicle and equipment use in these locations to avoid soil compaction; or

2. Condition areas of compacted soil prior to seeding or planting to support vegetation growth.

3. **Exception.** You are not required to minimize soil compaction where the intended function of a specific area of the site dictates that soil be compacted.

3.16 Minimize Exposed Soil

You must schedule and sequence soil disturbing and stabilizing activities to minimize the amount and duration of soil exposure to erosion and sedimentation by wind, rain, surface runoff, and vehicle tracking. Consider factors such as high precipitation seasons when scheduling soil disturbing activities.

3.17 Protect Stockpiles

For any stockpiles or land clearing debris you must:

1. Locate the stockpiles and debris outside of any natural buffers established as required in Section 3.10 and away from any stormwater conveyances, drain inlets, and areas where stormwater flow is concentrated;

2. Protect the stockpiles debris from contact with stormwater run-on by using temporary sediment controls, berms, or other BMPs;

3. Properly maintain and position stockpiles to minimize dust generation and wind transport of sediment; and

4. Minimize stormwater runoff from the piles by properly positioning stockpiles and debris or installing effective sediment controls.

5. You are prohibited from placing stockpiles in surface waters of the state.

3.18 Stabilization Requirements

You are required to stabilize exposed portions of your site in accordance with the requirements of this section. You are responsible for implementing winter stabilization methods during frozen ground conditions if the site was not stabilized prior to the ground freezing.

1. **Deadline to Initiate Stabilization.** You must begin soil stabilization measures by the following work day whenever earth-disturbing activities have permanently or temporarily ceased on any portion of the site.

a. Earth-disturbing activities have permanently ceased when you complete clearing, grading, and excavation within any area of your site that will not include permanent structures.

b. Earth-disturbing activities have temporarily ceased when you cease clearing, grading, and excavation within any area for a period of at least **14 calendar days**, but will resume such activities in the future.

2. **Deadline to Complete Temporary Stabilization**. As soon as practicable, but no later than **14 calendar days** after initiating soil stabilization measures, you are required to have completed:

   a. All activities necessary to initially seed or plant the area to be stabilized for vegetative stabilization practices.

   b. The installation or application of all non-vegetative measures.

   c. As soon as practicable after seeding or planting, select, design, and install non-vegetative erosion controls (e.g., mulch or rolled erosion control products) to prevent erosion on the seeded or planted areas while vegetation establishes.

3. **Criteria for Final Stabilization**. To be considered as having reached final stabilization, you must meet the criteria below based on the type of cover you are using.

   a. **Vegetative Stabilization**. If you are seeding or planting vegetation to stabilize the site, you must meet the following requirements:

      i. Provide 70 percent or more of the density of coverage that was provided by vegetation prior to commencement of construction activities.

      ii. Provide perennial vegetative cover.

      iii. Minimize the presence of invasive species.

   b. **Non-Vegetative Stabilization**. If you are using non-vegetative controls for final stabilization at your site, the controls must provide effective cover to properly stabilize the exposed portions of your site.

   c. **Return to Pre-construction Agricultural Land Use.** For construction projects on land used for agricultural purposes, final stabilization may be accomplished by returning the disturbed land to its pre-construction agricultural use. Areas disturbed that were not previously used for agricultural purposes, such as buffer strips immediately next to surface waters and areas not being returned to pre-agricultural use must meet the final stabilization criteria listed in (a) and (b) above.

4. **Site Specific Stabilization Requirements**. If you are constructing in the specific areas listed below, you must complete the following stabilization requirements as soon as practicable, but no later than the deadlines listed below after initiating soil stabilization measures:

    a. Stream diversions or drainage ditches that divert water around or drain water from your construction site must be stabilized with appropriate controls prior to connection with any surface water.

    b. For stockpiles that will be unused for 14 or more days, provide cover or appropriate temporary stabilization consistent with Section 3.18.

3.19 Maintenance Requirements

1. **Effective operating condition.** You must ensure that all erosion and sediment controls remain in effective operating condition until final stabilization is complete. At a minimum, you must:

    a. Remove sediment from sedimentation basins when the design capacity has been reduced by 50% or more.

    b. Remove sediment from sediment controls before the deposit reaches 50% of the above-ground height of the control.

    c. Repair vegetative buffers if they become silt-covered, contain rills, or are otherwise rendered ineffective.

    d. You must repair and stabilize eroded areas by the end of the same work day they are identified. If repair is infeasible, you must implement alternative control measures.

    e. Clean inlet protection devices when sediment accumulates, or when the filter becomes clogged, or performance is compromised.

    f. Ensure that all controls remain in effective operating condition and are protected from activities that would reduce their effectiveness.

    g. All nonfunctional BMPs must be repaired, replaced, maintained or supplemented with functional BMPs. If a nonfunctioning BMP is supplemented, the nonfunctional BMP shall be removed.

2. **Deadline for maintenance.** If you find a problem or if your inspections identify that control measures are not operating effectively, you must make the necessary repairs or modifications as follows:

    a. If you discover a problem that does not require repair or replacement, you must initiate work to fix the problem on the same day. If the problem is identified at a time in the work day when it is too late to complete the corrective actions, you must initiate work to fix the problem on the following work day or before the next anticipated runoff event, whichever comes first.

    b. If you need to install new erosion or sediment controls or need to complete repairs, you must complete the work before the next anticipated runoff event or by no later than seven (7) calendar days from the time the problem is discovered, whichever comes first.

    c. You must modify your SWPPP within seven (7) calendar days of completing the work. The SWPPP must address any changes to the controls and must detail the necessary steps to prevent similar damage in the future.

3.20 Pollution Prevention Procedures

You must design, install, implement, and maintain effective pollution prevention measures to minimize the discharge of pollutants from the activities listed below. Spills must be reported as required in Section 7.1 of this general permit.

1. **Prohibited Discharges.** You are prohibited from discharging the following from your construction site:

    a. Wastewater from washout and cleanout of concrete, stucco, paint, form release oils, curing compounds, and other construction materials.

    b. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.

    c. Detergents, soaps, or solvents used in vehicle and equipment washing.

    d. Toxic or hazardous substances from a spill or other release.

    e. Waste, garbage, floatable debris, construction debris, and sanitary waste.

2. **Fueling and Maintenance of Equipment or Vehicles**. If you fuel or maintain equipment or vehicles at your site, you must minimize the discharge of spilled or leaked materials from the area where these activities take place.

3. **Washing of Equipment and Vehicles**. You must provide an effective means of minimizing the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of washing. The washing must be limited to a defined area of the site and must be properly disposed.

4. **Management of Construction Products, Chemicals, Materials, and Wastes**. You must properly store, handle, and dispose of any construction products and materials, chemicals, landscape materials, and wastes in order to minimize the exposure to stormwater. Products or wastes that are either not a source of contamination to stormwater or are designed to be exposed to stormwater are not held to this requirement. Requirements are as follows:

    a. You must cover or otherwise protect any materials that have the potential to leach pollutants in order to minimize contact with stormwater and prevent the discharge of pollutants.

    b. Clean up spills by the end of the same work day in which the spill occurred, using dry clean-up methods where possible, and dispose of used materials properly. Do not clean surfaces or spills by hosing the area down. Eliminate the source of the spill to prevent a discharge or continuation of an ongoing discharge.

    c. For registered pesticides and fertilizers, you must comply with all application and disposal requirements included on the label. Pesticides and fertilizers must be stored under cover or other effective means designed to minimize contact with stormwater. You must document any departures from the manufacturer's specifications for applying fertilizers and pesticides.

    d. Store all diesel fuel, oil, hydraulic fluids, other petroleum products, and other chemicals and products in water-tight container.

    e. Hazardous or toxic wastes that may be present at construction sites include, but are not limited to, paints, solvents, petroleum-based products, wood preservatives, additives, curing compounds, acids, and alkaline materials. For these materials and wastes, you must:

        i. Separate hazardous or toxic wastes and materials from construction and domestic waste.

        ii. Store hazardous or toxic wastes and materials in sealed containers and provide secondary containment as applicable. These containers must be constructed of suitable materials to prevent leakage and corrosion. These containers must be labeled in accordance with the applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable federal, state, or local requirements.

        iii. Dispose of hazardous or toxic wastes in accordance with the manufacturer's recommended method of disposal and in compliance with federal, state, and local requirements.

f. You must provide effective containment for all liquid and solid wastes generated by washout operations including, but not limited to, concrete, stucco, paint, form release oils, curing compounds, and other construction materials related to the construction activity. For these materials and wastes, you must comply with the following requirements:

   i. Designate areas to be used for washout and cleanout activities. The containment must be designed so that it does not result in runoff from washout operations or during runoff events;

   ii. Install signs adjacent to each washout facility directing site personnel to use the proper facilities for concrete disposal and other washout wastes;

   iii. Direct all wash water into a leak-proof container or leak-proof pit;

   iv. Do not dump liquid wastes in the storm sewers; and,

   v. Clean up and properly dispose of any accumulated wastes in designated waste containers.

g. You must provide proper waste disposal receptacles of sufficient size and number to handle construction wastes including, but not limited to, packaging materials, scrap construction materials, masonry products, timber, pipe, and electrical cuttings, plastics, Styrofoam®, concrete, and other trash or building materials.

   i. For sanitary waste, you must position portable toilets so they are secure and will not be tipped or knocked over. You must properly remove and dispose of wastes from the portable toilets.

3.21 Construction Dewatering

You are prohibited from discharging from dewatering activities, including discharges from dewatering of trenches and excavation, unless the discharges are managed by the following controls:

1. You shall not discharge toxic pollutants in toxic amounts.

2. Your discharge shall not impart a visible film or sheen to the surface of the receiving water or adjoining shoreline.

3. Your discharge shall not contain visible pollutants. You must visually monitor the discharge for suspended solids. If you observe suspended solids in the discharge, you must implement the following requirements:

   a. You must install additional best management practices and update your stormwater pollution prevention plan to reduce the visible solids.

b. You must sample the dewatering discharge for total suspended solids on a daily basis until there is no longer a discharge of visible solids. The samples must be analyzed in accordance with Title 40 of the Code of Federal Regulations, Part 136. If the total suspended solids value exceeds 53 mg/L in any sample or measurement, you must cease the dewatering discharge to surface waters of the state until you can demonstrate the additional best management practices are sufficient to eliminate the visible pollutants. You must also document this in your stormwater pollution prevention plan (SWPPP).

4. You must use best management practices to minimize or prevent stream channel scouring or erosion caused by dewatering discharges.

5. You cannot add chemicals to the discharge without prior approval from SDDENR.

6. You must obtain a Temporary Water Right. Contact SDDENR Water Rights Program at (605) 773-3352 for more information and to obtain a temporary water right.

4.0 INSPECTION REQUIREMENTS

You are required to conduct site inspections to determine the effectiveness of your control measures and your compliance with the conditions of the general permit.

4.1 Person(s) Responsible for Inspecting the Site

The person(s) inspecting your site may be a member of your staff or a third party you hire to conduct the inspections. You are responsible for ensuring the person who conducts the inspection is knowledgeable in the principles and practice of erosion and sediment controls and pollution, possesses the skills to assess conditions at the site that could impact stormwater quality, and is able to assess the effectiveness of any control measures selected and installed to meet the requirements of the general permit.

4.2 Frequency of Inspections

At a minimum, you must conduct a site inspection at the following frequencies:

1. Once every 7 calendar days; or

2. Once every 14 calendar days **and** within 24 hours of precipitation that exceeds 0.25 inches or snowmelt that generates runoff. You must keep a properly maintained rain gauge on your site.

4.3 Reduction of Inspection Frequency

You may reduce your inspection frequency from the requirements above under the following circumstances. You must document the beginning and ending dates of these periods in your inspection records.

1. **Partial final stabilization.** You may reduce the frequency of inspections to once per month on any portion of your site where you have reached final stabilization. If construction activity resumes in this portion at a later date, you must increase the frequency as required in Section 4.2 above.

2. **Frozen conditions.** If you are suspending earth-disturbing activities due to frozen conditions and all disturbed areas of the site have been temporarily or permanently stabilized as required in Section 3.19, you shall conduct inspections at least once per month. You must resume weekly inspections by no later than March 1st of each year until your site is permanently stabilized and you have submitted a Notice of Termination (NOT) in accordance with Section 2.6.

4.4 Areas that Need to Be Inspected

During your site inspections you must, at a minimum, inspect the following areas:

1. All areas that have been cleared, graded, or excavated and have not yet reached final stabilization;

2. All sediment and erosion control measures and best management practices, including inlet protection;

3. Vegetated buffers;

4. Stockpiles, chemical and fuel storage, fertilizer and pesticide storage and other material, waste, borrow, and/or equipment storage and maintenance areas;

5. All areas where stormwater typically flows within the site, including drainage ways designed to divert, convey, and/or treat stormwater;

6. All points of discharge from the site including surface waters, drainage ditches, and conveyance systems; and,

7. All dewatering activities at the site.

8. **Exception.** You are not required to inspect areas that, at the time of the inspection, are unsafe for your inspection personnel. A detailed description of the situation must be documented in your inspection records explaining the reason the site conditions prevented the inspection.

4.5 Requirements for Inspections

During your site inspections you must, at a minimum:

1. Check whether all erosion and sediment controls and best management practices are implemented and functioning to minimize pollutant discharges. Determine if you need to replace, repair, or maintain any controls.

2. Check for spills, leaks, or other accumulation of pollutants on the site, or for the presence of conditions that could lead to spills, leaks, or other accumulations of pollutants on site. Determine if you need to install additional controls or take corrective actions to prevent the discharge of these pollutants.

3. Determine if site conditions have changed and if current controls are still effective in controlling pollutants from leaving your site. Identify any locations where new or modified control measures are necessary.

4. Check for signs of erosion, scour, and sediment deposits that have occurred on or off the construction site:

    a. Inspect the discharge points and, where applicable, the banks of any surface waters of the state flowing within your property boundaries or immediately adjacent to your property.

    b. Identify areas where you need to correct erosion and remove sediment.

c. Determine if you need controls to reduce the velocity of the discharge or prevent further erosion and sedimentation.

5. If a discharge is occurring during your inspection, you are required to:

   a. Identify all points of the property where there is a discharge;

   b. Observe and document the visual quality of the stormwater discharge and note the characteristics of the discharge, including color, odor, floating, settled, or suspended solids, foam, oil sheen, and other obvious indicators of stormwater pollutants; and

   c. Document whether your control measures are operating effectively. Describe any controls that are not clearly operating as intended or are in need of maintenance.

6. Identify all incidents of noncompliance that you observe.

7. Based on the results of your inspection, you must initiate corrective action(s) where needed.

4.6 Inspection Report

You must complete an inspection report in conjunction with each site inspection.

1. Each inspection report must be maintained in accordance with the requirements in Section 7.3 and must include the following information;

   a. Date and time of the inspection.

   b. Names and titles of the personnel conducting the inspection.

   c. Date and amount of most recent precipitation event, as well as if runoff was flowing onsite and/or offsite at the time of the inspection.

   d. A summary of your inspection findings, covering, at a minimum, the observations you made as required in Sections 4.4. and 4.5;

   e. Specific locations where maintenance, additional best management practices, cleanup, or corrective action is needed;

   f. The results of the total suspended solids levels in any dewatering discharge, as required by Section 3.21; and

   g. A summary of any corrective actions taken in response to the inspection findings, including any changes made to the SWPPP.

2. If you have determined it is unsafe to inspect a portion of your site, you must describe the reason(s) you found it to be unsafe and specify the locations that were not inspected.

3. If an inspection does not identify any incidents of noncompliance, you must include a statement in the report that the site is in compliance with the SWPPP and the general permit.

4. You must sign and certify each inspection report in accordance with the signatory requirements found in Section 7.4.

5.0 STORMWATER POLLUTION PREVENTION PLAN

You must develop a stormwater pollution prevention plan, also referred to as a "SWPPP," to be covered under this general permit. Stormwater management documents developed under other regulatory programs may be included or incorporated by reference in the SWPPP, or used in whole as a SWPPP if it meets the requirements of this section.

5.1 SWPPP Deadlines

1. You must develop the SWPPP **prior** to the submittal of the NOI.

   Note: If you were covered under the February 1, 2010, general permit and reauthorized under this general permit, you must update your SWPPP to comply with the conditions of this general permit by **October 1, 2018**.

2. You must implement and maintain the SWPPP for any construction activity requiring this general permit until final stabilization is reached.

5.2 TMDL

For projects that discharge stormwater to a water body listed as impaired under section 303(d) of the Federal Clean Water Act due to sediment, suspended solids, or turbidity, you must identify the water body and impairment in the SWPPP. Your SWPPP must describe and conform to any Wasteload Allocation (WLA) for the water body as required in Section 2.2.4

5.3 SWPPP Contents

You must develop your SWPPP to ensure compliance with the effluent limits in Section 3.0. Your SWPPP must include the following information, at a minimum.

1. **Personnel**. Your SWPPP must identify those person(s), by name or position, who are knowledgeable and experienced in the application of erosion and sediment control BMPs and who are responsible for the development and implementation of any portion of the SWPPP, for any later modifications to the SWPPP, and for compliance with the requirements of this general permit.

2. **Staff Training**. The SWPPP shall outline how employees and responsible parties shall be trained on the implementation of the SWPPP. Training must be provided at least annually, as new employees or responsible parties are hired, or as necessary to ensure compliance with the SWPPP and this general permit. Employees and responsible parties include individuals who are responsible for conducting inspections or for the design, installation, maintenance, or repair of stormwater controls.

3. **Description of Construction Activities**. Your SWPPP must include a narrative description of the nature of your construction activities, including the following:

a. A description of the overall project and type of construction activities to occur on the site and a description of the final completed project;

b. The total size of the project and total area expected to be disturbed by construction activities;

c. The maximum area expected to be disturbed at any one time;

d. Description of the existing vegetation at the site and an estimate of the percent of vegetative ground cover;

e. A description of the soil within the disturbed areas;

f. The name of the surface waters or municipal separate storm sewer system at or near the disturbed area that could potentially receive discharges from the project site;

g. Any construction support activity areas; and,

h. The intended sequence and estimated dates of construction activity for the following:

i. Implementation of BMPs, including when they will be operational and an explanation of how you will ensure the control measures are installed by the time each phase of earth-disturbing activity begins.

ii. Commencement and duration of earth-disturbing activities, including clearing and grubbing, mass grading, site preparation (i.e., excavating, cutting and filling), final grading, and creation of soil and vegetation stockpiles requiring stabilization.

iii. Cessation, temporary or permanent, of construction activities on the site or in designated portions of the site.

4. **Site Map.** You must include a legible site map depicting the following features and boundaries of the project:

a. Pre-construction site conditions, including existing vegetative and non-vegetative cover (e.g. – forest, pasture, pavement, structures, etc.);

b. Locations where earth-disturbing activities will occur, noting any phasing of construction activities;

c. Approximate slopes before and after major grading activities. Note areas with a slope greater than three horizontal to one vertical (3:1);

d. Topography of the site;

e. Drainage patterns of stormwater and authorized non-stormwater flows from the site property before and after major grading activities. Mark the flow direction with arrows on the map.

f. Locations and names, where appropriate, of all surface waters of the state that exist within or in the immediate vicinity of the site and could potentially receive discharges from the project site.

g. Locations of any surface water crossings, noting areas where work near waterbodies is necessary;

h. Location of any stormwater conveyances including, but not limited to, sediment ponds, ditches, pipes, swales, stormwater diversions, culverts, and ditch blocks;

i. Discharge locations, including locations of any storm drain inlets on or in the immediate vicinity of the site that could potentially receive discharges from the project site;

j. Locations where stormwater or allowable non-stormwater will be discharged to surface waters of the state on or in the immediate vicinity of the site.

k. Locations where sediment, soil, or other construction materials will be stockpiled;

l. Designated site access points;

m. Locations of structures and other impervious surfaces upon completion of construction;

n. Natural buffer boundaries and widths;

o. Locations of fueling activity, vehicle and equipment maintenance areas, designated wash water collection areas, lubricant and chemical storage, paint storage, material storage, staging areas, and debris collection areas;

p. Locations of all activities that could potentially generate pollutants at the site, such as dumpsters, chemical storage, construction site washout, portable toilets, or equipment storage.

q. Location and types of all sediment and erosions controls, velocity dissipation devices, post-construction controls, and all other BMPs used on the site.

r. Locations of construction support activities covered by this general permit.

5. **Description and Maintenance of Control Measures.** Your SWPPP must include a narrative description of the erosion and sediment control measures that will be implemented during construction at your site to meet the conditions of this general permit. For each control measure you must provide a narrative on the following:

a. A timeframe for the installation, maintenance, and removal (if necessary) of all selected BMPs for each phase of construction activity;

b. Your rationale for the selection of all BMPs, including calculations as necessary;

c. Whether selected BMPs are temporary or permanent;

d. A description of maintenance specifications and procedures;

e. A description of structural diversion practices intended to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site;

f. A description of the removal of any temporary stormwater conveyance; and

g. A description of the temporary and final stabilization of areas of exposed soil where construction activities have been completed or temporarily ceased. Your SWPPP must describe the specific vegetative and/or non-vegetative practices you will use to comply with the stabilization requirements in Section 3.19, along with the reasons for choosing each practice.

6. **Procedures for Inspections.** The SWPPP must describe the procedures you will follow for conducting site inspections and, where necessary, taking corrective actions. The following information must also be included in your SWPPP:

   a. Personnel responsible for conducting inspections;

   b. Required frequency of inspections;

   c. Rationale for reduction of inspection frequency; and,

   d. Any inspection checklists or other forms that you will use.

7. **Post Construction Stormwater Management.** You must identify stormwater management practices that will be installed during the construction process to control pollutants in stormwater discharges occurring after construction operations have been completed. Maintenance for onsite stormwater management features is the responsibility of the permittee until the NOT is submitted or the feature is accepted by the party responsible for long term maintenance. The following information must be included in your SWPPP:

   a. An explanation of the technical basis used to select the practices to control pollution where flows exceed pre-development levels;

   b. A description of structural stormwater management practices such as stormwater ponds, open vegetated swales, natural depressions to allow

infiltration of runoff onsite, and sequential systems that combine several practices or other post construction stormwater management features; and

c. The location of velocity and energy dissipation devices placed at discharge points and appropriate erosion protection for outfall channels and ditches.

8. **Pollution Prevention Procedures**

a. **Spill Prevention and Response Procedures**. Your SWPPP must describe the procedures you will follow to prevent and respond to spills and leaks, including:

i. Procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases. The SWPPP must identify the name or position of the employee(s) responsible for detection and response of spills and leaks;

ii. Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies as required by Section 7.1; and,

iii. Ways to prevent reoccurrence of such releases and steps to prevent any such releases from contaminating stormwater runoff. The SWPPP shall be modified and changes implemented as appropriate.

b. **Waste Management Procedures**. The SWPPP must describe procedures for how you will handle and dispose of all wastes generated at your site, including, but not limited to, clearing and demolition debris, sediment removed from the site, construction and domestic waste, hazardous or toxic waste, and sanitary waste.

9. **Construction Site Pollutants**

a. You must include information in your SWPPP about all activities that could generate pollutants at your site. Examples of pollutant-generating activities include, but are not limited to: paving operations; concrete, paint, and stucco washout; solid waste storage and disposal; storage of fertilizers, pesticides, solvents, fuels, and soils. You must include in your SWPPP a description of the removal of construction equipment and vehicles and any cessation of any pollutant generating activities.

b. You must include an inventory of the pollutants and chemicals associated with your construction activity and consider where potential spills and leaks could occur.

c. If SDDENR approves the use of water treatment chemicals, your SWPPP must include:

i. A listing of all water treatment chemicals planned for use at the site and why these chemicals were selected;

ii. The proper dosage and method of application for all water treatment chemicals;

iii. All applicable Safety Data Sheets (SDS) for chemicals planned to be used;

iv. Schematic drawings of any controls or treatment system used for the application of the water treatment chemicals;

v. A description of how the chemicals will be stored;

vi. Copies of the applicable manufacturer's specifications regarding the use of the water treatment chemicals and chemical treatment systems;

vii. A description of the training that personnel who handle, apply, or store the chemicals have received or will receive prior to the use of water treatment chemicals and chemical treatment systems;

viii. A description of safe handling, spill prevention, and spill response procedures; and

ix. A copy of the approval letter from SDDENR, approving the use of the water treatment chemicals and/or chemical treatment system.

10. **Non-Stormwater Discharges.** You must identify in your SWPPP all sources of non-stormwater discharges.

11. **Infeasibility Documentation.** If you determine it is infeasible to comply with any of the requirements of this general permit, you must thoroughly document your rationale in your SWPPP.

5.4 SWPPP Certification

You must sign and date your SWPPP as required by Section 7.4.

5.5 Required SWPPP Modifications

1. **Conditions Requiring SWPPP Modification**. You must modify your SWPPP, including the site map(s), in response to any of the following conditions:

   a. When you have a new operator responsible for implementation of any part the SWPPP.

   b. When you make changes to your construction plans, sediment and erosion control measures, or any best management practices at your site that are no longer accurately reflected in your SWPPP. This includes changes made in response to corrective actions triggered by inspections.

c. To reflect areas on your site map where operational control has been transferred (including the date of the transfer) or has been covered under a new permit since initiating coverage under this general permit.

d. If inspections by site staff, local officials, SDDENR, or U.S. EPA determine that SWPPP modifications are necessary for compliance with this general permit.

e. To reflect any revisions to applicable federal, state, or local requirements that affect the control measures implemented at the site.

f. If approved by the Secretary, to reflect any changes in chemical water treatment systems or controls, including the use of a different water treatment chemical, different dosage rates, or different areas or methods of application.

2. **Deadlines for SWPPP Modification**. You must complete the required revisions to the SWPPP within 7 calendar days following any of the items listed above.

3. **Documentation of Modifications to the Plan**. You are required to maintain records showing the dates of all SWPPP modifications. The records must include the name of the person authorizing each change and a brief summary of all changes.

4. **Certification Requirements**. All modifications made to your SWPPP must be signed and certified as required in Section 7.4.

5. **Required Notice to Other Operators**. If there are multiple operators at the site, you must notify each operator that may be impacted by the change to the SWPPP within 24 hours.

6.0 SPECIAL CONDITIONS

6.1 Qualified Local Programs

1. To receive approval as a qualified local program, SDDENR will review the local requirements to ensure they comply with both state and federal requirements. SDDENR may authorize minor variations and alternative standards in lieu of the specific conditions of the general permit based upon the unique comprehensive control measures established in the qualifying local program. SDDENR will review each qualifying local program for recertification during the renewal of its municipal separate storm sewer system permit.

2. If a construction site is within the jurisdiction of a qualifying local program, the operator shall submit a Notice of Intent (NOI) to SDDENR to be covered under the general permit and comply with all requirements of the qualifying local program. Compliance with the qualifying local program requirements is deemed to be compliance with this general permit. A violation of qualifying local program requirements is also a violation of this general permit.

3. At this time only the City of Sioux Falls is meeting SDDENR's minimum requirements. If additional municipalities are approved as a Qualifying Local Program in the future, a modification to this general permit will be offered for public comment in the municipality's local newspaper.

7.0 REPORTING AND RECORDKEEPING REQUIREMENTS

7.1 Emergency Spill Notification

1. You must report a release or spill of a regulated substance (including petroleum and petroleum products) to SDDENR as soon as you become aware of it if any one of the following conditions exists:

    a. The release or spill threatens or is in a position to threaten waters of the state (surface water or ground water);

    b. The release or spill causes an immediate danger to human health or safety;

    c. The release or spill exceeds 25 gallons;

    d. The release or spill causes a sheen on surface water;

    e. The release or spill of any substance that exceeds the ground water quality standards of ARSD Chapter 74:54:01;

    f. The release or spill of any substance that exceeds the surface water quality standards of ARSD Chapter 74:51:01;

    g. The release or spill of any substance that harms or threatens to harm wildlife or aquatic life;

    h. The release or spill of crude oil in field activities under SDCL chapter 45-9 is greater than 1 barrel (42 gallons); or

    i. The release or spill is required to be reported according to Superfund Amendments and Reauthorization Act (SARA) Title III List of Lists, Consolidated List of Chemicals Subject to Reporting Under the Emergency Planning and Community Right to Know Act, US Environmental Protection Agency.

2. To report a release or spill, call SDDENR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central Standard Time). To report the release after hours, on weekends or holidays, call South Dakota Emergency Management at 605-773-3231. Reporting the release to SDDENR does not meet any obligation for reporting to other state, local, or federal agencies. Therefore, you must also contact local authorities to determine the local reporting requirements for releases. A written report of the unauthorized release of any regulated substance, including quantity discharged and the location of the discharge shall be sent to SDDENR within 14 days of the discharge.

7.2 Planned Changes

You must notify SDDENR as soon as possible of any planned physical alterations or additions to your site. Notice is required only when the alteration or addition could significantly change the nature or increase the quantity of pollutant discharged, or could result in noncompliance with permit conditions. This notification also applies to pollutants that are not addressed by the effluent limits in Section 3.0.

7.3 Records Contents & Retention

1. You must maintain onsite, or make readily available to SDDENR, the following documents:

    a. The SWPPP, including all certificates, reports, records, or other information required by this general permit.

    b. A copy of the Notice of Intent (NOI) submitted to SDDENR, along with any correspondence related to coverage under this general permit.

    c. A copy of the authorization letter you receive from SDDENR granting coverage under this general permit.

    d. A copy of this general permit.

2. You must retain copies of the SWPPP, your inspection records, all reports required by this general permit, and records of the date you used to complete the NOI and NOT for a period of at least three (3) years from the date you terminate your coverage under the general permit. SDDENR may extend the time period for retaining your records with a written notification to you.

3. You must submit all reports and documents required to be submitted to SDDENR by this general permit by email (stormwater@state.sd.us), or to the address below:

    SD Department of Environment and Natural Resources
    Surface Water Quality Program
    523 East Capitol
    Pierre, SD 57501

7.4 Signatory Requirements

1. All applications submitted to SDDENR under this general permit must be signed by either a principal executive officer or ranking elected official.

2. All reports required by the general permit and other information requested by SDDENR shall be signed by the person described in Paragraph 1 above or by a duly authorized representative of that person. A person is a duly authorized representative if:

   a. The authorization is made in writing by a person described in Paragraph 1 above and submitted to SDDENR; and

   b. The authorized representative must have responsibility for the overall operation of the site, such as the superintendent, or have overall responsibility for environmental matters. A duly authorized representative may be either a named individual or any individual occupying a named position.

3. If the authorization under Paragraph 2 above is no longer accurate, you must submit a new authorization to SDDENR.

4. You must include the following certification statement with all documents signed under this section:

   I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure qualified personal properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

7.5 Duty to Provide Information

1. You must provide, within a reasonable period of time, any information SDDENR requests to determine whether cause exists for modifying, revoking and reissuing, or terminating this general permit, or to determine compliance with the general permit.

2. You must provide to SDDENR, upon request, copies of the records required to be kept by this general permit.

3. You must make your SWPPP available to SDDENR, U.S. EPA, or your local storm sewer operator upon request.

4. If you become aware that you failed to submit any relevant facts or submitted incorrect information in your NOI, you must promptly submit such facts or information.

5. You must provide SDDENR with an updated point of contact including a mailing address.

7.6 Availability of Information

1. Except for data determined to be confidential under ARSD Section 74:52:02:17, all reports you prepare and submit in accordance with the terms of this general permit must be available for public inspection at the offices of SDDENR.

2. Your name and address, the NOI and NOT, your SWPPP, and your inspection records will not be considered confidential.

8.0 COMPLIANCE REQUIREMENTS

8.1 Duty to Comply

1. You must comply with all conditions of this general permit. Any permit noncompliance is a violation of the South Dakota Water Pollution Control Act and the federal Clean Water Act. A violation is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

2. If you violate a condition of the general permit or make any false statement, representation, or certification, you may be subject to enforcement action under South Dakota Codified Law, Chapter 34A-2.

3. You are responsible for complying with all local ordinance and requirements. Local governments may have additional or more stringent requirements than those included in this general permit.

8.2 Duty to Mitigate

You must take all reasonable steps to minimize or prevent any discharge of pollutants in violation of this general permit if it has a reasonable likelihood of adversely affecting human health or the environment.

8.3 Need to Halt or Reduce Activity Not a Defense

It is not a defense for you in an enforcement action that it would have been necessary to halt or reduce your construction activity to maintain compliance with the conditions of the general permit.

8.4 Upset Conditions

1. An upset constitutes an affirmative defense to an action brought for noncompliance with technology-based permit effluent limits if the requirements of Paragraph 2 of this section are met. You will have an opportunity for a judicial determination on any claim of an upset only if SDDENR or U.S EPA bring an enforcement action for noncompliance with technology-based effluent limits.

2. If you wish to establish an affirmative defense of any upset, you must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

    a. An upset occurred and you can identify the cause of the upset;

    b. You were properly operating the pollution controls at your site;

c. You notified SDDENR within 24 hours of becoming aware of the upset. To report a release or spill, call SDDENR at 605-773-3296 during regular office hours (8 a.m. to 5 p.m. Central Standard Time). To report the release after hours, on weekends or holidays, call South Dakota Emergency Management at 605-773-3231.

d. You complied with the mitigation measures required under Section 8.2.

3. In any enforcement proceeding, you have the burden of proof to establish and document that an upset occurred.

8.5 Removed Substances

Collected solids, sludge, grit, or other pollutants removed in the course of treatment shall be properly disposed of in a manner to prevent any pollutant from entering surface waters of the state or creating a health hazard.

8.6 Inspections and Entry

You must allow SDDENR, U.S. EPA, or the operator of a municipal separate storm sewer system receiving your discharges to:

1. Enter your construction site and enter areas where you keep the records required by the general permit;

2. Have access to and copy, at reasonable times, any records that you must keep under the conditions of the general permit;

3. Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated under this general permit; and

4. At reasonable times, sample or monitor any substances or parameters at any location for the purpose of ensuring permit compliance or as otherwise authorized by the South Dakota Water Pollution Control Act (SDCL 34A-2).

8.7 Oil and Hazardous Substance Liability

Nothing in this general permit shall relieve you from any responsibilities, liabilities, or penalties you may be subject to under Section 311 of the federal Clean Water Act.

8.8 Penalties for Violations of general permit Conditions

1. If you violate a condition of the general permit, you are in violation of the provisions of SDCL 34A-2-36 and subject to penalties under SDCL 34A-2-75. In addition to a jail sentence authorized by SDCL 22-6-2, you can be subject to a criminal fine not to exceed $10,000 per day per violation. You can also be subject to a civil penalty not to exceed $10,000 per day per violation, or for damages to the environment of this state.

2. Except as provided above in the Upset Conditions in Section 8.4, nothing in this general permit relieves you of the civil or criminal penalties for noncompliance.

8.9 Penalties for Falsification of Reports

1. If you knowingly make any false statement, representation, or certification in any record or other document submitted or required to be maintained under this general permit, you are in violation of the provisions of SDCL 34A-2-77 and subject to penalties under SDCL 34A-2-75.

2. If you falsify, tamper with, or knowingly render inaccurate any monitoring device or method required to be maintained under this general permit, you are in violation of the provisions of SDCL 34A-2-77 and is subject to penalties under SDCL 34A-2-75.

3. In addition to a jail sentence authorized by SDCL 22-6-2, you can be subject to a criminal fine not to exceed $10,000 per day per violation. You are also subject to a civil penalty not to exceed $10,000 per day per violation, or for damages to the environment of this state.

Appendix A

NOTICE OF INTENT (NOI) FORM

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
NOTICE OF INTENT (NOI)
to Obtain Coverage Under the SWD General Permit for
Stormwater Discharges Associated with Construction Activities

Submit form to: SD Department of Environment and Natural Resources
Surface Water Quality Program
523 East Capitol Avenue
Pierre, South Dakota 57501
stormwater@state.sd.us
Telephone: 1-800-SDSTORM

ALL QUESTIONS MUST BE ANSWERED COMPLETELY FOR THIS FORM TO BE VALID

I. Site Owner Contact Information:

Company Name: _____

Primary Contact Person: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Phone Number: _____ Email Address: _____

Type of Ownership: ☐ Private ☐ Federal ☐ State ☐ Other (Municipal, County, etc.)
(any type not listed previously)

II. Contractor Information:

Will any contractors be responsible for erosion and sediment control practices: ☐ Yes ☐ No

(A contractor authorization form must be submitted for each contractor that will have day to day responsibility for erosion and sediment control practices. If these contractors have not been identified at the time this NOI is submitted, the contractor authorization form may be submitted after they have been identified, but before they begin construction work.)

III. Engineering Firm Contact Information (if applicable):

Contact Person: _____

Contact's Email Address: _____

IV. Construction Project Information:

Project Name: _____

Physical Project Address or Description of Construction Site Location: _____

_____

City: _____ State: _____ Zip Code: _____

On-Site Contact Person: _____

Contact's Email Address: _____

Contact's Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Phone Number: _____ County of Construction Site: _____

Latitude: _____ Longitude: _____ Source (GPS, Google, etc.): _____

Quarter(s): _____ Section(s): _____ Township(s): _____ Range(s): _____

FOR DENR USE ONLY

Permit Number: _____ Date Approved: _____ Approved by: _____

Construction Project Information (Continued):

Is this project on Tribal Lands? ☐ Yes ☐ No

Total area disturbed by the project (in acres): _____

Will this project encroach, damage, or destroy one of the historic sites identified at the following wesites:

https://www.nps.gov/subjects/nationalhistoriclandmarks/list-of-nhls-by-state.htm ☐ Yes ☐ No

http://history.sd.gov/Preservation/nationalregisterofhistoricplaces.aspx ☐ Yes ☐ No

V. Stormwater Pollution Prevention Plan (SWPPP):

Has the SWPPP been developed as required? ☐ Yes ☐ No

(The plan must be developed **before** the NOI is submitted. DENR will not issue coverage before this has been developed.)

VI. Receiving Waters:

Please list all possible waters that may receive a discharge from this site. If discharging to a Municipal Storm Sewer System, indicate which municipality and the ultimate receiving water.

_____

_____

VII. Nature of Discharge:

Please include a brief description of the construction project:

_____

_____

Will construction dewatering be required? ☐ Yes ☐ No If yes, please complete section IX also.

VIII. Construction Dates:

Project Start Date (MM/DD/YYYY): _____

Estimated Completion Date (MM/DD/YYYY): _____

IX. Dewatering Activities (Complete this section if you answered yes in VII):

Date dewatering will commence (MM/DD/YYYY): _____

Date dewatering will end (MM/DD/YYYY): _____

Total volume of dewatering (gallons): _____ Average flow rate (gallons per minute): _____

Source of water to be discharged: _____

Receiving water: _____

Brief description of water treatment processes to be employed, if any: _____

_____

Will the dewatering discharge contain anything other than uncontaminated groundwater and stormwater: ☐ Yes ☐ No

NOTE: If there will be dewatering activities, please place points of withdrawal and discharge on a topographic map, or other map if a topographic map is unavailable. This map should extend to one (1) square mile beyond the property boundaries of the facility and each of its discharge facilities, and those wells, springs, and other surface water bodies, drinking water wells, and surface water intake structures listed in public records, or otherwise known to the applicant in the map area.

X. Other Information

List other information you feel should be brought to the attention of the SDDENR regarding coverage under this general permit. Attach additional sheets if necessary.

_____

_____

_____

STATE OF SOUTH DAKOTA

BEFORE THE SECRETARY OF

THE DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

IN THE MATTER OF THE APPLICATION OF	**)**	
	)	**CERTIFICATION OF**
_____	**)**	
	)	**APPLICANT**
STATE OF _____	**)**	
	)	
COUNTY OF _____	**)**	

I, _____, the applicant in the above matter after being duly sworn upon oath hereby certify the following information in regard to this application:

I have read and understand South Dakota Codified Law Section 1-40-27 which provides:

"The secretary may reject an application for any permit filed pursuant to Titles 34A or 45, including any application by any concentrated swine feeding operation for authorization to operate under a general permit, upon making a specific finding that:

(1) The applicant is unsuited or unqualified to perform the obligations of a permit holder based upon a finding that the applicant, any officer, director, partner, or resident general manager of the facility for which application has been made:

(a) Has intentionally misrepresented a material fact in applying for a permit;

(b) Has been convicted of a felony or other crime involving moral turpitude;

(c) Has habitually and intentionally violated environmental laws of any state or the United States which have caused significant and material environmental damage;

(d) Has had any permit revoked under the environmental laws of any state or the United States; or

(e) Has otherwise demonstrated through clear and convincing evidence of previous actions that the applicant lacks the necessary good character and competency to reliably carry out the obligations imposed by law upon the permit holder; or

(2) The application substantially duplicates an application by the same applicant denied within the past five years which denial has not been reversed by a court of competent jurisdiction. Nothing in this subdivision may be construed to prohibit an applicant from submitting a new application for a permit previously denied, if the new application represents a good faith attempt by the applicant to correct the deficiencies that served as the basis for the denial in the original application.

All applications filed pursuant to Titles 34A and 45 shall include a certification, sworn to under oath and signed by the applicant, that he is not disqualified by reason of this section from obtaining a permit. In the absence of evidence to the contrary, that certification shall constitute a prima facie showing of the suitability and qualification of the applicant. If at any point in the application review, recommendation or hearing process, the secretary finds the applicant has intentionally made any material misrepresentation of fact in regard to this certification,

consideration of the application may be suspended and the application may be rejected as provided for under this section.

Applications rejected pursuant to this section constitute final agency action upon that application and may be appealed to circuit court as provided for under chapter 1-26."

I certify pursuant to 1-40-27, that as an applicant, officer, director, partner, or resident general manager of the activity or facility for which the application has been made that I; a) have not intentionally misrepresented a material fact in applying for a permit; b) have not been convicted of a felony or other crime of moral turpitude; c) have not habitually and intentionally violated environmental laws of any state or the United States which have caused significant and material environmental damage; (d) have not had any permit revoked under the environmental laws of any state or the United States; or e) have not otherwise demonstrated through clear and convincing evidence of previous actions that I lack the necessary good character and competency to reliably carry out the obligations imposed by law upon me. I also certify that this application does not substantially duplicate an application by the same applicant denied within the past five years which denial has not been reversed by a court of competent jurisdiction. Further;

"I declare and affirm under the penalties of perjury that this claim (petition, application, information) has been examined by me, and to the best of my knowledge and belief, is in all things true and correct."

Dated this _____ day of _____ , 20____ .

_____
Applicant (print)

_____
Applicant (signature)

Subscribed and sworn before me this _____ day of _____ , 20_____ .

_____
Notary Public (signature)

My commission expires: _____

(SEAL)

PLEASE ATTACH ANY ADDITIONAL INFORMATION NECESSARY TO DISCLOSE ALL FACTS AND DOCUMENTS PERTAINING TO SDCL 1-40-27 (1) (a) THROUGH (e). ALL VIOLATIONS MUST BE DISCLOSED, BUT WILL NOT AUTOMATICALLY RESULT IN THE REJECTION OF AN APPLICATION

Appendix B

NOTICE OF TERMINATION
(NOT) FORM

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
NOTICE OF TERMINATION (NOT)
of Coverage Under the SWD General Permit for
Stormwater Discharges Associated with Construction Activities

This form is required to be submitted when a discharge permit is no longer required or necessary. Submission of this form shall in no way relieve the permittee of permit obligations required prior to submission of this form. Please submit this form to the following address:

Submit form to: SD Department of Environment and Natural Resources
Surface Water Quality Program
523 East Capitol Avenue
Pierre, South Dakota 57501
stormwater@state.sd.us
Telephone: 1-800-SDSTORM

I. Permit Number: _____

II. Primary Contact Information:

Company Name: _____

Primary Contact Person: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Phone Number: _____ Email Address: _____

III. Mailing Address for Facility/Site Location:

Project Name: _____

Primary Contact Person: _____

Contact's Email Address: _____

Contact's Mailing Address: _____

City: _____ State: _____ Zip Code: _____

I certify under penalty of law that all stormwater discharges associated with construction activity from the identified facility that are authorized by a SWD general permit have been eliminated. I understand that by submitting the Notice of Termination, I am no longer authorized to discharge stormwater associated with construction activity under this general permit, and that discharging pollutants in stormwater associated with construction activity to waters of the state is unlawful under the federal Clean Water Act and the South Dakota Water Pollution Control Act if the discharge is not authorized by a SWD permit. I also understand that the submittal of this Notice of Termination does not release an operator from liability for any violations of this permit or the South Dakota Water Pollution Control Act. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

NOTE: Notice of Termination shall be signed by the authorized chief elective or executive officer of the applicant, or by the applicant, if an individual.

Name: _____ Title: _____

Signature: _____ Date: _____

FOR DENR USE ONLY

Permit Number: _____ Date Approved: _____ Letter Date: _____ Approved by: _____

Appendix C

CONTRACTOR AUTHORIZATION FORM

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
CONTRACTOR AUTHORIZATION FORM

for Coverage Under the SWD General Permit for
Stormwater Discharges Associated with Construction Activities

This form is required to be submitted when a contractor will act as an operator and have day to day responsibility for erosion and sediment control measures. Submission of this form shall in no way relieve the permittee of permit obligations. Please submit this form to the following address:

Submit form to: SD Department of Environment and Natural Resources
Surface Water Quality Program
523 East Capitol Avenue
Pierre, South Dakota 57501
stormwater@state.sd.us
Telephone: 1-800-SDSTORM

ALL QUESTIONS MUST BE ANSWERED COMPLETELY FOR THIS FORM TO BE VALID

Project Name: _____ Permit Number (if available): _____

Project Site Legal Location: _____

Contractor Company Name: _____

Responsible Contact Person: _____

Contact's Email Address: _____

Contractor Mailing Address: _____

City: _____ State: _____ Zip Code: _____ Phone Number: _____

The contractor(s) responsible for the day to day operation of the construction site shall certify the following:

"I certify under penalty of law that I understand and will comply with the terms and conditions of the Surface Water Discharge General Permit for Stormwater Discharges Associated with Construction Activities for the project identified above."

South Dakota Codified Laws Section 1-40-27 provides:

"The secretary may reject an application for any permit filed pursuant to Titles 34A or 45, including any application by any concentrated swine feeding operation for authorization to operate under a general permit, upon making a specific finding that:

(1) The applicant is unsuited or unqualified to perform the obligations of a permit holder based upon a finding that the applicant, any officer, director, partner or resident general manager of the facility for which application has been made:

(a) Has intentionally misrepresented a material fact in applying for a permit;

(b) Has been convicted of a felony or other crime involving moral turpitude;

(c) Has habitually and intentionally violated environmental laws of any state or the United States which have caused significant and material environmental damage;

(d) Has had any permit revoked under the environmental laws of any state or the United States; or

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Permit Number: _____ Date Approved: _____ Approved by: _____

(e) Has otherwise demonstrated through clear and convincing evidence of previous actions that the applicant lacks the necessary good character and competency to reliably carry out the obligations imposed by law upon the permit holder; or

(2) The application substantially duplicates an application by the same applicant denied within the past five years which denial has not been reversed by a court of competent jurisdiction. Nothing in this subdivision may be construed to prohibit an applicant from submitting a new application for a permit previously denied, if the new application represents a good faith attempt by the applicant to correct the deficiencies that served as the basis for the denial in the original application.

All applications filed pursuant to Titles 34A and 45 shall include a certification, sworn to under oath and signed by the applicant, that he is not disqualified by reason of this section from obtaining a permit. In the absence of evidence to the contrary, that certification shall constitute a prima facie showing of the suitability and qualification of the applicant. If at any point in the application review, recommendation or hearing process, the secretary finds the applicant has intentionally made any material misrepresentation of fact in regard to this certification, consideration of the application may be suspended and the application may be rejected as provided for under this section.

Applications rejected pursuant to this section constitute final agency action upon that application and may be appealed to circuit court as provided for under chapter 1-26."

I certify pursuant to SDCL 1-40-27, that as an applicant, officer, partner, or resident general manager of the activity or facility for which the application has been made that I; a) have not intentionally misrepresented a material fact in applying for a permit; b) have not been convicted of a felony or other crime of moral turpitude; c) have not habitually and intentionally violated environmental laws of any state or the United States which have caused significant and material environmental damage; d) have not had any permit revoked under the environmental laws of any state or the United States; or e) have not otherwise demonstrated through clear and convincing evidence of previous actions that I lack the necessary good character and competency to reliably carry out the obligations imposed by law upon me. I also certify that this application does not substantially duplicate an application by the same applicant denied within the past five years which denial has not been reversed by a court of competent jurisdiction. Further;

"I declare and affirm under the penalties of perjury that this claim (petition, application, information) has been examined by me, and to the best of my knowledge and belief, is in all things true and correct."

Dated this _____ day of _____, 20____.

_____

Applicant (print)

_____

Applicant (signature)

Subscribed and sworn before me this _____ day of _____, 20____.

_____

Notary Public (signature)

My commission expires: _____

(SEAL)

PLEASE ATTACH A SHEET DISCLOSING ALL FACTS PERTAINING TO SDCL 1-40-27 (1) (a) THROUGH (e). ALL VIOLATIONS MUST BE DISCLOSED, BUT WILL NOT AUTOMATICALLY RESULT IN THE REJECTION OF AN APPLICATION.

Appendix D

TRANSFER OF PERMIT COVERAGE FORM

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
TRANSFER OF PERMIT COVERAGE FORM

for Coverage Under the SWD General Permit for
Stormwater Discharges Associated with Construction Activities

This form is required to be submitted when ownership of a construction project or an individual lot in a larger common plan of development has been transferred to a different owner. Please submit this form to the following address:

Submit form to: SD Department of Environment and Natural Resources
Surface Water Quality Program
523 East Capitol Avenue
Pierre, South Dakota 57501
stormwater@state.sd.us
Telephone: 1-800-SDSTORM

Project Name: _____ Permit Number: _____

Site (Lot) Legal Location: _____

Site (Lot) Description: _____

Previous Owner's Name: _____

New Owner's Name: _____

New Owner's Mailing Information:

City: _____ State: _____ Zip Code: _____

Phone Number: _____ Email: _____

Stabilization measures implemented prior to transfer: _____

_____

Date transfer of property responsibility and liability becomes effective: _____

****NOTE: Any change in location, operation, and/or coverage area requires that the Stormwater Pollution Prevention Plan be updated and revised to reflect all changes.**

The site (lot) described about is covered under the General Permit for Stormwater Discharges Associated with Construction Activity. Temporary or permanent stabilization has been established on the site, which has now transferred ownership/responsibility as indicated above. The new owners, or operators, have been made aware of the importance of site stabilization in an effort to control pollutant runoff and/or sedimentation.

The new owner assumes responsibility for implementing best management practices to reduce or eliminate a discharge of pollutants to waters of the state. The new owner is aware that permit coverage for the site is required until all soil-disturbing activities at the site have been completed and one of the following conditions have been met:

- **all portions of the site not covered by pavement or permanent structures have a uniform perennial vegetative cover over at least 70% of the site; or**
- **equivalent permanent stabilization measure have been employed, such as the use of riprap, gabions, or geotextiles.**

New Owner/Operator Signature: _____

Date: _____

Previous Owner/Operator Signature: _____

Date: _____

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Permit Number: _____ Date Approved: _____ Approved by: _____

Appendix E

NOTICE OF INTENT
FOR
REAUTHORIZATION FORM

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
NOTICE OF INTENT (NOI) for REAUTHORIZATION
of Coverage Under the SWD General Permit for
Stormwater Discharges Associated with Construction Activities

The following facility currently has coverage under the General Permit for Stormwater Discharges Associated with Construction Activities. ***This form must be submitted if you wish to continue coverage under the General Permit.*** Submission of this form shall in no way relieve the permittee of permit obligations required prior to submission of this form. Please submit this form to the following address:

Submit form to: SD Department of Environment and Natural Resources
Surface Water Quality Program
523 East Capitol Avenue
Pierre, South Dakota 57501
stormwater@state.sd.us
Telephone: 1-800-SDSTORM

Update information below as needed. Please print or type information.

I. Permit Number: _____

II. Owner Information:

Company Name: _____

Primary Contact Person: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Phone Number: _____ Email Address: _____

III. Construction Project Information:

Project Name: _____

Project Description: _____

On-Site Contact Person: _____

Mailing Address: _____

City: _____ County: _____ State: _____ Zip Code: _____

Phone Number: _____ Total area disturbed by the project (in acres): _____

Project Start Date: _____ Estimated Completion Date: _____

IV. Signature of Applicant

By signing this form, you are requesting to continue permit coverage under the reissued General Permit. You are certifying you will comply with the new General Permit and update your Stormwater Pollution Prevention Plan if necessary to meet the reissued General Permit conditions.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including revocation of the permit and the possibility of fine and imprisonment for knowing violations. In addition, I certify that I am aware of the terms and conditions of the General Stormwater permit and I agree to comply with those requirements.

NOTE: The NOI for Reauthorization must be signed by the authorized chief elective or executive offier of the applicant, or by the applicant, if an individual project.

Name (print): _____ Title: _____

Signature: _____ Date: _____

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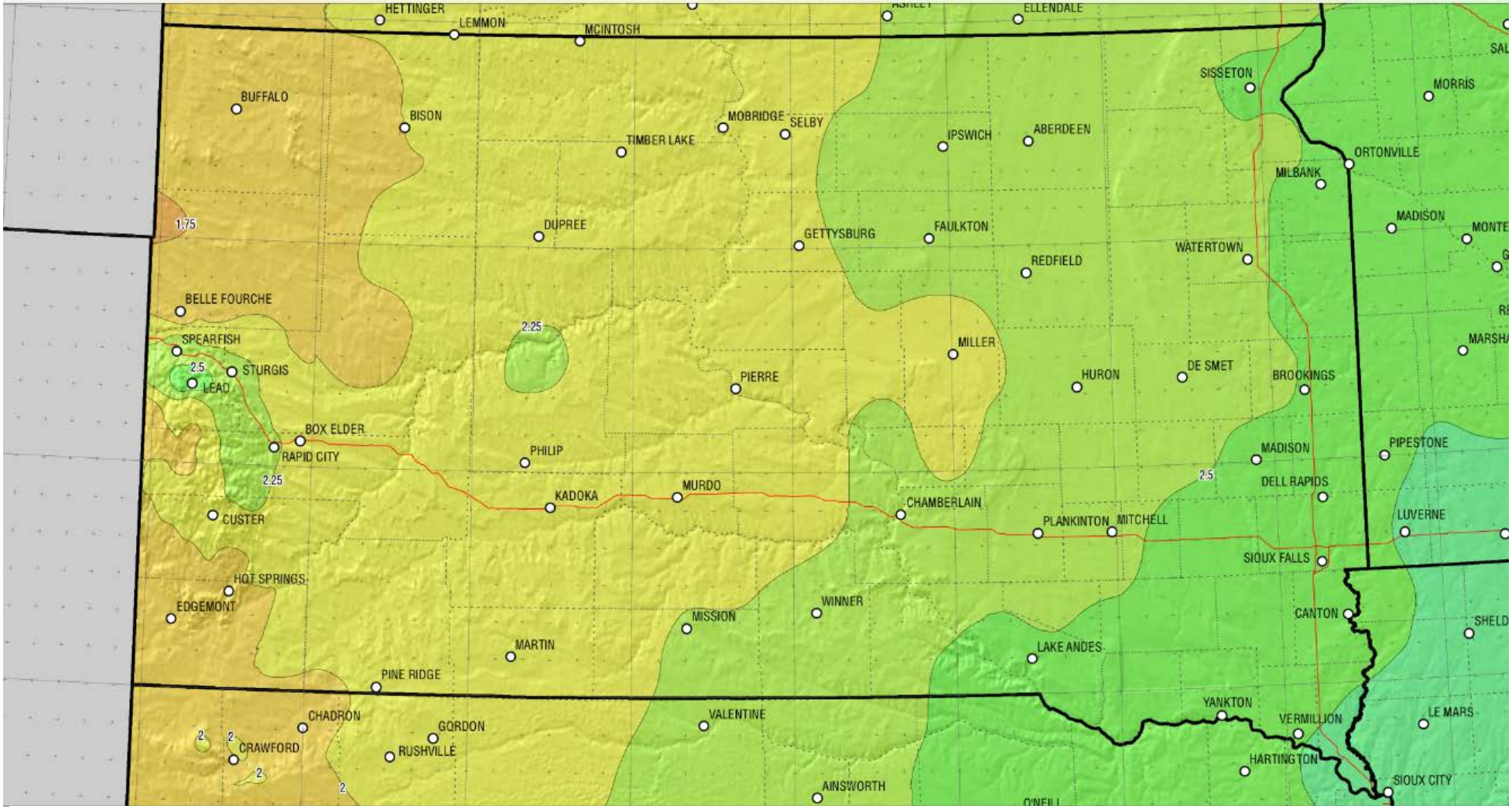
Permit Number: _____ Date Reauthorized: _____ Approved by: _____

Appendix F

TWO YEAR, TWENTY-FOUR HOUR PRECIPITATION EVENT MAP

ftp://hdsc.nws.noaa.gov/pub/hdsc/data/mw/nd2y24h.pdf



NOAA Atlas 14, Volume 8, Version 2
Midwestern States

Prepared by U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE
OFFICE OF HYDROLOGIC DEVELOPMENT
HYDROMETEOROLOGICAL DESIGN STUDIES CENTER
April 2013

SOUTH DAKOTA

2-year 24-hour precipitation in inches

0.88 - 1.00	2.01 - 2.25	3.26 - 3.50	4.51 - 4.75
1.01 - 1.25	2.26 - 2.50	3.51 - 3.75	4.76 - 5.00
1.26 - 1.50	2.51 - 2.75	3.76 - 4.00	5.01 - 5.19
1.51 - 1.75	2.76 - 3.00	4.01 - 4.25	
1.76 - 2.00	3.01 - 3.25	4.26 - 4.50	

Legend based on entire Volume 8 project area

Appendix C Site Civil Erosion and Sediment Control Plans

GENERAL NOTES

1. THE PLANS UTILIZE HORIZONTAL DATUM: NSRS 2011 SOUTH DAKOTA STATE PLANES, SOUTH ZONE, US FOOT.
2. GROUND SURFACE CONTOURS AND ELEVATIONS WERE COMPLETED BY WESTWOOD AND PROVIDED BY NATIONAL GRID RENEWABLES.
3. THE ACCURACY OF THE TOPOGRAPHIC SURVEY IS UNKNOWN. THE DESIGN SURFACE DEVELOPED IN THE PLANS WAS DEVELOPED FROM CONTOUR LINES PROVIDED BY NATIONAL GRID RENEWABLES AND MAY RESULT IN DEVIATIONS FROM ACTUAL GROUND SURFACE ELEVATIONS. WHERE MAJOR VARIATIONS ARE FOUND, THE OWNER AND ENGINEER SHALL BE NOTIFIED. ADDITIONAL GRADING MAY BE REQUIRED, AS WELL AS ADDITIONAL EXISTING INFRASTRUCTURE, UTILITIES, AND OBSTACLES WHICH DO NOT APPEAR RECOGNIZABLE ON THE PLANS AND WERE NOT DIGITIZED FOR THIS PLAN MAY BE ENCOUNTERED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE MINOR ADJUSTMENTS WHILE STAYING WITHIN THE CONSTRUCTION LIMITS TO AVOID THESE ITEMS WHEN REQUIRED. CONTRACTOR SHALL BE ENTITLED TO RELIEF FOR DISCREPANCIES OF A MAJOR NATURE. CONTRACTOR SHALL FOLLOW ALL NOTICE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
4. THE PROJECT ALTA SURVEY WAS COMPLETED BY WESTWOOD AND PROVIDED BY NATIONAL GRID RENEWABLES. PROPERTY LINES, ROW LINES, AND EASEMENTS AND OTHER LINEWORK FROM THE ALTA SURVEY WERE USED TO COMPLETE THE DESIGN.
5. WHERE SECTION OR SUBSECTION MONUMENTS ARE ENCOUNTERED, THE OWNER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. IF MONUMENT CANNOT BE AVOIDED, THE CONTRACTOR SHALL NOT REMOVE THE MONUMENT UNTIL THE OWNER, AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED AND DOCUMENTED ITS LOCATION. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING DAMAGED PROPERTY MARKERS AND MONUMENTS.
6. THE CONTRACTOR SHALL NOTIFY SOUTH DAKOTA STATE ONE CALL (1-800-781-7474 OR 811) AT LEAST 48 HOURS BEFORE EXCAVATION ACTIVITIES COMMENCE.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING UTILITIES VIA ONE CALL PRIOR TO CONSTRUCTION. IF UTILITIES ARE DETERMINED TO EXIST THAT ARE NOT SHOWN ON THE PLANS THE ENGINEER SHALL BE CONTACTED IMMEDIATELY. THE CONTRACTOR SHALL PROTECT EXISTING UTILITIES AND RELOCATE AS REQUIRED IN COORDINATION WITH UTILITY AND LANDOWNER. ALL UTILITIES NOT IDENTIFIED BUT REQUIRED TO BE RELOCATED SHALL BE LOCATED ON THE AS-BUILT DOCUMENTS. CONTRACTOR SHALL BE ENTITLED TO COST & SCHEDULE RELIEF FOR RELOCATION OF UTILITIES NOT SHOWN ON THE PLANS.
8. THE CONTRACTOR SHALL NOTIFY AND COORDINATE ALL WORK WITH THE UTILITY COMPANIES IF WITHIN THEIR ROW.
9. CONTRACTOR SHALL VERIFY CROSSING DESIGNS WITH ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION AND IS RESPONSIBLE FOR DAMAGES TO UTILITIES DURING CONSTRUCTION.
10. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS SHOWN ON THE PLANS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER IF THERE ARE ANY DISCREPANCIES.
11. ANY STRUCTURES REMOVED OR RELOCATED TO ALLOW FOR CONSTRUCTION (MAILBOXES, SIGNS, FENCES, LIGHTING, ETC.) SHALL BE REPLACED BY THE CONTRACTOR TO THE EXISTING CONDITION AT THE TIME OF REMOVAL, UNLESS OTHERWISE DIRECTED BY THE OWNER.
12. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING DRAINAGE AND MINIMIZING PONDING THROUGHOUT THE LIFE OF THE CONSTRUCTION PROJECT. CONSTRUCTION ACTIVITIES SHALL NOT BLOCK NATURAL OR MANMADE CREEKS OR DRAINAGE SWALES.
13. CONTRACTOR SHALL NOT DISTURB AREAS LOCATED WITHIN DELINEATED WETLANDS OR JURISDICTIONAL WATERS SHOWN ON THE PLANS. TREE CLEARING ACTIVITIES MAY BE ONLY COMPELTED IN AREAS SHOWN ON THE PLANS AND MAY ONLY BE COMPLETED USING NON-MACHNICAL DEVICES.
14. THE CONSTRUCTION OF THE ROADS AND EXCAVATING AREAS NEEDED TO BE GRADED MAY RESULT IN EXCESS MATERIAL. THE CONTRACTOR SHALL DISPOSE OF THIS EXCESS MATERIAL IN AN APPROVED MANNER. EXCESS TOPSOIL SHALL BE PLACED ON LAND IMMEDIATELY ADJACENT TO WHERE THE TOPSOIL ORIGINATED. NO TOPSOIL SHALL LEAVE THE PROPERTY AND THE CONTRACTOR SHALL CREATE A FINAL SURFACE OF DISTURBED TOPSOIL WHICH SHALL BE SMOOTH AND FOLLOW THE NATURAL CONTOUR OF THE LAND.
15. ALL DISTURBED AREAS OUTSIDE THE FINAL ROADWAY SHALL BE RETURNED TO THEIR ORIGINAL CONDITION. GRASSY AREAS SHALL BE SEEDED AND ESTABLISHED TO PRE-CONSTRUCTION CONDITION.
16. FINAL GRADING SHALL MEET REQUIREMENTS OF THE SINGLE-AXIS TRACKER RACKING.
17. ALL RESTORATION SHALL MEET REQUIREMENTS OF PROJECT SWPPP FOR SOIL DECOMPACTION.
18. UNLESS OTHERWISE NOTED, ROADS, TEMPORARY DISTURBANCE AREAS, ETC. SHALL BE CONSTRUCTED AT OR NEAR EXISTING GRADE. CONTRACTOR SHALL FOLLOW RECOMMENDATIONS STATED IN THE GEOTECHNICAL REPORT COMPLETED BY TERRACON, AND REMOVE TOPSOIL, COMPACT & PROOF-ROLL SUBGRADE, AND PLACE AN AGGREGATE BASE COURSE WHERE SHOWN ON PLANS.
19. ALL CONSTRUCTION ACTIVITY SHALL TAKE PLACE WITHIN THE PROJECT LIMITS AS SHOWN IN THE PLANS.
20. THE CONTRACTOR SHALL REVIEW AND BE FAMILIAR WITH THE GEOTECHNICAL REPORT(S) PREPARED FOR THE PROJECT, AND ADHERE TO THE RECOMMENDATIONS MADE FOR THE PROJECT. ALL GRADING SHALL CONFORM TO THE GEOTECHNICAL REPORT AND RECOMMENDATIONS.
21. ACTIVITIES SUCH AS ROAD CONSTRUCTION, CUT AND FILL, TRENCHING, STAGING AREAS, AND ELECTRICAL EQUIPMENT AREA PREPARATION SHALL BE CONSIDERED AS GROUND DISTURBING ACTIVITIES. ADDITIONAL AREAS DISTURBED INCIDENTALLY BY EQUIPMENT MOVEMENT IN ADVERSE WEATHER SHALL BE CONSIDERED AS PART OF THE DISTURBANCE LIMITS AT TIME OF CONSTRUCTION AND SHALL BE STABILIZED IN ACCORDANCE WITH ULTEIG RECOMMENDATIONS. ALL WORK COMPLETED OUTSIDE THESE LIMITS MUST BE DOCUMENTED AND CAPTURED IN THE AS-BUILT DRAWINGS DEVELOPED AT THE END OF THE PROJECT.
22. DISPOSE OF ALL WASTE MATERIALS LEGALLY OFF SITE AT A LICENSED WASTE MANAGEMENT FACILITY. BURNING OF WASTE MATERIAL ON SITE IS NOT PERMITTED.

DESIGN CODES AND STANDARDS

1. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)— STANDARDS AND SPECIFICATIONS
2. AMERICAN CONCRETE INSTITUTE (ACI) - STANDARDS AND RECOMMENDED PRACTICES
3. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) – STANDARDS
4. AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM) - STANDARDS, SPECIFICATIONS, AND RECOMMENDED PRACTICES
5. AMERICAN WELDING SOCIETY (AWS)
6. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - NFPA70, NATIONAL ELECTRIC CODE (NEC)
7. UNDERWRITERS LABORATORIES, INC. (UL)
8. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) – 29 CFR 1910
9. NATIONAL ENGINEERING HANDBOOK – PART 630 (HYDROLOGY)
10. AMERICAN NURSERY AND LANDSCAPE ASSOCIATION/AMERICAN NATIONAL STANDARDS INSTITUTE (ANLA/ANSI)
11. AOAC INTERNATIONAL
12. ASTM: UNITED STATES DEPARTMENT OF AGRICULTURE (USDA) - FEDERAL SEED ACT
13. NEXTRACKER HORIZON RACKING INSTALLATION
14. REQUIREMENTS APPLICABLE TO THE PLANNED INSTALLATION
15. SDDOT SPECIFICATIONS – STATE SPECIFIC REQUIREMENTS
16. PENNINGTON COUNTY – COUNTY SPECIFIC REQUIREMENTS

GRADING AND DRAINAGE

1. GRADING AND DRAINAGE NOTES
   a. CONTRACTOR SHALL NOT MAKE SIGNIFICANT ALTERATIONS TO DESIGN GRADES WITHOUT PRIOR APPROVAL FROM ENGINEER. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS REQUIRED PROTECT ADJACENT PROPERTIES DURING GRADING OPERATIONS.
   b. ALL AREAS REQUIRED TO BE FILLED SHALL BE PREPARED AND FILL SHALL BE PLACED IN ACCORDANCE WITH RECOMMENDATIONS OF THE THE TERRACON GEOTECHNICAL REPORT. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PLACE, SPREAD, WATER AND COMPLETE THE FILL IN STRICT ACCORDANCE WITH THESE SPECIFICATIONS.
   c. GRADING CONTRACTOR SHALL COORDINATE THE GRADING OPERATION WITH THE UTILITY COMPANIES WITH REGARDS TO CONFLICTS REQUIRING REMOVAL/RELOCATION/ADJUSTMENT OF EXISTING UTILITIES (POWER POLES/UNDERGROUND CABLES, VAULTS AND BOXES) NECESSARY TO PERFORM THE SCOPE OF THE WORK
   d. ALL NON-SUITABLE MATERIAL (MUCK, ROCK, PEAT, ETC.) SHALL BE REMOVED BELOW ANY NEW ACCESS ROADS, CUT/FILL GRADING AREAS, AND FACILITIES, OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER. ALL REMOVED MATERIAL SHALL BE STOCKPILED IN AN APPROVED ON-SITE LOCATION (NO TRUCKING OF MATERIAL) LOCATION BY THE OWNER AND/OR CONTRACTOR.
   e. THE CONTRACTOR SHALL ENSURE THAT POSITIVE DRAINAGE IS MAINTAINED THROUGHOUT CONSTRUCTION AND POST-CONSTRUCTION. LOCAL PONDING MAY OCCUR.
2. CULVERTS
   a. SEE THE DRAINAGE SCHEDULE FOR CULVERT LOCATIONS. CULVERTS PLANNED FOR PRIVATE ENTRANCES SHALL BE CORRUGATED METAL PIPE AND MEET H20 LOADING.
   b. CULVERT EXTENSIONS SHALL MATCH THE EXISTING PIPE SIZE / MATERIAL.
   c. PERMANENT AND TEMPORARY DRAINAGE CULVERTS ARE SHOWN FOR REFERENCE AND BIDDING PURPOSES, FINAL PLANS WILL BE DESIGNED TO CONVEY STORM WATER FOR A MINIMUM 24-HR 5 YR STORM EVENT AND TO WITHSTAND A 24-HR 25-YR STORM EVENT.
   d. REUSED CORRUGATED METAL PIPE (CMP) OR CORRUGATED HIGH-DENSITY POLYETHYLENE (HDPE) MAY BE USED AS TEMPORARY CULVERTS. ALL CULVERTS USED FOR TEMPORARY CROSSINGS SHALL MEET H20 LOADING.
   e. THE CONTRACTOR SHALL VERIFY WITH PIPE SUPPLIER THAT THE MINIMUM COVER SHOWN IS ADEQUATE FOR H2O LOADING OR CONSTRUCTION EQUIPMENT LOADING WHICHEVER IS GREATER.
   f. ALL PERMANENT CULVERTS SHALL BE INSTALLED TO COUNTY REQUIREMENTS.
   g. IT IS EXPECTED THAT CULVERTS SHALL OVERTOP DURING STORM EVENTS GREATER THAN 24-HR 5 YR EVENTS AND PERIODIC MAINTENANCE MIGHT BE REQUIRED DURING O&M PERIOD.
3. LOW WATER CROSSINGS
   a. ALL PERMANENT LOW WATER CROSSINGS ARE SHOWN FOR REFERENCE AND BIDDING PURPOSES, FINAL PLANS WILL BE SIZED TO WITHSTAND A 24-HR 25-YR RAIN EVENT WITHOUT FAILURE. SEE THE DRAINAGE SCHEDULE FOR THE LOW WATER CROSSING LOCATIONS AND REQUIRED INSTALLATIONS DETAILS.
   b. TEMPORARY LOW WATER CROSSINGS SHALL BE CONSTRUCTED TO MEET REQUIREMENTS FOR ANTICIPATED CONSTRUCTION TRAFFIC. THE CONTRACTOR SHALL REMOVE ANY NON-SUITABLE MATERIAL AND COMPACT AND/OR UTILIZE MATS TO MEET TRAVEL REQUIREMENTS.

EARTHWORK

1. CLEARING AND GRUBBING
   a. THE CONTRACTOR SHALL BE REQUIRED AS NECESSARY TO FACILITATE CONSTRUCTION OPERATIONS, TO REMOVE ALL TREES, STUMPS, BRUSH, AND DEBRIS WITHIN THE GRADING AREAS SHOWN ON THE PLANS. THE CONTRACTOR IS TO REMOVE ONLY THOSE TREES WHICH ARE DESIGNATED BY THE OWNERS REPRESENTATIVE FOR REMOVAL, AND SHALL EXERCISE EXTREME CARE AROUND EXISTING TREES TO BE SAVED.
   b. THE CONTRACTOR SHALL DISPOSE OF TREES, BRUSH, STUMPS, ROOTS, AND OTHER DEBRIS OR BYPRODUCTS BY CHIPPING, MARKETING, BURNING, OR BURYING.
2. TOPSOIL STRIPPING
   a. ALL AREAS TO BE EXCAVATED SHALL BE STRIPPED OF VEGETATION AND TOPSOIL.
   b. TOPSOIL SHALL BE STRIPPED FROM ALL ROADWAY AREAS THROUGH THE ROOT ZONE. TOPSOIL SHALL NOT BE STRIPPED OUTSIDE THE DESIGNATED DISTURBANCE AREAS. AVERAGE REMOVAL DEPTH OF 4"-6". IF DEEPER AREAS ARE OBSERVED THE MATERIAL SHALL BE REMOVED AS REQUIRED.
   c. ANY TOPSOIL THAT HAS BEEN STRIPPED SHALL BE RE-SPREAD OR STOCKPILED WITHIN GRADING AREAS AS DESIGNATED ON THE PLAN. IF USED AS FILL OUTSIDE THE DISTURBED AREA, PRIOR APPROVAL IS REQUIRED. TOPSOIL STOCKPILES SHALL BE SEGREGATED FROM THE NATIVE SOIL STOCKPILES. ALL TOPSOIL SHALL BE REDISTRIBUTED ON THE LANDOWNERS PROPERTY WHERE IT ORIGINATED FROM.
3. EXCAVATION
   a. ALL SUITABLE EXCAVATED MATERIAL SHALL BE USED IN THE FORMATION OF EMBANKMENT, SUBGRADE, OR OTHER PROPOSED AREAS SHOWN ON THE PLANS.
   b. ALL UNSUITABLE MATERIAL SHALL BE DISPOSED OF TO AN ON-SITE LOCATION AS SHOWN ON THE PLANS
   c. WHEN THE VOLUME OF EXCAVATION EXCEEDS THAT REQUIRED TO CONSTRUCT THE EMBANKMENTS TO THE GRADES INDICATED, THE EXCESS SHALL BE USED TO GRADE THE AREAS OF ULTIMATE DEVELOPMENT OR DISPOSED OF ON SITE AS APPROVED BY THE ENGINEER.
   d. ALL RUTS OR ROUGH PLACES THAT DEVELOP IN THE COMPLETED SUBGRADE SHALL BE GRADED AND RE-COMPACTED. DEEP RUTS SHALL RECEIVE ADDITIONAL MATERIAL PRIOR TO RECOMPACTION.
   e. DO NOT COMMENCE EXCAVATIONS FOR FOUNDATIONS UNTIL OWNER HAS APPROVED: 1) THE REMOVAL OF TOPSOIL AND OTHER UNSUITABLE AND UNDESIRABLE MATERIAL FROM THE EXISTING SUBGRADE, 2) DENSITY AND MOISTURE CONTENT OF SITE AREA COMPACTED FILL MATERIAL MEETS REQUIREMENTS OF SPECIFICATIONS.
4. EMBANKMENT
   a. EMBANKMENT CONSTRUCTION SHALL CONSIST OF THE PLACING OF SUITABLE FILL MATERIAL AFTER TOPSOIL STRIPPING, ABOVE THE EXISTING GRADE. GENERALLY, EMBANKMENTS SHALL HAVE COMPACTED SUPPORT SLOPES OF THREE FEET HORIZONTAL TO ONE FOOT VERTICAL. THE MATERIAL FOR EMBANKMENT CONSTRUCTION SHALL BE OBTAINED FROM THE PV ARRAY GRADING AND ACCESS ROAD EXCAVATION (SEE GEOTECHNICAL REPORT FOR RESTRICTIONS), OR ANY SUITABLE, APPROVED SOIL OBTAINED BY CONTRACTOR, AS DIRECTED OR APPROVED BY THE ENGINEER. THIS MATERIAL SHALL BE PLACED IN LOOSE LIFTS NOT TO EXCEED 8" FOR COHESIVE SOILS OR 12" FOR GRANULAR SOILS AND COMPACTED TO A DENSITY OF NOT LESS THAN NINETY-FIVE (95) PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698. SEE TABLE 2 FOR COMPACTION REQUIREMENTS.
   b. THE MAXIMUM STONE SIZE TO BE UTILIZED FOR EMBANKMENTS MAY NOT BE GREATER THAN 1/2 THE FILL HEIGHT AND OR A MAXIMUM OF 9" DIAMETER FOR FILLS BETWEEN 1'-3'. FOR FILLS GREATER THAN 3' IN DEPTH, THE MAXIMUM SIZE STONE SHALL BE NO LARGER THAN 14" DIAMETER. STONES OR ROCK FRAGMENTS LARGER THAN 4" IN THEIR GREATEST DIMENSION WILL NOT BE PERMITTED IN THE TOP 6" OF THE SUBGRADE. EXPOSED SURFACES SHALL BE FREE OF MOUNDS AND DEPRESSIONS WHICH COULD PREVENT UNIFORM COMPACTION.
   c. ACCESS ROADS SHALL BE CONSTRUCTED OF SUITABLE, NATIVE FILL MATERIAL EXCAVATED FROM THE PROPOSED ROADWAY ALIGNMENT OR ENGINEER APPROVED FILL MATERIAL. EMBANKMENTS SHALL BE CONSTRUCTED AND COMPACTED TO SUPPORT SOLAR COMPONENT DELIVERY TRUCKS, AND OTHER REQUIRED CONSTRUCTION TRAFFIC.
   d. ALL MV COLLECTION OR NEW UTILITY CROSSINGS TRENCHES ACROSS IN ACCESS ROADS SHALL BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY (ASTM D 698)
   e. SIDE SLOPES FOR PERMANENTLY STABILIZED SLOPES STEEPER THAN 3:1 WILL NOT BE PERMITTED, UNLESS OTHERWISE NOTED ON THE PLAN.
   f. MATERIALS SUCH AS BRUSH, HEDGE, ROOTS, STUMPS, GRASS AND OTHER ORGANIC MATTER SHALL NOT BE INCORPORATED OR BURIED IN THE EMBANKMENT.

ROAD DESIGN PARAMETERS AND CONSTRUCTION

1. ACCESS ROADS ARE TO BE CONSTRUCTED FOR YEAR ROUND ACCESS. HOWEVER, PERIODIC ROADWAY MAINTENANCE SUCH AS GRADING AND BLADING IN THE SPRING IS REQUIRED TO MAINTAIN POSITIVE DRAINAGE.
2. VERTICAL AND HORIZONTAL DESIGN PARAMETERS SHALL BE PER THE OWNER SPECIFICATIONS.
3. ACCESS ROADS SHALL MAINTAIN A 1% (MIN.) - 2% (MAX.) CROWN OR A 0.5% (MIN.) TO 4% (MAX.) CROSS SLOPE TO PROVIDE PROPER DRAINAGE FOR THE SITE. THE ROAD AGGREGATE THICKNESS SHALL BE PER THE TYPICAL SECTIONS PROVIDED IN THE CONSTRUCTION DETAILS.
4. SURFACE AGGREGATE SHALL BE TESTED AS PER THE FREQUENCY INDICATED IN TABLE 1.
5. SURFACE AGGREGATE SHALL BE FREE FROM LUMPS OF CLAY, ORGANIC MATTER, AND OTHER OBJECTIONABLE MATERIALS OR COATINGS.
6. SURFACE AGGREGATE MATERIAL SHALL BE CLEAN, SOUND, DURABLE PARTICLES AND FRAGMENTS OF STONE OR GRAVEL, CRUSHED STONE, OR CRUSHED GRAVEL MIXED OR BLENDED WITH SAND, SCREENINGS, OR OTHER SIMILAR MATERIALS PRODUCED FROM APPROVED SOURCES.
7. GEOTEXTILE FABRIC, WHERE NECESSARY, SHALL BE TENSAR TX-7 OR ENGINEER APPROVED EQUIVALENT.
8. ROAD SECTION AND SPECIFICATIONS SHOWN ON THE PLANS WERE PREPARED BY ULTEIG BASED ON THE SOIL CONDITIONS REPORTED IN GEOTECHNICAL RECOMMENDATIONS FROM TERRACON.
9. MINIMUM WIDTH OF ACCESS ROADS SHALL BE 16'. ALL ROADS MUST HAVE A MINIMUM INTERNAL RADIUS OF 50'.
10. GRADATION SPECIFICATIONS - SDDOT TYPE 5 OR 6 SUBBASE COURSE AGGREGATE COMPACTED TO 95%. (SEE TABLE BELOW).

LAYDOWN YARD/STORAGE YARD

1. THE LAYDOWN YARD /STORAGE YARD SHALL CONSIST OF COMPACTED NATIVE MATERIAL.
2. CONTRACTOR MAY PLACE GRAVEL OR MULCH AS NEEDED THROUGHOUT LAYDOWN AREAS.
3. COMPACTED SUBGRADE SHALL BE MOISTURE CONDITIONED AND COMPACTED AS PER THE SPECIFICATION OF TABLE 2.
4. FOLLOWING PROJECT COMPLETION, THE NATIVE MATERIAL SHALL BE DECOMPACTED AND PERMANENTLY STABILIZED IN ACCORDANCE WITH PROJECT SWPPP SPECIFCATIONS.

AGGREGATE GRADATION REQUIREMENTS
(SDDOT SPECIFICATION 882.2 AGGREGATE BASE COURSE)

SIEVE SIZE	PERCENT PASSING (TARGET)
ALL ROADS EXCLUDING ENTRANCES	
1"	100
3/4"	80-100
1/2"	68-91
NO. 4	46-70
NO. 8	34-58
NO. 40	13-35
NO. 200	3-12
CONSTRUCTION ENTRANCES AGGREGATE GRADATION REQUIREMENT	
3"	100
2 1/2"	90-100
1 1/2"	25-60
3/4"	0-10
1/2"	0-5

NOTES:
1. THE FRACTION PASSING THE #200 SIEVE SHALL NOT BE GREATER THAN 2/3 OF THE FRACTION PASSING THE #40 SIEVE. IN NO CASE SHALL THE UPPER LIMIT SPECIFIED FOR THE #200 SIEVE BE EXCEEDED.

2023.09.09

WILD SPRINGS SOLAR PROJECT
PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
0A	09/02/2022	30% DESIGN SUBMITTAL	TLB

nationalgrid renewables
8400 NORMANDALE LAKE BLVD, SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction
2500 CO RD 42 W,
BURNSVILLE, MN 55337

NSRS 2011 South Dakota State Planes, South Zone, US Foot

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW ONLY IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

Ulteig
We listen. We solve.™
DESIGN BY: C. PANGANIBAN
DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

CONSTRUCTION NOTES

DRAWING NUMBER: WSS-C-500-01
REVISION: 0A

FENCING AND GATES

1. FENCE AND GATES SHALL CONFORM TO THE FOLLOWING ASTM STANDARDS:
   - 1.1. A153/A153M - STANDARD SPECIFICATION FOR ZINC COATING (HOT DIP) ON IRON AND STEEL HARDWARE
   - 1.2. A392 - STANDARD SPECIFICATION FOR ZINC-COATED STEEL CHAIN-LINK FENCE FABRIC
   - 1.3. A824 - STANDARD SPECIFICATION FOR METALLIC-COATED STEEL MARCELLED TENSION WIRE FOR USE WITH CHAIN-LINK FENCE
   - 1.4. F552 - STANDARD TERMINOLOGY RELATING TO CHAIN-LINK FENCING
   - 1.5. F567 - STANDARD PRACTICE FOR INSTALLATION OF CHAIN-LINK FENCE
   - 1.6. F626 - STANDARD SPECIFICATION FOR FENCE FITTINGS
   - 1.7. F900 - STANDARD SPECIFICATION FOR INDUSTRIAL AND COMMERCIAL STEEL SWING GATES
   - 1.8. F1043 - STANDARD SPECIFICATION FOR STRENGTH AND PROTECTIVE COATING ON STEEL INDUSTRIAL FENCE FRAMEWORK.
   - 1.9. F1083 - STANDARD SPECIFICATION FOR PIPE, STEEL, HOT-DIPPED ZINC-COATED (GALVANIZED) WELDED, FOR FENCE STRUCTURES
2. FENCE AND GATE COMPONENTS SHALL MEET THE FOLLOWING SPECIFICATIONS:
   - 2.1. CHAIN-LINK FABRIC:
     - 2.1.1. ASTM A392 ZINC-COATED STEEL (COATED BEFORE WEAVING, 2.0 OZ/SF)
     - 2.1.2. WIRE GAGE: 9
     - 2.1.3. MESH SIZE: 2IN
     - 2.1.4. 8FT TALL FROM BOTTOM OF FABRIC TO TOP OF BARBED WIRE
     - 2.1.5. SELVAGE TREATMENT:
       - 2.1.5.1. TOP: TWISTED
       - 2.1.5.2. BOTTOM: KNUCKLED
   - 2.2. LINE POST:
     - 2.2.1. ASTM F1083 PIPE - SCHEDULE 40, NPS 2
   - 2.3. CORNER TERMINAL POSTS:
     - 2.3.1. ASTM F1083 PIPE - SCHEDULE 40, NPS 2-1/2
   - 2.4. BRACE AND RAILS:
     - 2.4.1. ASTM F1083 PIPE - SCHEDULE 40, NPS 1-1/4
   - 2.5. TENSION WIRE:
     - 2.5.1. TIP AND BOTTOM FABRIC - ASTM A824, GALVANIZED STEEL, CLASS 3
   - 2.6. FENCE FITTINGS:
     - 2.6.1. POST AND LINE CAPS, RAIL AND BRACE ENDS, SLEEVES-TOP RAIL, TIE WIRES AND CLIPS, TENSION AND BRACE BANDS, TENSION BARS, TRUSS RODS - ASTM F626
   - 2.7. SWING GATE:
     - 2.7.1. ASTM F900
     - 2.7.2. MATERIAL AS SPECIFIED FOR FENCE FRAMEWORK AND FABRIC
     - 2.7.3. HARDWARE - GALVANIZED PER ASTM A153, HINGES TO PERMIT 180-DEGREE INWARD AND OUTWARD GATE OPENING, PROVIDE HEAVY DUTY PADLOCK
3. INSTALLATION:
   - 3.1. INSTALL IN ACCORDANCE WITH: MANUFACTURE'S INSTRUCTIONS, LINES AND GRADES SHOWN IN DRAWINGS, ASTM F567
   - 3.2. DO NOT START FENCE INSTALLATION BEFORE FINAL GRADING IS COMPLETE AND FINISH ELEVATIONS ARE ESTABLISHED.
   - 3.3. DRILL HOLES IN FIRM UNDISTURBED OR COMPACTED SOIL.
   - 3.4. PLACE FENCE WITH BOTTOM EDGE OF FABRIC AT MAXIMUM CLEARANCE ABOVE GRADE, AS SHOWN ON DRAWINGS (CORRECT MINOR IRREGULARITIES IN EARTH TO MAINTAIN MAXIMUM CLEARANCE).
   - 3.5. SPACE LINE POSTS AT EQUAL INTERVALS NOT EXCEEDING 10FT OC.
   - 3.6. PROVIDE POST BRACES FOR EACH GATE, CORNER, PULL AND TERMINAL POST AND FIRST ADJACENT LINE POST.
   - 3.7. INSTALL TENSION BARS FULL HEIGHT OF FABRIC.
   - 3.8. RAILS: 1) FIT RAILS WITH EXPANSION COUPLINGS OF OUTSIDE SLEEVE TYPE, 2) RAILS CONTINUOUS FOR OUTSIDE SLEEVE TYPE FOR FULL LENGTH OF FENCE
   - 3.9. PROVIDE EXPANSION COUPLINGS IN TOP RAILS AT NOR MORE THAN 20 FT INTERVALS.
   - 3.10. ANCHOR TOP RAILS TO MAIN POSTS WITH APPROPRIATE WROUGHT OR MALLEABLE FITTINGS.
   - 3.11. INSTALL BRACING ASSEMBLIES AT ALL END AND GATE POSTS, AS WELL AS SIDE, CORNER AND PULL POSTS.
     - 3.11.1. LOCATE COMPRESSION MEMBERS AT MID-HEIGHT OF FABRIC.
     - 3.11.2. EXTEND DIAGONAL TENSION MEMBERS FROM COMPRESSION MEMBER TO BASES OF POSTS.
     - 3.11.3. INSTALL SO THAT POSTS ARE PLUMB WHEN UNDER CORRECT TENSION.
   - 3.12. PULL FABRIC TAUT AND SECURE TO POSTS AND RAILS.
     - 3.12.1. SECURE SO THAT FABRIC REMAINS IN TENSION AFTER PULLING FORCE IS RELEASED.
     - 3.12.2. SECURE TO POSTS AT NOT OVER 15 IN OC, AND TO RAILS NOT OVER 24 IN OC, AND TO TENSION WIRES AT NOT OVER 24 IN OC.
     - 3.12.3. USE U-SHAPED WIRE CONFORMING TO DIAMETER OF PIPE TO WHICH ATTACHED, CLASPING PIPE AND FABRIC FIRMLY WITH ENDS TWISTED AT LEAST TWO (2) FULL TURNS.
     - 3.12.4. BEND ENDS OF WIRE TO MINIMIZE HAZARDS TO PERSONS OR CLOTHING
   - 3.13. INSTALL POST TOP AT EACH POST.
   - 3.14. GATES:
     - 3.14.1. CONSTRUCT WITH FITTINGS OR BY WELDING.
     - 3.14.2. PROVIDE RIGID, WEATHERPROOF JOINTS.
     - 3.14.3. ASSURE RIGHT, NON-SAGGING, NON-TWISTING GATE.
     - 3.14.4. COAT WELDS WITH RUST PREVENTIVE PAINTS, COLOR TO MATCH PIPE.

EROSION AND SEDIMENT CONTROL

1. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MEASURES AS PLANNED AND SPECIFIED FOLLOWING BEST MANAGEMENT PRACTICES AS OUTLINED BY THE PENNINGTON COUNTY SOUTH DAKOTA STORMWATER MANAGEMENT AND WATER QUALITY MANUAL, AND BEING IN CONFORMANCE WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL STORMWATER PERMIT. SEE THE ASSOCIATED STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR EROSION CONTROL AND RESTORATION SPECIFICATION. UNLESS OTHERWISE NOTED OR MODIFIED HEREIN, ALL SECTIONS OF THE GENERAL CONDITIONS SHALL APPLY.
2. ANY AREAS DISTURBED DUE TO CONSTRUCTION ACTIVITIES AND NOT WITHIN AN ACTIVE CONSTRUCTION AREA SHOULD BE STABILIZED WITHIN 14 DAYS OF INACTIVITY. TEMPORARY OR PERMANENT STABILIZATION SHALL BE COMPLETED PER THE PROJECT SWPPP.
3. DECOMPACTION OF ANY AREAS WITHIN THE PROJECT SITE TO BE RESTORED SHALL BE DECOMPACTED TO A MINIMUM DEPTH OF 12" BELOW GRADE. ALL RESTORATION SHALL MEET REQUIREMENTS OF PROJECT SWPPP FOR SOIL DECOMPACTION.
4. SEED AND FERTILIZER
   a. PROVIDE AND USE SEEDS IN ACCORDANCE WITH THE STATE OF SOUTH DAKOTA SEED LAW, THE FEDERAL SEED ACT AND SOUTH DAKOTA NRCS STANDARDS PER THE VEGETATION MANAGEMENT PLAN DATED APRIL 3, 2020. PURCHASE SEEDS THROUGH A DEALER LICENSED WITH THE SOUTH DAKOTA DEPARTMENT OF AGRICULTURE. PROVIDE AND USE FERTILIZER IN ACCORDANCE WITH THE SOUTH DAKOTA FERTILIZER LAWS, SEED SUPPLIER'S REGIONAL RECOMMENDATIONS AND VEGETATION MANAGEMENT PLAN.
   b. SEED MIX AND FERTILIZER APPLICATION RATE SHALL BE PROVIDED TO OWNER FOR REVIEW AND APPROVAL PRIOR TO APPLICATION. REFER TO TABLE 3, VEGETATION MANAGEMENT PLAN, AND PROJECT SWPPP, IN THESE GENERAL NOTES FOR APPROVED SEED MIX DESIGNS.
   c. REPRESENTATIVE SOIL SAMPLES SHALL BE TAKEN AND ANALYZED FOR PROPER SOIL AMENDMENTS PRIOR TO SEED APPLICATION.
   d. ALL WATER USED ON THE PROJECT SHALL BE FREE OF ANY SUBSTANCES HARMFUL TO PLANT GERMINATION AND GROWTH OR TO THE ENVIRONMENT IN GENERAL.
   e. APPLY SEED MIX IN FOLLOWING MANNER:
      - e.a. PLANT ONLY TEMPORARY AND PERMANENT SEED MIXES APPROVED BY OWNER AS PROVIDED IN THE VEGETATION MANAGEMENT PLAN.
      - e.b. EMPLOY SATISFACTORY METHODS OF SOWING USING MECHANICAL POWER-DRIVEN DRILLS, NO-TILL DRILLS, OR SEEDERS; OR MECHANICAL HAND SEEDERS, OR OTHER APPROVED EQUIPMENT AS SPECIFIED IN THE VEGETATION MANAGEMENT PLAN.
      - e.c. DISTRIBUTE SEED EVENLY OVER ENTIRE AREA AT RATE OF APPLICATION RECOMMENDED PER APPROVED SEED MIX.
      - e.d. STOP WORK WHEN WORK EXTENDS BEYOND MOST FAVORABLE PLANTING SEASON FOR SPECIES DESIGNATED, OR WHEN SATISFACTORY RESULTS CANNOT BE OBTAINED BECAUSE OF DROUGHT, HIGH WINDS, EXCESSIVE MOISTURE, OR OTHER FACTORS.
        - e.d.a. RESUME WORK ONLY WHEN FAVORABLE CONDITIONS DEVELOP.
      - e.e. IF SEED BROADCASTED ON SURFACE, LIGHTLY RAKE SEED INTO SOIL FOLLOWED BY LIGHT ROLLING OR CULTIPACKING.
      - e.f. PROTECT SEEDED AREAS AGAINST TRAFFIC OR OTHER USE BY ERECTING BARRICADES AND PLACING WARNING SIGNS.
      - e.g. IF HYDROSEEDING IS USED, MACHINERY MUST BE APPROVED, MODERN, PROPERLY EQUIPPED AND OPERATED BY AN EXPERIENCED OPERATOR.
        - e.g.a. SEED AND FERTILIZE AT THE RATE SPECIFIED.
        - e.g.b. USE APPROPRIATE SHIELDS TO PROTECT AGAINST SITE IMPROVEMENTS.
   f. STRAW MULCH SHALL BE APPLIED IMMEDIATELY AFTER SEEDING HAS BEEN COMPLETED WITH A MECHANICAL SPREADER AT A RATE NOT LESS THAN ONE AND ONE-HALF (1-1/2) TONS PER ACRE, AND NOT MORE THAN TWO (2) TONS PER ACRE, AT CONTRACTOR'S DISCRETION.
   g. VEGETATIVE COVER SHOULD BE 70% ESTABLISHED PRIOR TO CONSTRUCTION, WITH 95% COVERAGE IN A 36 MONTH PERIOD. SEE COUNTY, STATE AND VEGETATION MANAGEMENT PLAN FOR REFERENCE.
5. TACKIFIERS FOR DUST CONTROL AND SOIL STABILITY
   a. WATER WILL BE THE PRIMARY DUST CONTROL METHOD.
   b. CHEMICAL TREATMENT SUCH AS MAGNESIUM CHLORIDE OR POLYACRYLAMIDES (PAM) MAY BE USED ON SITE FOR DUST CONTROL AND TO PROMOTE STABILITY AND ADHESION/SETTLING OF FINE PARTICLE SOILS. ONLY USE CHEMICALS APPROVED BY THE STATE; ONLY THE ANIONIC FORM OF PAM MAY BE USED.
      i. APPLICATIONS MAY INCLUDE PASSIVE USE WITHIN STAGING AREAS, AFTER MASS GRADING AND BEFORE APPLYING STRAW MULCH.
      ii. REPEAT APPLICATION AS NEEDED TO DECREASE TURBIDITY AND ACHIEVE SOIL STABILITY AND/OR DEPOSITION BUT DO NOT EXCEED SPECIFIED CONCENTRATIONS AS HIGHER CONCENTRATIONS DO NOT PROVIDE ADDITIONAL EFFECTIVENESS.
   c. USE A 50-FOOT MINIMUM SETBACK FROM WETLANDS AND STREAMS FOR APPLICATION
   d. NEVER ADD WATER TO PAM; ADD PAM SLOWLY TO WATER TO AVOID CLUMPING.
   e. FOLLOW STATE AND MANUFACTURER'S GUIDANCE.
   f. TACKIFIERS ARE NOT INTENDED FOR USE IN CONCENTRATED FLOW LOCATIONS, DITCHES AND CHANNELS. USE RECOMMENDED FLOCCULANTS FOR CHEMICAL TREATMENT WITHIN CONCENTRATED FLOW LOCATIONS.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

1. A SUITABLE SWPPP DOCUMENT SHALL BE DEVELOPED ALONG WITH THE CONSTRUCTION DOCUMENTS OF THIS PROJECT.
2. THE CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT PRACTICES (BMPs) AS OUTLINED IN THE SWPPP DOCUMENT .
3. ALL CONSTRUCTION ACTIVITIES SHALL COMPLY WITH THE SWPPP DOCUMENT AND GUIDELINES. THE CONTRACTOR MAY CHOOSE TO UTILIZE ADDITIONAL BMPs AS NECESSARY TO ENSURE THAT EROSION AND SEDIMENT IS MANAGED THROUGHOUT CONSTRUCTION AND AFTER THE COMPLETION OF THE PROJECT.
4. THE CONTRACTOR SHALL PERFORM RESTORATION AND/OR SEEDING TO AREAS TEMPORARILY DISTURBED BY CONSTRUCTION ACTIVITIES THROUGHOUT THE PROJECT AS REQUIRED BY THE PROJECT SWPPP.
5. NON-STORM WATER POLLUTANTS SUCH AS CONCRETE, FLY ASH, LIME, ETC. AND/OR OTHER MATERIAL S SHALL BE CONTAINED ON-SITE AND DISPOSED OF PROPERLY PER THE REQUIREMENTS OF THE PROJECT SWPPP.
6. NATURAL BUFFERS SHOULD BE THE FIRST OPTION FOR ALL SEDIMENT AND EROSION CONTROL WITHIN THE PROJECT. A NATURAL BUFFER SHOULD PROVIDE A 50-FOOT BUFFER FROM SURFACE WATERS, WATER OF THE UNITED STATES, AND DEFINED DRAINAGE CHANNELS WHEN FEASIBLE.
7. ANY ERODIBLE MATERIAL WITHIN PROJECT NEW OR EXISTING DRAINAGE WAYS OR CONVEYANCE SYSTEMS INCLUDING CULVERTS, DITCHES, AND/OR TRENCHES SHALL BE PROTECTED UTILIZING TEMPORARY BERMS, SILT FENCE, EROSION BLANKETS, BIOROLLS, AND/OR SEEDING. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL AND MONITOR THE BMPs THROUGHOUT CONSTRUCTION UNTIL PERMANENT STABILIZATION IS REACHED FOR THE PROJECT.
8. TEMPORARY SEDIMENT BASIN(S) SHALL BE CONSTRUCTED DOWNSTREAM OF MAJOR GRADING AREAS TO FILTER SEDIMENT AS SHOWN IN THE PLANS AND AS NEEDED PER THE SWPPP DOCUMENT.

RANGE LAND ARRAY MIX

SCIENTIFIC NAME	COMON NAME	OZ/ACRE	LBS/ACRE	% OF MIX BY WEIGHT	SEEDS/SQ FTE
Bouteloua curtipendula	Side oats grama	32	2	24.5	4.41
Bouteloua gracilis	Blue grama grass	4	0.25	3.1	3.67
Elymus trachycaulus	Slender wheatgrass	24	1.5	18.4	3.8
Koeleria macrantha	June grass	1	0.06	0.8	4.59
Nassella viridula	Green needlegrass	16	1	12.2	2.75
Pascopyrum smithii	Western wheatgrass	16	1	12.2	2.64
Poa compressa	Canada bluegrass	1.5	0.09	1.2	5.38
Schizachyrium scoparium	Little bluestem	16	1	12.2	5.51
	GRAMINOIDS	**110.5**	**6.91**	**84.5**	**32.76**
Achillea millefolium	Yarrow	0.5	0.03	0.4	2.05
Asclepias verticillata	Whorled milkweed	1	0.06	0.8	0.25
Dalea candida	White prairie clover	1	0.06	0.8	0.85
Dalea purpurea	Purple prairie clover	4	0.25	3.1	1.74
Echinacea angustifolia	Narrow purple coneflower	1	0.06	0.8	0.16
Liatris punctata	Dotted blazing star	0.75	0.05	0.6	0.12
Monarda fistulosa	Wild bergamot	1.5	0.09	1.2	2.41
Pulsatilla patens	Pasque flower	0.5	0.03	0.4	0.21
Ratibida columnifera	Upright coneflower	2	0.13	1.5	1.93
Rudbeckia hirta	Black-eyed Susan	4	0.25	3.1	8.45
Solidago nemoralis	Old-field goldenrod	0.25	0.02	0.2	1.72
Symphyotrichum ericoides	Heath aster	0.2	0.01	0.2	0.92
Tradescantia bracteata	Long-bracted spiderwort	1	0.06	0.8	0.23
Verbena stricta	Hoary vervain	1.5	0.09	1.2	0.96
Zizia aptera	Heart-leaved golden alexanders	1	0.06	0.8	0.28
	FORBS	**20.2**	**1.26**	**15.5**	**22.27**
	TOTAL	**130.7**	**8.17**		**55.03**

WET MIX

SCIENTIFIC NAME	COMON NAME	OZ/ACRE	LBS/ACRE	% OF MIX BY WEIGHT	SEEDS/SQ FTE
Carex bebbii	Bebb's sedge	2	0.13	1.8	1.56
Carex hystericina	Bottlebrush sedge	4	0.25	3.7	2.75
Carex vulpinoidea	Fox sedge	2	0.13	1.8	4.59
Juncus dudleyi	Dudley's rush	0.06	0.004	0.1	4.41
Nassella viridula	Green needlegrass	32	2	29.3	5.51
Pascopyrum smithii	Western wheatgrass	32	2	29.3	5.28
Schizachyrium scoparium	Little bluestem	24	1.5	22	8.26
	GRAMINOIDS	**96.06**	**6**	**88.1**	**32.37**
Bidens cernua	Nodding bur marigold	2.5	0.16	2.3	1.21
Lycopus americanus	American water horehound	1	0.06	0.9	2.98
Mentha arvensis	Wild mint	0.25	0.02	0.2	1.72
Monarda fistulosa	Wild bergamot	1	0.06	0.9	1.61
Symphyotrichum lanceolatu	Panicled aster	1.25	0.08	1.1	1.26
Symphyotrichum novae-ang	New England aster	1	0.06	0.9	1.52
Verbena hastata	Blue vervain	1	0.06	0.9	2.13
Zizia aurea	Golden alexanders	5	0.31	4.6	1.26
	FORBS	**13**	**0.81**	**11.9**	**13.69**
	TOTAL	**109.06**	**6.82**		**46.16**

LOW-FORB ARRAY MIX - GRAZING

SCIENTIFIC NAME	COMON NAME	OZ/ACRE	LBS/ACRE	% OF MIX BY WEIGHT	SEEDS/SQ FTE
Bouteloua curtipendula	Side oats grama	60	3.75	30.3	8.26
Bouteloua gracilis	Blue grama grass	8	0.5	4	7.35
Elymus trachycaulus	Slender wheatgrass	34	2.13	17.2	5.39
Koeleria macrantha	June grass	2	0.13	1	9.18
Nassella viridula	Green needlegrass	32	2	16.2	5.51
Pascopyrum smithii	Western wheatgrass	32	2	16.2	5.28
Poa compressa	Canada bluegrass	2	0.13	1	7.17
Schizachyrium scoparium	Little bluestem	24	1.5	12.1	8.26
	Graminoids	**194**	**12.13**	**98**	**56.41**
Rudbeckia hirta	*Black-eyed Susan*	4	0.25	2	8.45
	Forbs	**4**	**0.25**	**2**	**8.45**
	Total	**198**	**12.38**		**64.86**

* SEED MIX DESIGN AND PLANTING DATES PER THE VEGETATION MANAGEMENT PLAN FOR FOR WILD SPRINGS SOLAR DATED APRIL 3, 2020.

WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
0A	09/02/2022	30% DESIGN SUBMITTAL	TLB

nationalgrid renewables
8400 NORMANDALE LAKE BLVD, SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction
2500 CO RD 42 W,
BURNSVILLE, MN 55337

NSRS 2011 South Dakota State Planes, South Zone, US Foot

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Ulteig
We listen. We solve.™
DESIGN BY: C. PANGANIBAN
DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

CONSTRUCTION NOTES

DRAWING NUMBER: WSS-C-500-02
REVISION: 0A

TESTING

DEFINITIONS

1. TESTING SHALL BE PERFORMED BY A DESIGNATED INDEPENDENT TESTING AGENCY. ALL TESTING SHALL COMPLY WITH REQUIRED STANDARDS IN OWNER'S SPECIFICATIONS (SECTION 31.23.00)
2. SUBMIT TESTING AND INSPECTION REPORTS TO EOR.
   a. ENGINEER SHALL REVIEW THE TESTING REPORTS TO CHECK CONFORMANCE WITH DRAWINGS AND SPECIFICATIONS.
4. PROOF ROLLING SHALL BE PERFORMED IN THE PRESENCE OF GEOTECHNICAL ENGINEER OR QUALIFIED GEOTECHNICAL ENGINEER REPRESENTATIVE USING A FULLY LOADED TANDEM AXLE DUMP TRUCK WITH A MINIMUM WEIGHT OF 25 TONS OR FULLY LOADED WATER TRUCK WITH AN EQUIVALENT AXLE LOADING.
5. SIEVE ANALYSIS SHALL BE CONDUCTED IN ACCORDANCE WITH ASTM C136.
6. MOISTURE CONTENT SHALL BE CONDUCTED IN ACCORDANCE WITH ASTM D2216.
7. PROCTORS SHALL BE CONDUCTED IN ACCORDANCE WITH ASTM D698.
8. ATTERBERG LIMITS SHALL BE CONDUCTED IN ACCORDANCE WITH ASTM D4318.
9. MOISTURE DENSITY (NUCLEAR) SHALL BE IN ACCORDANCE WITH ASTM D2922.
10. DYNAMIC CONE PENETROMETER (DCP) TESTING SHALL BE CONDUCTED IN ACCORDANCE WITH ASTM D 6951.

REQUIREMENTS

- PLEASE REFER TO TABLE 1 AND 2 FOR THE TESTING FREQUENCIES AND PASSING CRITERIA.

TABLE 1: TESTING SCHEDULE SUMMARY

MATERIAL	TEST REQUIRED	FREQUENCY
STRUCTURAL FILL	ASTM D6913:GRAIN SIZE ANALYSIS; ASTM B698 :PROCTOR DENSITY; ASTM B2216 : MOISTURE CONTENT AND ASTM D4318 ATTERBERG'S ON FINES	1 PER SOIL TYPE
COMPACTED SUBGRADE	MOISTURE DENSITY (NUCLEAR) (ASTM D6938)	1 PER THE FIRST 5,000 LF OF EACH ROAD *
	PROOF-ROLL	ENTIRE LENGTH
AGGREGATE BASE	SIEVE ANALYSIS	1 PER AGGREGATE SOURCE OR EVERY 4,000 CY
	ATTERBERG'S ON FINES (ASTM D4318)	
	MOISTURE DENSITY (NUCLEAR) (ASTM D6938)	
MISCELLANEOUS FILL	MOISTURE DENSITY (NUCLEAR) (ASTM D6938)	EVERY 12" OF MATERIAL PLACED (1 LIFT=12")
TRENCH BACKFILL	MOISTURE DENSITY (NUCLEAR) (ASTM D698)	OVER LOAD-BEARING CROSSINGS: 1 PER 500 LF OF TRENCH
		REMAINING LENGTHS: 1 PER 5,000 LF OF TRENCH

* IF ALL TESTS PASS IN FIRST 5,000 FT, PROOF ROLL ONLY IS ACCEPTABLE FOR REMAINING ROAD LENGTHS WITHIN * SAME SOIL ZONE AS DEFINED BY GEOTECHNICAL ENGINEER.

TABLE 2: COMPACTION AND MOISTURE CONTENT REQUIREMENTS

MATERIAL TYPE AND LOCATION	MIN. COMPACTION REQUIREMENT (%) (ASTM D698)	RANGE OF MOISTURE CONTENTS FOR COMPACTION (% ABOVE OPTIMUM)	
		MINIMUM	MAXIMUM
STRUCTURAL FILL	95	-2	+2
SUBGRADE (ROAD AND BENEATH EQUIPMENT PADS, NATIVE)	95	-2	+2
SUBRAGE (ROAD AND BENEATH EQUIPMENT PADS, IMPORTED)	95	-2	+3
AGGREGATE BASE	95	-3	+3
MISCELLANEOUS FILL (NON-STRUCTURAL)	85	-4	+4
TRENCH BACKFILL	OVER LOAD-BEARING CROSSINGS: 95 REMAINING LENGTHS: 85	-3	+3

WILD SPRINGS SOLAR BILL OF MATERIALS

ITEM	DESCRIPTION	UNIT	QTY (EXACT)
ACCESS ROADS	16' SITE ACCESS ROAD - LENGTH	LF	45,899
	16' SITE ACCESS ROAD - AGGREGATE VOLUME	CY	13,600
	HP270 - GEOTEXTILE	SY	81,599
	30' SITE ACCESS ROAD - LENGTH	LF	877
	30' SITE ACCESS ROAD - AGGREGATE VOLUME	CY	488
	HP270 - GEOTEXTILE	SY	2,924
DEMOLITION	GRUBBING	AC	1
	TOPSOIL STRIPPING (ACCESS ROADS ONLY)	AC	20.3
	DEMOLISH EXISTING FENCE	LF	22,612
FENCING AND GATES	FENCE - LENGTH	LF	82,386
	24' MANUAL SWING ACCESS GATES	EA	11
LAYDOWN YARD	LAYDOWN YARD	AC	47.4
SUBSTATION GRADING	AGGREGATE	CY	370
SITE GRADING	CUT VOLUME	CY	74,337
	FILL VOLUME	CY	100,526
EROSION CONTROL	PERIMETER CONTROL	LF	85,546
	CONSTRUCTION ENTRANCE	EA	9
	TRIPLE STACKED FIBER ROLL SLOPE APPLICATION FOR GRADED AREAS	EA	12
	TEMPORARY SEDIMENT BASINS	EA	1
	PERMANENT SEEDING	AC	892
	LOW WATER CROSSING	SF	34,755
SITE ENTRANCE	PERMANENT SITE ENTRANCE	EA	10
CULVERTS	CULVERT	EA	25

PV PLANT CONSTRAINTS

Wild Springs Solar Project - 128 MW

General Setbacks	Buffer (FT)	Description	File Name (from Client)	Comments
Property line (Exterior) or Section Line	63	Ulteig Standard - Client Provided	2020-03-06 Wild Springs CUP Plans.pdf	33' For Statutory ROW Plus Public Road Set Back
Easement line	5	Ulteig Standard		
Edge of any Public Road (Edge of Pavement)	40' min. depends on Project Boundary and R/W	Ulteig Standard		
Edge of State Highway (Edge of Pavement)	50' min. depends on Project Boundary and R/W	Ulteig Standard		
Public Roads (Right-of-Way)	100' min to PV Array (fence 20ft in front of setback)	Ulteig Standard		
Non-Participating Residence	100	Ulteig Standard	WildSprings_NearbyResidence_NoEncroachment.shp	Clarify the Distance to the Homestead
Homestead Within Boundaries	100 (No Encroachment)	Ulteig Standard -Client Provided		
Trees or Tree lines	- 100' setback-to-modules from tree-lines to the E, W and S. - 35' setback-to-modules from tree-lines to the N.	Ulteig Standard		
High Slope Areas (PV Array)	Avoid Slopes 8-15% (Where Possible) and >15% (Always)	Ulteig Standard		
Utility Setbacks	**Buffer (FT) min.**	**Description**	**File Name (from Client)**	**Comments**
Transmission Line (>69kV)	100	Ulteig Standard		
Distribution Line (<69kV)	50	Ulteig Standard		
Collection Line	75	Ulteig Standard		
Oil Pads/Wells - active	300	Ulteig Standard		
Oil Wells-plugged, non-producing/abandoned	250	Ulteig Standard		
Oil Pipelines	50	Ulteig Standard		
Gas Pads/Wells - active	300	Ulteig Standard		
Gas Wells-plugged, non-producing/abandoned	250	Ulteig Standard		
Gas Pipelines	50	Ulteig Standard		
Water Well / windmill	150	Ulteig Standard		
Waterline	50	Ulteig Standard		
Fiber optic	25	Ulteig Standard		
Railroad Easement	70	Ulteig Standard		
Wetland and Stream Setbacks	**Buffer (FT) min.**	**Source of Notes**	**File Name (from Client)**	**Comments**
Wetlands (Jurisdictional)	50	Ulteig Standard	HU8_10120111_Wetlands.shp,WS_Wetlands_Expanded_Clip.shp, ALTA Streams, Flowlines, Ponds	Determine if these are Jurisdictional-AVOID
Wetlands (Non-Jurisdictional)	25	Ulteig Standard		AVOID
Streams	25	Ulteig Standard		
Water Bodies - Ponds	10	Ulteig Standard		
Ditches	0	Ulteig Standard		
FEMA	50	Ulteig Standard	LOMR_Request_Floodplain_Boundary.shp, WildSprings_FloodPlain_FEMA.shp	AVOID
Design Storm Event Inundation Depth (1ft)	0	Ulteig Standard	WSSG_Velocity_Preliminary_170712.kmz, WSSG_Flow_Depth_Preliminary_170712.kmz	Avoid Areas with more than 1' Inundation Depth or Velocity over 5 FT/S
Cultural Areas	50	Ulteig Standard	See Below	See Below
Environmentally Sensitive Areas	50	Ulteig Standard		
Client Provided Misc	**Buffer (FT) min.**	**Source of Notes**	**File Name (from Client)**	**Comments**
Quarry's	50	Client Provided	Quarry.shp, Quarry_50ftBuffer.shp	AVOID
Prairie Dogs	25	Client Provided	WS_Pdogs.shp	AVOID
Documented Source - Tribal/Cultural Areas	50	Client Provided	Documented_Resource_50ft.shp, Documented_Resource.shp	AVOID
Structures	30	Client Provided	2020-03-06 Wild Springs CUP Plans.pdf	25' or 1.5x the Height of the Structure, Whichever is Greater

2022.09.09

WILD SPRINGS SOLAR PROJECT
PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
0A	09/02/2022	30% DESIGN SUBMITTAL	TLB

nationalgrid renewables
8400 NORMANDALE LAKE BLVD, SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction
2500 CO RD 42 W,
BURNSVILLE, MN 55337

NSRS 2011 South Dakota State Planes, South Zone, US Foot

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DESIGN BY: C. PANGANIBAN
DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

CONSTRUCTION NOTES

DRAWING NUMBER: WSS-C-500-03
REVISION: 0A

CIVIL BASIS OF DESIGN				
Wild Springs Solar Project - 128 MW				
Design vehicle - component delivery	WB-67 OR 43' Fire Truck	Ulteig Standard		
Design vehicle (final) - maintenance	Maintenance Truck	Ulteig Standard		
Primary Access	Used Main Roads	Ulteig Standard		
Internal Roads	Use existing roads as much as possible and upgrade surface	Ulteig Standard		
Temporary Road X-Section	6": aggregate base thickness over exposed subgrade designed using 1.0% CBR value & estimate of ESAL counts	Updated based on Georeport	20205110 Draft GER (2-12-21).pdf	A design CBR of 1.0 is recommended for the access road design. A separation geotextile or geogrid is recommended between subgrade and aggregate surface due to high plasticity clay soils present at site. Base Materials will be SDDOT Type 5 or 6 Subbase Course Aggregate compacted to 95%. . 6 inches of aggregate with Tensar TX-7 geogrid.
Permanent Road X-Section	6": aggregate base thickness designed using 1.0 CBR value & estimate of ESAL counts. Subgrade prep to scarify 12" min. and compact.	Updated based on Georeport	20205110 Draft GER (2-12-21).pdf	A design CBR of 1.0 is recommended for the access road design. A separation geotextile is recommended between subgrade and aggregate surface due to high plasticity clay soils present at site. Base Materials will be SDDOT Type 5 or 6 Subbase Course Aggregate compacted to 95%. 6 inches of aggregate with Tensar TX-7 geogrid.
Horizontal curve centerline radius	58'R for 16' Roads, 60'R for 20'	Ulteig Standard		
Road profile	K-value for sag/crest curve per WB-67 or 43' Fire Truck component vehicle specs.	Ulteig Standard		
Access Roads proposed width	16	Ulteig Standard		Will use 16 for PV array roads. 20' for access roads going to the substation and O&M
Inner radius - component vehicle	50' min.	Ulteig Standard		
Inner radius - maintenance vehicle	40' (30' min.)	ICC International Fire Code, Appx. D 2012		
Turnarounds - 120' hammerhead	with 35' radius typ.	ICC International Fire Code, Appx. D 2012		
Turnarounds - Alternative to 120' hammerhead	with 70' leg & 35' radius typ.	ICC International Fire Code, Appx. D 2012		
Row to Row Spacing	19.9412' per PV design layout	Per Design		12' Glass to Glass, 6 Modules per string
Modules to Fence	20' min.	Ulteig Standard		
Access Road Offset to Fence	5' min.	Ulteig Standard		
Access Road Offset to Module	3.75' min.	Ulteig Standard		
Property to Fence Offset	10'	Ulteig Standard		
Perimeter	6' height chain-link with 3-strand barbwire	Ulteig Standard		
Internal	6' height chain-link	Ulteig Standard		
Gate type	Double Swinging Gate	Ulteig Standard		
Gate width	20' min.	Ulteig Standard		Use a 20ft gate for 16ft roads and a 24ft gate for 20ft roads
Posts	Gates and Corner Braces per manufacture	Ulteig Standard		
Excavation & Embankment	Shall meet the provisions provided in the geotechnical report.	Update based on Geotechnical Report & Ulteig Standard		
Maximum Slope - Outside Array	Foreslopes & Backslopes shall be no greater than 4H:1V	Ulteig Standard		NextTracker was to be used per Meeting
Maximum Slope - Inside Array	NexTracker: South Facing Trackers: 15% max North Facing Trackers: 8.7% max	NexTracker Horizon		PDM-000031 Site Slope and Grading Guidelines Rev_E.pdf
Tracker Tolerance	44" - 60" (+/- 8")	NexTracker Horizon		Confirmed with Ames on Topography buffer to eliminate pile tolerance issues
Flooded Areas	Avoid areas of greater than 24" stormwater inundation depths where possible, and raise/adjust layout as necessary to optimize layout.	Ulteig Standard		During constraints use 12" inundation as a standard to stay out of for buildable area
Runoff Management	Drainage structure sizing calculation by using rational method, curve number method, or local regression equations	Ulteig. Design shall meet State & National Pollution Discharge Elimination System (NPDES) requirements.		During construcion conditions, higher runoff and erosion rates can be expected than the fully vegetated final condition or existing condition. To mitigate this temporary construction sedimentation basins will be necessary where greater than 10 acres of disturbed area discharges to a common point or 5 acres when within 1 mile of impaired or special waters. Since greater than 10 acres of disturbed area discharges to a common point, temporary sediment basins will be necessary on site. This will maintain compliance with the South Dakota NPDES permit. Also, using temporary seed/mulch at the onset of construction can greatly reduce the amount of erosion and rework on the solar sites.
Internal Drainage	Maintain agricultural ditches where feasible; reroute with proposed ditches to optimize layout and constructability	Ulteig Standard		
Freeboard	12-inches above preliminary drainage inundation depths for array equipment & 24-inches for inverters and transformers	National Grid Renewables		
Box or pipe culvert structures	Size for 5-yr, 24-hr storm event	Ulteig Standard		
Structure armoring	Withstand 25-yr, 24-hr storm event w/o failure	Ulteig Standard		
Silt Fence	Access roads: 5' min. offset PV Array: 15' min. offset	Ulteig Standard		
Seeding	TBD	Ulteig Standard		
Trees (Shadowing)	70' for S,W,E and 35' N buffer Based on Direction	Ulteig Standard		Confirm with client on preference

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WILD SPRINGS
SOLAR PROJECT
PENNINGTON COUNTY,
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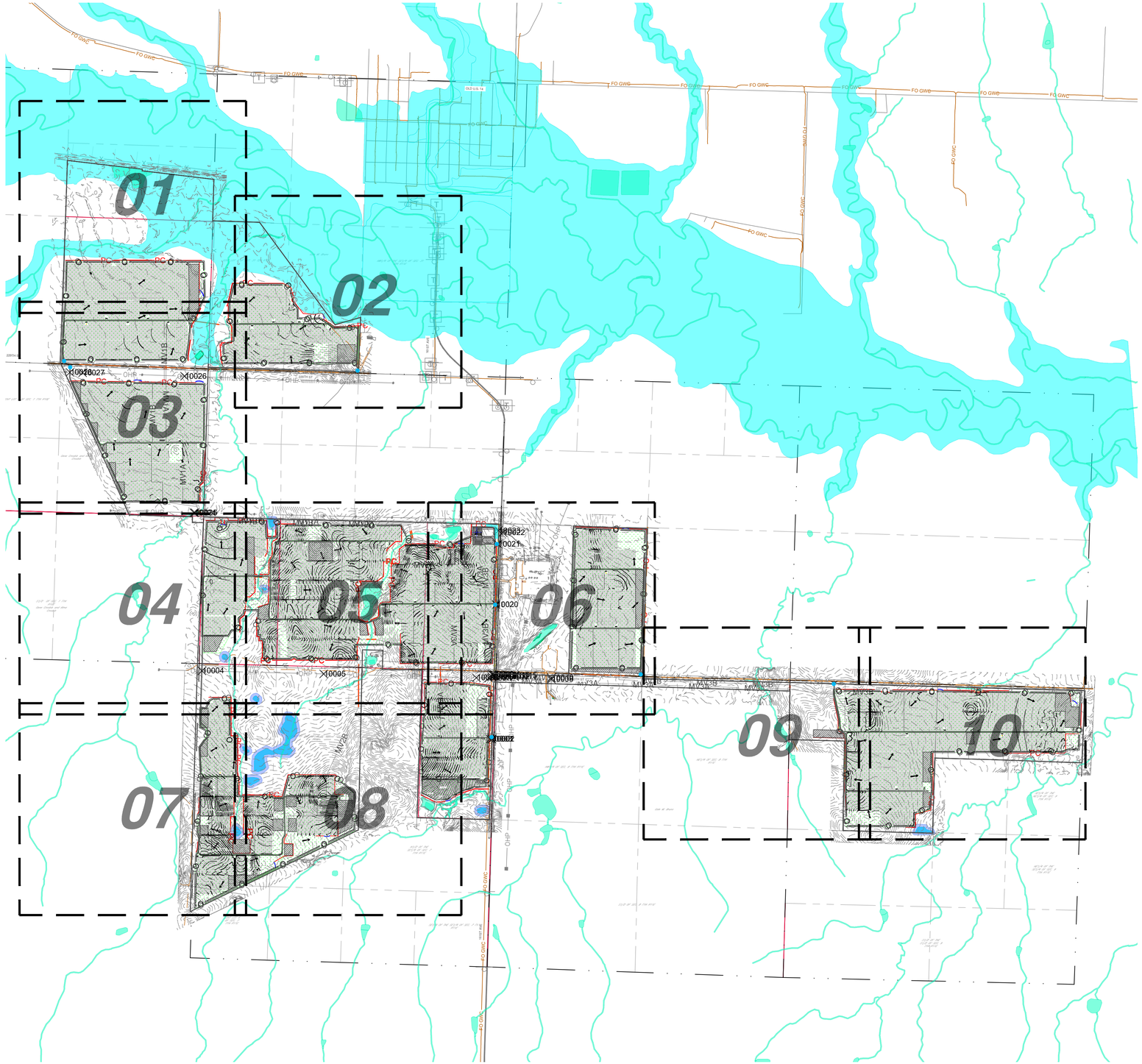
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

CONSTRUCTION NOTES

DRAWING NUMBER: WSS-C-500-04
REVISION: 0A



LEGEND

- PROJECT BOUNDARY
- PC — PERIMETER CONTROL (SEE NOTE 2)
- EXISTING CONTOUR
- FO GWC — EXISTING FIBER OPTIC
- PROPOSED ACCESS ROAD
- O — PROPOSED FENCE
- PROPOSED PV TABLES
- PROPOSED CONTOUR
- MV## — PROPOSED COLLECTION LINE
- PROPOSED GRADING LIMITS (SEE NOTE 4)
- PROPOSED LAYDOWN AREA
- SEED MIX
- ROCK CONSTRUCTION ENTRANCE
- LOW WATER CROSSING
- TRIPLE STACK FIBER ROLLS
- DIRECTION OF FLOW
- PROPOSED CULVERT
- FEMA FLOOD ZONE

NOTES:

1. SEED MIX PER VEGETATION MANAGEMENT PLAN DATED 04/03/2020.
2. PERIMETER CONTROLS TO BE CHOSEN PER CONTRACTOR PREFERENCE FOR SEDIMENT CAPTURE ON SITE. ACCEPTABLE PERIMETER CONTROLS LISTED BELOW ARE IN ORDER OF INCREASING EFFECTIVENESS. A COMBINATION OF THE BMPS LISTED BELOW MAY BE REQUIRED IN AREAS OBSERVED TO EXPERIENCE HIGHER THAN EXPECTED SEDIMENTATION.
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   - 2.3. VEGETATED TOP SOIL BERMS (DETAIL ECD-522)
   - 2.4. ADD FLOCCULANTS UPSTREAM PER DETAIL ECD-524 AS NEEDED.
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5. LARGE AREAS OF BARE SOIL EXPOSURE SHALL BE LIMITED AND STABILIZED WITH SEEDING AND MULCH APPLICATION PROMPTLY AFTER DISTURBANCE.

WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By

nationalgrid renewables
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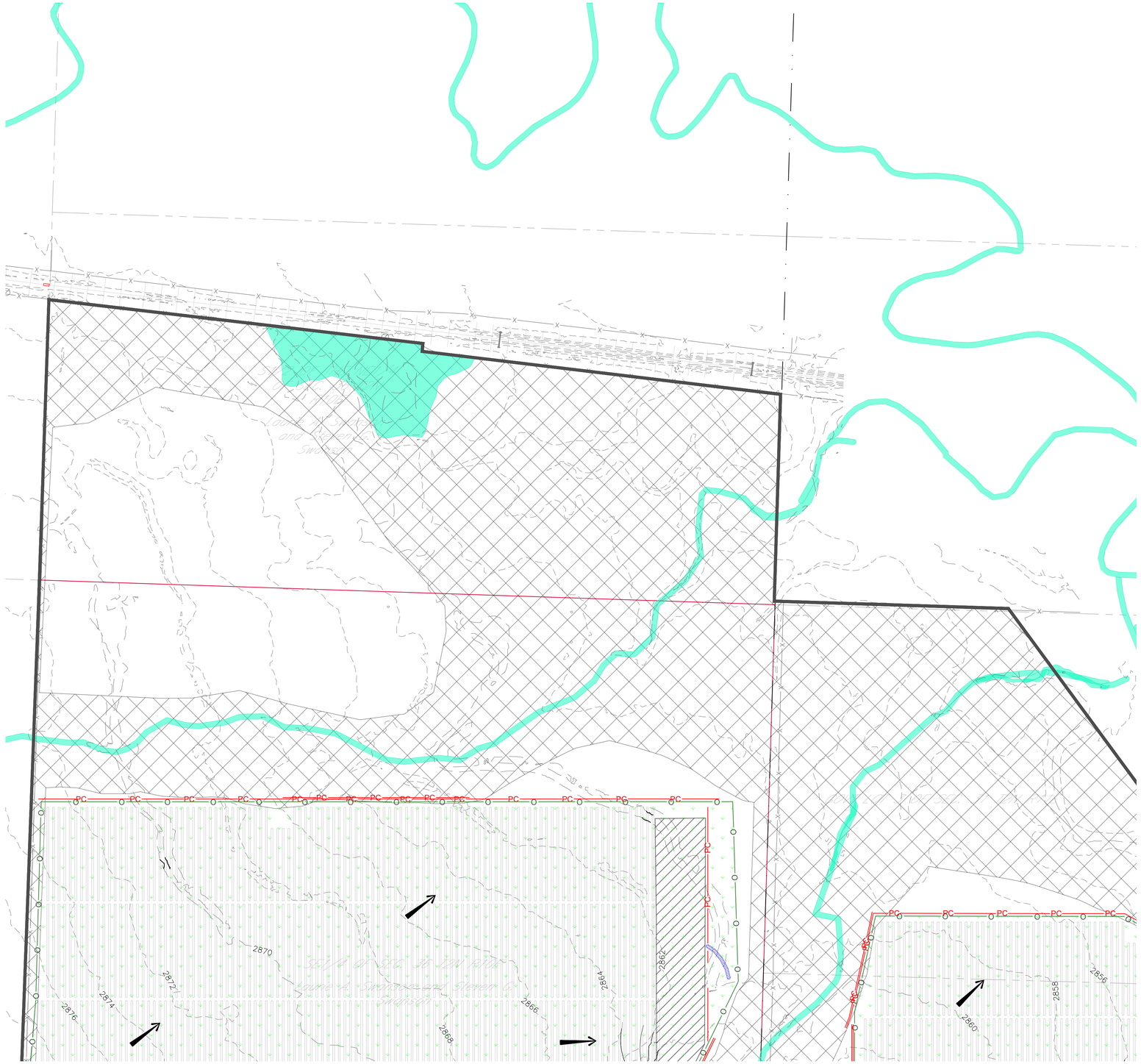
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

DRAWING NUMBER: REVISION:

2023.09.09



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- PROJECT BOUNDARY
- PERIMETER CONTROL (SEE NOTE 2)
- EXISTING CONTOUR
- EXISTING FIBER OPTIC
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- PROPOSED PV TABLES
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- SEED MIX
- ROCK CONSTRUCTION ENTRANCE
- LOW WATER CROSSING
- TRIPLE STACK FIBER ROLLS
- DIRECTION OF FLOW
- PROPOSED CULVERT
- FEMA FLOOD ZONE

NOTES:

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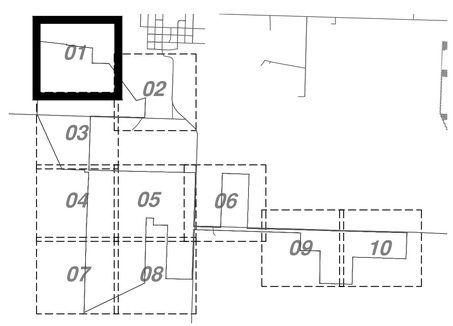
5. LARGE AREAS OF BARE SOIL EXPOSURE SHALL BE LIMITED AND STABILIZED WITH SEEDING AND MULCH APPLICATION PROMPTLY AFTER DISTURBANCE.



KEYMAP

WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

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0A	09/09/2022	60% DESIGN SUBMITTAL	TLB

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EROSION AND SEDIMENT CONTROL PLAN 1

DRAWING NUMBER: WSS-C-551-02
REVISION: 0A

2022.09.09

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EROSION AND SEDIMENT CONTROL PLAN 2

DRAWING NUMBER: WSS-C-551-03
REVISION: 0A

2022.09.09

NOTES:

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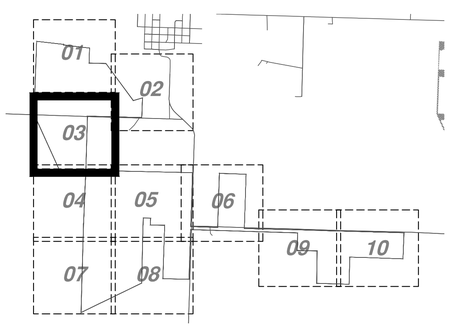

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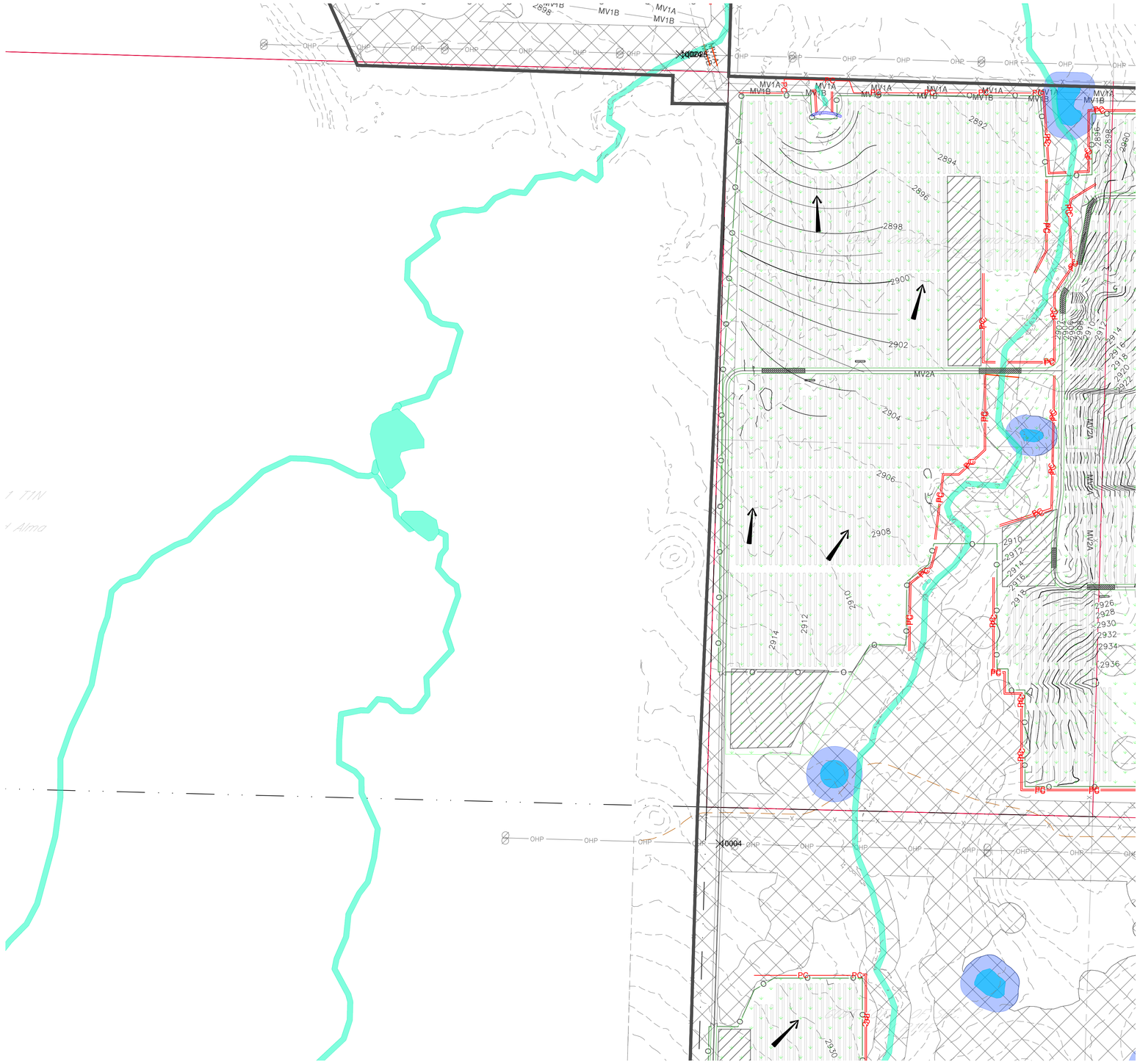
EROSION AND SEDIMENT CONTROL PLAN 3

DRAWING NUMBER: WSS-C-551-04
REVISION: 0A

2022.09.09



NOTES:

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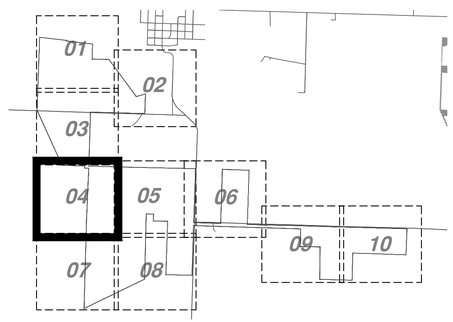

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EROSION AND SEDIMENT CONTROL PLAN 4

DRAWING NUMBER: WSS-C-551-05
REVISION: 0A

2022.09.09

LEGEND

- PROJECT BOUNDARY
- PC — PERIMETER CONTROL (SEE NOTE 2)
- EXISTING CONTOUR
- FO GWB — EXISTING FIBER OPTIC
- PROPOSED ACCESS ROAD
- O — PROPOSED FENCE
- PROPOSED PV TABLES
- PROPOSED CONTOUR
- MV## — PROPOSED COLLECTION LINE
- PROPOSED GRADING LIMITS (SEE NOTE 4)
- PROPOSED LAYDOWN AREA
- SEED MIX
- ROCK CONSTRUCTION ENTRANCE
- LOW WATER CROSSING
- TRIPLE STACK FIBER ROLLS
- DIRECTION OF FLOW
- PROPOSED CULVERT
- FEMA FLOOD ZONE

NOTES:

1. SEED MIX PER VEGETATION MANAGEMENT PLAN DATED 04/03/2020.
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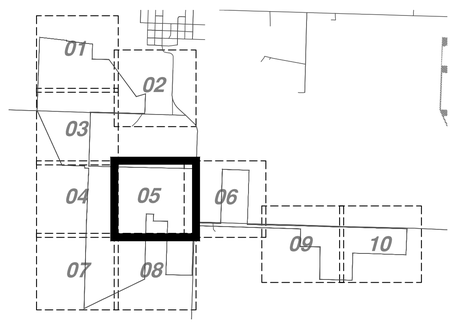
5. LARGE AREAS OF BARE SOIL EXPOSURE SHALL BE LIMITED AND STABILIZED WITH SEEDING AND MULCH APPLICATION PROMPTLY AFTER DISTURBANCE.



KEYMAP

WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
0A	09/09/2022	60% DESIGN SUBMITTAL	TLB

nationalgrid renewables
8400 NORMANDALE LAKE BLVD, SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction
2500 CO RD 42 W,
BURNSVILLE, MN 55337

N W E S

0 100 200 400

NSRS 2011 South Dakota State Planes, South Zone, US Foot

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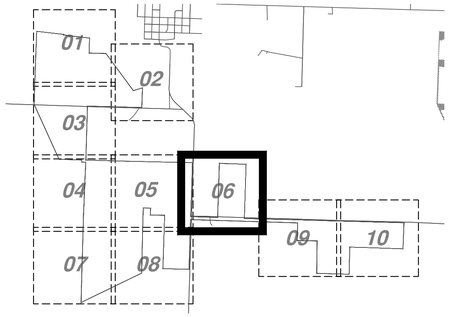
DESIGN BY: C. PANGANIBAN
DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

EROSION AND SEDIMENT CONTROL PLAN 5

DRAWING NUMBER: WSS-C-551-06
REVISION: 0A

2022.09.09



KEYMAP

LEGEND

- PROJECT BOUNDARY
- PC — PERIMETER CONTROL (SEE NOTE 2)
- EXISTING CONTOUR
- FO GWB — EXISTING FIBER OPTIC
- PROPOSED ACCESS ROAD
- O — PROPOSED FENCE
- PROPOSED PV TABLES
- PROPOSED CONTOUR
- MV## — PROPOSED COLLECTION LINE
- PROPOSED GRADING LIMITS (SEE NOTE 4)
- PROPOSED LAYDOWN AREA
- SEED MIX
- ROCK CONSTRUCTION ENTRANCE
- LOW WATER CROSSING
- TRIPLE STACK FIBER ROLLS
- DIRECTION OF FLOW
- PROPOSED CULVERT
- FEMA FLOOD ZONE

NOTES:

1. SEED MIX PER VEGETATION MANAGEMENT PLAN DATED 04/03/2020.
2. PERIMETER CONTROLS TO BE CHOSEN PER CONTRACTOR PREFERENCE FOR SEDIMENT CAPTURE ON SITE. ACCEPTABLE PERIMETER CONTROLS LISTED BELOW ARE IN ORDER OF INCREASING EFFECTIVENESS. A COMBINATION OF THE BMPS LISTED BELOW MAY BE REQUIRED IN AREAS OBSERVED TO EXPERIENCE HIGHER THAN EXPECTED SEDIMENTATION.
   - 2.1. SILT FENCE (DETAIL ECD-501)
   - 2.2. SILT WORM OR EQUIVALENT (DETAIL ECD-523.1 & ECD-523.2)
   - 2.3. VEGETATED TOP SOIL BERMS (DETAIL ECD-522)
   - 2.4. ADD FLOCCULANTS UPSTREAM PER DETAIL ECD-524 AS NEEDED.
3. SEE CONSTRUCTION NOTES FOR DUST CONTROL/SOIL STABILITY FOR AREAS OF EXPOSED SOIL.
4. PLEASE NOTE THAT THE PRESENCE OF LARGE AREAS OF EXPOSED SOILS, ESPECIALLY CLAY SOILS, REDUCE THE EFFECTIVENESS OF THE ABOVE PERIMETER CONTROLS IF NOT PROPERLY MAINTAINED DURING CONSTRUCTION (SEE SWPPP REPORT FOR MAINTENANCE SCHEDULE AND PROCEDURES).
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WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
0A	09/09/2022	60% DESIGN SUBMITTAL	TLB

nationalgrid renewables
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Ames Construction
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BURNSVILLE, MN 55337

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DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

EROSION AND SEDIMENT CONTROL PLAN 6

DRAWING NUMBER: WSS-C-551-07
REVISION: 0A

2022.09.09

LEGEND

- PROJECT BOUNDARY
- PERIMETER CONTROL (SEE NOTE 2)
- EXISTING CONTOUR
- EXISTING FIBER OPTIC
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
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NOTES:

1. SEED MIX PER VEGETATION MANAGEMENT PLAN DATED 04/03/2020.
2. PERIMETER CONTROLS TO BE CHOSEN PER CONTRACTOR PREFERENCE FOR SEDIMENT CAPTURE ON SITE. ACCEPTABLE PERIMETER CONTROLS LISTED BELOW ARE IN ORDER OF INCREASING EFFECTIVENESS. A COMBINATION OF THE BMPS LISTED BELOW MAY BE REQUIRED IN AREAS OBSERVED TO EXPERIENCE HIGHER THAN EXPECTED SEDIMENTATION.
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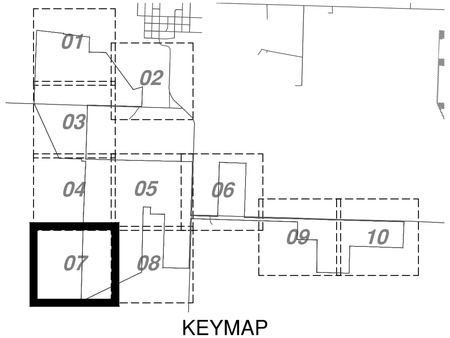

KEYMAP

WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

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0A	09/09/2022	60% DESIGN SUBMITTAL	TLB

nationalgrid renewables
8400 NORMANDALE LAKE BLVD,
SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction
2500 CO RD 42 W,
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DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

EROSION AND SEDIMENT CONTROL PLAN 7

DRAWING NUMBER: WSS-C-551-08

REVISION: 0A

2022.09.09

LEGEND

- PROJECT BOUNDARY
- PC — PERIMETER CONTROL (SEE NOTE 2)
- EXISTING CONTOUR
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NOTES:

1. SEED MIX PER VEGETATION MANAGEMENT PLAN DATED 04/03/2020.
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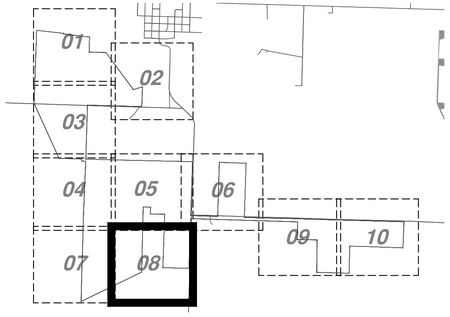

KEYMAP

WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

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nationalgrid renewables
8400 NORMANDALE LAKE BLVD, SUITE 1200
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Ames Construction
2500 CO RD 42 W,
BURNSVILLE, MN 55337

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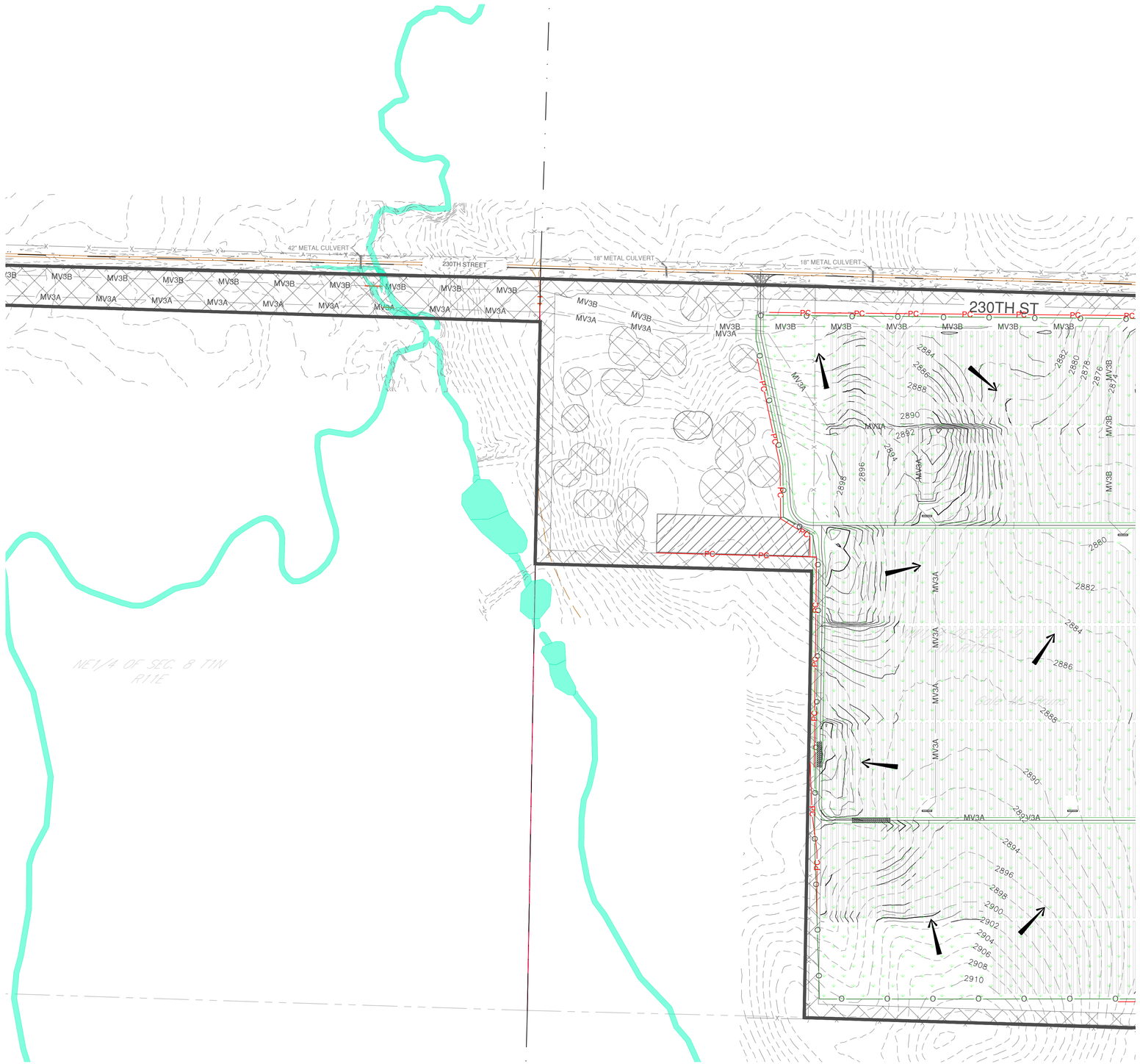
DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

EROSION AND SEDIMENT CONTROL PLAN 8

DRAWING NUMBER: WSS-C-551-09
REVISION: 0A

2022.09.09



LEGEND

- PROJECT BOUNDARY
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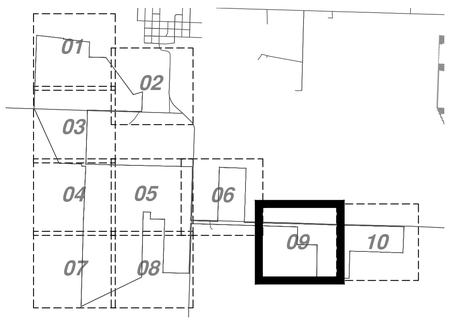

KEYMAP

WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

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nationalgrid renewables
8400 NORMANDALE LAKE BLVD,
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BLOOMINGTON, MN 55437

Ames Construction
2500 CO RD 42 W,
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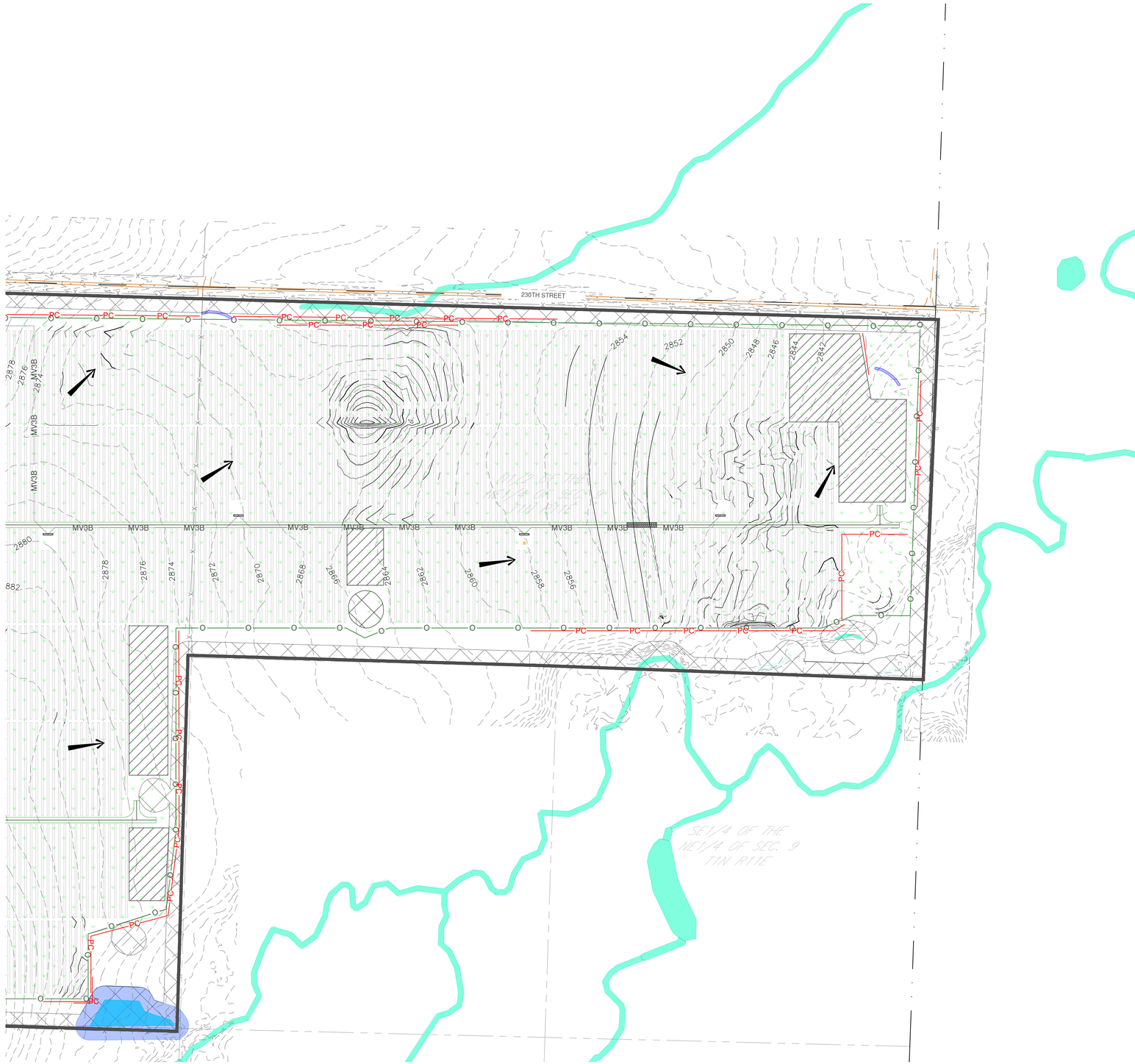
DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

EROSION AND SEDIMENT CONTROL PLAN 9

DRAWING NUMBER: WSS-C-551-10
REVISION: 0A

2023.09.09



LEGEND

- PROJECT BOUNDARY
- PERIMETER CONTROL (SEE NOTE 2)
- EXISTING CONTOUR
- EXISTING FIBER OPTIC
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- PROPOSED PV TABLES
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NOTES:

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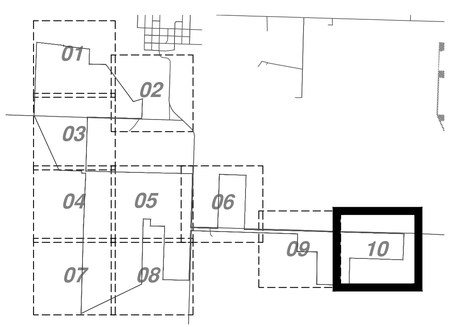

KEYMAP

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APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

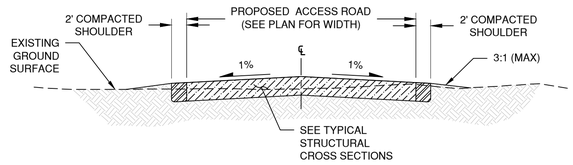
EROSION AND SEDIMENT CONTROL PLAN 10

DRAWING NUMBER: WSS-C-551-11

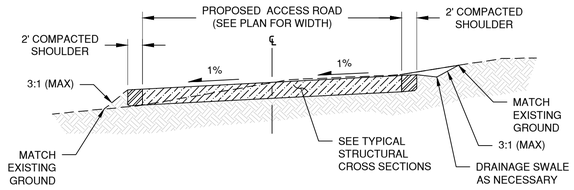
REVISION: 0A

2022.09.09

DETAIL # ACR-101



CROWNED

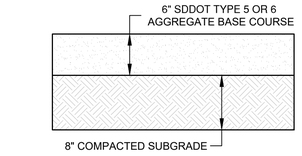


CROSS SLOPED

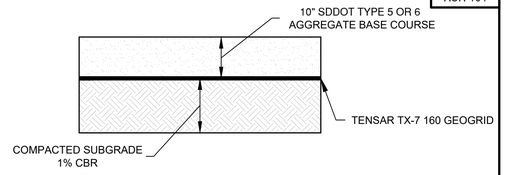
NOTES:
1. ROADS SHALL BE CONSTRUCTED WITH 1% (MIN.) - 2% (MAX.) CROWN OR A 0.5% (MIN.) TO 4% (MAX.) CROSS SLOPE, OR AS SHOWN ON THE PLANS IN ORDER TO MAINTAIN SITE DRAINAGE.
2. UNLESS SHOWN ON THE PLANS, THE CONTRACTOR SHALL MAKE THE DETERMINATION AS TO WHICH TYPICAL SECTION SHALL BE USED FOR CONSTRUCTION.
3. SLOPES SHOWN ARE IN HORIZONTAL TO VERTICAL (H:V) FORMAT.
4. SLOPES SHOWN ARE TYPICAL. SOME ROAD LOCATIONS MAY REQUIRE VARIATIONS IN SLOPE, SEE PLANS.

TYPICAL ACCESS ROAD

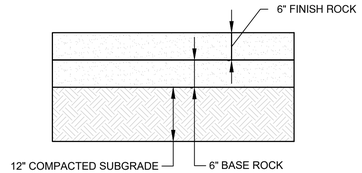
DETAIL # ACR-104



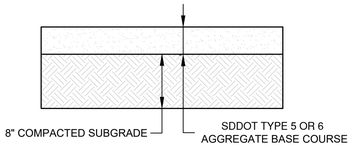
INVERTER PAD



ACCESS ROAD



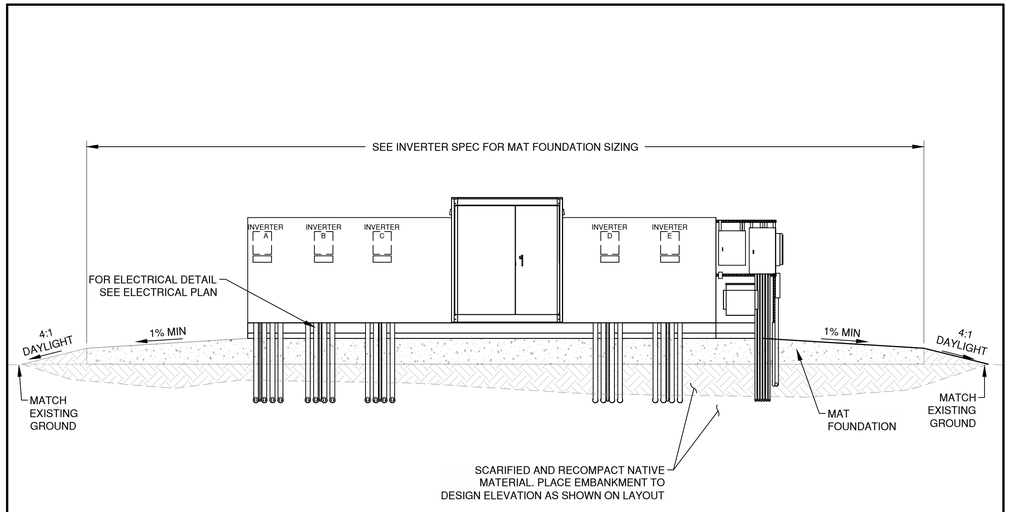
SUBSTATION PAD



LAYDOWN YARD

NOTES:
1. TYPICAL SECTIONS SHOWN ARE BASED ON NORMAL FIELD CONDITIONS, ACTUAL FIELD CONDITIONS MAY REQUIRE ADDITIONAL AGGREGATE OR CHANGES TO THE SUBGRADE.
2. CONTRACTOR SHALL MAINTAIN THE TYPICAL SECTIONS AND THE AGGREGATE SURFACES THROUGHOUT THE LIFE OF THE PROJECT.
3. DEPENDING ON ACTUAL SUBGRADE CONDITIONS ENCOUNTERED AND EXCESSIVE GRAVEL SURFACE RUTTING, ADDITIONAL GRAVEL THICKNESS OR OTHER SUBGRADE IMPROVEMENTS MAY BE REQUIRED AS DIRECTED BY ENGINEER.
4. CONTRACTOR SHALL ENSURE THAT ALL STRUCTURAL FILL SECTIONS FOR THE PROJECT MEETS OR EXCEEDS BEARING CAPACITY REQUIREMENTS FOR SOLAR COMPONENT DELIVERY.

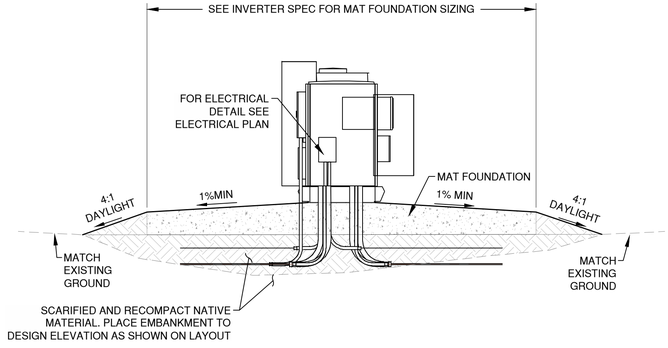
TYPICAL STRUCTURAL CROSS SECTIONS



NOTES:
1. CONTRACTOR SHALL REFER TO ELECTRICAL AND STRUCTURAL DESIGNS FOR FINAL INVERTER MOUNTING REQUIREMENTS.
2. REFER TO TABLE 1 AND 2 IN THE NOTES AND DETAILS SECTION FOR COMPACTION INFORMATION.
3. (SEE SHEET WS-NTS-002)
4. INVERTER SKID TO BE SET A MINIMUM OF 1' ABOVE THE 100-YR FLOOD ELEVATION.

REVISION
DATE: 2020.07.27
BY: T. DEJONG

TYPICAL INVERTER SKID DETAIL - FRONT VIEW



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3. (SEE SHEET WS-NTS-002)

REVISION
DATE: 2020.07.27
BY: T. DEJONG

TYPICAL INVERTER SKID DETAIL - SIDE VIEW

2022.09.09

WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

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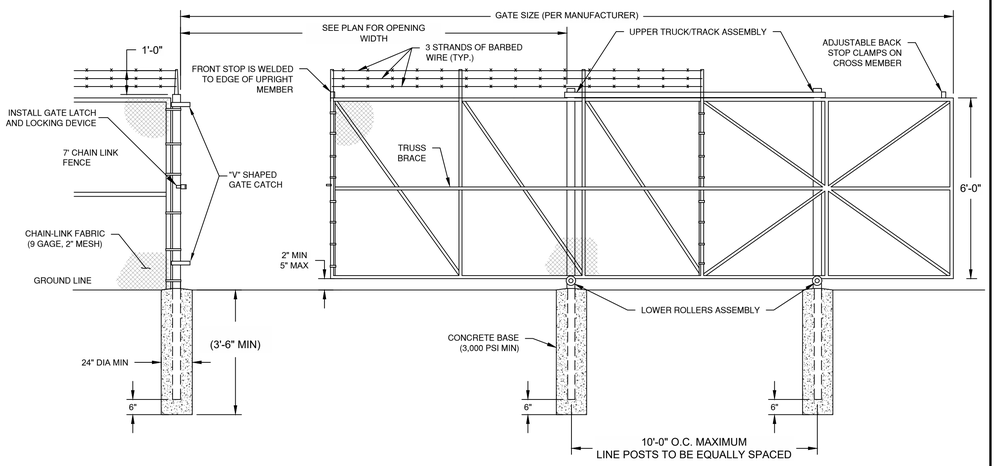
DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

TYPICAL ROAD AND FENCE DETAILS

DRAWING NUMBER: WSS-C-556-01
REVISION: 0A

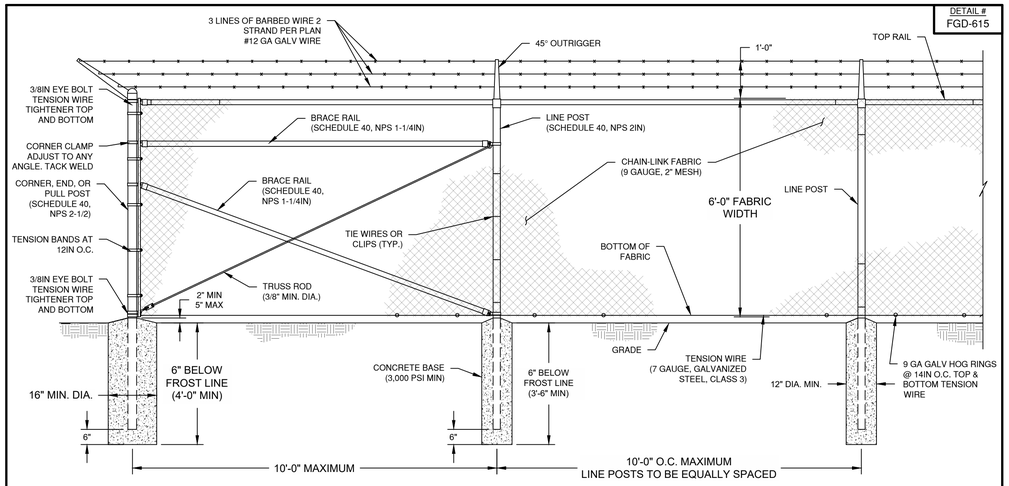
DETAIL # FGD-614



NOTES:
1. CHAINLINK FENCE SHALL BE INSTALLED PER MANUFACTURE RECOMMENDATIONS.
2. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPES OF FENCE SECTIONS AND METHODS OF INSTALLATION THAT COMPLY WITH THE SPECIFICATIONS.
3. ROLLERS SHALL BE MOUNTED TO GATE POST WITH ADJUSTABLE CLAMPS.
4. ROLLERS SHALL BE NYLON COMPOSITE W/ SEALED BEARINGS OR APPROVED EQUAL.

SLIDING GATE DETAIL WITH BARBWIRE

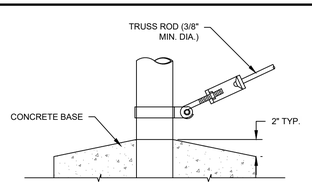
DETAIL # FGD-615



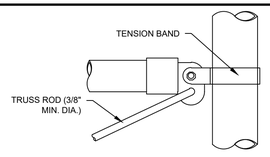
NOTES:
1. CHAINLINK FENCE SHALL BE INSTALLED PER MANUFACTURE RECOMMENDATIONS.
2. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPES OF FENCE SECTIONS AND METHODS OF INSTALLATION THAT COMPLY WITH THE SPECIFICATIONS.
3. WIRE TIES, RAILS, POSTS, AND BRACES SHALL BE CONSTRUCTED ON THE SECURE SIDE OF THE FENCE ALIGNMENT. CHAIN-LINK FABRIC SHALL BE PLACED ON THE SIDE OPPOSITE THE SECURE AREA.

TYPICAL CHAIN LINK FENCE DETAIL (3-STRAND SECURITY BARBWIRE)

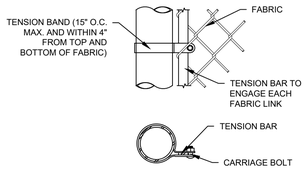
DETAIL # FGD-618



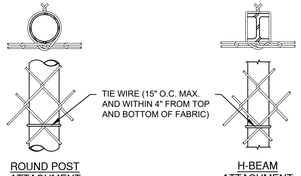
TRUSS ROD AND BAND



BRACE RAIL CLAMP DETAILS

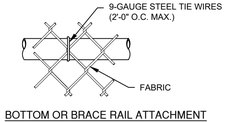


END OR GATE POST DETAIL

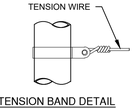


ROUND POST ATTACHMENT

H-BEAM ATTACHMENT



BOTTOM OR BRACE RAIL ATTACHMENT

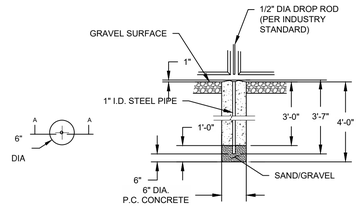


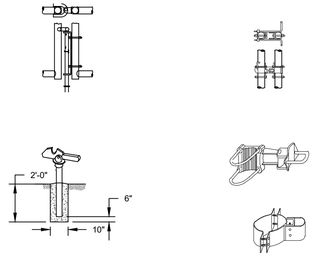
TENSION BAND DETAIL

NOTES:
1. CHAINLINK FENCE SHALL BE INSTALLED PER MANUFACTURE RECOMMENDATIONS.
2. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPES OF FENCE SECTIONS AND METHODS OF INSTALLATION THAT COMPLY WITH THE SPECIFICATIONS.

CHAIN LINK FENCE FASTENING DETAILS

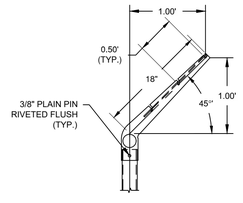
DETAIL # FGD-617

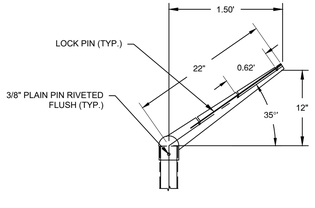




ACCESS GATE DETAILS

DETAIL # FGD-619





EXTENSION ARM DETAILS

NSRS 2011 South Dakota State Planes, South Zone, US Foot

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DESIGN BY: C. PANGANIBAN
DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

FENCE DETAILS

DRAWING NUMBER: WSS-C-556-02
REVISION: 0A

WILD SPRINGS SOLAR PROJECT

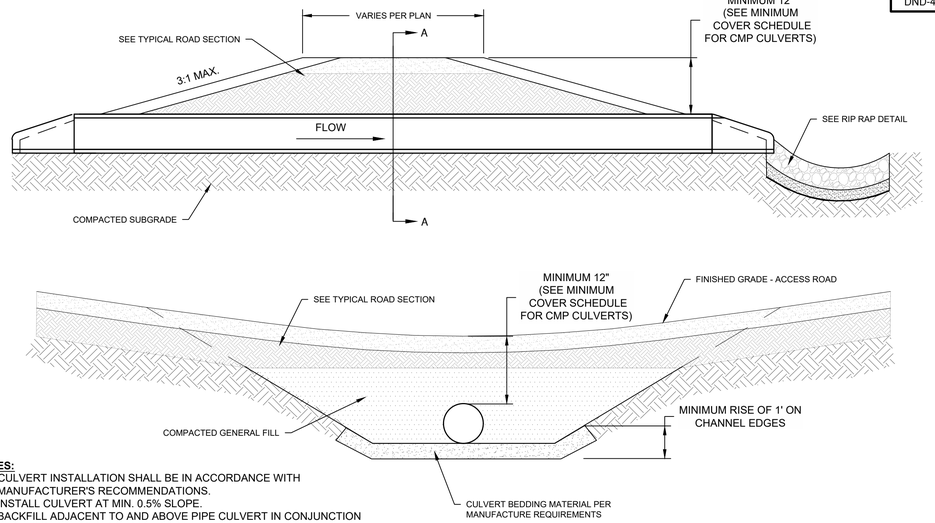
PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
0A	09/02/2022	30% DESIGN SUBMITTAL	TLB

nationalgrid renewables
8400 NORMANDALE LAKE BLVD, SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction
2500 CO RD 42 W,
BURNSVILLE, MN 55337

DETAIL # DND-401



SECTION A-A

NOTES:

1. CULVERT INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. INSTALL CULVERT AT MIN. 0.5% SLOPE.
3. BACKFILL ADJACENT TO AND ABOVE PIPE CULVERT IN CONJUNCTION WITH EMBANKMENT CONSTRUCTION.
4. CULVERTS SHOULD HAVE A MINIMUM COVER IN ACCORDANCE WITH THE MINIMUM COVER SCHEDULE FOR CMP CULVERTS TABLE .

TYPICAL CULVERT PROFILE AND CROSS SECTION

DETAIL # DND-402

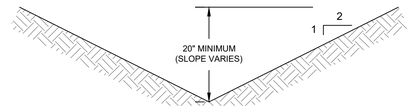
MINIMUM COVER SCHEDULE FOR CMP CULVERTS					
STEEL ROUND PIPE 2 2/3" x 1/2" CORRIGATIONS					
DIAMETER OF PIPE (IN)	MINIMUM ALLOWABLE COVER (FT)				
	16 GAGE	14 GAGE	12 GAGE	10 GAGE	8 GAGE
12	1.0	1.0			
18	1.0	1.0			
24	1.0	1.0	1.0		
30	1.0	1.0	1.0		
36	2.0	1.0	1.0	1.0	
48		3.0	1.0	1.0	1.0
60			2.5	1.0	1.0
STEEL ROUND PIPE 3" x 1" AND 5" x 1" CORRIGATIONS					
DIAMETER OF PIPE (IN)	MINIMUM ALLOWABLE COVER (FT)				
	16 GAGE	14 GAGE	12 GAGE	10 GAGE	8 GAGE
36	1.0	1.0	1.0	1.0	1.0
48	4.0	1.5	1.0	1.0	1.0
60		3.5	1.0	1.0	1.0

BASED ON "SEWER MANUAL FOR CORRIGATED STEEL PIPE," BY NATIONAL CORRUGATED STEEL PIPE ASSOCIATION, USING DESIGN THEROY USED IN THE "HANDBOOK OF STEEL DRAINAGE AND HIGHWAY CONSTRUCTION PRODUCTS," BY AMERICAN IRON AND STEEL INSTITUTE, ASSUMING 4,500 PSF CRANE LOADING WITH A 30 DEGREE DISTRIBUTION ANGLE, COVER SOIL UNIT WIEGHT OF 120 PCF, AND CRANE TRACK WIDTH OF 5', SAFTEY FACTOR = 3.0

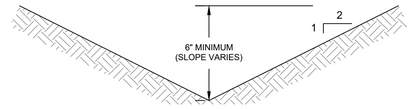
FOR 66" CULVERT, PROVIDE MINIMUM COVER THICKNESS AS RECOMMENDED BY MANUFACTURER.

MINIMUM COVER FOR CMP CULVERTS

DETAIL # DND-403



GRASS AND EROSION CONTROL LINED



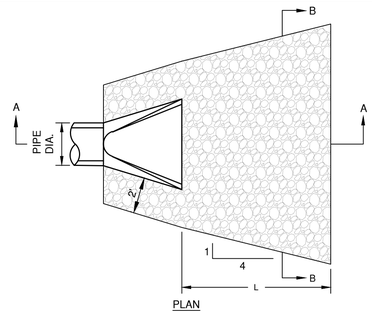
LOW VOLUME GRASS

NOTES:

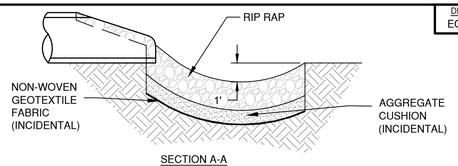
1. INSTALL SWALE IN LOCATIONS DEPICTED ON DRAWINGS.
2. INSTALL TEMPORARY EROSION CONTROL BLANKET IN ANY SWALE WITH SLOPES GREATER THAN 2 PERCENT AND LESS THAN 8 PERCENT SLOPE OR AS INDICATED ON PLANS.
3. INSTALL PERMANENT EROSION CONTROL FABRIC IN ANY SWALE WITH SLOPES GREATER THAN 8 PERCENT OR AS INDICATED ON THE PLANS.

TYPICAL SWALE DETAIL

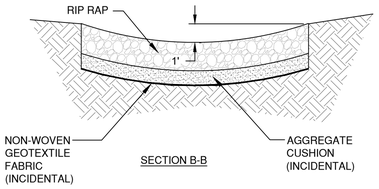
DETAIL # ECD-507



PLAN



SECTION A-A



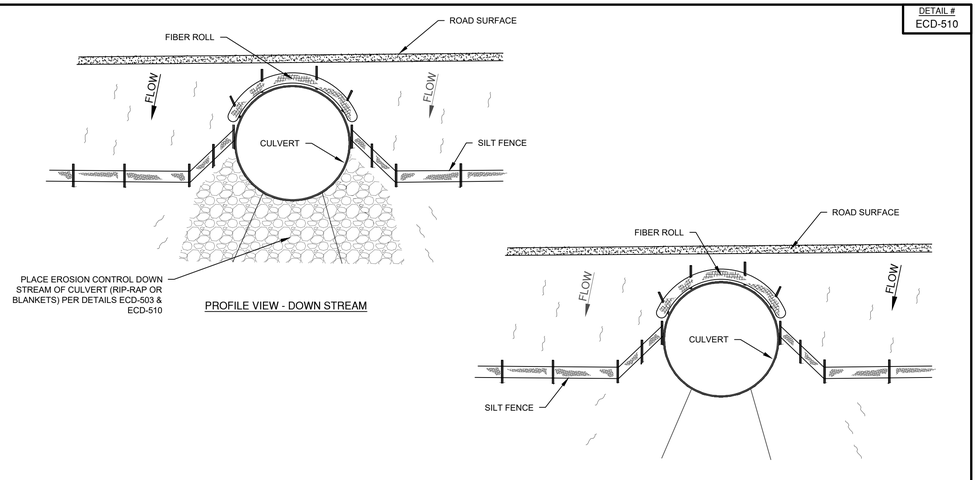
SECTION B-B

RIP RAP TABLE (CLASS I)			
PIPE DIAMTER (IN)	L (FT)	24 IN DEPTH RIP RAP (CY)	12 IN DEPTH AGG. CUSH. (CY)
12	8	5.5	2.8
15	8	5.8	2.9
18	10	7.8	3.9
21	10	8.4	4.2
24	12	11.0	5.5
27	12	11.6	5.8
30	14	14.5	7.3
36	16	18.3	9.2
42	18	21.7	10.9
48	20	25.8	12.9

ROCK RIPRAP GRADATION TABLE								
ROCK RIPRAP CLASS BY MEDIAN PARTICLE DIAMETER (D50)		D15 (IN)		D50 (IN)		D85 (IN)		D100 (IN)
CLASS	DIAMETER (IN)	MIN	MAX	MIN	MAX	MIN	MAX	MAX
I	6	3.7	5.2	5.7	6.9	7.8	9.2	12.0
II	9	5.3	7.8	8.5	10.5	11.5	14.0	18.0
III	12	7.3	10.5	11.5	14.0	15.5	18.5	24.0

RIP RAP DETAIL

DETAIL # ECD-510



PROFILE VIEW - DOWN STREAM

PROFILE VIEW - UPSTREAM

NOTES:

1. CONTRACTOR TO INSTALL AND MAINTAIN EROSION CONTROL AT CULVERTS THROUGHOUT DURATION OF CONSTRUCTION.
2. EXTENT OF DOWN STREAM EROSION CONTROL REQUIRED TO BE FIELD VERIFIED BY ON-SITE FIELD ENGINEER.
3. RETURN STREAMBED TO PRE-CONSTRUCTION CONDITIONS AFTER CULVERT INSTALLATION.

EROSION CONTROL (CULVERT END TREATMENTS)

2022.09.09

WILD SPRINGS SOLAR PROJECT
PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
0A	09/02/2022	30% DESIGN SUBMITTAL	TLB

nationalgrid renewables
8400 NORMANDALE LAKE BLVD, SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction
2500 CO RD 42 W,
BURNSVILLE, MN 55337

NSRS 2011 South Dakota State Planes, South Zone, US Foot

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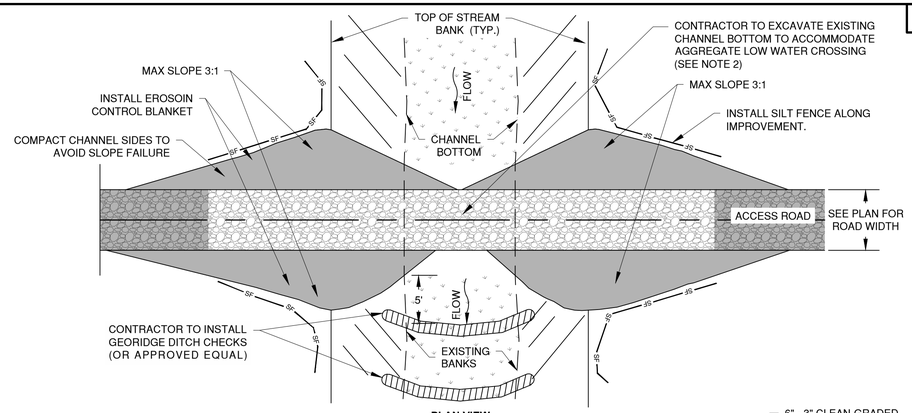
DESIGN BY: C. PANGANIBAN
DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

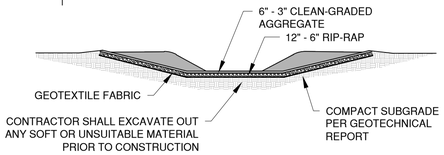
CULVERT INSTALLATION DETAILS

DRAWING NUMBER: WSS-C-556-03
REVISION: 0A

DETAIL # ACR-120



PLAN VIEW



PROFILE VIEW

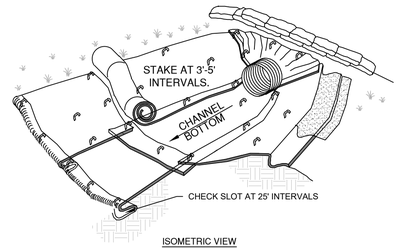
NOTES:

1. CHANNEL SLOPES TO BE MODIFIED DURING CONSTRUCTION TO ALLOW FOR ADEQUATE COMPONENT DELIVERY AND STABILIZED NEW SLOPES CREATED
2. CROSSING SHALL HAVE THE TOP-MOST SURFACE LAYER A MINIMUM OF 2.5" BELOW THE STREAM CHANNEL BOTTOM.
3. THE ACCESS ROAD SHALL CROSS THE DITCH AT 90° ANGLE AND MEET TURBINE DEFLECTION REQUIREMENTS.
4. MINIMIZE DISTURBANCE TO THE STREAM/DITCH DURING INSTALLATION. RESTORE DISTURBED AREA TO NATIVE CONDITIONS IN ACCORDANCE WITH THE SWPPP
5. ROCK CHECK DAMS MAY BE NECESSARY IF FLOWS AND DRAINAGE AREAS REQUIRE.
6. COMPACTED SHOULDER SHALL BE SEEDED AFTER CONSTRUCTION TO NATIVE CONDITIONS IN ACCORDANCE WITH THE SWPPP.

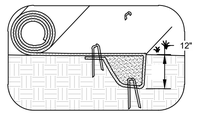
REVISION
DATE: 2019.07.30
BY: C. SMAALADEN

ACCESS ROAD LOW WATER CROSSING (AGGREGATE)

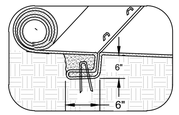
DETAIL # ECD-503



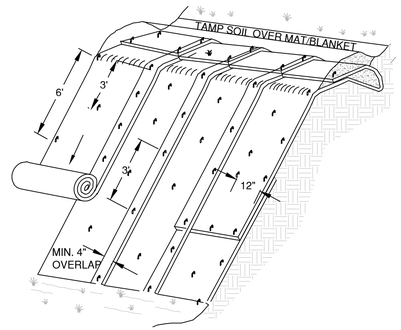
ISOMETRIC VIEW



INITIAL CHANNEL ANCHOR TRENCH



INTERMITTENT CHECK SLOT

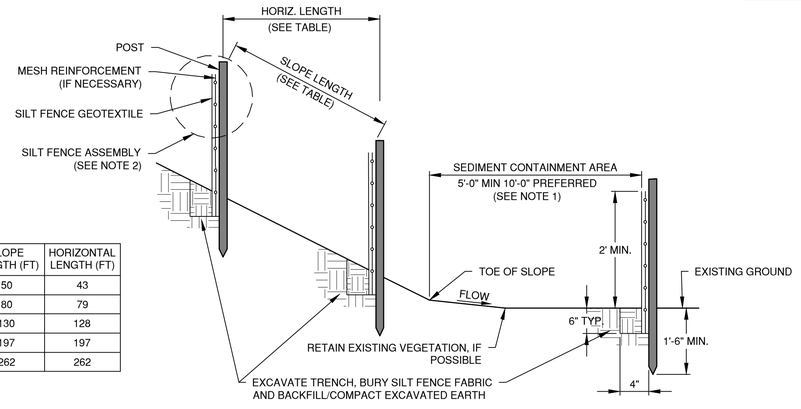


ISOMETRIC VIEW

NOTES:
1. SLOPE SURFACE SHALL BE SMOOTH BEFORE PLACEMENT FOR PROPER SOIL CONTACT.
2. STAMPING PATTERN AS PER MANUFACTURER'S RECOMMENDATIONS.
3. IF THERE IS A BERM AT THE TOP OF SLOPE, ANCHOR UPSLOPE OF THE BERM.
4. DO NOT STRETCH BLANKETS/MATTINGS TIGHT, ALLOW THE ROLLS TO MOLD TO ANY IRREGULARITIES. FOR SLOPES LESS THAN 3H:1V ROLLS MAY BE PLACED IN HORIZONTAL STRIPS.
5. LIME, FERTILIZE, AND SEED BEFORE INSTALLATION. PLANTING OF SHRUBS, TREES, ETC. SHOULD OCCUR AFTER INSTALLATION.
6. CHECK SLOTS TO BE CONSTRUCTED PER MANUFACTURERS SPECIFICATIONS.
7. STACKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.

EROSION CONTROL BLANKET DETAIL

DETAIL # ECD-501



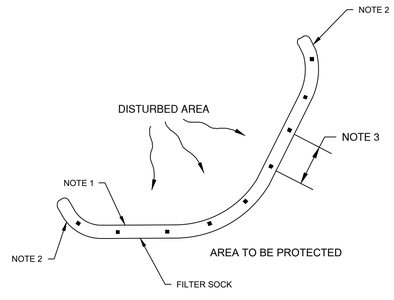
SLOPE	SLOPE LENGTH (FT)	HORIZONTAL LENGTH (FT)
2:1	50	43
3:1	80	79
4:1	130	128
5:1	197	197
> 5:1	262	262

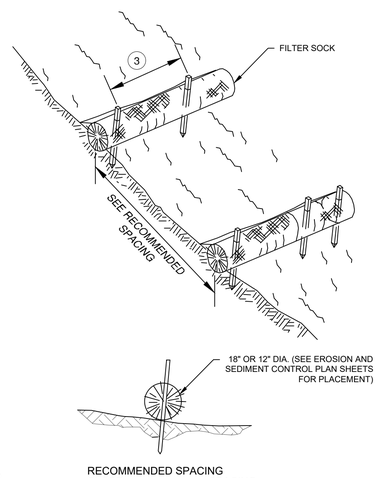
NOTES:

1. SILT FENCE OR STRAWBALE DIKE SHALL BE PLACED A MINIMUM OF 5'-0" FROM TOE OF SLOPE, 10'-0" PREFERRED. TO PROVIDE ADEQUATE AREA FOR SEDIMENT STORAGE AND FACILITATE MAINTENANCE OR SEDIMENT CONTROL AREA.
2. POST MAY BE 1 1/4" x 1 1/4" (MINIMUM) HARDWOOD, 1 1/2" x 3 1/2" (MINIMUM) SOFTWOOD, OR 4LB/FT (MIN) STEEL. SPACING FOR THE PROVIDED SILT FENCE SHALL BE AS DESIGNATED ON THE DEPARTMENT APPROVED LIST FOR SILT FENCE.
3. THE BOTTOM EDGE OF SILT FENCE SHALL BE BURIED A MINIMUM OF 6" BELOW GROUND. THE FENCE SHALL BE INSTALLED WITH THE POSTS ON THE DOWNSTREAM SIDE OF THE FABRIC.
4. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES ONE-HALF OF THE MEASURE HEIGHT. SEDIMENT SHALL BE DISPOSED OF AS UNSUITABLE MATERIAL.
5. INSTALL ENDS OF SILT FENCE UPHILL TO PREVENT WATER FROM FLOWING AROUND.

SILT FENCE DETAIL

DETAIL # ECD-502





NOTES:

1. INSTALL FILTER SOCK ALONG CONTOUR OF SLOPE.
2. TURN ENDS OF FILTER SOCK UPHILL TO PREVENT WATER FROM FLOWING AROUND ENDS.
3. INSTALL WOOD STAKES AS NECESSARY TO PREVENT MOVEMENT AND UNDERMINING. STAKES SHALL BE SPACED AT 10' MAX. INTERVALS WITH WIRE SUPPORTED FENCE AND 6' MAX INTERVALS WITHOUT WIRE SUPPORT.
4. SEE SILT FENCE SPECIFICATIONS FOR APPLICABILITY AND MAINTENANCE.

RECOMMENDED SPACING

SLOPE	SPACING
<4:1	20'
2:1 TO 4:1	15'
2:1 OR GREATER	10'

FIBER ROLL DETAIL

WILD SPRINGS SOLAR PROJECT
PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
0A	09/02/2022	30% DESIGN SUBMITTAL	TLB

nationalgrid renewables
8400 NORMANDALE LAKE BLVD, SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction
2500 CO RD 42 W,
BURNSVILLE, MN 55337

NSRS 2011 South Dakota State Planes, South Zone, US Foot

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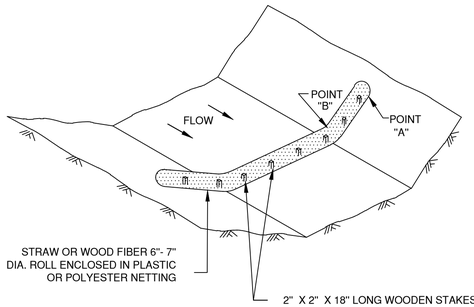
DESIGN BY: C. PANGANIBAN
DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

LOW WATER CROSSING INSTALLATION DETAIL

DRAWING NUMBER: WSS-C-556-04
REVISION: 0A

2022.09.09

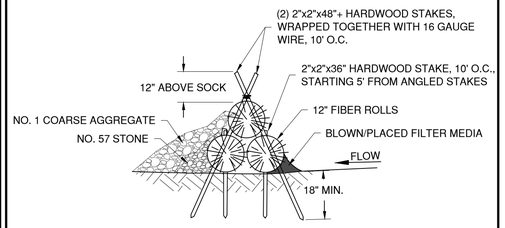
DETAIL # ECD-514



NOTES:
1. POINT "A" MUST BE AT LEAST 1 HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND ENDS.

FIBER ROLL (DITCH APPLICATION)

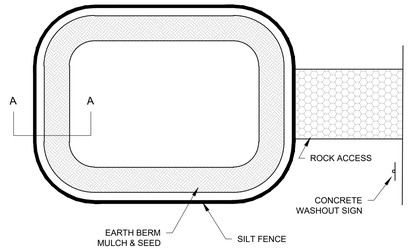
DETAIL # ECD-502a

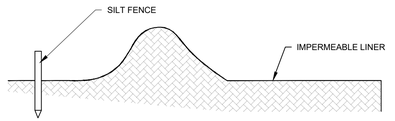


NOTES:
1. INSTALL FILTER SOCK ALONG CONTOUR OF SLOPE.
2. TURN ENDS OF FILTER SOCK UPHILL TO PREVENT WATER FROM FLOWING AROUND ENDS.
3. INSTALL WOOD STAKES AS NECESSARY TO PREVENT MOVEMENT AND UNDERMINING. STAKES SHALL BE SPACED AT 10' MAX. INTERVALS WITH WIRE SUPPORTED FENCE AND 6' MAX INTERVALS WITHOUT WIRE SUPPORT.
4. SEE SILT FENCE SPECIFICATIONS FOR APPLICABILITY AND MAINTENANCE.

TRIPLE-STACKED FIBER ROLL DETAIL

DETAIL # ECD-504





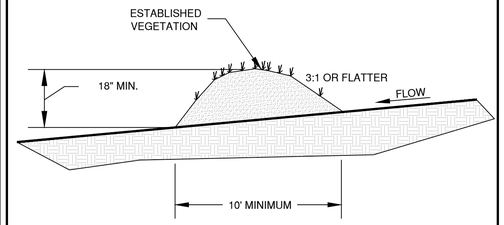
SECTION A-A

NOTE:
1. CONCRETE WASHOUT AREAS SHALL HAVE AN IMPERMEABLE LINER TO PREVENT CONCRETE WASHOUT WATER FROM INFILTRATING/CONTACTING WITH SOIL. IMPERMEABLE LINER INCLUDES 10 MIL. POLYLINER OR COMPACTED CLAY LINER. WASHOUT SYSTEMS CAN BE USED AS ALTERNATE WASHOUT AREAS.
2. AN APPROVED ALTERNATE MAY BE USED.
3. CONCRETE WASHOUT SHALL BE LOCATED AT THE BATCH PLANT AND/OR EACH TURBINE SITE.

REVISION
DATE: 2019.07.30
BY: C. SMAALADEN

TYPICAL CONCRETE WASHOUT AREA

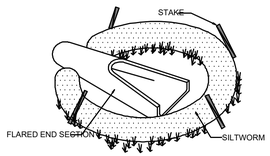
DETAIL # ECD-522



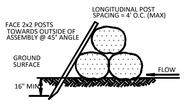
NOTES:
1. BERMS SHALL HAVE A HEIGHT OF 18 INCHES, SIDE SLOPES OF 3:1 OR FLATTER AND A MINIMUM BASE WIDTH OF 10 FEET.
2. BERMS SHALL BE USED TO INTERCEPT AND DIVERT DRAINAGE TO A DESIGNATED OUTLET.
3. BERMS SHALL NOT BE USED WHERE DRAINAGE AREA EXCEEDS 10 ACRES.
4. TRIPLE STACKED FIBER ROLLS TO BE ADDED AT OUTFLOW LOCATIONS

PERIMETER CONTROL VEGETATED BERM

DETAIL # ECD-523.1

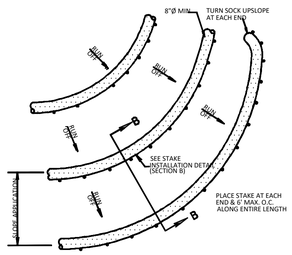


FLARED END APPLICATION

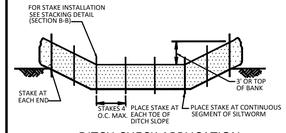


SILTWORM (STACK DETAIL ONLY)

STACK DETAIL - IS AN EFFECTIVE INSTALLATION METHOD TO ACHIEVE HEIGHT/VOLUME NEEDS. SEDIMENT RETENTIONS ARE TYPICALLY INCREASED WHEN ADDING A STACKED DETAIL WHERE SITE CONDITIONS REQUIRE.

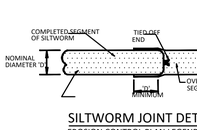


PLAN VIEW FOR SLOPE APPLICATION



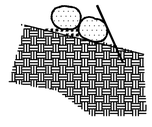
DITCH CHECK APPLICATION

ADD ADDITIONAL LINE OF DEFENSE WHEN SEDIMENT REACHES 50% OF THE HEIGHT OF THE SILTWORM



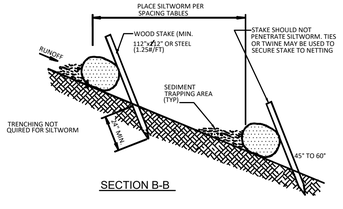
SILTWORM JOINT DETAIL

EROSION CONTROL PLAN LEGEND SILTWORM

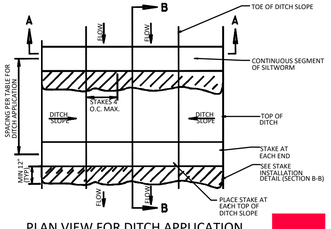


MAINTENANCE APPLICATION

IN THE EVENT THAT THE SILTWORM IS RUN OVER WITH LIGHT VEHICLE TRAFFIC OR COMPRESSED, RESHAPE TO ORIGINAL CONTOUR. IN THE EVENT THAT NETTING IS TORN, ADD PROVIDED SLEEVE OVER EXISTING TORN AREA, OR CUT OUT THE TORN AREA AND RE-TIE THE NEW EXISTING ENDS.



SECTION B-B



PLAN VIEW FOR DITCH APPLICATION

SILTWORM DETAIL

DETAIL # ECD-523.2

SILTWORM HEIGHTS INSTALLED		
NOMINAL DIAMETER, D	INSTALLED HEIGHT OF SINGLE SILTWORM	INSTALLED HEIGHT OF STACKED SILTWORM
6"	4.5"	9"
9"	7.5"	15"
12"	9.5"	19"
18"	14.5"	29"

MINIMUM SPECIFICATION FOR SILTWORM		
PROPERTY		
PH	1.0	5.0 - 8.5
MOISTURE CONTENT	% WET WEIGHT BASIS	< 60
ORGANIC MATTER CONTENT	% DRY WEIGHT BASIS	25 - 100
PHYSICAL CONTAMINANTS	% DRY WEIGHT BASIS	< 1%
PARTICLE SIZE		2 INCH - 70%-80% / 38 INCH - 20% - 30% MAX. PARTICLE SIZE 2"

SILTWORM CHECK DAM ESTIMATED QUANTITIES				
	V - DITCH (1)		TRAPEZOIDAL DITCH (2)	
	12" SILTWORM	18" SILTWORM	12" SILTWORM	18" SILTWORM
LENGTH (FT)	60	48	72	60

(1) ESTIMATED QUANTITIES BASED ON A 4:1 SIDE SLOPE. QUANTITIES WILL VARY BASED ON ACTUAL DITCH CONFIGURATION
(2) ESTIMATED QUANTITIES BASED ON A 4 FT BOTTOM WIDTH, 4 FT DEPTH, AND 4:1 SIDE SLOPES. QUANTITIES WILL VARY BASED ON ACTUAL DITCH CONFIGURATION

SILTWORM SPACING FOR SLOPE APPLICATION			
SLOPE	8"	12"	18"
2%	70"	80"	100"
5%	30"	60"	80"
10%	20"	30"	70"
6:1	N/A	20"	40"
4:1	N/A	20"	30"
3:1	N/A	N/A	20"
2:1	N/A	N/A	20"

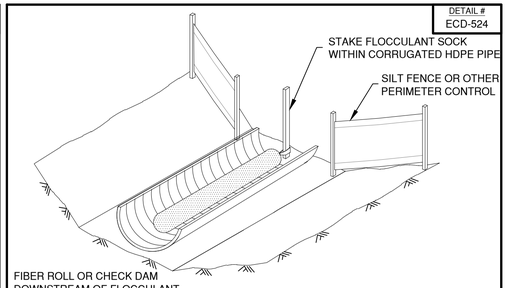
(P) N/A = NOT RECOMMENDED SPACING NOT TO EXCEED 100'

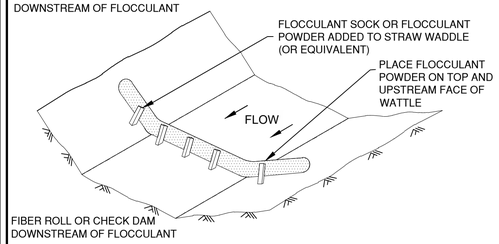
SILTWORM SPACING FOR DITCH APPLICATION	
DITCH SLOPE	MAXIMUM SPACING
LESS THAN 2%	80'
2%	80'
3%	50'
4%	40'
5%	30'
6%	20'
GREATER THAN 2%	20'

REVISION
DATE: 2022.09.09
BY: R. KAWLESKI

SILTWORM DETAIL TABLES

DETAIL # ECD-524





NOTES:
1. FLOCCULANT SOCK CAN BE INSTALLED IN CONCENTRATED FLOW AREAS, 10 FT (MIN.) UPSTREAM OF TRIPLE STACKED FIBER ROLLS ACCORDING TO MANUFACTURING GUIDELINES AS APPROVED BY THE STATE.

REVISION
DATE: 2022.09.09
BY: R. KAWLESKI

FLOCCULANT UPSTREAM DETAIL

2022.09.09

WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
0A	09/02/2022	30% DESIGN SUBMITTAL	TLB

nationalgrid renewables
8400 NORMANDALE LAKE BLVD, SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction
2500 CO RD 42 W,
BURNSVILLE, MN 55337

NSRS 2011 South Dakota State Planes, South Zone, US Foot

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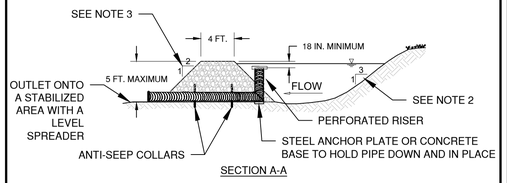
Ulteig — We listen. We solve.®
DESIGN BY: C. PANGANIBAN
DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

EROSION AND SEDIMENT CONTROL AND UTILITY DETAILS

DRAWING NUMBER: WSS-C-556-05
REVISION: 0A

DETAIL # ASR-100



SECTION A-A

NOTES:

1. ALL PIPE CONNECTIONS SHALL BE WATERTIGHT.
2. SIDE SLOPES WITHIN THE SAFETY CLEAR ZONE OF A ROADWAY SHALL BE 6:1 (H:V) OR FLATTER. PROTECT THE TRAVELING PUBLIC FROM INLET STACKS WITHIN THE CLEAR ZONE.
3. SEDIMENT BASINS SHALL HAVE SIDE SLOPES OF 3:1 OR GREATER.
4. THE DIMENSIONS AND LIMITS OF THE EXCAVATION FOR SEDIMENT BASINS AND TRAPS WILL BE AS SHOWN ON THE PLANS.
5. THE SANDBAG MATERIAL SHALL BE MADE OF POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE WOVEN FABRIC, MIN. UNIT WIGHT 4 OUNCES/SY, MULLEN BURST STRENGTH EXCEEDING 300 PSI AND ULTRAVIOLET STABILITY EXCEEDING 70%.

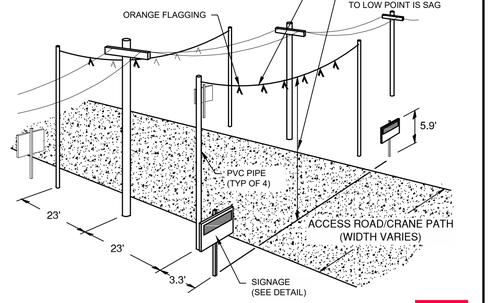
SEDIMENT BASIN AND/OR TRAP WITH PIPE OUTLET

DETAIL # UCD-711

NOTES:

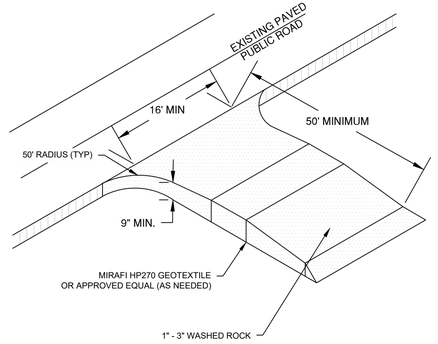
1. CONTACT UTILITY COMPANY PRIOR TO CROSSING.
2. OSHA CLEARANCE REQUIREMENTS SHALL BE FOLLOWED FOR ALL UTILITY CROSSINGS.
3. WARNING SIGNS SHALL BE ERECTED ACCORDING TO THE DIAGRAM BELOW PRIOR TO CROSSING UNDERNEATH POWERLINES.
4. ALL EQUIPMENT OPERATORS AND MACHINERY MUST REMAIN A MINIMUM OF 20 FEET AWAY FROM TRANSMISSION LINES AND POLES AT ALL TIMES.
5. IN THE EVENT THAT CONTACT IS MADE WITH A TRANSMISSION LINE, THE EQUIPMENT OPERATOR WILL CONTACT A SUPERVISOR IMMEDIATELY AND FOLLOW SAFE WORK PRACTICES. TREAT AND AND ALL POWER LINES AS LIVE.

SIGNAGE DETAIL



POWERLINE CROSSING REQUIREMENTS

DETAIL # ECD-505

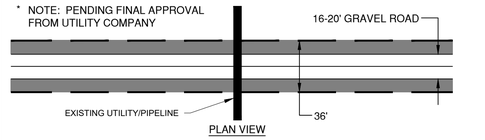


NOTES:

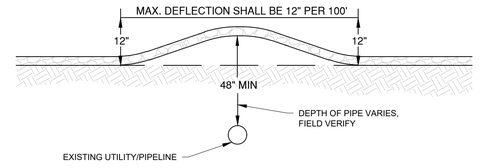
1. TRACKED SEDIMENT ONTO PUBLIC ROADS SHALL BE REMOVED BY THE END OF THE WORK DAY OR WITHIN 24 HOURS OF DISCOVERY.

TYPICAL VEHICLE TRACKING PAD

DETAIL # UCD-701



PLAN VIEW



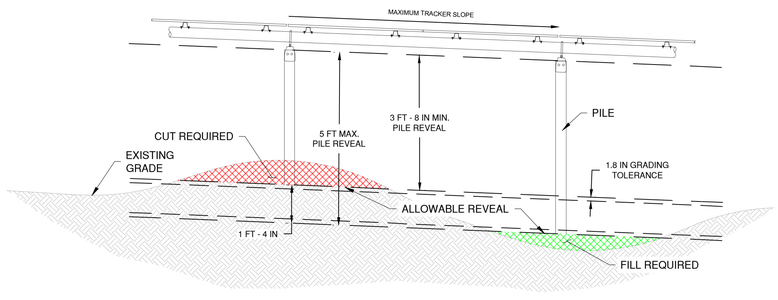
PROFILE VIEW

NOTES:

1. CROSSING DETAIL FOR INFORMATION ONLY. CROSSING MUST BE APPROVED BY UTILITY COMPANY PRIOR TO CROSSING.
2. LOCATION AND DEPTH OF EXISTING UTILITY SHALL BE FIELD VERIFIED BY EXISTING UTILITY OWNER/OPERATOR.
3. EARTH COVER PROTECTION FOR EXISTING UTILITIES SHALL BE USED WHERE THE COVER OVER EXISTING UTILITY IS LESS THAN 48".
4. CONTRACTOR SHALL NOTIFY THE UTILITY COMPANY AT LEAST 48 HOURS PRIOR TO CONSTRUCTION ACTIVITIES.

EARTH COVER PROTECTION FOR UTILITY CROSSING

DETAIL # GRD-801



NOTES:

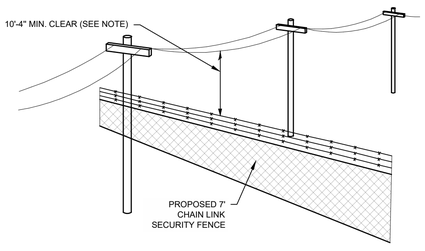
1. THE TRACKER GRADING CRITERIA IS BASED ON A MEDIAN PILE REVEAL OF 4 FT - 4 IN. A 1.8 IN GRADING TOLERANCE SHOULD BE ACCOUNTED FOR FOR VARIANCES IN GRADING VARIABILITY.
   - 1.1. MINIMUM PILE REVEAL - 3 FT - 8 IN
   - 1.2. MAXIMUM PILE REVEAL -5 FT
   - 1.3. MAXIMUM TRACKER SLOPE (SOUTH FACING) - 15%
   - 1.4. MAXIMUM TRACKER SLOPE (NORTH FACING) - 8.7%
2. FINAL EARTHWORK TOTALS MAY VARY BASED ON FINAL TRACKER GRADING REQUIREMENTS, PILE REVEALS, AND GRADING TOLERANCES.

TYPICAL TRACKER GRADING DETAIL

DETAIL # UCD-716

NOTES :

1. CONTACT UTILITY COMPANY PRIOR TO CROSSING.
2. OSHA CLEARANCE REQUIREMENTS SHALL BE FOLLOWED FOR ALL UTILITY CROSSINGS.
3. ALL EQUIPMENT OPERATORS AND MACHINERY MUST REMAIN A MINIMUM OF 20 FEET AWAY FROM TRANSMISSION LINES AND POLES AT ALL TIMES.
4. IN THE EVENT THAT CONTACT IS MADE WITH A TRANSMISSION LINE, THE EQUIPMENT OPERATOR WILL CONTACT A SUPERVISOR IMMEDIATELY AND FOLLOW SAFE WORK PRACTICES. TREAT ANY AND ALL POWER LINES AS LIVE.



POWERLINE/FENCE CROSSING REQUIREMENTS

2022.09.09

WILD SPRINGS SOLAR PROJECT

PENNINGTON COUNTY, SOUTH DAKOTA

Rev.	Date	Description	By
0A	09/09/2022	60% DESIGN SUBMITTAL	TLB

nationalgrid renewables
8400 NORMANDALE LAKE BLVD, SUITE 1200
BLOOMINGTON, MN 55437

Ames Construction
2500 CO RD 42 W,
BURNSVILLE, MN 55337

NSRS 2011 South Dakota State Planes, South Zone, US Foot

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF REVIEW ONLY IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

DESIGN BY: C. PANGANIBAN
DRAWN BY: J. JOHNSON
APPROVED BY: B. BUCHOLZ
PROJECT NO: 22.11742
CONTACT: ULTEIG.COM

EROSION AND SEDIMENT CONTROL AND UTILITY DETAILS

DRAWING NUMBER: WSS-C-556-06
REVISION: 0A

Appendix D SWPPP Inspection Forms

Stormwater Construction Site Inspection Report

General Information			
Project Name			
Permit No.		Location	
Date of Inspection		Start/End Time	
Inspector's Name(s)			
Inspector's Title(s)			
Inspector's Contact Information			
Describe present phase of construction			

Type of Inspection:

❑ Regular ❑ Pre-storm event ❑ During storm event ❑ Post-storm event

Weather Information

Has there been a storm event since the last inspection? ❑Yes ❑No

If yes, provide:

Storm Start Date & Time: Storm Duration (hrs): Approximate Amount of Precipitation (in):

Weather at time of this inspection?

❑ Clear ❑Cloudy ❑ Rain ❑ Sleet ❑ Fog ❑ Snowing ❑ High Winds

❑ Other: Temperature:

Have any discharges occurred since the last inspection? ❑Yes ❑No

If yes, describe:

Are there any discharges at the time of inspection? ❑Yes ❑No

If yes, describe:

Subcontractor/Secondary Operators				
Subcontractor Name	ADEM Number	Scope on Project	Compliance with site SWPPP?	Correction Actions Needed and Notes
			Y / N	
			Y / N	
			Y / N	
			Y / N	
			Y / N	

Site-specific BMPs

- Number the structural and non-structural BMPs identified in your SWPPP on your site map and list them below (add as many BMPs as necessary). Carry a copy of the numbered site map with you during your inspections. This list will ensure that you are inspecting all required BMPs at your site.
- Describe corrective actions initiated, date completed, and note the person that completed the work in the Corrective Action Log.

	BMP	BMP Installed?	BMP Maintenance Required?	Corrective Action(s) Required/Notes
1		❑Yes ❑No	❑Yes ❑No	
2		❑Yes ❑No	❑Yes ❑No	
3		❑Yes ❑No	❑Yes ❑No	
4		❑Yes ❑No	❑Yes ❑No	
5		❑Yes ❑No	❑Yes ❑No	
6		❑Yes ❑No	❑Yes ❑No	
7		❑Yes ❑No	❑Yes ❑No	
8		❑Yes ❑No	❑Yes ❑No	
9		❑Yes ❑No	❑Yes ❑No	
10		❑Yes ❑No	❑Yes ❑No	
11		❑Yes ❑No	❑Yes ❑No	
12		❑Yes ❑No	❑Yes ❑No	
13		❑Yes ❑No	❑Yes ❑No	
14		❑Yes ❑No	❑Yes ❑No	
15		❑Yes ❑No	❑Yes ❑No	
16		❑Yes ❑No	❑Yes ❑No	
17		❑Yes ❑No	❑Yes ❑No	
18		❑Yes ❑No	❑Yes ❑No	
19		❑Yes ❑No	❑Yes ❑No	

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Customize this list as needed for conditions at your site.

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
1	Are all slopes and disturbed areas not actively being worked properly stabilized?	❑Yes ❑No	❑Yes ❑No	
2	Are natural resource areas (e.g., streams, wetlands, mature trees, etc.) protected with barriers or similar BMPs?	❑Yes ❑No	❑Yes ❑No	
3	Are perimeter controls and sediment barriers adequately installed (keyed into substrate) and maintained?	❑Yes ❑No	❑Yes ❑No	
4	Are discharge points and receiving waters free of any sediment deposits?	❑Yes ❑No	❑Yes ❑No	
5	Are storm drain inlets properly protected?	❑Yes ❑No	❑Yes ❑No	
6	Is the construction exit preventing sediment from being tracked into the street?	❑Yes ❑No	❑Yes ❑No	

	BMP/activity	Implemented?	Maintenance Required?	Corrective Action Needed and Notes
7	Is trash/litter from work areas collected and placed in covered dumpsters?	❑Yes ❑No	❑Yes ❑No	
8	Are washout facilities (e.g., paint, stucco, concrete) available, clearly marked, and maintained?	❑Yes ❑No	❑Yes ❑No	
9	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	❑Yes ❑No	❑Yes ❑No	
10	Are materials that are potential stormwater contaminants stored inside or under cover?	❑Yes ❑No	❑Yes ❑No	
11	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	❑Yes ❑No	❑Yes ❑No	
12	(Other)	❑Yes ❑No	❑Yes ❑No	

Non-Compliance

Describe any incidents of non-compliance not described above:

_____
_____
_____
_____
_____
_____

CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Print name and title: _____

Signature: _____ Date:_____

Appendix E Corrective Action Form

Corrective Action Log				
Inspection Date	Inspector Name(s)	Description of BMP Deficiency	Corrective Action Needed (including planned date/responsible person)	Date Action Taken/Responsible Person

Appendix F SWPPP Amendment Log

SWPPP Amendment Log			
No.	**Description of the Amendment**	**Date of Amendment**	**Amendment Prepared by [Name(s) and Title]**

Appendix G Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION

CONSTRUCTION BEST MANAGEMENT PRACTICES PLAN

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Construction Best Management Practices Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above-named project:

Company: _____

Address: _____

Telephone: _____

Type of construction service to be provided:

_____

_____

Signature: _____

Title: _____

Date: _____

Appendix H Grading and Stabilization Activities Log

Grading and Stabilization Activities Log				
Date Grading Activity Initiated	**Description of Grading Activity**	**Description of Stabilization Measure and Location**	**Date Grading Activity Ceased** *(Indicate Temporary or Permanent)*	**Date When Stabilization Measures Initiated**

Appendix I SWPPP Training Log

Stormwater Pollution Prevention Training Log

Project Name:
Project Location:
Instructor's Name(s):
Instructor's Title(s):

Course Location: _____

Date: _____

Course Length (hours): _____

Stormwater Training Topic (check as appropriate):

❑	Sediment and Erosion Controls	❑	Emergency Procedures
❑	Stabilization Controls	❑	Inspections/Corrective Actions
❑	Pollution Prevention Measures		

Specific Training Objective:

_____
_____
_____
_____
_____

Attendee Roster:

No.	Name of Attendee	Company
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Appendix J Delegation of Authority Form

Delegation of Authority

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, at the _____ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_____ (name of person or position)

_____ (company)

_____ (address)

_____ (city, state, zip)

_____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in the Alabama Department of Environmental Management Construction General Permit No. ALR100000 and that the designee above meets the definition of a "duly authorized representative."

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____

Company: _____

Title: _____

Signature: _____

Date: _____

Appendix K Environmental Documentation

Final Environmental Assessment for Wild Springs Solar Project

Level 2 Wetland Delineation Report for Wild Springs Solar

Level I and Level III Cultural Resources Inventory for the Wild Springs Solar Project

Natural Resources Strategy Report

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
AC	alternating current
Basin Electric	Basin Electric Power Cooperative
BCC	Birds of Conservation Concern
BMP	best management practice
CEQ	Council on Environmental Quality
DC	direct current
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
kV	kilovolt
MW	megawatt
NEPA	National Environmental Policy Act
NHD	National Hydrography Dataset
NLCD	National Land Cover Database
NLEB	northern long-eared bat
NRHP	National Register of Historic Places
NRCS	Natural Resources Conservation Service
O&M	operations and maintenance
Project	Wild Springs Solar Project
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.
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
SDDENR	South Dakota Department of Environment and Natural Resources
SDDOT	South Dakota Department of Transportation
SDGFP	South Dakota Department of Game, Fish, and Parks
SGCN	South Dakota Department of Game, Fish, and Parks Species of Greatest Conservation Need
SHFC	U.S. Fish and Wildlife Service Species of Habitat Fragmentation Concern
SHPO	State Historic Preservation Office
SPP	Southwest Power Pool
SWPPP	Stormwater Pollution Prevention Plan
THPO	Tribal Historic Preservation Officer
TCP	Traditional Cultural Property
TCS	Traditional Cultural Survey
UDP	Unanticipated Discovery Plan
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMP	Vegetation Management Plan
WAPA	Western Area Power Administration
Wild Springs Solar	Wild Springs Solar, LLC
WNS	White-Nose Syndrome

Chapter 1: Introduction and Background

The Western Area Power Administration (WAPA) is one of four power marking 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.

Table 1: Estimated Project Facility Acreages within the Project Footprint

Project Facilities[1]	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 to12 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 manufactures 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).

Table 3: Summary of Land Cover in the Project Boundary

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.

Table 4: Summary of Land Cover Impacts Within the Project Footprint					
	NLCD Category				
Project Facilities	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 threated 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.

Table 5: Summary of Wildlife Studies for the Wild Springs Solar 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.

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

Common Name	# Groups	# Individuals	Status	Breeding Behavior Observed[1]
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

[1]Behavior 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 to30 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 finding 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).

Table 7: Previously Recorded Archaeological Sites and Historic Architectural Resources within One-half Mile of the Project Boundary

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 of 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, WSO41, 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 Solars' 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 C02 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/revised by WAPA.

Table 9: List of Preparers and Technical Support, Management, and Reviewers	
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.

Table 10: Summary of Public Scoping Comments	
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.

Table 10: Summary of Public Scoping Comments	
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	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. 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.
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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Level 2 Wetland Delineation Report
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Pennington County, South Dakota

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AREAM

February 2020

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I certify that, to the best of my knowledge, this wetland delineation and report were completed following current wetland standards as set forth by the USACE and NRCS. Findings in this report represent Area M's best judgement based on conditions and information available at the time of the wetland delineation.

Jonathan Knudsen, WDC, MS
Principal Biologist/Wetland Specialist
MN Certified Wetland Delineator 1307

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INTRODUCTION

Area M Consulting (Area M), on behalf of Wild Springs Solar, LLC, a wholly owned subsidiary of Geronimo Energy, LLC (Client), a National Grid Company, conducted a wetland delineation for the Wild Springs Solar (Wild Springs or Project), a proposed utility-scale solar facility located within Pennington County, South Dakota. The Area M biologist conducted a routine Level 2 (field) Delineation, as defined by the United States Army Corps of Engineers (USACE) within the Project boundaries. The objective of the wetland delineation was to identify and map wetlands and provide a jurisdictional opinion of aquatic resources within the Project. An initial wetland delineation was conducted by Area M for in 2017 for a portion the Project, which subsequently expanded in 2019. This wetland delineation was conducted within only the expansion area (Study Area). This wetland delineation report is assembled to assist the Client with internal planning and to meet regulatory requirements necessary for permitting a commercial solar project in Pennington County.

PROJECT DESCRIPTION

The Wild Springs Solar Project located south of New Underwood, South Dakota, encompasses 1498.6 acres in Pennington County, South Dakota. The Project is a commercial-level solar garden proposed to produce up to 128 MW of electricity from ground-mounted photovoltaic arrays. The Project will consist of a series of solar arrays, access and maintenance roads, equipment pads, and aboveground transmission lines connecting the Project to a nearby Western Area Power Authority (WAPA) substation. A wetland delineation was previously conducted by Area M for a large portion of the Project (Appendix A). This portion was a reviewed by the USACE and an Approved Jurisdictional Determination was rendered (#NWO-2017-110-PIE) However, the Project has expanded substantially to the south and east, encompassing several additional parcels totaling 647.0 acres within Sections 5, 7, 8, and 9 T001N:R11E (Study Area).

The topography within the Study Area is undulating, containing several hills and drainageways with an overall relief of approximately 160 feet (2,840-3,020 ft). Box Elder Creek is located approximately one mile north of the Study Area, flowing east towards its confluence with the Cheyenne River 20 miles to the southeast. Generally, the Study Area slopes to the north, but several hills and shallow basins divert surface run-off into ephemeral swales and minor drainageways which flow north towards Box Elder Creek. The existing landscape is a mixture of cropland, disturbed grassland, and drainageways with most of the land currently being used as cattle pasture. The most common plant species identified by Area M biologists during ground surveys included blue grama (*Bouteloua gracilis*), Kentucky bluegrass (*Poa pratensis*), buffalograss (*Bouteloua dactyloides*), western wheatgrass (*Pascopyrum smithii*), crested wheatgrass (*Agropyron cristatum*) and several low-lying forbs such as common dandelion (*Taraxacum officinale*) and fringed sage (*Artemesia frigida*). Woodlands and shrublands are absent from the Project, with the exception of small monotypic communities of willow (*Salix spp.*) and snowberry (*Symphoricarpos occidentalis*). Sparse cottonwoods (*Populus deltoids*), boxelder (*Acer negundo*), and willows occur in small clusters within some of the shallow swales and along drainageways. The Study Area is composed of private land with the exception of a parcel that is owned by Western Area Power Administration (WAPA) and contains the WAPA owned New Underwood Substation.

OFF-SITE REVIEW

Prior to fieldwork, Area M conducted a comprehensive desktop review of data sources to identify the presence/absence and extent of wetlands that could occur within the Study Area. Areas with wetland signatures, suggesting potential wetland conditions, were evaluated in greater detail during the field investigation. The following data sources were reviewed; the analysis of each data set is discussed in greater detail in the later part of this section.

- Hydrologic soil data
- Elevation Data
  - United States Geological Survey (USGS) topographic maps
- Mapped Wetlands/Waterbodies
  - U.S. Fish and Wildlife Services (USFWS) National Wetland Inventory (NWI)
  - National Hydrography Dataset (NHD)
- Historic and current aerial photographs
- Antecedent precipitation data

Soils

The Web Soil Survey (NRCS, 2019a) was accessed to summarize mapped soil types which occur within the Study Area. Map Units and their associated hydric attributes are presented in Table 1.

Table 1. All NRCS soil units within the Study Area (NRCS, 2019).

Map Unit	Soil type	% Slope	Depth to Water table (Inches)	Ponding/ Flooding Frequency	Hydrologic Group/ Hydric Rating	Acres within Study Area	Percent within Study Area
HpB	Hisle silt loam	0-6	>80	None/None	D/0	134.9	20.8
KyA	Kyle clay	0-2	>80	None/None	D/0	134.9	20.8
KyB	Kyle clay	2-6	>80	None/None	D/0	36.5	5.6
NuA	Nunn loam	0-2	>80	None/None	C/1	52.4	8.1
NuB	Nunn loam	2-6	>80	None/None	C/1	44.6	6.9
PeB	Pierre clay	2-6	>80	None/None	D/2	213.1	32.9
PeC	Pierre clay	6-9	>80	None/None	D/0	11.0	1.7
PeD	Pierre clay	6-20	>80	None/None	D/0	1.4	0.2
SzB	Swanboy clay	0-3	>80	None/None	D/0	18.1	2.8

Overall, the Study Area consists of an even mix of soils with hydric and non-hydric ratings. All soils are well-drained and contain hydric rating less than 2. Only two soil series within the Study Area, Lohmiller Silty Clay and Nunn loam, are categorized as hydric in Pennington County (Neilson, 1996). The full list of hydric soils components and attributes are listed in Appendix B.

Mapped Wetland Data

The NWI (USFWS, 2019) and NHD (USGS, 2019) data sets were reviewed to document suspected wetlands and/or waterbodies within the Study Area. Area M confirmed seven NWI features, six NHD flowlines, and one NHD waterbody occur within the Study Area (Appendix A). All wetland and waterbody features within these datasets appear to be hydrologically associated with Box Elder Creek.

Topographic Data

Elevation and topographic data from the USGS were reviewed within the Study to identify potential basins, drainageways, or depressional areas which are indicative of wetlands. The Project contains a mixture of steep topography, drainageways, eroded hillsides, and gently sloping flats. Several minor drainageways or swales run north or northeast towards their confluence with Box Elder Creek; these drainageways appear to contain possible natural and man-made basins or seeps that are indicative of wetlands (Appendix A). Depending on the amount, duration, and frequency of rain events, these drainageways may contain wetlands.

Historic Aerial Review

Aerial photography from 10 separate years was analyzed to identify areas within the Study Area that exhibited wetland hydrology signatures (Appendix C). Overall, consistent hydric signatures were identified within portions of minor drainageways (outlined in yellow in Appendix C). These areas were investigated in greater detail during the field delineation.

Off-site Summary

Overall, the off-site review suggests wetlands may occur within the shallow drainageways associated with Box Elder Creek. In additional, several apparent man-made stock ponds are located adjacent to or in-line with swales or drainageways (Appendix A). All potential wetland areas identified during this off-site review, as well as the remainder of the Study Area, were investigated in detail during the field delineation.

FIELD DELINEATION

Methodology

Wetlands identified during the off-site analysis were confirmed in the field using routine on-site delineation methods in accordance with the USACE Wetlands Delineation Manual (USACE, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0) (USACE, 2010). This included the characterization of vegetation, soils, and hydrology on-site. Wetlands are defined by the USACE as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." For an area to be delineated as a regulated wetland, the vegetative, hydrologic, and soil characteristics must all be present and consistent with federal classification criteria.

Transects were established in representative transition zones, perpendicular between suspected wetland and upland areas. Paired Survey Points were recorded along each transect, one in the upland and one in the wetland, in order to identify the wetland boundary. Wetland criteria were evaluated at each Survey Point and a Wetland Determination Form – Great Plains Region (Form) was completed. Additional Survey Points were collected within each unique vegetation community (if present) and/or potential wetland area to document and characterize baseline hydrology, soils, and vegetation within the Study Area. Determination of wetland type was based on the classification system developed by Cowardin et al. (1979). The entire Study Area was surveyed in the field to confirm the absence of additional wetlands.

The location and boundaries of wetland features identified by Area M during field surveys were recorded in the field using a Trimble Geoexplorer 6000 which typically achieves accuracy within 2 feet. Waterways detected within the Study Area were mapped by identifying the Ordinary High Water Mark (OHWM). A map depicting wetland and waterway boundaries, survey points, and transects is included in Appendix A. Representative photos of the Study Area are included in Appendix D. Field Forms are included in Appendix E.

Field Conditions

Area M conducted a field delineation within the Study Area October 8-11 for the western parcels and November 22-25, 2019 for the eastern parcels. Field conditions were variable, ranging from calm, clear days to persistent rain. The temperature varied between days but remained between 32- and 50-degrees Fahrenheit during surveys in October and November. As indicated during the off-site review, the majority of the Study Area is used as pastureland, and some fields were hayed (natural grasses) at the time of the surveys. Several fenced fields were used as cropland in 2019. Due to the surveys being conducted in the fall, only shrubs, trees, late-season grasses, and late-blooming forbs could be positively identified in the field. However, the ground was still unfrozen; soil and hydrology indicators were observable.

Antecedent Precipitation Conditions

Antecedent Precipitation conditions were evaluated using the NRCS Method for Evaluating Antecedent Moisture Conditions prior to the delineation to place field observations in context with recent precipitation. Based on using this three-month approach, precipitation was greater than normal during the field delineations on October 8-11, 2019 and November 22-25.

Table 2. Study Area precipitation data.

Month	Observed Precipitation	Monthly Average	Condition	Value	Weight*	Product*
August	3.17	1.56	Wet	3	1/-	3/-
September	1.47	1.29	Normal	2	2/1	4/2
October	2.45	1.42	Wet	3	3/2	9/6
November	1.09	0.61	Wet	3	-/3	-/9
						16/17

Source: (NOAA, 2019)
* October survey /November survey

Field Review Summary

Based upon this routine Level 2 Wetland Delineation, it is the professional opinion of Area M that ten wetlands occur within the Study Area (Table 3, Appendix A).

Table 3. Delineated Wetlands

Wetland[1]	Cowardin Classification Code	Acreage within Study Area	Lat	Long
Wetland 17	PEM1C	0.04	44.066034	-102.840597
Wetland 18	PEM1C	0.09	44.066608	-102.838861
Wetland 19	PUBhx	0.83	44.060656	-102.833476
Wetland 20	PEMC/R4SB5	0.98	44.06076	-102.831606
Wetland 21	PUBG/PEM1C	1.67	44.068953	-102.826508
Wetland 22	PEM1A/R4SB5	0.10	44.066888	-102.811164
Wetland 23	PEM1C/R4SB5	0.03	44.063758	-102.792983
Wetland 24	PEM1C	0.02	44.06377	-102.791216
Wetland 25	PEM1C	0.02	44.064095	-102.790164
Wetland 26	PEMC/R4SB5	0.05	44.063801	-102.789499

[1]Wetland numbering starts after last delineated wetland from previous report (Area M, 2017)

Wetland 17: PEM1C – 0.04 acres

Wetland 17 is a small depressional emergent wetland contained within an upland swale in the western portion of the Study Area. Aerial imagery suggests inundation and saturation is highly variable between years, ranging from being completely dry in some years to supplying intermittent water flow to the stock pond to the north. At SP 17-W, located on the edge of the feature, Standing Water (A1) was observed. Soils were reduced with redox concentration under a dark stratum, meeting the Depleted Matrix (F3) and Depleted Below Dark Surface (A11) indicators. The plant community was hydric, dominated by sedge (*Carex sp.*), curly dock (*Rumex crispus*), and *poa*. Several upland or FAC U species were also present, suggesting this wetland likely fluctuates in size relative to antecedent precipitation. At SP 17-U, located upland from the feature, wetland hydrology indicators were absent, and soils were non-hydric. The plant community was also non-hydric, dominated by Kentucky bluegrass and buffalograss. The wetland boundary was mapped by following the perimeter of the sedge community.

Wetland 18: PEM1C – 0.09 acres

Wetland 18 is a small depressional emergent wetland contained within an upland swale in the western portion of the Study Area (within the same broken channel as Wetland 17). Aerial imagery suggests inundation and saturation is highly variable between years, ranging from being completely dry in some years to supplying intermittent water flow to the stock pond to the north. At SP 18-W, located on the edge of the feature, Standing Water (A1) was observed. Soils were reduced with redox concentration under a dark stratum, meeting the Depleted Matrix (F3) and Depleted Below Dark Surface (A11) indicators. The plant community was hydric, dominated by sedge, but several upland or FAC U species were present,

suggesting this wetland likely fluctuates in size relative to antecedent precipitation. At SP 18-U, located upland from the feature, wetland hydrology indicators were absent, and soils were non-hydric. The plant community was also non-hydric, dominated by Kentucky bluegrass, curlycup gumweed (*Grindelia squarrosa*), sweet clover (*Meliotus officinale*), and buffalograss. The wetland boundary was mapped by following the perimeter of the sedge community and distinct topographic margin.

Wetland 19: PUBhx – 0.83 acres

Wetland 19 is a small stock pond created from the impoundment of a minor/ephemeral drainage (Wetland 20) associated with Box Elder Creek. Aerial imagery suggests this reservoir contains water most years. At SP 19-W, located at the OHWM, surface water was present was present (A1). Aerial imagery demonstrates this area to be ponded in all reviewed imagery (B7). Soils were dark at the surface but reduced with redox concentrations at approximately 3 inches (A11, F3). The plant community was hydric, dominated by sedge and curly dock. The wetland boundary was mapped by following the OHWM. Wetland 19 was significantly disturbed due to the cattle use.

Wetland 20: PEMC/R4SB5 – 0.98 acres

Wetland 20 includes an intermittent to perennial tributary to Box Elder Creek and associated wetland fringe within the southern portion of the Study Area. Wetland 20 displayed both lentic and lotic qualities during the survey, with large pools of water and saturated soils both inside and outside of the channel. At SP 20-W, located within the wetland fringe adjacent to the channel, Saturated Soils (A2) and a High Water Table (A3) were observed at two inches and six inches, respectively. Soils were reduced with redox concentration under a dark stratum, meeting the Depleted Matrix (F3) and Depleted Below Dark Surface (A11) indicators. The plant community was hydric, dominated by prairie cordgrass (*Spartina pectinata*) at the SP, but other hydric plants (e.g. *Typha sp.*) were prevalent within adjacent portions of the wetland. At SP 20-U, located upland from the wetland fringe, wetland hydrology indicators were absent, and soils were non-hydric. The plant community was also non-hydric, dominated by Kentucky bluegrass, western wheatgrass, leadplant (*Amorpha canescens*), and dandelion (residual). The wetland boundary was mapped by following the perimeter of the distinct wetland plant community (mostly cordgrass) and presence of saturated soils.

Wetland 21: PUBG/PEM1C– 1.67 acres

Wetland 21 is a large, ponded basin in the northcentral portion of the Study Area. Wetland 21 appears to be isolated, as no inlets or outlets were identified during the survey. The wetland includes both a pond and wetland fringe, with a community of young boxelder and willow trees surrounding the feature. At SP 21-W, located within the wetland fringe and adjacent to the pond, Saturated Soils (A2) and a High Water Table (A3) were observed at five inches and eight inches, respectively. Soils were reduced with redox concentration under a dark stratum, meeting the Depleted Matrix (F3) and Depleted Below Dark Surface (A11) indicators. The plant community was hydric, dominated by green bulrush (*Scirpus atrovirens*), prairie cordgrass, boxelder, and willow (*Salix alba*). At SP 21-U, located on the relatively steep bank surrounding the wetland fringe, wetland hydrology indicators were absent, and soils were non-hydric. The plant community was also non-hydric, dominated by disturbed upland species including sweet clover, crested wheatgrass, and Canada thistle (*Cirsium arvense*). The wetland boundary was mapped by following the perimeter of the distinct transition between upland and wetland plant communities.

Wetland 22: PEM1A/R4SB5 – 0.10 acres

Wetland 22 includes an intermittent to perennial tributary to Box Elder Creek and associated wetland fringe within the central portion of the Study Area. The wetland is mostly contained within the channel but extends outside of the shallow banks and into the ditch to the west as the stream meets a culvert at its northern extent. Wetland 22 displayed both lentic and lotic qualities during the survey, with large pools of water and a gently flowing channel. This wetland/waterbody is located downstream of Wetland 20. At SP 22-W, located within the wetland fringe adjacent to the channel, Saturated Soils (A2) and a High Water Table (A3) were observed at eight inches and twelve inches, respectively. Soils were reduced with redox, meeting the Depleted Matrix (F3) indicator. The plant community was hydric, dominated by prairie cordgrass and Kentucky bluegrass. At SP 22-U, located upland from the wetland fringe, wetland hydrology indicators were absent, and soils were non-hydric. The plant community was also non-hydric, dominated by crested wheatgrass, sweet clover, and curlycup gumweed. The wetland boundary was mapped by following the OHWM of the channel and expanding to include saturated soils and wetland plant species along the southern edge of the road at the culvert. The wetland was mapped west along the ditch to encompass the extent of cordgrass.

Wetland 23: PEM1C/R4SB5 – 0.03 acres

Wetland 23 is an intermittent drainage associated with Box Elder Creek within the southeastern portion of the Study Area. Wetland 23 did not contain flowing water at the time of the survey, but likely transmits large volumes after rainfall and during spring melt. At SP 23-W, located on the edge of the narrow channel, Saturated Soils (A2) and a High Water Table (A3) were observed at five inches and ten inches, respectively. Soils were reduced with redox concentration, meeting the Depleted Matrix (F3) indicator. The plant community was hydric, dominated by prairie cordgrass and bluejoint (*Calamagrostis canadensis*). At SP 23-U, located just outside of the channel, wetland hydrology indicators were absent, and soils were non-hydric. The plant community was also non-hydric, dominated by Kentucky bluegrass, western wheatgrass and sweet clover. The wetland boundary was mapped by following the perimeter of the distinct wetland plant community and natural topographic transition between convex and concave landform.

Wetland 24: PEM1C – 0.02 acres

Wetland 24 is a small depressional emergent wetland contained within an upland swale in the southeastern portion of the Study Area (within the same broken swale as Wetland 25). This wetland is contained within an eroded depression within the swale, which may have historically been part of the main channel of the drainage to the south. The swale is upland throughout the majority of its extent within the Study Area, except for Wetland 24 and 25. At SP 24-W, located on the edge of the eroded feature, Saturated Soils (A2) and a High Water Table (A3) were observed at three inches and twelve inches, respectively. Soils were reduced with redox concentration, meeting the Depleted Matrix (F3) indicator. The plant community was hydric and dominated by bluejoint and Kentucky bluegrass. At SP 24-U, located on a flat area adjacent to the wetland, wetland hydrology indicators were absent, and soils were non-hydric. The plant community was also non-hydric, dominated by western wheatgrass, crested wheatgrass, and sweet clover. The wetland boundary was mapped by following the perimeter of the bluejoint community and distinct topographic transition.

Wetland 25: PEM1C – 0.02 acres

Wetland 25 is a depressional emergent wetland contained within an upland swale in the southeastern portion of the Study Area (within the same broken swale as Wetland 24). This wetland is contained within an eroded depression within the swale, which may have historically been part of the main channel of the drainage to the south. The swale is upland throughout the majority of its extent within the Study Area, except for Wetland 24 and 25. At SP 25-W, located within the eroded depression, Saturated Soils (A2) and a High Water Table (A3) were observed at four inches and ten inches, respectively. Soils were reduced with redox concentration, meeting the Depleted Matrix (F3) indicator. The plant community was hydric, dominated by bluejoint, prairie cordgrass, and Kentucky bluegrass. At SP 25-U, located on the slope adjacent to the wetland, wetland hydrology indicators were absent, and soils were non-hydric. The plant community was also non-hydric, dominated by western wheatgrass, crested wheatgrass, and sweet clover. The wetland boundary was mapped by following the perimeter of the bluejoint/cordgrass community and distinct topographic transition.

Wetland 26: PEM1C/R4SB5 – 0.03 acres

Wetland 26, located downstream from Wetland 23, is an intermittent drainage associated with Box Elder Creek within the southeastern portion of the Study Area. The channel encompassing Wetland 26 was flattened out at this point on the landscape and water was ponded. At SP 26-W, located on the edge of the wide ponded area, Surface Water (A1) was present. Several aquatic insects were also observed swimming within the wide pool (B13). Soils were reduced with redox concentration, meeting the Depleted Matrix (F3) indicator. The plant community was hydric. Dominant species included prairie cordgrass and cattail (*Typha angustifolia*) At SP 26-U, located on the edge of the ponded area, wetland hydrology indicators were absent, and soils were non-hydric. The plant community was also non-hydric, dominated by a monoculture of blue grama. The wetland boundary was mapped by following the perimeter of the distinct wetland plant community and very steep topographic transition between convex and concave landform. This wetland was extremely degraded due to heavy cattle grazing.

Upland Areas:

Upland areas within the Study Area were predominantly mid-grass prairie used as pastureland/hay, agricultural fields (winter wheat and alfalfa), and upland swales. Areas identified as depressions, or which had hydric signatures in at least one historic slide, were visited in the field and corresponding SP's were recorded. Most areas did not meet any wetland criteria (soils, vegetation hydrology).

RESULTS AND RECOMMENDATIONS

Based upon this routine Level 2 Wetland Delineation, it is the professional opinion of Area M that the Study Area contains **ten** features that satisfy the criteria to be wetlands pursuant to the Army Corps of Engineers' 1987 Manual with subsequent clarification memoranda and pursuant to confirmation by the USACE (Appendix A). Note that only the USACE which regulate activates impacting wetlands/waterbodies, has final authority over aquatic resource extent and jurisdictional status.

It is the professional opinion of Area M that Wetlands 19, 20, 22, 23, and 26 are jurisdictional under Section 404 of the Clean Water Act due to their hydrologic connectivity to Box Elder Creek. Wetlands 17, 18, 21,

24, and 25 are likely not jurisdiction under Section 404 due to their isolation or lack of hydrologic significance. This Jurisdictional Opinion is based on the results of the desktop and field studies and should not be used as proof of wetland presence/absence, extent, or jurisdiction without written concurrence from the USACE. Note that local government units and zoning authorities may impose additional restrictions on wetland disturbance.

Note that this wetland delineation is based on scientific standards and protocols set forth by the USACE and NRCS and represents wetland status and extent based on the conditions within the Study Area at the time of the delineation. These boundaries are subject to approval and amendment after review by the appropriate regulatory agencies.

REFERENCES

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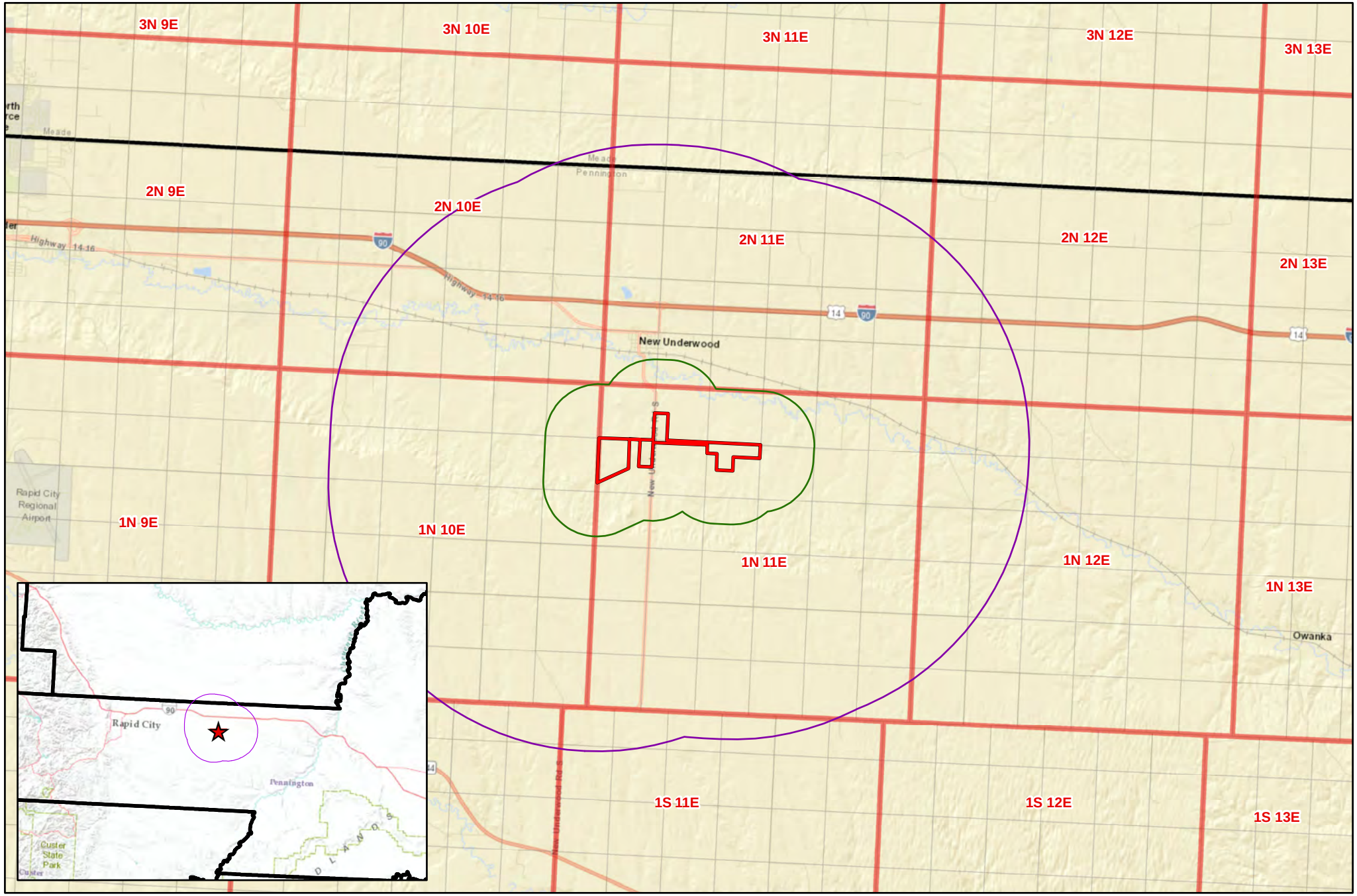
Appendix A:

Maps



Project Location

Wild Springs Solar

Pennington County, South Dakota

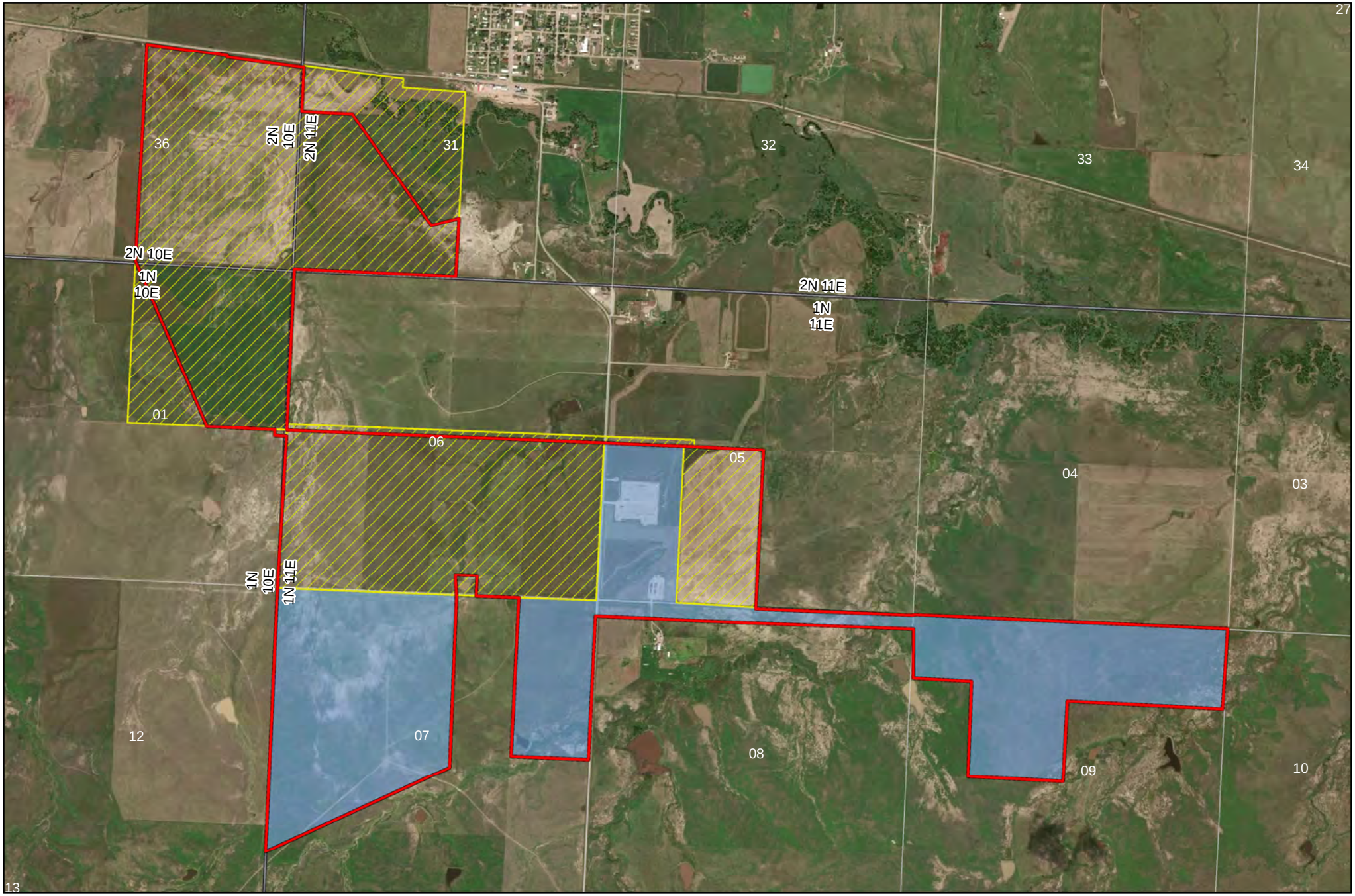
- Study Area
- Project Location
- 1-mile Buffer
- 5-Mile Buffer
- Township Boundary
- Section Boundary
- County Boundary

0 6,250 12,500 25,000 Feet

1:150,000

N

AREA M



Overview Map

Wild Springs Solar

Pennington County, South Dakota

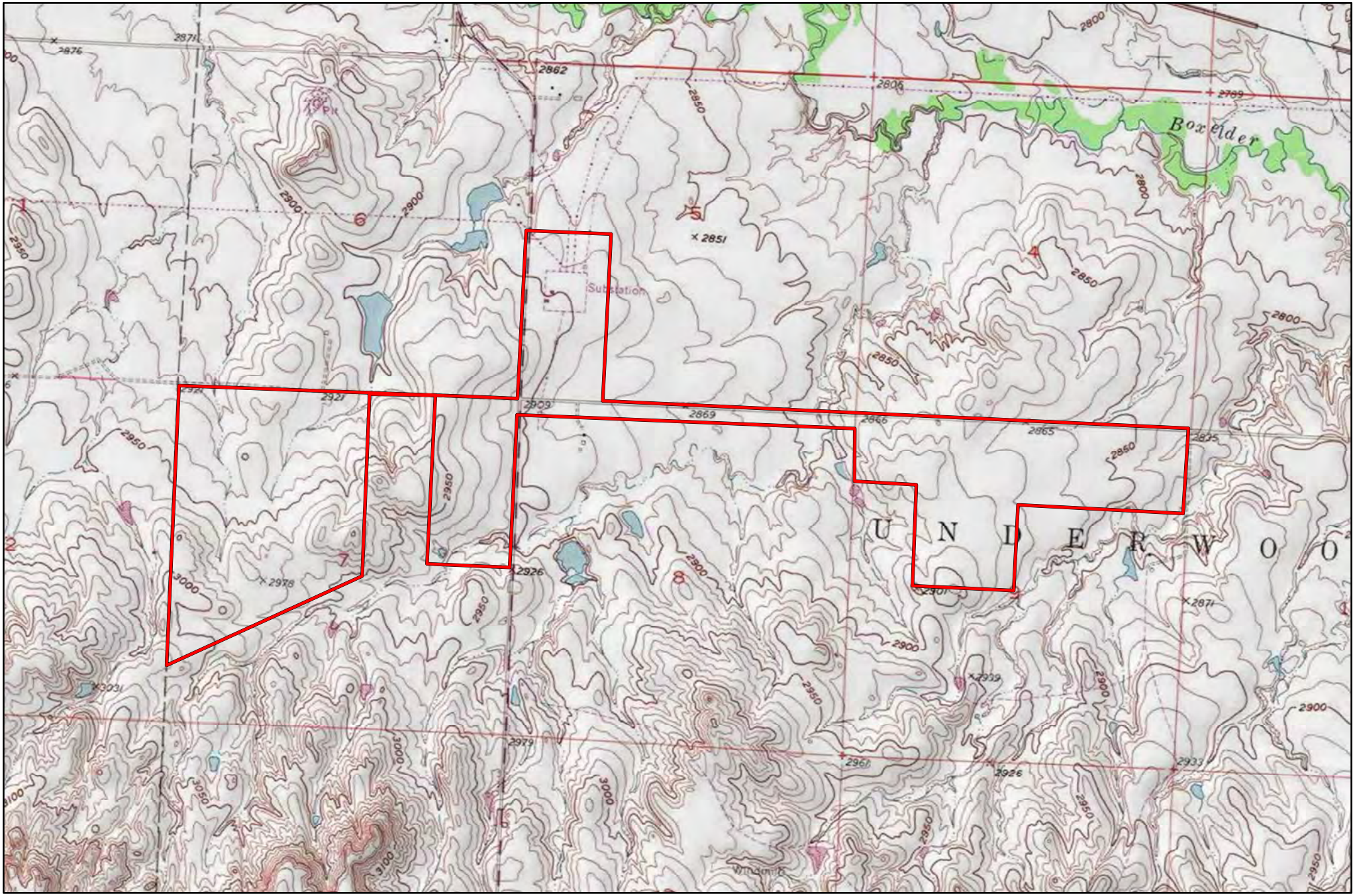
- Study Area
- 2017 Study Area - AJD Issued
- Section Boundary
- Total Project Area
- Township Boundary

0 1,050 2,100 4,200

1:25,500 Feet

N

AREA M



Topographic Map (1:24,0000)

Wild Springs Solar

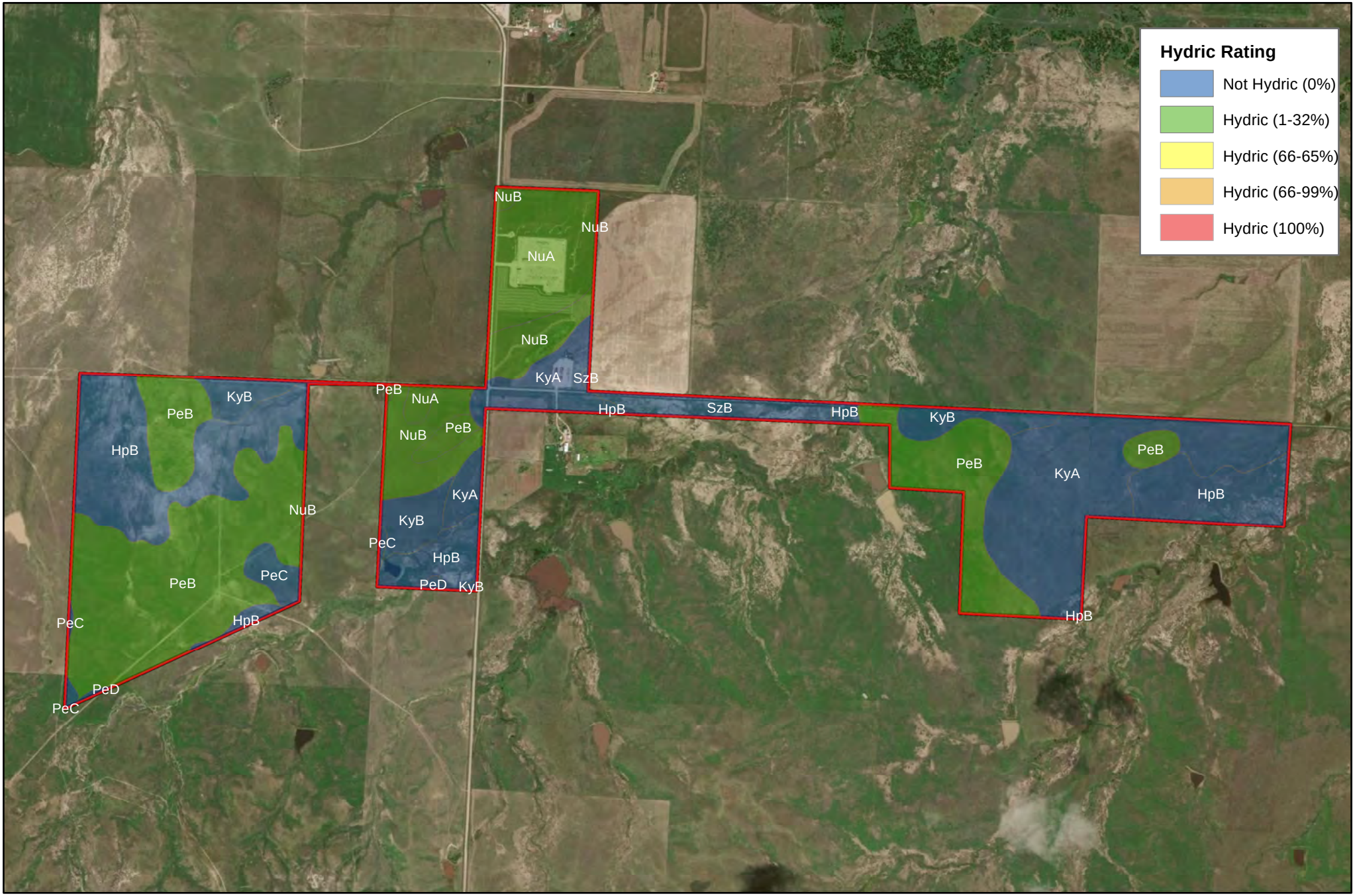
Study Area

Pennington County, South Dakota

N

0 1,000 2,000 4,000
1:24,000 Feet

AREA M



Soils Map

Study Area

Wild Springs Solar

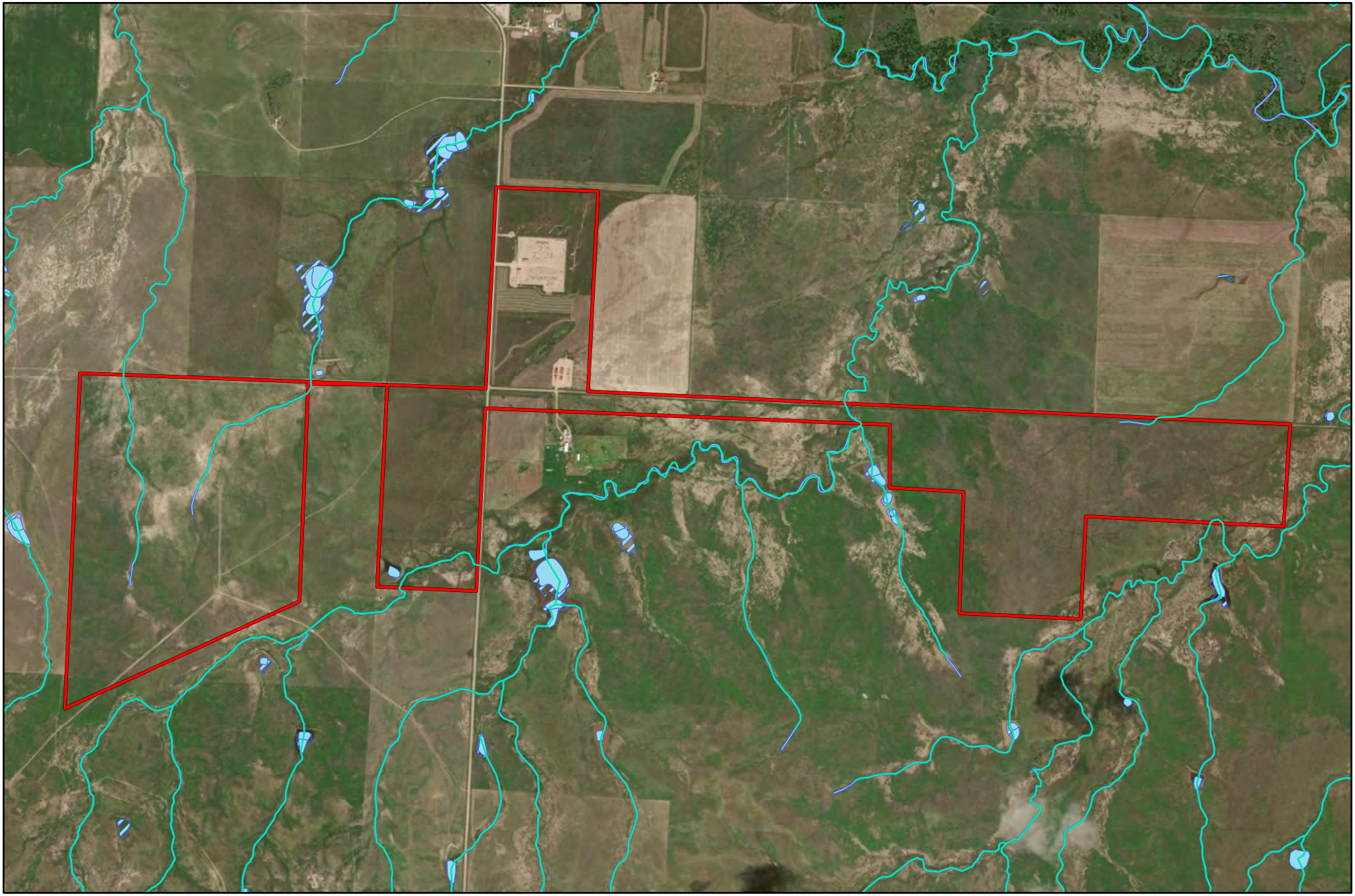
Pennington County, South Dakota

N

AREA M

0 800 1,600 3,200

1:20,020 Feet



Aerial Map

Wild Springs Solar

Pennington County, South Dakota

Study Area

NWI Wetland

NHD Flowline

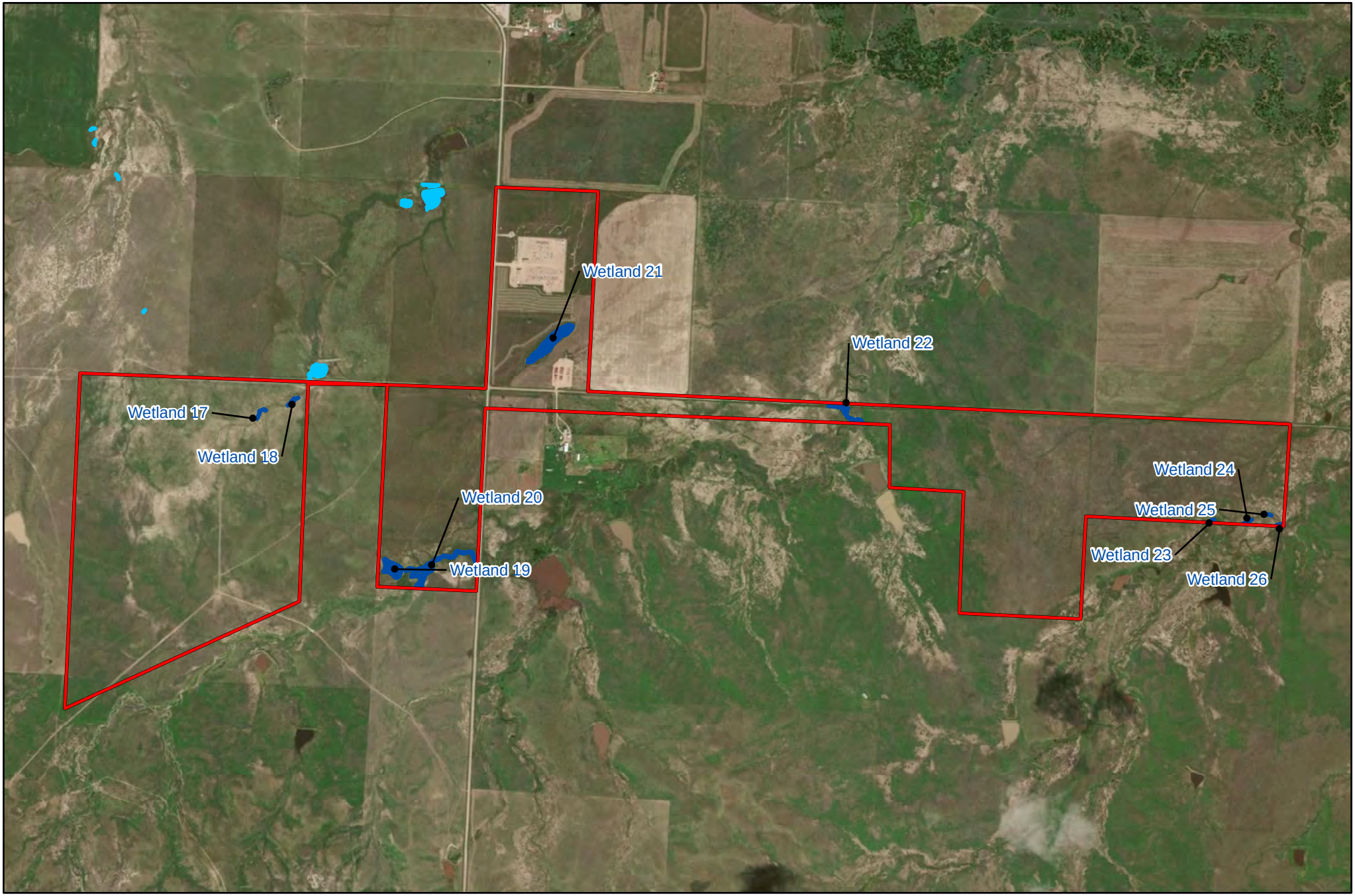
NHD Waterbody

N

0 800 1,600 3,200

1:20,020 Feet

AREA M



Wetland Delineation Overview Map

Wild Springs Solar

Pennington County, South Dakota

Study Area

Previously-delineated Wetland

Delineated Wetland

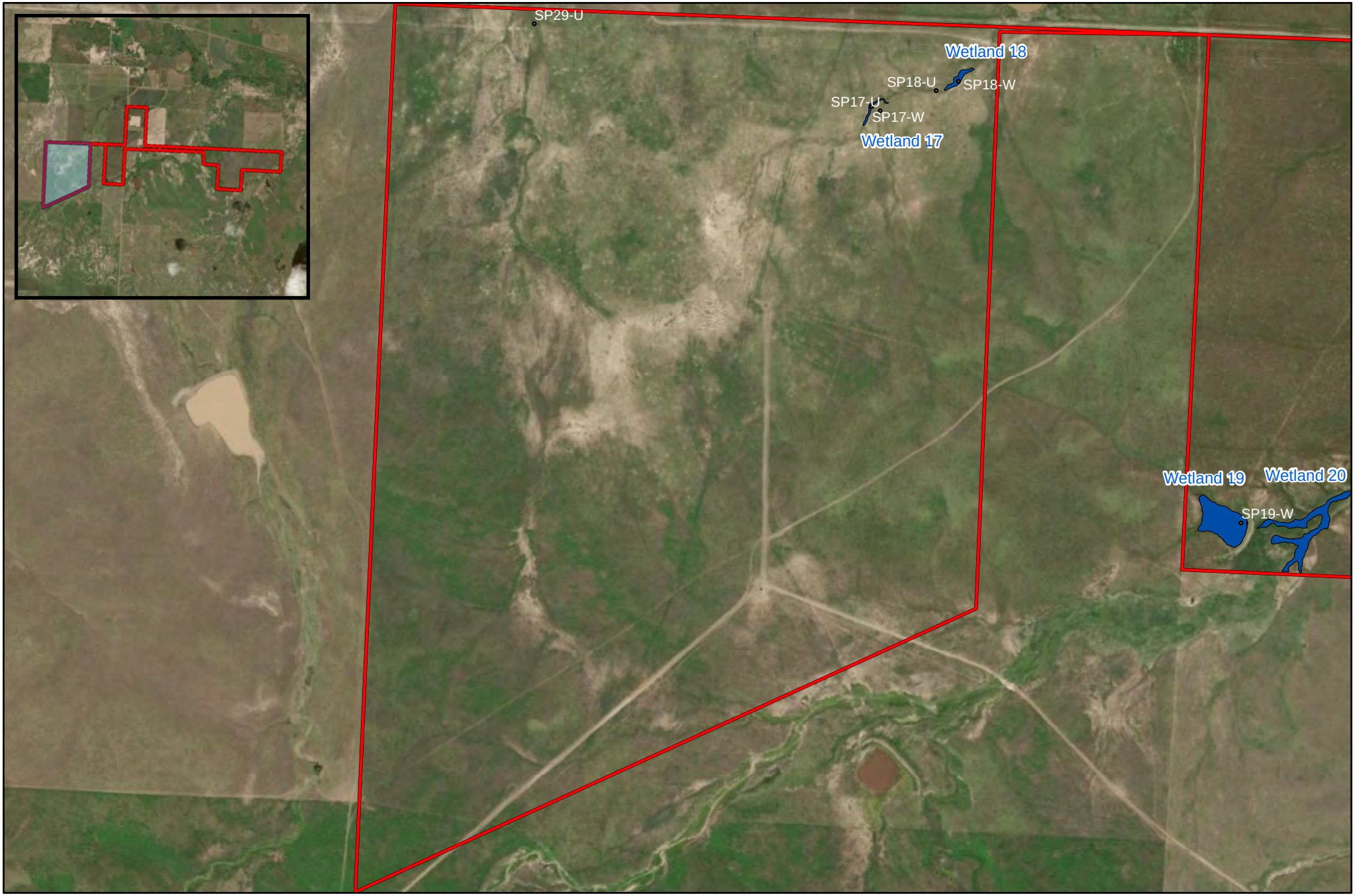
Wetland boundaries enlarged for display

0 800 1,600 3,200

1:20,020 Feet

N

AREA M



Delineation Inset Map

Wild Springs Solar

Pennington County, South Dakota

Study Area

Delineated Wetland

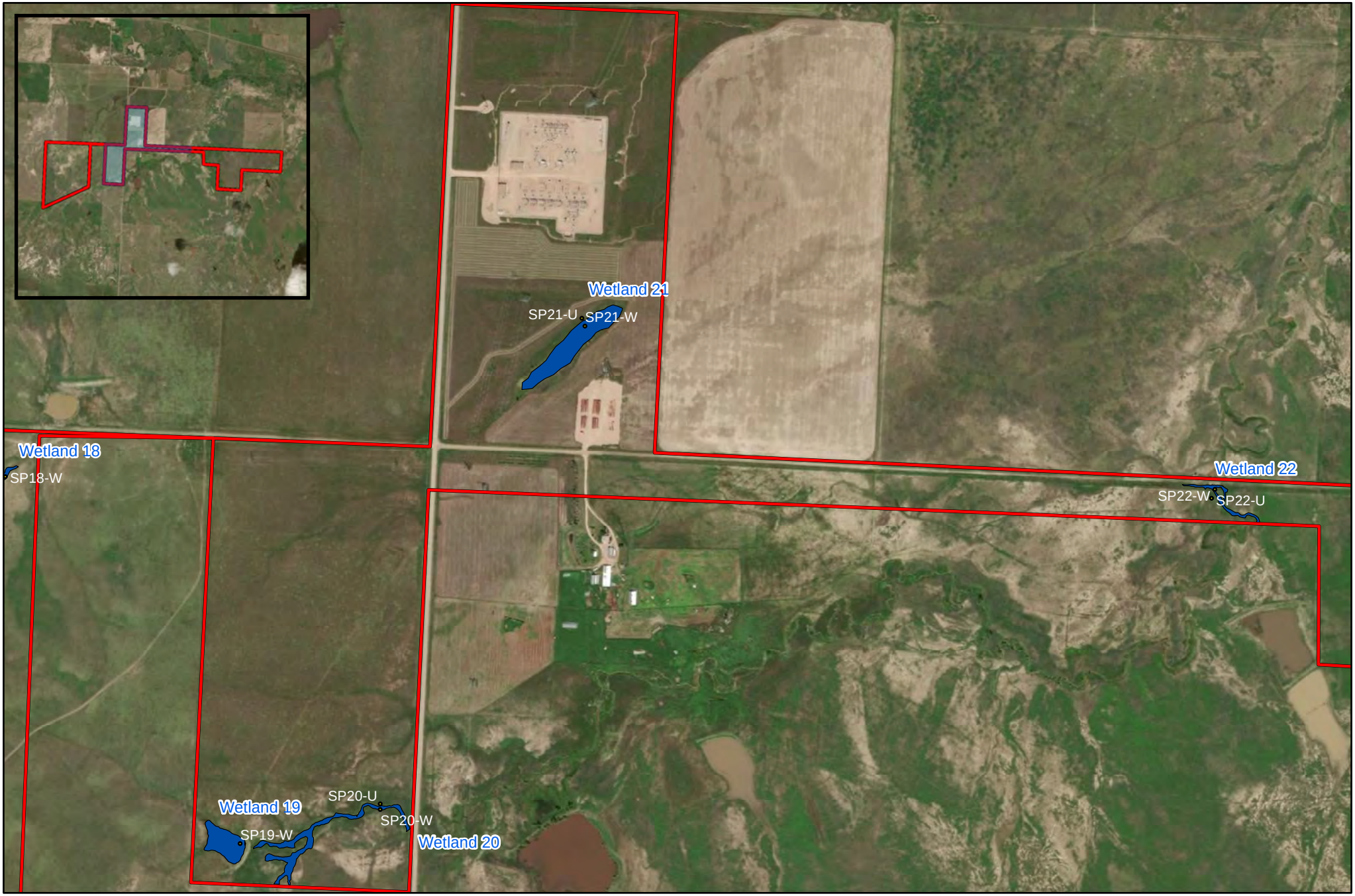
Wetland Sampling Point

0 320 640 1,280

1:7,560 Feet

N

AREA M



Delineation Inset Map

Wild Springs Solar

Pennington County, South Dakota

Study Area

Delineated Wetland

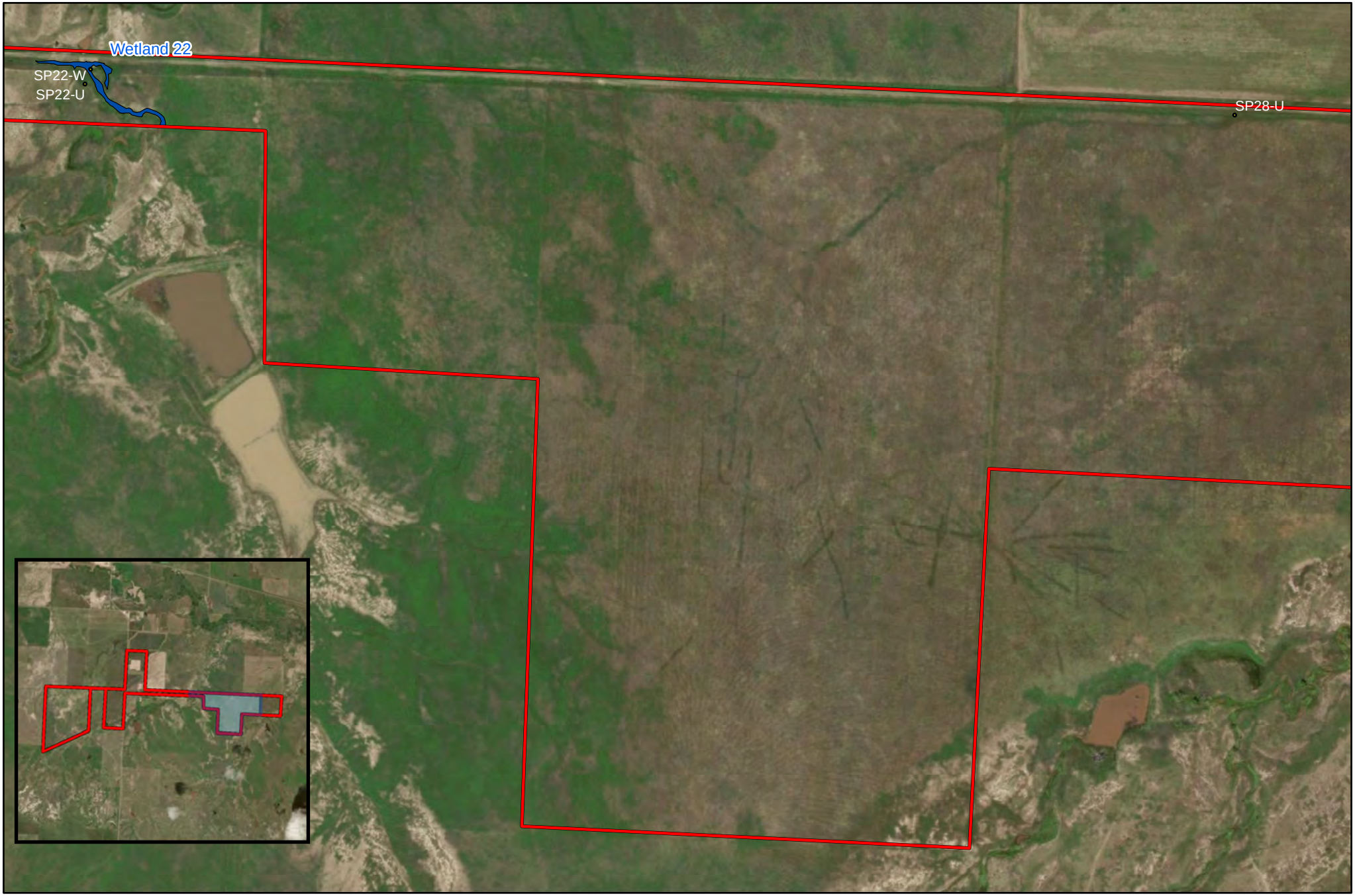
Wetland Sampling Point

0 385 770 1,540

1:9,100 Feet

N

AREA M



Delineation Inset Map

Wild Springs Solar

Pennington County, South Dakota

Study Area

Delineated Wetland

Wetland Sampling Point

0 230 460 920

1:5,420 Feet

N

AREA M

Delineation Inset Map

Wild Springs Solar

Pennington County, South Dakota

Study Area

Delineated Wetland

Wetland Sampling Point

0 100 200 400

1:2,410 Feet

N

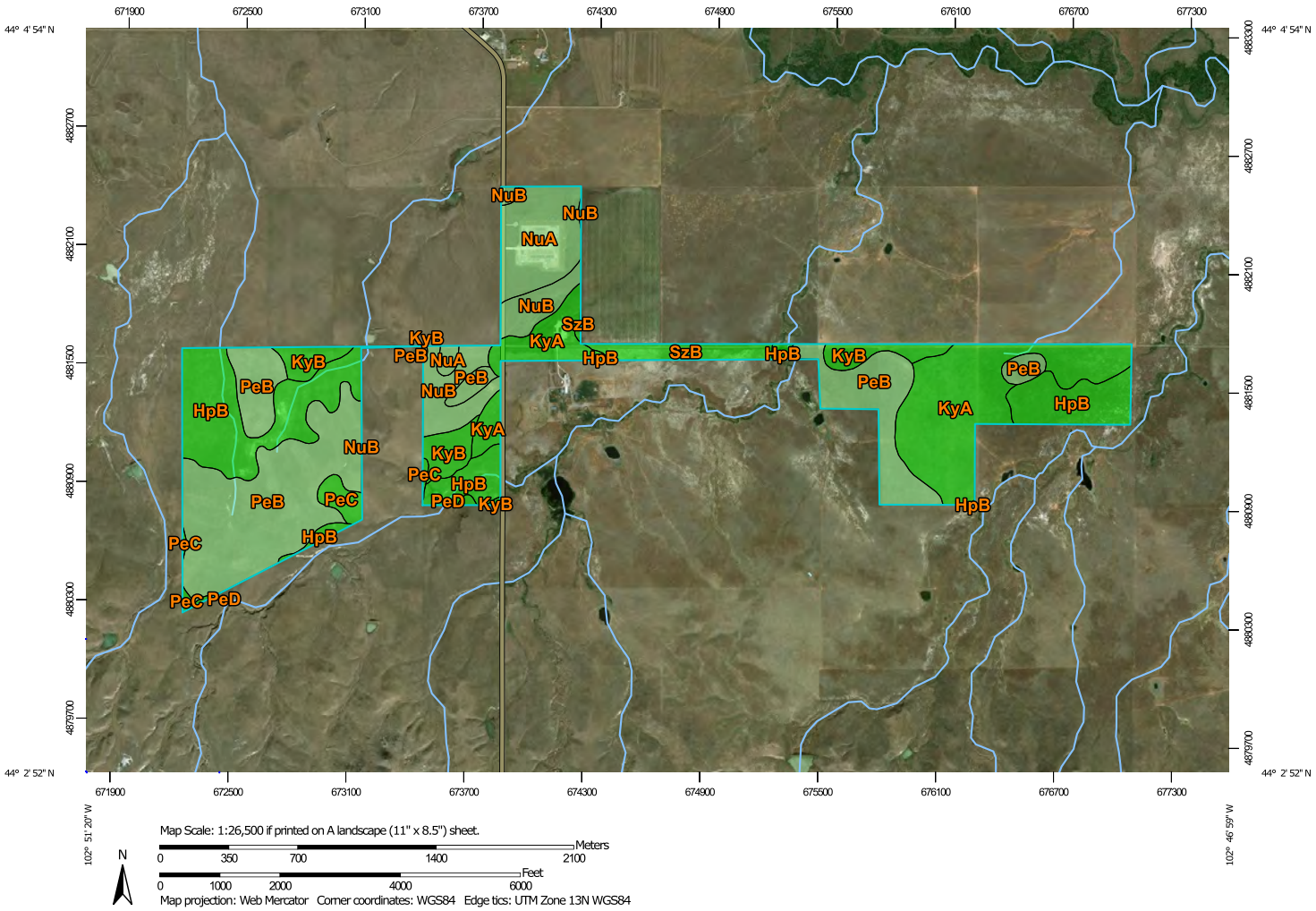
AREA M

Appendix B:

Soils Report

Hydric Rating by Soils Unit and Hydric Soil List – All components

Hydric Rating by Map Unit—Custer and Pennington Counties Area, Prairie Parts, South Dakota
(Wetland_PA)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Custer and Pennington Counties Area, Prairie Parts, South Dakota
Survey Area Data: Version 11, Sep 17, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 23, 2015—Mar 4, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
HpB	Hisle silt loam, 0 to 6 percent slopes	0	134.9	20.8%
KyA	Kyle clay, 0 to 2 percent slopes	0	134.9	20.9%
KyB	Kyle clay, 2 to 6 percent slopes	0	36.5	5.6%
NuA	Nunn loam, 0 to 2 percent slopes	1	52.4	8.1%
NuB	Nunn loam, 2 to 6 percent slopes	1	44.6	6.9%
PeB	Pierre clay, 2 to 6 percent slopes	2	213.1	32.9%
PeC	Pierre clay, 6 to 9 percent slopes	0	11.0	1.7%
PeD	Pierre clay, 6 to 20 percent slopes	0	1.4	0.2%
SzB	Swanboy clay, 0 to 3 percent slopes	0	18.1	2.8%
Totals for Area of Interest			**647.0**	**100.0%**

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

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Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Hydric Soil List - All Components

This table lists the map unit components and their hydric status in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2). Definitions for the codes are as follows:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
   B. Show evidence that the soil meets the definition of a hydric soil;
3. Soils that are frequently ponded for long or very long duration during the growing season.
   A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
   B. Show evidence that the soil meets the definition of a hydric soil;
4. Map unit components that are frequently flooded for long duration or very long duration during the growing season that:
   A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
   B. Show evidence that the soil meets the definition of a hydric soil;

Hydric Condition: Food Security Act information regarding the ability to grow a commodity crop without removing woody vegetation or manipulating hydrology.

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. Doc. 2012-4733 Filed 2-28-12. February, 28, 2012. Hydric soils of the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Vasilas, L.M., G.W. Hurt, and C.V. Noble, editors. Version 7.0, 2010. Field indicators of hydric soils in the United States.

Report—Hydric Soil List - All Components

Hydric Soil List - All Components–SD606-Custer and Pennington Counties Area, Prairie Parts, South Dakota					
Map symbol and map unit name	**Component/Local Phase**	**Comp. pct.**	**Landform**	**Hydric status**	**Hydric criteria met (code)**
HpB: Hisle silt loam, 0 to 6 percent slopes	Hisle	90	Hillslopes	No	—
	Kyle	3	Hillslopes	No	—
	Pierre	3	Hillslopes	No	—
	Samsil	3	Ridges	No	—
	Slickspots	1	Hillslopes	No	—
KyA: Kyle clay, 0 to 2 percent slopes	Kyle	85	Alluvial fans,terraces	No	—
	Lohmiller-Rarely flooded	5	Flood plains	No	—
	Hisle	5	Hillslopes,terraces	No	—
	Swanboy	5	Terraces	No	—
KyB: Kyle clay, 2 to 6 percent slopes	Kyle	85	Terraces,alluvial fans	No	—
	Hisle	5	Hillslopes,terraces	No	—
	Swanboy	5	Terraces	No	—
	Pierre	5	Hillslopes	No	—
NuA: Nunn loam, 0 to 2 percent slopes	Nunn	90	Fans,terraces	No	—
	Beckton	5	Alluvial fans	No	—
	Recluse	4	Fans,terraces	No	—
	Hoven	1	Playas	Yes	2,3
NuB: Nunn loam, 2 to 6 percent slopes	Nunn	90	Terraces,fans	No	—
	Beckton	5	Alluvial fans	No	—
	Recluse	4	Fans,terraces	No	—
	Hoven	1	Playas	Yes	2,3
PeB: Pierre clay, 2 to 6 percent slopes	Pierre	85	Hillslopes	No	—
	Kyle	4	Alluvial fans,terraces	No	—
	Hisle	3	Plains,terraces	No	—
	Lismas	2	Ridges	No	—
	Hoven	2	Playas	Yes	2,3
	Samsil	2	Ridges	No	—
	Stetter	2	Flood plains,swales	No	—
PeC: Pierre clay, 6 to 9 percent slopes	Pierre	85	Plains	No	—
	Hisle	4	Swales	No	—

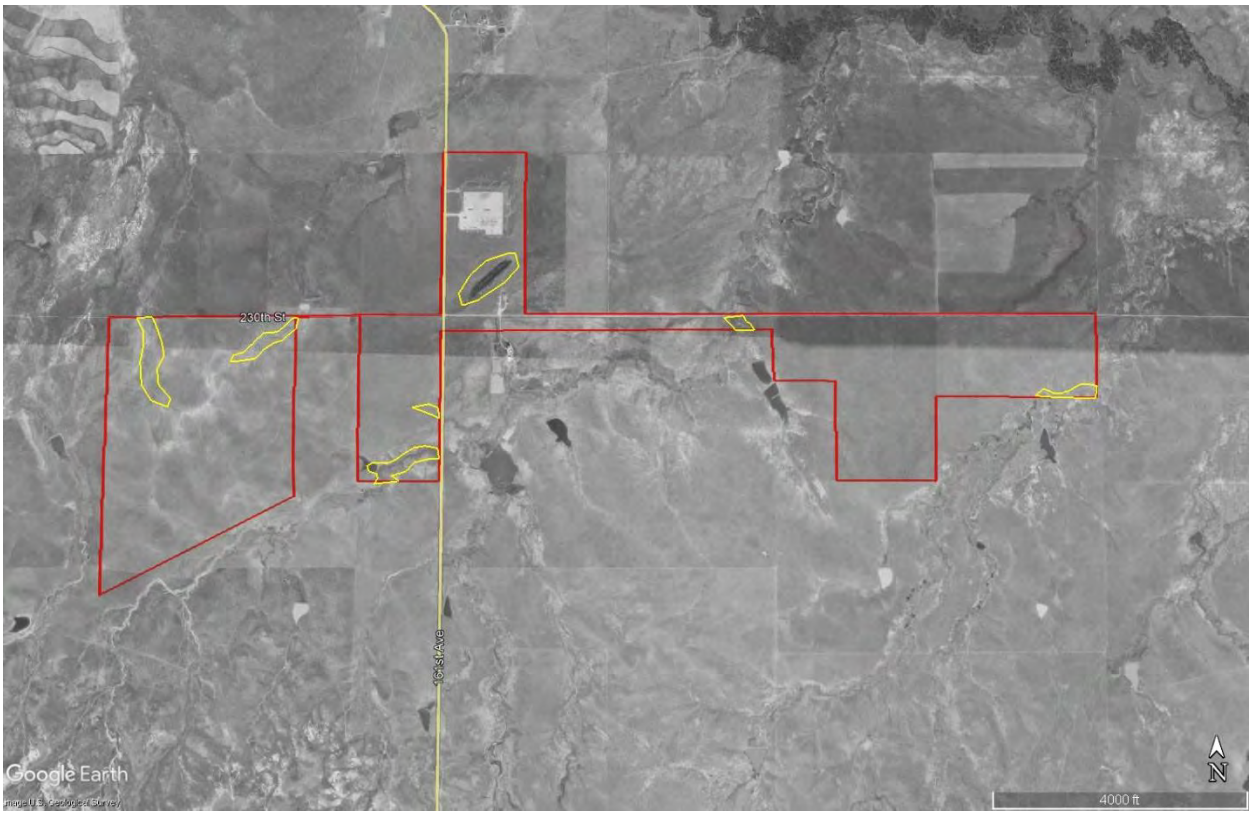
Hydric Soil List - All Components–SD606-Custer and Pennington Counties Area, Prairie Parts, South Dakota					
Map symbol and map unit name	**Component/Local Phase**	**Comp. pct.**	**Landform**	**Hydric status**	**Hydric criteria met (code)**
	Kyle	4	Plains	No	—
	Samsil	4	Plains	No	—
	Lohmiller	3	Drainageways	No	—
PeD: Pierre clay, 6 to 20 percent slopes	Pierre	85	Hillslopes	No	—
	Kyle	6	Alluvial fans,terraces	No	—
	Samsil	3	Ridges	No	—
	Stetter	2	Flood plains,swales	No	—
	Hisle	2	Terraces,hillslopes	No	—
	Lismas	2	Ridges	No	—
SzB: Swanboy clay, 0 to 3 percent slopes	Swanboy	85	Terraces	No	—
	Kyle	7	Terraces,alluvial fans	No	—
	Hisle	3	Alluvial fans,terraces	No	—
	Slickspots	3	Terraces	No	—
	Stetter	2	Flood plains	No	—

Data Source Information

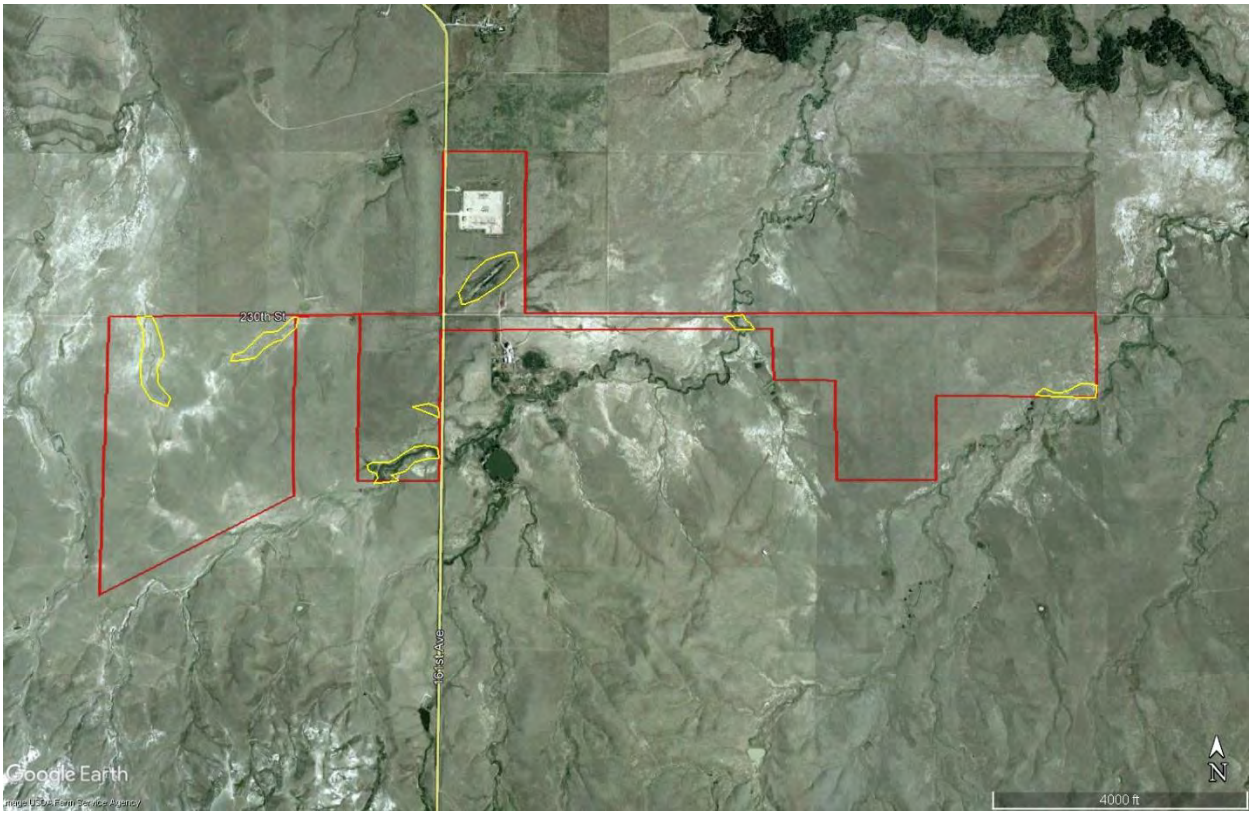
Soil Survey Area: Custer and Pennington Counties Area, Prairie Parts, South Dakota
Survey Area Data: Version 11, Sep 17, 2019

Appendix C:

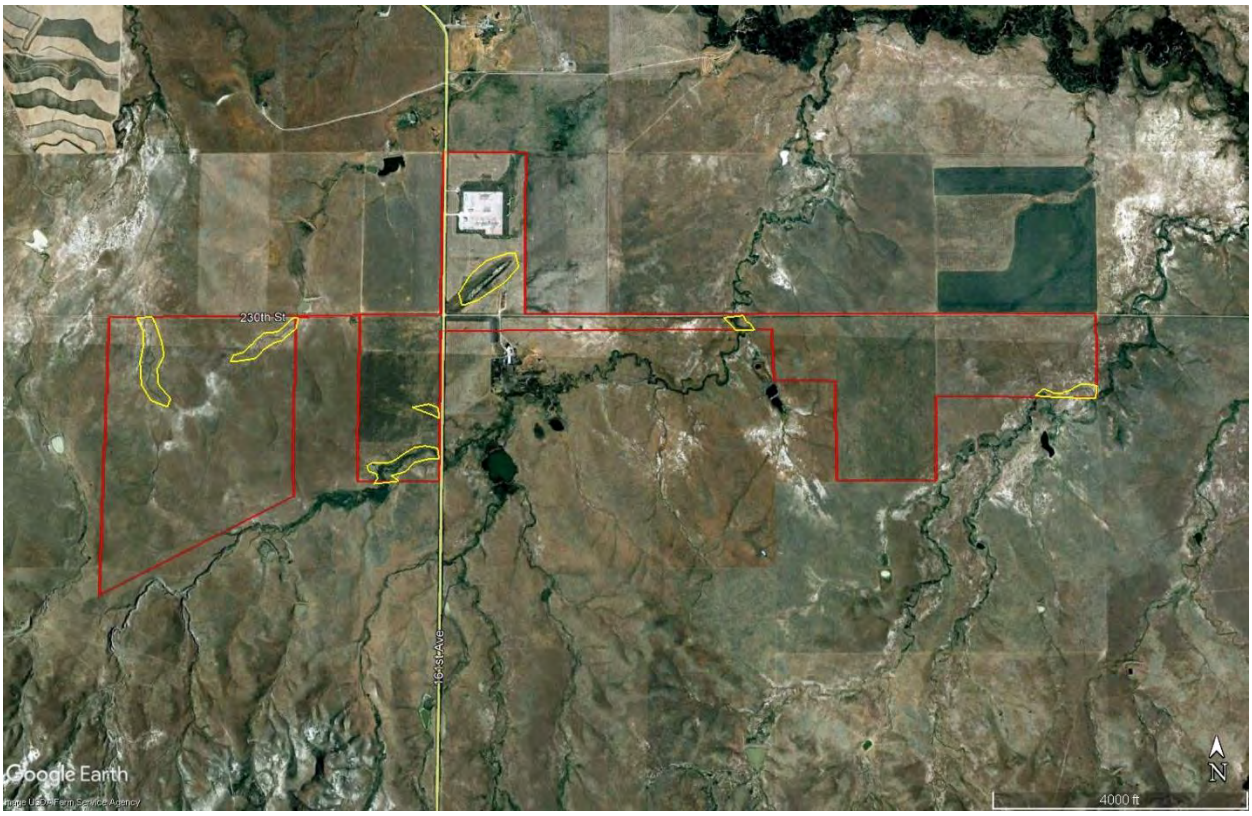
Aerial Imagery Review



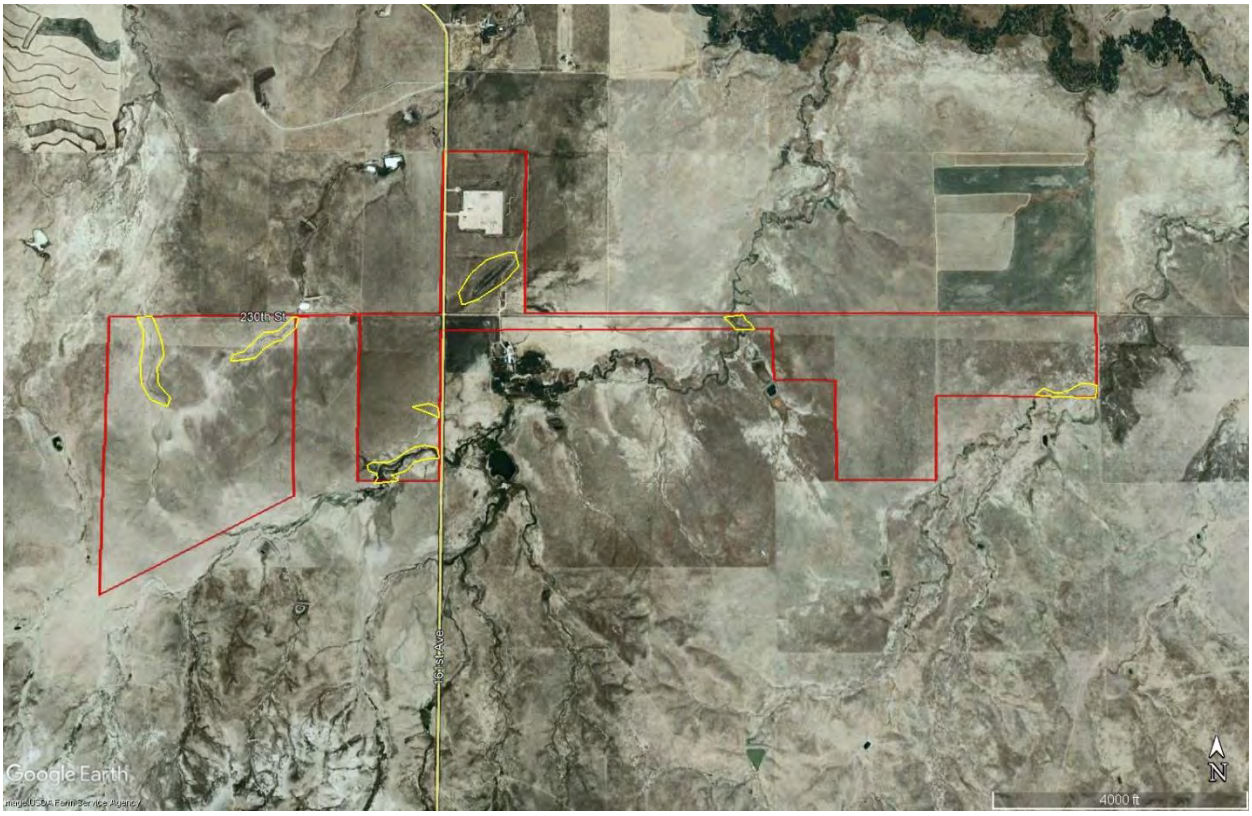
September 1997



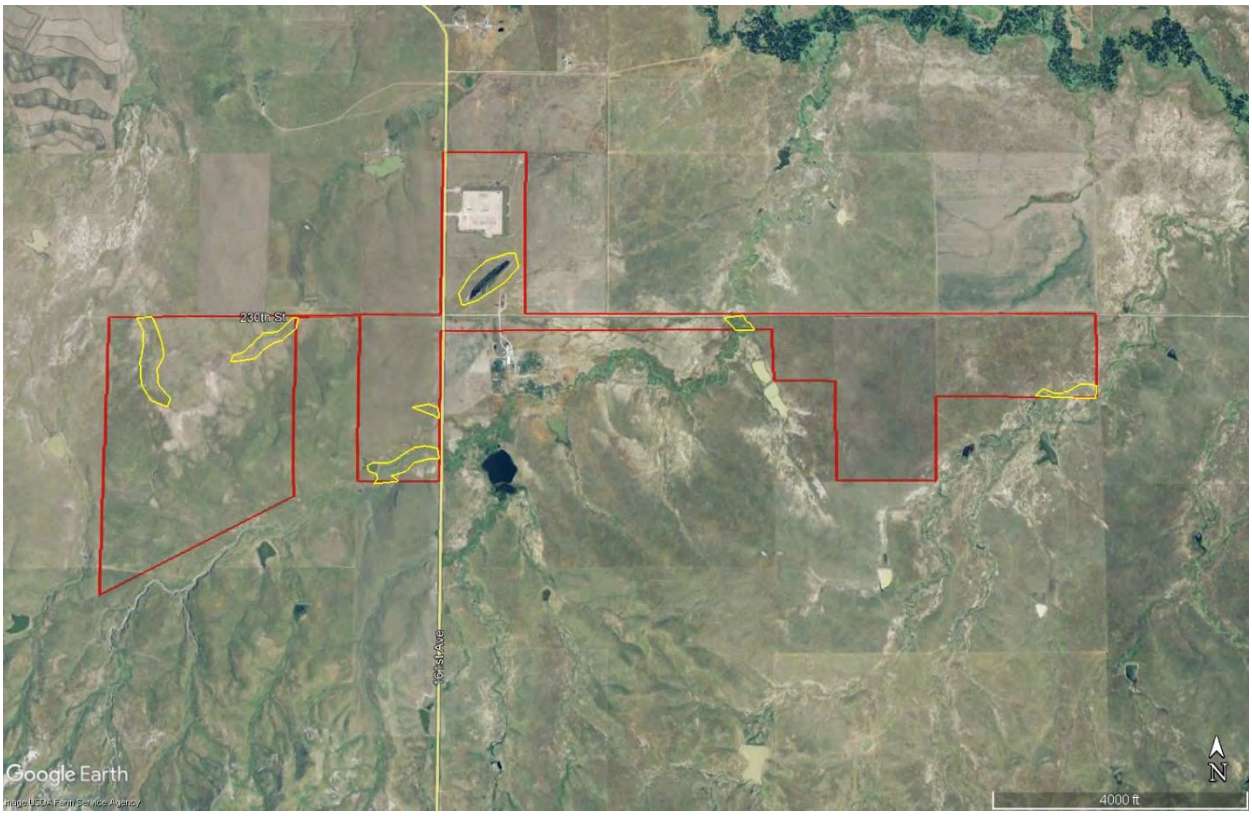
March 2003



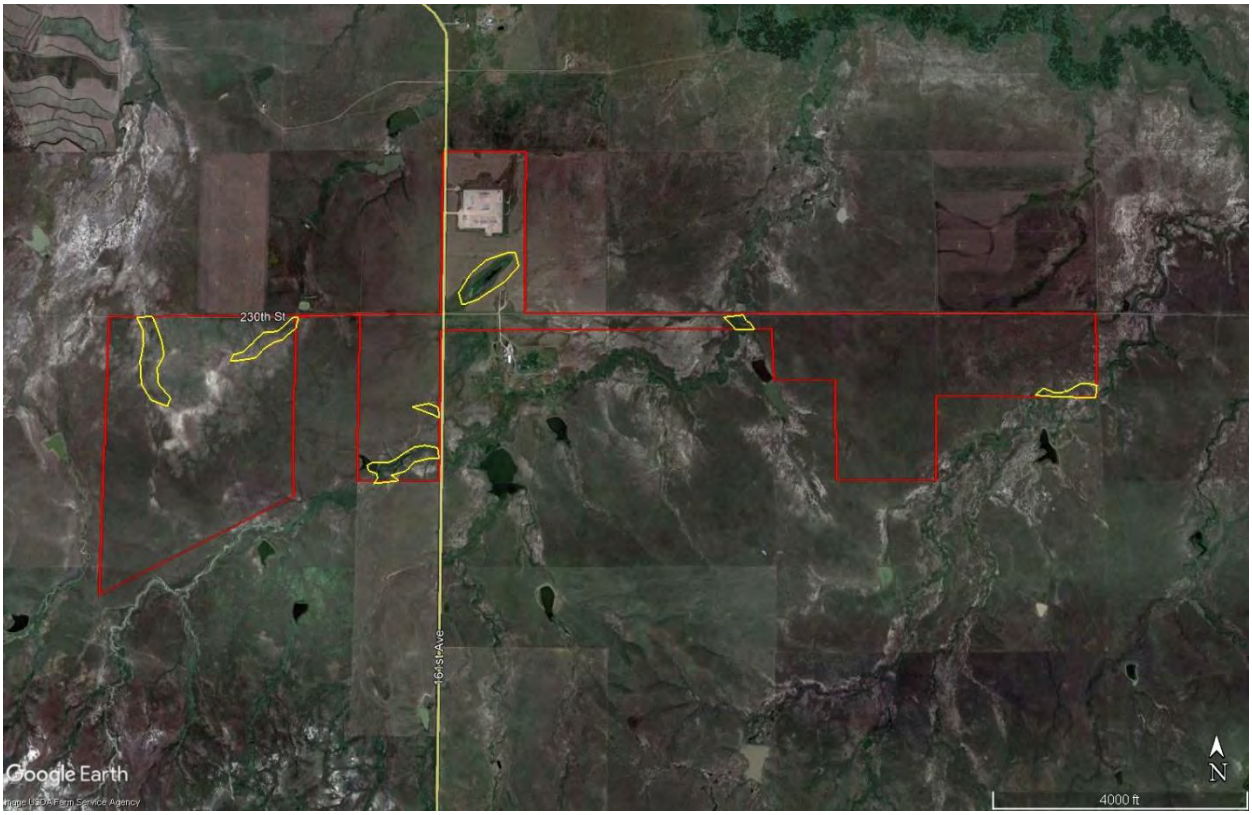
May 2005



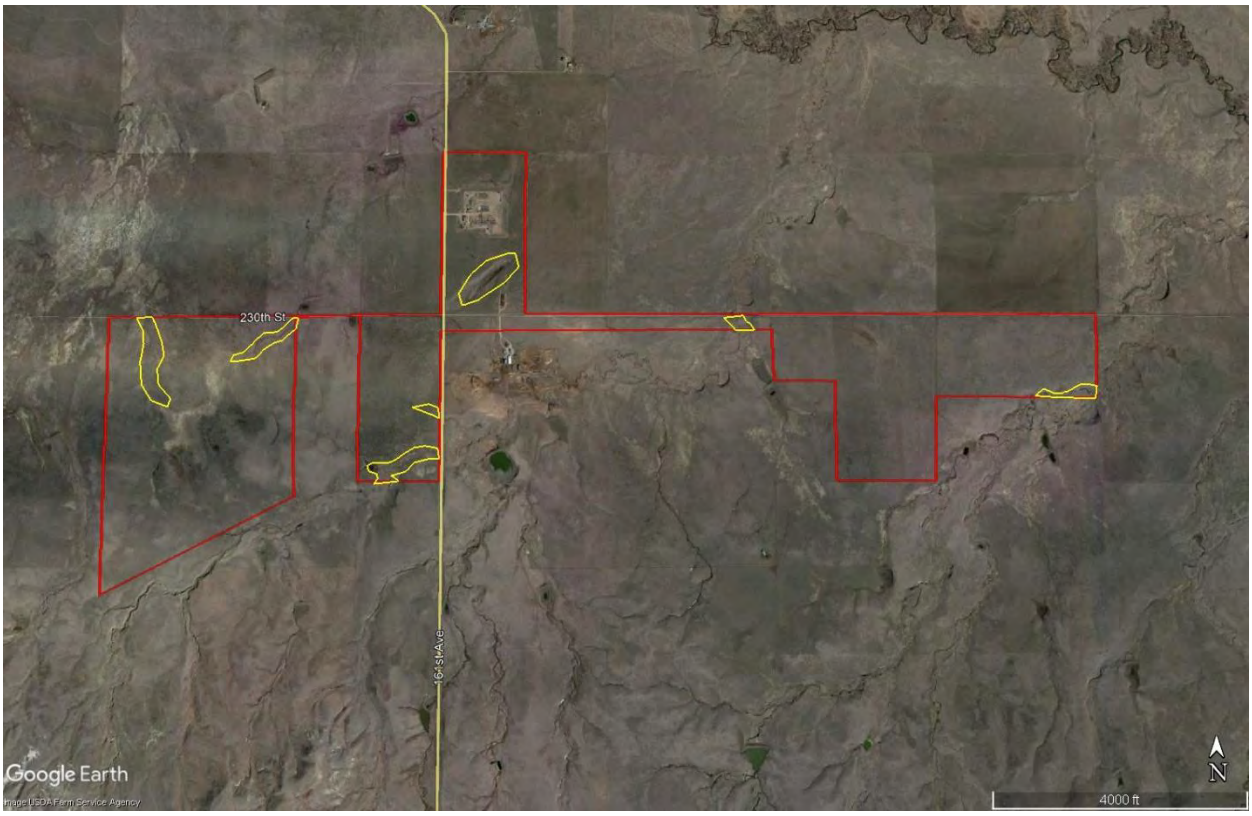
April 2006



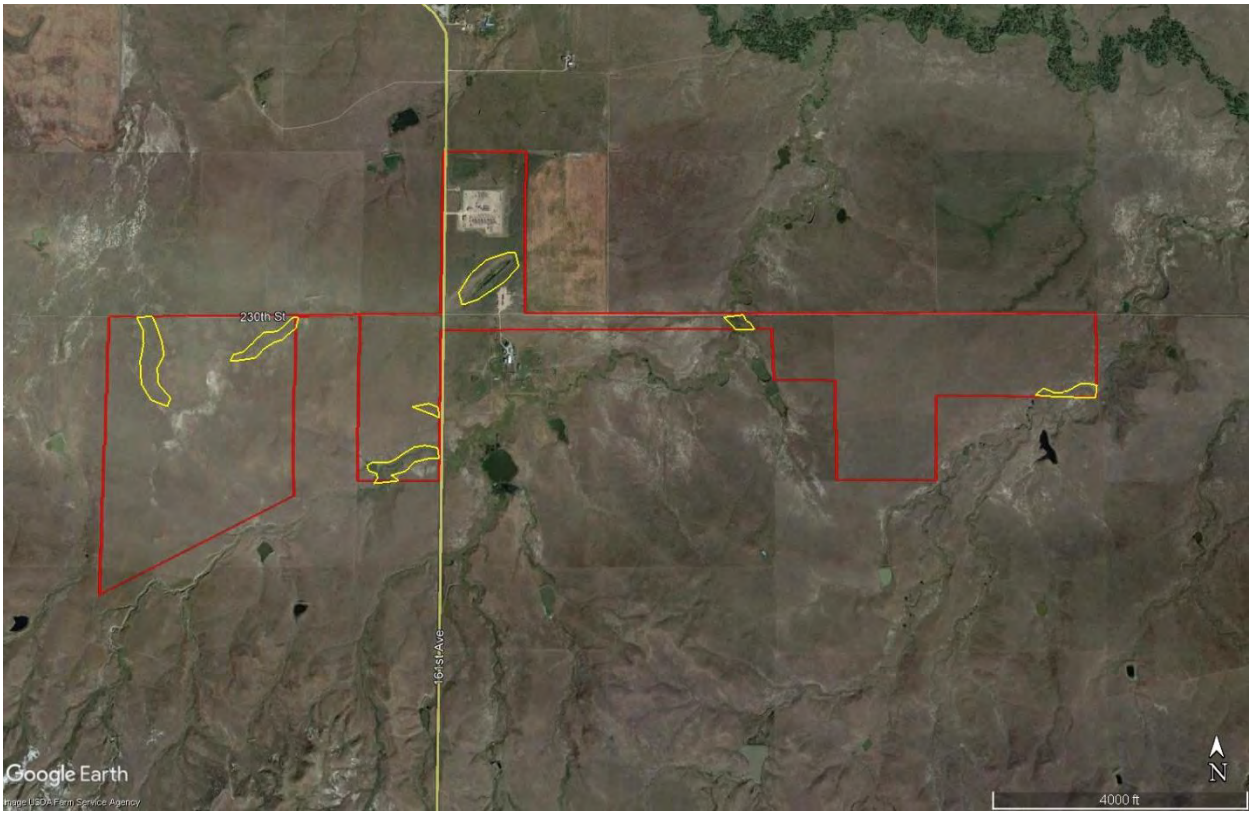
June 2009



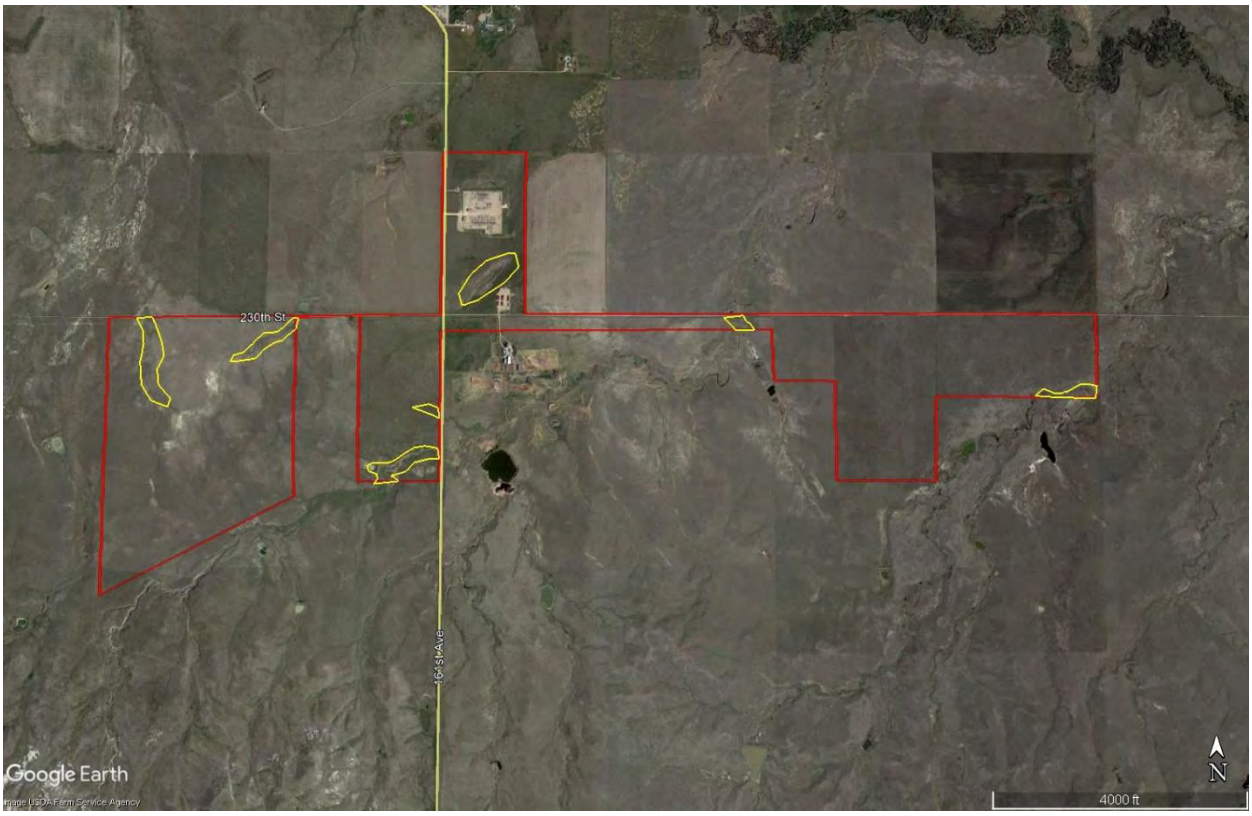
July 2011



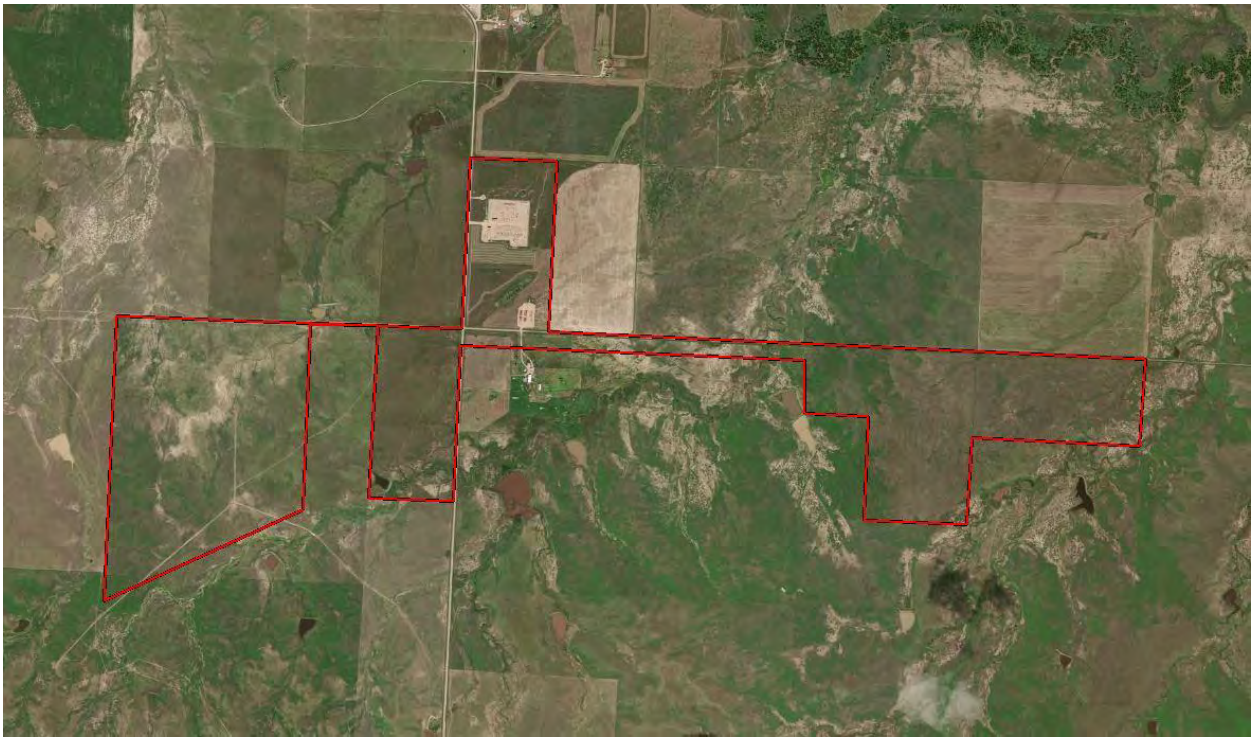
April 2013



September 2015



April 2017

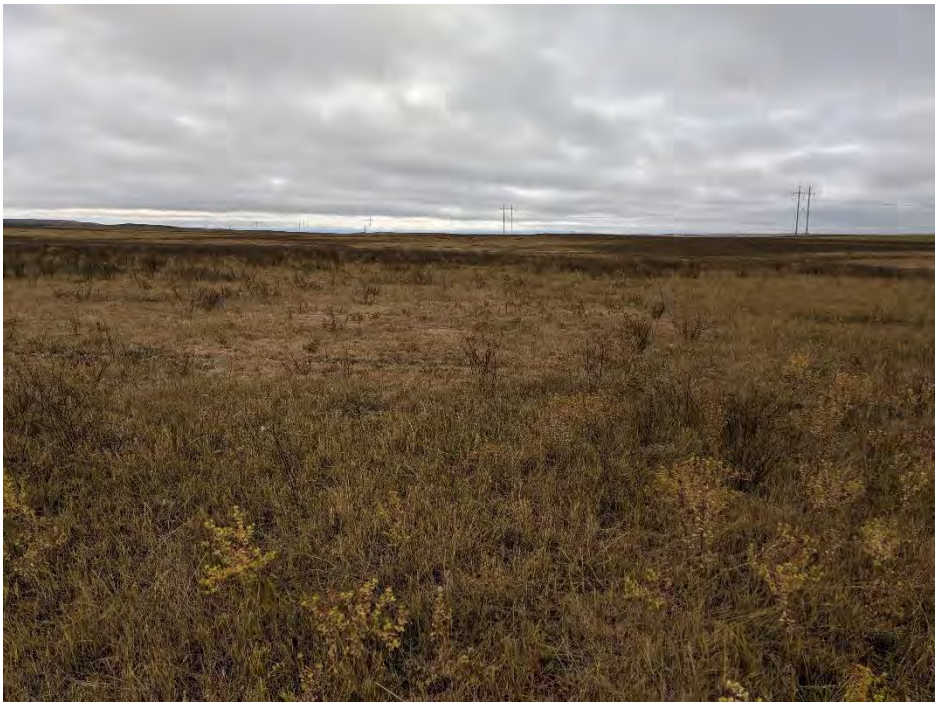


June 2018

Appendix D:

Field Photos

Representative cropland (hay field) located within the Study Area



Representative short grass prairie/pastureland located within the Study Area

Representative hayfield/disturbed landscape located within Study Area

Small upland swale, mapped as an NWI wetland, located within the Study Area

Wetland 17, a depressional PEM, contained within an upland swale/drainage

Wetland 18, a depressional PEM, contained within an ephemeral/intermittent drainage

Wetland 19, a PUB, created from the embankment of an upland drainage

Wetland 20, a depressional PEM, contained within an ephemeral/intermittent drainage

Wetland 20 outlet, facing east towards a culvert under 161st Avenue

Wetland 21, an isolated PUB/PEM, located in a small basin

Wetland 21 landscape with surrounding willow trees

Wetland 22, a PEM/Riverine wetland, contained within the OWM of an intermittent tributary to Box Elder Creek

Wetland 23, an ephemeral PEM, located within a small swale associated with Box Elder Creek

Wetland 24, an ephemeral PEM, located within a small swale associated with Box Elder Creek

Wetland 25, an ephemeral PEM, located within a small swale associated with Box Elder Creek

Wetland 26, a PEM, associated with Box Elder Creek

Appendix E:

Wetland Data Sheets

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 10/9/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 17-U

Investigator(s): Jon Knudsen Section, Township, Range: S7, T001N, R011E

Landform (hillslope, terrace, etc.): swale edge Local relief (concave, convex, none): None Slope (%): 3

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.066054 Long: -102.840414 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks: SP collected on edge of swale. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Grindelia squarrosa	30%	Y	FACU
2. Poa pratensis	15%	Y	FAC
3. Bouteloua dactyloides	15%	Y	FACU
4. Taraxacum officinale	5%	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	65% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 35%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: Sampling location contains typical upland species for this area - residual gumweed prominent

SOIL

Sampling Point: SP 17-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-1	10YR 4/1	100					Silt loam	
1-18	10YR 5/3	100					Silt loam	
18-22	10YR 6/2	100					Silt clay loam	Clay strata - hard

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 10/9/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 17-W

Investigator(s): Jon Knudsen Section, Township, Range: S7, T01N, R011E

Landform (hillslope, terrace, etc.): depression within swale Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.066106 Long: -102.840576 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: SP collected just above ponded water within disconnected, ephemeral swale. Most of swale dry. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Carex nebrascensis	30%	Y	OBL
2. Rumex crispus	10%	Y	FAC
3. Poa pratensis	10%	Y	FAC
4. Bouteloua dactyloides	5%	N	FACU
5. Grindelia squarrosa	5%	N	FACU
6.			
7.			
8.			
9.			
10.			
	60% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 40%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Sampling location contains distinct, sedge community separated from upland grasses

SOIL

Sampling Point: SP 17-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-7	10YR 3/2	100					Loamy Clay	
7-14	2.5YR 5/2	95	5YR 5/6	5%	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: Dark soil with obvious redox concentrations in depleted horizon. Very sticky clay.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): _____

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Several indicators present, including standing water

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 10/9/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 18-U

Investigator(s): Jon Knudsen Section, Township, Range: S7, T001N, R011E

Landform (hillslope, terrace, etc.): swale edge Local relief (concave, convex, none): None Slope (%): 3

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.066359 Long: -102.839378 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks: SP collected on edge of swale. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Grindelia squarrosa	25%	Y	FACU
2. Poa pratensis	10%	Y	FAC
3. Bouteloua dactyloides	10%	Y	FACU
4. Melilotus officinalis	10%	Y	FACU
5. Taraxacum officinale	5%	N	FACU
6.			
7.			
8.			
9.			
10.			
	60% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 40%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: Sampling location contains typical upland species for this area - residual gumweed prominent

SOIL

Sampling Point: SP 18-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-2	10YR 4/1	100					Silt loam	
2-20	10YR 5/3	100					Silt loam	
20-22	10YR 6/2	100					Silt clay loam	Clay strata - hard

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 10/9/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 18-W

Investigator(s): Jon Knudsen Section, Township, Range: S7, T001N, R011E

Landform (hillslope, terrace, etc.): depression within swale Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.066503 Long: -102.838963 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: SP collected just above ponded water within disconnected, ephemeral swale - connected to downstream stock pond. Most of swale dry. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Carex nebrascensis	50%	Y	OBL
2. Poa pratensis	10%	N	FAC
3. Bouteloua dactyloides	10%	N	FACU
4. Grindelia squarrosa	10%	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Sampling location contains distinct, sedge community separated from upland grasses

SOIL

Sampling Point: SP 18-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					Loamy Clay	
8-15	2.5YR 5/2	95	5YR 5/6	5%	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: Dark soil with obvious redox concentrations in depleted horizon. Very sticky clay.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): _____

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Several indicators present, including standing water

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 10/9/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 19-W

Investigator(s): Jon Knudsen Section, Township, Range: S7, T001N, R011E

Landform (hillslope, terrace, etc.): Impoundment Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.060689 Long: -102.833259 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: PUBx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: SP just below OHWM within PUB. Water levels were still high despite late season. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Carex nebrascensis	10%	Y	OBL
2. Rumex crispus	5%	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	15% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 85%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Sampling location mostly bare ground, due to proximity to OHWM - sedge and dock at edge of water level.

SOIL

Sampling Point: SP 19-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-2	10YR 3/1	100					Clay loam	
2-10	2.5YR 5/2	95	10YR 5/6	5%	C	M	Silt clay loam	Gravel and debris

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: Dark soil with obvious redox concentrations in depleted horizon.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): _____

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 10/9/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 20-U

Investigator(s): Jon Knudsen Section, Township, Range: S7, T001N, R011E

Landform (hillslope, terrace, etc.): slight hillside Local relief (concave, convex, none): None Slope (%): 4

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.061445 Long: -102.830127 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: SP collected on edge of intermittent stream, adjacent to wetland fringe on small rise. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Pascopyrum smithii	30%	Y	FACU
2. Amorpha canescens	25%	Y	UPL
3. Poa pratensis	10%	Y	FAC
4. Taraxacum officinale	5%	Y	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	60% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 40%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Sampling location contains mostly wheatgrass with leadplant mixed throughout.

SOIL

Sampling Point: SP 20-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 4/1	100					Silt loam	
2-20	10YR 5/3	100					Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 10/9/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 20-W

Investigator(s): Jon Knudsen Section, Township, Range: S7, T001N, R011E

Landform (hillslope, terrace, etc.): Intermittent swale Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.061350 Long: -102.830121 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: SP on wetland fringe outside of channel, which contained standing/flowing water. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Spartina pectinata	60%	Y	FACW
2. Carex nebrascensis	10%	N	OBL
3. Rumex crispus	10%	N	FAC
4. Xanthium strumarium	5%	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	85% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 15%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Sampling location within thick cord grass location with sedge and other forbs

SOIL

Sampling Point: SP 20-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-2	10YR 3/1	100					Clay loam	
2-10	2.5YR 5/1	95	10YR 4/4	5%	C	M	Silt clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks: Dark soil with redox concentrations in depleted horizon.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes X No ____ Depth (inches): 2

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 6

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 10/9/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 21-U

Investigator(s): Jon Knudsen Section, Township, Range: S5, T001N, R011E

Landform (hillslope, terrace, etc.): slope of basin Local relief (concave, convex, none): None Slope (%): 4

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.069528 Long: -102.826071 Datum: Nad 83 Z14

Soil Map Unit Name: NuB - Nunn loam, 2-6% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: SP just upland from ponded basin with distinct vegetation. Antecedent precipitation conditions were much higher than normal. Very abrupt wetland boundary.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Melilotus officinalis	45%	Y	FACU
2. Agropyron cristatum	25%	Y	FACU
3. Cirsium arvense	20%	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

__2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Sampling location has distinct upland vegetation compared to SP 21-W

SOIL

Sampling Point: SP 21-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 3/2	100					Clay loam	
12-20	10YR 4/3	100					Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 10/9/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 21-W

Investigator(s): Jon Knudsen Section, Township, Range: S5, T001N, R011E

Landform (hillslope, terrace, etc.): Large basin Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.069402 Long: -102.825992 Datum: Nad 83 Z14

Soil Map Unit Name: NuB - Nunn loam, 2-6% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: SP on fringe of large, impounded basin. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo	5%	Y	FAC
2.			
3.			
4.			
	5%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. Salix alba	10%	Y	FACW
2. Acer negundo	10%	Y	FAC
3.			
4.			
5.			
	20%	= Total Cover	
Herb Stratum (Plot size: 5 feet)			
1. Scirpus atrovirens	30%	Y	FACW
2. Spartina pectinata	30%	Y	FACW
3. Carex nebrascensis	10%	N	OBL
4. Poa pratensis	10%	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
	80%	= Total Cover	
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0%	= Total Cover	

% Bare Ground in Herb Stratum 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Sampling location in mixed area of bulrush and grasses, with trees/shrubs on perimeter of sampling radius.

SOIL

Sampling Point: SP 21-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/1	100					Silt clay loam	
1-7	2.5YR 5/2	90	10YR 5/6	10%	C	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: Dark soil with redox concentrations in depleted horizon.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 5

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 8

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 11/25/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 22-U

Investigator(s): Jon Knudsen Section, Township, Range: S8, T001N, R011E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): None Slope (%): 3

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.067067 Long: -102.811622 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: SP on terrace adjacent to depressoin. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0%	= Total Cover	
Herb Stratum (Plot size: 5 feet)			
1. Agropyron cristatum	40%	Y	UPL
2. Meliotus officinalis	20%	Y	FACU
3. Grindelia squarrosa	20%	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80%	= Total Cover	
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0%	= Total Cover	

% Bare Ground in Herb Stratum 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Sampling location contains typical upland species for this area - residual sweet clover and gumweed prominent

SOIL

Sampling Point: SP 22-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 4/1	100					Silt loam	
1-15	10YR 5/3	100					Silt loam	
15-20	10YR 6/2	100					Silt clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 11/23/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 22-W

Investigator(s): Jon Knudsen Section, Township, Range: S8, T001N, R011E

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.067213 Long: -102.811556 Datum: Nad 83 Z14

Soil Map Unit Name: HpB - Hisle sile loam, 0-6% slopes NWI classification: PEM1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: SP in depression assoicatied with intermittent tributary. Area appears to flood annually. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus deltoides	5%	Y	FAC
2.			
3.			
4.			
	5%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. Salix alba	10%	Y	FACW
2.			
3.			
4.			
5.			
	10%	= Total Cover	
Herb Stratum (Plot size: 5 feet)			
1. Spartina pectinata	60%	Y	FACW
2. Poa pratensis	15%	Y	FACW
3. Meliotus offinialis	10%	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	85%	= Total Cover	
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0%	= Total Cover	

% Bare Ground in Herb Stratum 15%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Sampling location dominated by cordgrass with a few small shrubs.

SOIL

Sampling Point: SP 22-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 4/2	100					Clay loam	
1-7	2.5YR 5/2	95	10YR 5/6	5%	C	M	Clay	Sticky

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X **No** _____

Remarks: Depleted soils with concentrations

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 12

Wetland Hydrology Present? Yes X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 11/24/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 23-U

Investigator(s): Jon Knudsen Section, Township, Range: S9, T001N, R011E

Landform (hillslope, terrace, etc.): Sloped edge of drainage Local relief (concave, convex, none): None Slope (%): 2

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.063758 Long: -102.793003 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks: SP collected on sloped edge of tributary channel. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Pascopyrum smithii	30%	Y	FACU
2. Meliotus officinalis	20%	Y	FACU
3. Gindelia squarrosa	10%	N	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 40%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Sampling location contains distinct upland community representative of the area.

SOIL

Sampling Point: SP 23-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					Loamy Clay	
4-22	2.5YR 5/3	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: very hard soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 11/24/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 23-W

Investigator(s): Jon Knudsen Section, Township, Range: S9, T001N, R011E

Landform (hillslope, terrace, etc.): Intermittent swale/drainage Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.063758 Long: -102.792983 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: SP collected on edge of intermittent drainaige (primary channel) which flows into tributary of Box Elder Creek. This channel was mostly wet/inundated (unlike wetlands 24 and 25). Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Spartina pectinata	30%	Y	FACW
2. Calamagrostis canadensis	20%	Y	FACW
3. Poa pratensis	10%	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 40%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Sampling location contains distinct, sedge community separated from upland grasses

SOIL

Sampling Point: SP 23-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR 4/2	100					Loamy Clay	
8-15	2.5YR 5/2	95	5YR 5/6	5%	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: Redox in light soils within hard clay strata.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): 5

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 10

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Several indicators present, and standing water adjacent to SP

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 11/24/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 24-U

Investigator(s): Jon Knudsen Section, Township, Range: S9, T001N, R011E

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 4

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.063789 Long: -102.791263 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: SP collected in flat area adjacent to eroded depression. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Pascopyrum smithii	30%	Y	FACU
2. Agropyron cristatum	30%	Y	FACU
3. Meliotus officinalis	20%	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Sampling location contains distinct upland community representative of the area.

SOIL

Sampling Point: SP 24-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR 3/2	100					Loamy Clay	
3-18	2.5YR 5/3	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: very hard soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 11/24/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 24-W

Investigator(s): Jon Knudsen Section, Township, Range: S9, T001N, R011E

Landform (hillslope, terrace, etc.): Eroded depression Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.06377 Long: -102.791216 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: SP collected in eroded depression within dry swale, disconnected from main tributary channel (Wetland 23). Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Calamagrostis canadensis	60%	Y	FACW
2. Poa pratensis	20%	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Sampling location contains wetland grasses distinct from upland.

SOIL

Sampling Point: SP 24-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR 4/2	100					Loamy Clay	
6-10	2.5YR 5/2	95	5YR 5/6	5%	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: Redox in light soils within hard clay strata.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): 3

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 12

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 11/24/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 25-U

Investigator(s): Jon Knudsen Section, Township, Range: S9, T001N, R011E

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 3

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.06413 Long: -102.790143 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks: SP collected on sloped area adjacent to dry swale. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Agropyron cristatum	40%	Y	FACU
2. Pascopyrum smithii	20%	Y	FACU
3. Meliotus officinalis	20%	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Sampling location contains distinct upland community representative of the area.

SOIL

Sampling Point: SP 25-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR 3/2	100					Loamy Clay	
3-15	2.5YR 5/3	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: very hard soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 11/24/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 25-W

Investigator(s): Jon Knudsen Section, Township, Range: S9, T001N, R011E

Landform (hillslope, terrace, etc.): Eroded depression Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.064095 Long: -102.790164 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: SP collected in eroded depression within dry swale containing Wetland 24, disconnected from main tributary channel (Wetland 23). Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Calamagrostis canadensis	40%	Y	FACW
2. Spartina pectinata	20%	Y	FACW
3. Poa pratensis	20%	Y	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Sampling location contains wetland grasses distinct from upland.

SOIL

Sampling Point: SP 25-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-5	10YR 4/2	100					Loamy Clay	
5-10	2.5YR 5/2	95	5YR 5/6	5%	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks: Redox in light soils within hard clay strata.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 4

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 10

Wetland Hydrology Present? **Yes** X **No** _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 11/24/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 26-U

Investigator(s): Jon Knudsen Section, Township, Range: S9, T001N, R011E

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 2

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.063801 Long: -102.789499 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks: SP collected on sloped area adjacent to dry swale. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Bouteloua gracilis	30%	Y	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	30% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 70%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Sampling location on a flat area adjacent to ponded stream near culvert. Mostly bare ground.

SOIL

Sampling Point: SP 26-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-5	10YR 4/2	100					Loamy Clay	
5-15	2.5YR 5/3	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: very hard soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 11/24/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 26-W

Investigator(s): Jon Knudsen Section, Township, Range: S9, T001N, R011E

Landform (hillslope, terrace, etc.): basin Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.063752 Long: -102.789385 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: SP in ponded area of tributary near culvert with standing water. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Spartina pectinata	60%	Y	FACW
2. Typha angustifolia	20%	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 20%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: SP 26-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 4/2	95	5YR 5/6	5%	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks: Redox in light soils within hard clay strata.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): _____

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 11/24/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 27-U

Investigator(s): Jon Knudsen Section, Township, Range: S9, T001N, R011E

Landform (hillslope, terrace, etc.): eroded swale Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.064219 Long: -102.792708 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks: SP collected in eroded depression sloped towards stream. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Agropyron cristatum	60%	Y	FACU
2. Pascopyrum smithii	15%	N	FACU
3. Meliotus officinalis	15%	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Sampling location contains distinct upland community representative of the area.

SOIL

Sampling Point: SP 27-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-1	10YR 3/2	100					Loamy Clay	
1-20	2.5YR 5/3	100					Clay	
20-23	2.5YR 6/3	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: very hard soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 11/24/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 28-U

Investigator(s): Jon Knudsen Section, Township, Range: S9, T001N, R011E

Landform (hillslope, terrace, etc.): ditch Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.064219 Long: -102.792708 Datum: Nad 83 Z14

Soil Map Unit Name: KyA - Kyle clay, 0-2% slopes NWI classification: R4SBC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks: SP collected along roadside mapped as riverine wetland in NWI. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Agropyron cristatum	70%	Y	FACU
2. Meliotus officinalis	20%	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks: Sampling location contains distinct upland community representative of the area.

SOIL

Sampling Point: SP 28-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-15	2.5YR 4/2	100					Clay	
15-20	2.5YR 5/2	100					Clay	Thick, sticky clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: very hard soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Wild Springs Solar Project City/County: New Underwood/Pennington Sampling Date: 11/24/2019

Applicant/Owner: Geronimo Energy, LLC State: SD Sampling Point: SP 29-U

Investigator(s): Jon Knudsen Section, Township, Range: S9, T001N, R011E

Landform (hillslope, terrace, etc.): dry swale Local relief (concave, convex, none): Concave Slope (%): 3

Subregion (LRR): Western Great Plains (LRR G) Lat: 44.067013 Long: -102.846996 Datum: Nad 83 Z14

Soil Map Unit Name: Hisle silt loam, 0-6% slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: SP collected in dry swale. Antecedent precipitation conditions were much higher than normal.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. Poa pratensis	20%	Y	FAC
2. Bouteloua dactyloides	20%	Y	FACU
3. Meliotus officinalis	20%	Y	FACU
4. Grindelia squarrosa	20%	Y	UPL
5.			
6.			
7.			
8.			
9.			
10.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 10%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: Sampling location contains even mix of common prairie species.

SOIL

Sampling Point: SP 29-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-1	10YR 4/2	100					Loamy Clay	
1-20	2.5YR 5/3	100					Clay	
20-23	2.5YR 6/3	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR F**)
- ___ 1 cm Muck (A9) (**LRR F, G, H**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (**LRR G, H**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR F**)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) (**MLRA 72 & 73 of LRR H**)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR I, J**)
- ___ Coast Prairie Redox (A16) (**LRR F, G, H**)
- ___ Dark Surface (S7) (**LRR G**)
- ___ High Plains Depressions (F16) (**LRR H outside of MLRA 72 & 73**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: very hard soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where not tilled**)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) (**where tilled**)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (**LRR F**)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Level I and Level III Cultural Resources Inventory

for the

Wild Springs Solar Project

Submitted to:

State Historical Society of South Dakota

Prepared for:

Wild Springs Solar, LLC

Prepared By:

Garrett L. Knudsen & Jonathan R. Knudsen

Principal Investigator:

Garrett L. Knudsen

December 2019

Area M Consulting, LLC
7302 Claredon Drive
Edina, MN 55439

EXECUTIVE SUMMARY

Area M Consulting (Area M) completed a Level I and Level III cultural resources inventory for the proposed Wild Springs Solar Project (Project) on behalf of Wild Springs Solar, LLC (Wild Springs), a wholly owned subsidiary of Geronimo Energy, LLC (Geronimo), a National Grid Company.

The Project Area of Potential Effect (APE), consisting of approximately 1,140 acres, is located on private land in Pennington County, South Dakota. Project design and boundaries have changed multiple times during the design phase initiated in 2017; this report includes results for the union of all acreages considered and surveyed for this Project, an area of 1,643 acres.

The Project scope is to develop up to 128 megawatts (MW) of solar-powered photovoltaic electric generators and related facilities. The regulatory agencies involved are the South Dakota State Historic Preservation Office (SD SHPO) and the South Dakota Public Utilities Commission (SDPUC); SD SHPO guidelines are implemented in this cultural resources study.

A Level I inventory conducted in April/May, 2017 and November/December, 2019 identified seven previously-completed cultural resources surveys (APN-49, APN-80, APN-175, APN-390, APN-459, APN-579, & APN-972) and three previously-recorded archaeological sites (39PN1976, 39PN2578, & 39PN3777) within one-half mile of the proposed Project APE. In addition, four recorded architectural resources were identified within one-half mile of the Project Area (39PN341, 39PN344, 39PN672, and 39PN673). There are zero previously-recorded cultural resources occur within the current Project APE.

The Level III inventory, conducted May, 2017 and October and November, 2019, included pedestrian survey of the entire APE in 15-meter (maximum) transects as part of this study. Initial survey efforts identified one cultural resource within the project area: 39PN3777 (referenced above). Subsequent adjustments to Project design removed the location of 39PN3777 from the APE.

The Project avoids 39PN3777 by more than 50 feet beyond delineated site boundaries. Therefore, Area M concludes that the Project will have no adverse effects to cultural resources. Should Project boundaries or layouts change, additional Level I and Level III Cultural resources inventories should be conducted for any additional areas added.

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1. INTRODUCTION

Area M Consulting (Area M) completed a Level I and Level III cultural resources inventory for the proposed Wild Springs Solar Project (Project) on behalf of Wild Springs Solar, LLC (Wild Springs), a wholly owned subsidiary of Geronimo Energy, LLC (Geronimo), a National Grid Company.

Geronimo has retained Area M Consulting (Area M) to complete cultural resource surveys of the Project and assess the potential effects of Project activities to cultural resources.

The Project Area of Potential Effect (APE), consisting of approximately 1,140 acres, is located on private land in Pennington County, South Dakota. Project design and boundaries have changed multiple times during the design phase initiated in 2017; this report includes results for the union of all acreages considered and surveyed for this Project, an area of 1,643 acres

This report details the Level I and Level III cultural resource inventories conducted by Area M in April and May of 2017 and October and November 2019. The Project is located approximately ten miles East and one miles South of Rapid City, South Dakota. The Project is situated in New Underwood, South Dakota, U.S. Geological Survey (USGS) topographic quadrangles (Figure 1).

Garrett Knudsen was Principal Investigator, assisted by Crew Chief Jonathan Knudsen and Field Technicians Daniel Lindsey, Wyatt Rowe, Jorge Chumley, and Gordon Sawyer. Terry Bruce (2017) and Briant Huot (2019) performed the Level I inventory at the South Dakota State Historical Society located in Rapid City, South Dakota.

Table 1: Legal Description of Project

COUNTY	LEGAL LOCATION	ESTIMATED AREA
Pennington	T1N - R10E - Section 1; T1N - R11E - Section 5,6; T2N - R10E - Section 36; T2N - R11E - Section 31	1,643 Acres

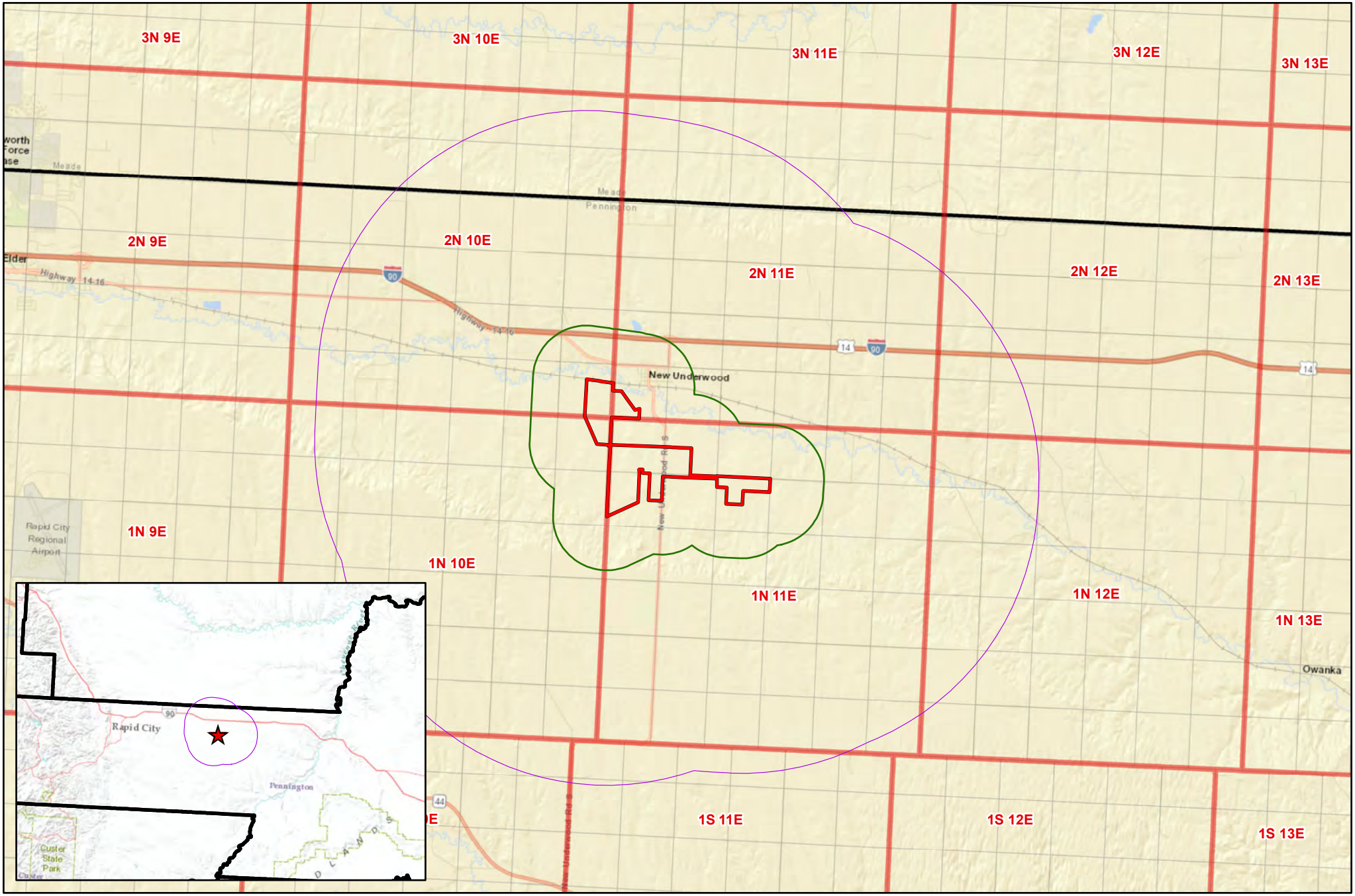

Figure 1 - Project Location

Wild Springs Solar

Pennington County, South Dakota

Project Area
Project Site Point
1-mile Buffer
5-Mile Buffer
Township Boundary
Section Boundary
County Boundary

0 6,250 12,500 25,000
1:150,000 Feet

N

AREA M

2. REGULATORY FRAMEWORK

The principal law relevant to the protection of cultural resources for the Project is the National Historic Preservation Act (NHPA), which established a State Historic Preservation Office (SHPO) in each state.

FEDERAL

The Project proposes to interconnect to the Western Area Power Administration (WAPA) owned New Underwood substation located in Township 1N, Range 11E, Section 5 and will therefore be subject to the National Environmental Policy Act (NEPA) and Section 106 of the NHPA.

STATE

The Project meets the South Dakota Public Utilities Commission (SDPUC) definition of an energy conversion facility.

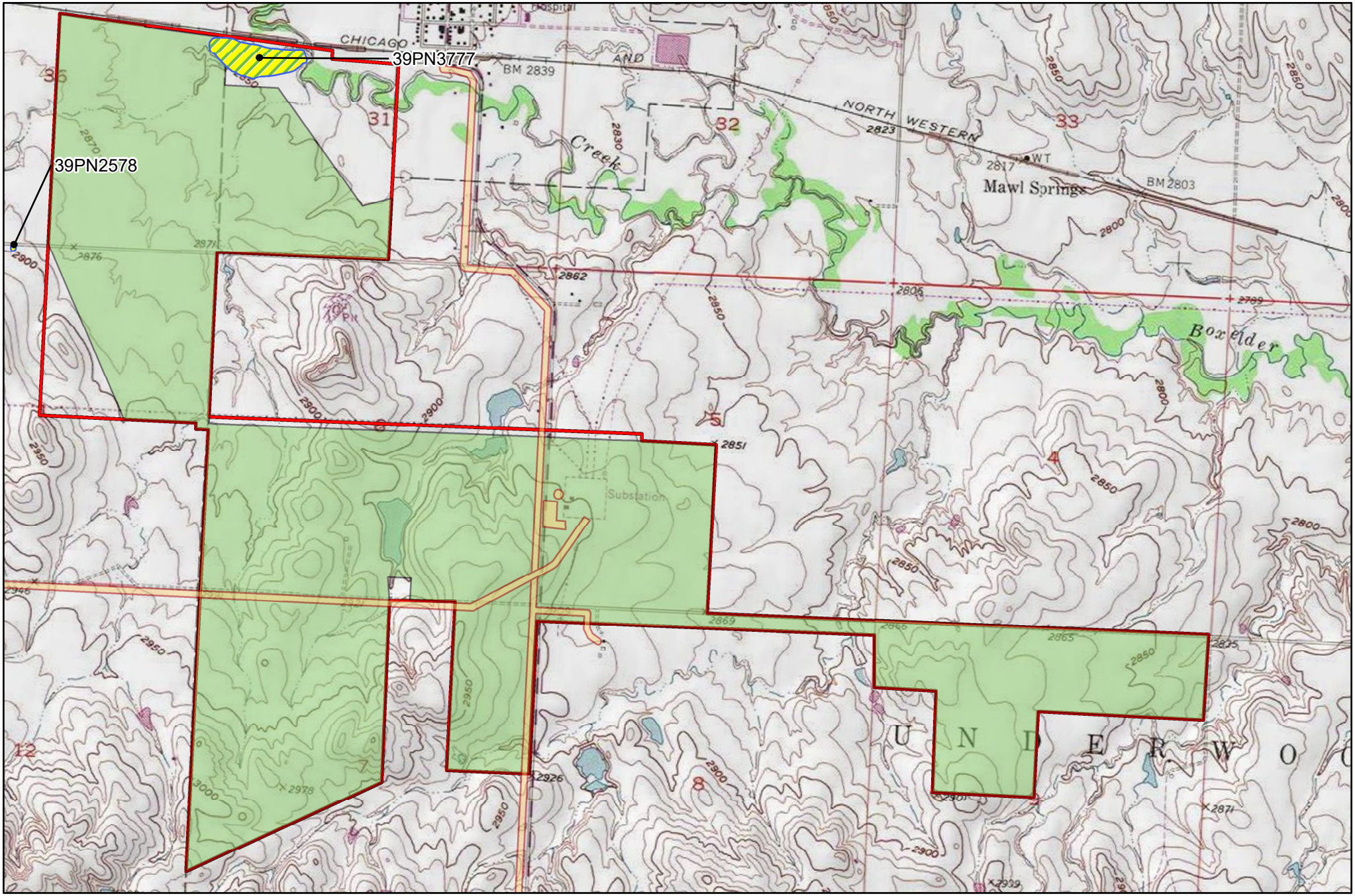

Figure 2. Level I & Level III Inventory Map (1:24,000)

Wild Springs Solar

Pennington County, South Dakota

Total Survey Area

Current Project Site

Structure

Bridge

Previous Cultural Resources Survey

Cultural Resources Site

0 1,000 2,000 4,000

1:24,000 Feet

N

AREA M

3. PROJECT SETTING

TOPOGRAPHY, LANDSCAPE, AND GEOLOGY

The Project is within the South Fork Cheyenne Archaeological Region, as defined by SD SHPO, located in western South Dakota, just east of the Black Hills. The northern edge of the Project area is south of Box Elder Creek. The entire APE is located within the Southern Rolling Pierre Shale Plains, which is characterized by low relief and a nearly level or rolling surface. Local geology consists of approximately 10 feet of native clayey and chalky sediments which overlay the Cretaceous-aged Pierre formation. The Pierre formation is a marine shale approximately 700 feet thick. Contemporaneous studies conducted for the Project document and detail wetlands and habitats within the APE (Figure 3 & Figure 4).

CLIMATE

The climate in Pennington County is characterized as semi-arid to sub-humid and continental. The county is usually warm in summer with frequent spells of hot weather with an average temperature of 72° F. Winters are typically very cold due to arctic air that surges over the area causing the average temperature to be 13° F. Pennington County have 95-130 mean annual frost-free days. In winter, the average temperature is 13° F. In summer, the average temperature is 72° F. The mean air temperature min/max for January is -3/21° and July 55/83° F (NCDC, 2015).

Mean annual precipitation in Pennington County is 18-20 inches. Most of the precipitation occurs during the late spring and early summer with about 80 percent falling April through September. It is normally heaviest in late spring and early summer. The average seasonal snowfall is about 37 inches and 46 days of the year have at least one inch of snow on the ground.

FLORA AND FAUNA

In Pennington County, common native wildlife species present today include white-tailed deer (*Odocoileus virginianus*), mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocapra Americana*), red fox (*Vulpes vulpes*), coyote (*Canis latrans*), white-tailed jackrabbit (*Lepus townsendii*), black-tailed prairie dog (*Cynomys ludovicianus*), sharp-tailed grouse (*Tympanuchus phasianellus*), mallard (*Anas platyrhynchos*), and Canada goose (*Branta Canadensis*); ring-necked pheasant (*Phasianus colchicus*) and gray partridge (*Perdix perdix*). Fish species present in the area include walleye (*Sander viteus*), smallmouth bass (*Micropterus dolomieu*), bluegill (*Lepomis macrochirus*), crappies (*Pomoxis*), yellow perch (*Perca flavenscens*), and northern pike (*Esox Lucius*). In the larger area of the Missouri River ecosystem, many wildlife species may also occur including fur-bearing mammals such as beaver (*Castor Canadensis*), muskrat (*Ondatra zibethicus*) as well as historically significant mammals such as bison (*Bison bison*), elk (*Cervus elaphus*), moose (*Alces alces*), black bear (*Ursus americanus*), mountain lion (*Puma concolor*), and gray wolf

wolf (*Canis lupus*). These later species were more common, available for human utilization, in the prehistoric and historic periods.

Natural prairie vegetation within the region consists of western wheatgrass (*Pascopyrum smithii*), needle-and-thread (*Hesperostipa comate*), green needlegrass (*Nassella viridula*), and blue grama (*Bouteloua gracilis*). Little bluestem (*Schizachyrium scoparium*), prairie sandreed (*Calamovilfa longifolia*), and sideoats grama (*Bouteloua curtipendula*) are important species on shallow soils. Prairie rose (*Rosa arkansana*), leadplant (*Amorpha canescens*), and patches of western snowberry (*Symphoricarpos occidentalis*) are interspersed throughout the area. Green ash (*Fraxinus pennsylvanica*), chokecherry (*Prunus Virginiana*), and silver buffaloberry (*Shepherdia argentea*) occur in draws and narrow valleys.

The current land-use of the Project Area is agricultural fields and pastureland. Nearly 60 percent of the Project area is under active agricultural production, dominated by wheat (*Tritcum aestivum)*, maize (*Zea mays*). Approximately 30 percent of the Project area is under active cattle grazing.

The remaining ten percent of the Project Area is covered in wooded areas within draws and ravines, primarily consisting of green ash (*Fraxinus pennsylvanica*), chokecherry (*Prunus Virginiana*), and American elm (*Ulmus americana*). Quaking aspen (*Populus deltoides*) and scrub oak (*Quercus macrocarpa*) stands occur.

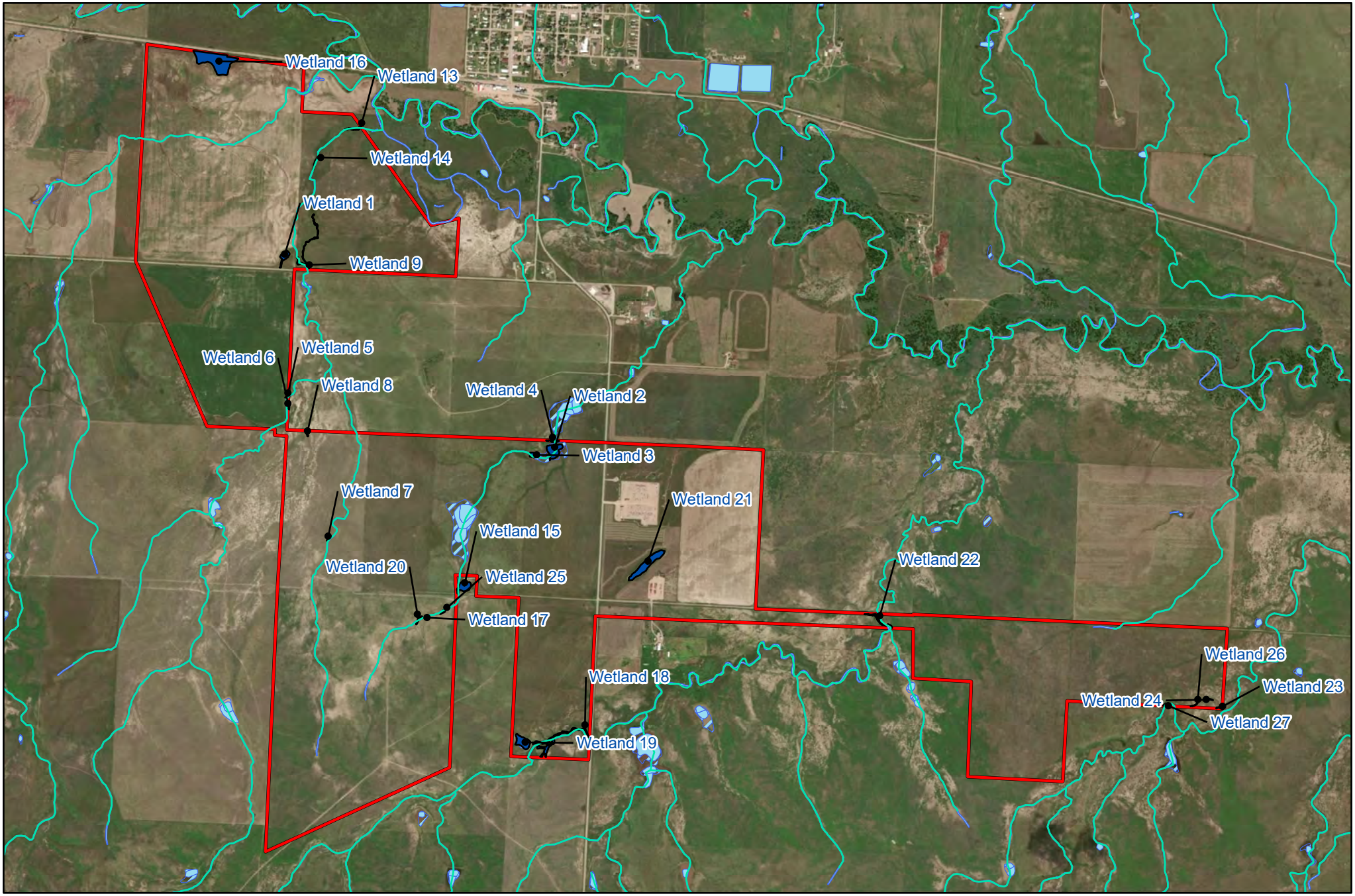

Figure 3 - Wetlands Map

Wild Springs Solar

Pennington County, South Dakota

Project Area

Delineated Wetland

NWI Wetland

NHD Flowline

NHD Waterbody

0 1,050 2,100 4,200

1:25,500 Feet

N

AREA M

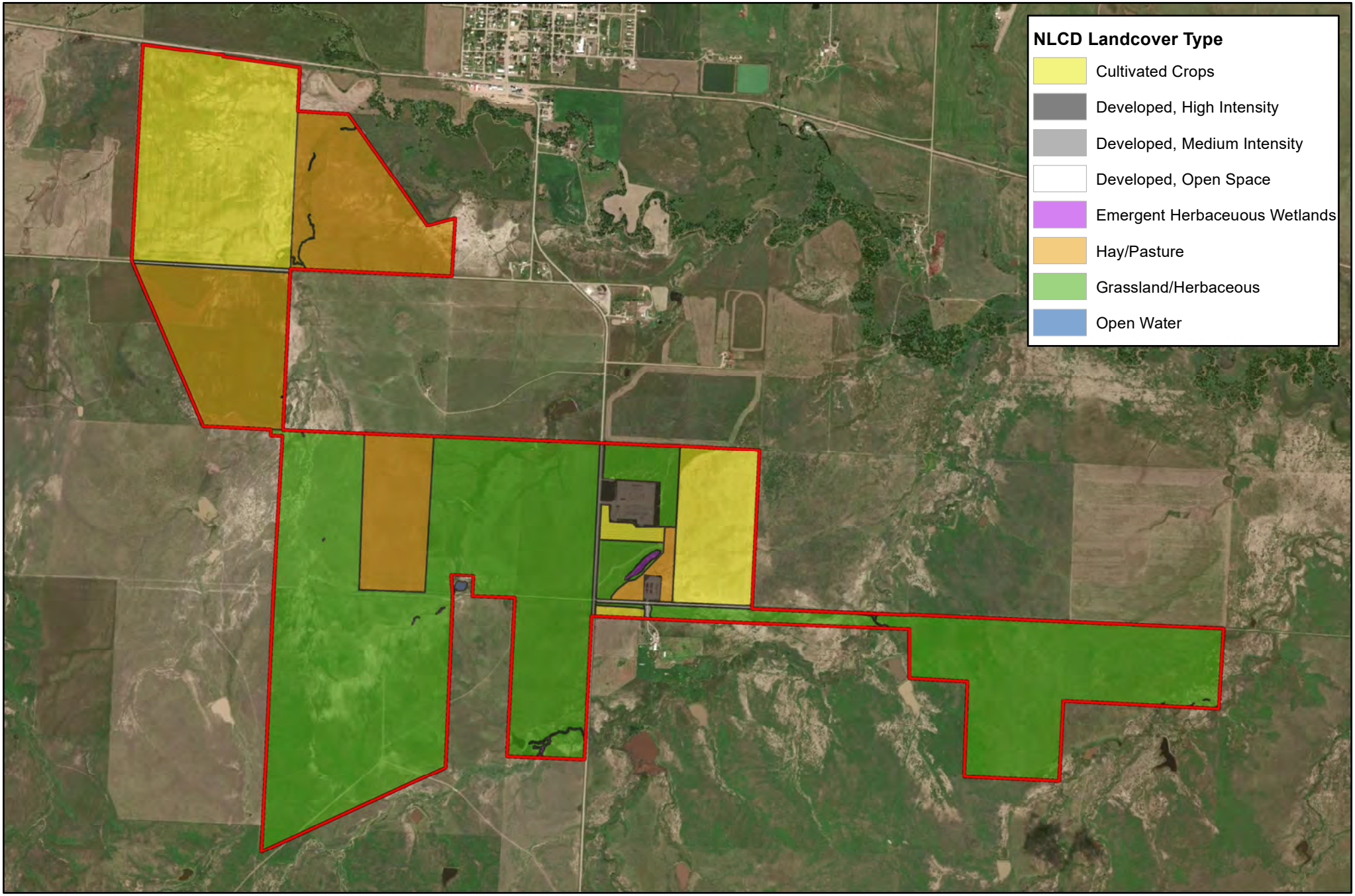

Figure 4 - Habitats Map

Wild Springs Solar

Pennington County, South Dakota

Project Area

0 1,050 2,100 4,200

1:25,500 Feet

N

AREA M

Overview of Project Area, view North

Overview of Project Area, view West

4. CULTURAL AND HISTORICAL CONTEXT

As part of the legislative framework governing the treatment of cultural resources, the South Dakota SHPO has developed a series of historic and thematic contexts in which cultural properties may be interpreted and evaluated. South Dakota's developmental sequence is divided into three broad periods: Pre-contact (ca. 12,000 years B.P. to A.D. 1700), Contact (ca. A.D. 1630 to 1820) and Post-contact (ca. A.D. 1830 to the present). The Pre-contact contexts emphasize patterns of regional adaptation, or technological and cultural traditions, whereas the contact and post-contact contexts are generally organized by themes addressing different interactions and industries. The cultural history of the Upper Plains is rather complex and differs between regions.

PREHISTORIC

The sequence of pre-contact cultural traditions within South Dakota resembles that of North America in that the cultural development is divided into generalized stages based on the material culture (e.g., tools, ceramics, refuse and fire hearths and subsistence adaptations, such as hunting, gathering or horticulture). Whenever possible, other sources of information are used to "type" a cultural tradition, including American Indian oral tradition and language studies. The generalized stages consist of Paleoindian, Archaic, Woodland and Late Pre-contact. Each general pre-contact cultural stage includes a variety of traditions.

This developmental or evolutionary sequence attempts to present a unified picture of the culture history of the Northern Plains in successive stages, from the first bands of migratory hunters on the periglacial fringe, through adaptations of increasingly diversified hunter-gatherers to rapid changes in climate and environment, to the tribal organizations and semi-permanent or permanent food-producing communities after A.D. 1000 to the equestrian adaptation of the early historic period.

Each stage represents one or more developmental themes within an estimated time frame, such as technical and behavioral innovations, or environmental change with associated ecological adaptations. This sequence is a simplification of what is actually a complex situation.

PALEOINDIAN PERIOD

During the early Holocene epoch, approximately 12,000 years ago, increasing temperatures and dry conditions resulted in the final retreat of glaciers. As the ice sheets melted and the landscape of the Upper Midwest and Great Plains emerged from the glacial lakes, the environment slowly rebounded and the region was colonized by new plant and animal species.

Paleo-Indians were the earliest people to inhabit the Americas and were characterized as highly mobile hunter-gatherers. Small nomadic hunting bands moved into the area in pursuit of large game (i.e., mastodon, caribou and Pleistocene bison) that followed the northward expansion of spruce forest, parkland, and prairie (Gregg & Bleier, 2008a).

In western South Dakota, the Paleoindian stage (ca. 11,500-7,900 B.P.) began after the retreat of the glaciers, although this area was never glaciated. The archaeological record for Paleoindian sites is sparse. Most evidence is confined to isolated lithic finds, specifically elongated or lanceolate-shaped projectile points. The lack of cultural material from this period may be a result of glacial destruction or the burying of older sites (Gregg & Bleier, 2008a).

The Paleoindian tradition in South Dakota is divided into six main technological complexes, reflecting diagnostic tool types. The seven complexes, listed in chronological order are: Clovis, Goshen, Folsom, Plano, Hell Gap/Agate Basin, Alberta/Cody, and Parallel Oblique Flaked. Clovis, Goshen and Folsom complexes are characterized by chipped stone points with fluted bases that were hafted to spears and thrown or thrusted. Complexes such as Hell Gap and Alberta produced larger stone points used as thrusting spears for dispatching game (Osborn, 2011).

ARCHAIC PERIOD

The second stage of the developmental sequence is the Archaic stage (ca. 8,000-1,500 B.P.), which is characterized by a new style of stone tool manufacturing and an increasing development of more varied hunting and gathering practices (Frison, 1991). Between 8,000 and 1,500 years ago, the Upper Midwest experienced a significant shift in climate and environment, during the warm and dry Atlantic Climatic Episode (Altithermal).

During this period, oak-hardwood forests progressively replaced coniferous forests, prairie grasses moved north and east in South Dakota and big-game animals migrated north or became extinct. Archaeologists attribute the diversification of hunter-gatherer adaptations during the Archaic Period to these climatic and environmental changes (Carlson, 1994). The shift in lithic technology included the abrupt appearance of large side notched projectile points, possibly reflecting a shift to atlatl use from spears, and the appearance of ground stone technology, reflecting the importance of plant resources (Frison, 1991).

A main theme in the archeological record of the Archaic stage is the post-glacial adaptation to a more diverse subsistence base through broad-spectrum hunting and gathering, induced by the demise of Pleistocene megafauna. This stage is also characterized by the appearance of pit houses and storage pits, and a pre-ceramic technology suggesting a reduced mobility and a predictable seasonal round (Frison, 1991). During the Archaic period, specialized hunting continued to be a dominant subsistence practice in the Plains, where large grazing animals were common.

In North America at large, the Archaic Period is divided into three-part chronological sequence: the Early, Middle and Late Archaic. In addition to these standard stages, the historic contexts developed for the Archaic period in South Dakota, known as the Plains Archaic Period, are based on more region-specific models of environmental adaptation (Frison, 1991).

The Plains Archaic Period represents an adaptation to grasslands, specifically bison hunting. Subsistence was focused on large ungulates, but there is evidence that Plains Archaic groups used a variety of available aquatic and woodland species. Additionally, the Plains Archaic was marked by socio-cultural changes such as the regionalization of projectile point styles, the decline in the quality of flintknapping technology, and a reduction in interactions between neighboring populations concentrations. Seven cultural complexes have been identified for the Plains Archaic in South Dakota (Gregg & Bleier, 2008a), although just four of these are known for the larger Project Region: the Logan Creek/Mummy Cave Complex, the Oxbow Complex, the McKean Complex, and the Pelican Lake Complex.

The Early Archaic Logan Creek/Mummy Cave Complex (5600-4000 B.P.) is the earliest complex and the first appearance of large side-notched projectile points on the northern Great Plains. Types of sites associated with the Logan Creek/Mummy Came complex are bison kill sites, nomadic camps, and stone circle sites.

The Early Archaic Oxbow Complex (5000-4000 B.P.) is centered in northern Montana, Alberta and Saskatchewan but is also found in North Dakota along the Missouri River and its tributaries. Side-notched, concave based projectile points identify this complex (Hannus, 1994). Sites associated with this complex are bison focused and include bison jumps, occupations on stream terraces, stone circles and bison processing sites (Reeves, 1969; Hannus, 1994).

The Early Archaic McKean Complex (4500-3400 B.P.) contains three distinct sub-phases, the McKean Lanceolate, Duncan and Hannah. Ground stone artifacts and slab-lined pits are common suggesting a diversified foraging regime that included plant processing and storage (Carlson, 1994; Frison, 1991). Three common lithic resources found in relation to McKean complex sites are Swan River Chert, Tongue River Silicified Sediment and Knife River Flint (Gregg, 1985).

The Middle Archaic Pelican Lake complex (3000-2700 B.P.) is usually identified on the presence of corner-notched dart points and is likely a descendant of the McKean complex. This complex is found throughout the northern and central Great Plains (Frison, 1991). Communal bison kill sites are common and the wide distribution of the Pelican Lake Complex suggests a large population growth during this time.

PLAINS WOODLAND TRADITION

The Woodland Tradition (ca. 2000 B.P. – 450 B.P), in eastern North America, is differentiated from the Archaic stage by pottery manufacture, increasingly sedentary villages, domestication

of plants, the appearance of the bow and arrow, and the construction and use of burial mounds (Gregg, 1985; Griffin, 1967). These criteria do not adequately fit the archaeological record of the northern plains, since fundamental subsistence strategies there did not differ drastically from the previous Archaic Period. In the Plains Woodland Tradition, an essentially Archaic subsistence base continued in North Dakota, despite the introduction of pottery in South Dakota and the emergence of mound building.

In South Dakota, Plains Woodland and Late Pre-contact contexts are mostly organized according to known pottery traditions within a quasi-chronological framework. The Plains Woodland pottery traditions can be placed into a standard Early, Middle and Late sequence, but actual chronological relationships between traditions are unclear and some traditions are long-lived and appear to crosscut standard chronological divisions.

Early Plains Woodland components appear to occur less frequently and have been located in southeastern North Dakota along the James River valley and north of Winnipeg along the lower Red River; there are no named archaeological Complexes described for this tradition. The Middle Plains Woodland Period contains the Besant, Sonota, and Laurel Complexes. The Late Plains Woodland contains the Avonlea, Brainerd, Old Women's, Blackduck, Mortlach, and Sandy Lake Complexes.

The Besant Complex (2000-1500 B.P.) is characterized by small to medium sized side notched triangular projectile points. In addition, the Besant complex marked the first appearance of ceramics in South Dakota which likely defused from eastern woodland cultures (Walde, 2006). The vessels are coniodal shaped and suggest lump modeling with coarse cording (Wood & Johnson, 1973).

Knife River flint is prevalent in Besant complex sites and can be associated with stone rings. Bison communal kill sites are prevalent suggesting a heavy reliance on bison. A possible sub-complex to the Besant is the Sonota complex (1850 – 1350 B.P.) that includes ceramics, Knife River flint with the addition of a developed burial mound complex (Wood, 1967).

The Laurel Complex (1800 – 1000 B.P.) sites are located mainly in eastern South Dakota. The Laurel complex is known for mound building and a specific ceramic style. Lithics associated with the Laurel complex are diverse and do not exhibit a particular style (Gregg, 1985).

The Avonlea Complex (1800-1000 B.P.) sites occur throughout the northern Great Plains, overlapping with the Besant complex. Common site types associated with the Avonlea Complex include stone circles, bison kill sites, and rock shelters (Reeves 1970). Avonlea lithic technology didn't include larger dart points and was limited to arrowheads. This suggests a complete transition to the bow and arrow.

Sandy Lake Complex (1000-300 B.P.) sites are located primarily in western Minnesota, southern

Manitoba, and eastern South Dakota Sandy Lake vessels are globular with weakly defined shoulders and vertical rims with exterior decorative features such as fabric impressions (Gregg et al. 2008).

Mortlach Complex (500 B.P.) sites are located in the Des Lacs-Souris basin of North Dakota, the Coteau and Coteau Slope in western South Dakota and North Dakota and eastern Montana, Saskatchewan, and Manitoba. This complex contains a mixture of ceramic traits indicative of contact with Villagers along the Missouri River and Woodland peoples to the north (Gregg et al. 2008).The Brainerd Complex (1400-1100 B.P.) ceramics have been identified near the upper James River and Devils Lake area.

Brainerd ceramics were originally defined in west-central Minnesota however such discoveries in South Dakota illustrated the lifeways practiced by Late Plains Woodland individuals remain to be fully understood (Gregg et al. 2008).

The Blackduck complex (A.D. 1150-1450) comes from northern Minnesota and was concentrated in southern Manitoba, and is contemporary with the Avonlea Complex. There is evidence of Blackduck ceramics along the Missouri River that suggests trade relations between the Missouri River cultures and the Blackduck people to the north (Joyes, 1970).

PLAINS VILLAGE TRADITION

The Plains Village Traditional is defined by a balanced economic strategy that included horticulture and bison hunting/foraging, semi-permanent villages on or near the Missouri River, earthen lodges, large storage pits and middens, distinctive ceramics, large numbers of end scrapers and arrow points; scapula hoes, and a heavy use of bone in making tools (Lehmer, 1971). The Plains Village Tradition is divided into the Middle Missouri Tradition (A.D. 969 – 1500) and the Coalescent Tradition (A.D. 1300 – 1650) (Gregg & Bleier, 2008a).

The Middle Missouri tradition is seen as a continuation and intensification of the Northern Plains Woodland tradition. The intensification of the Woodland lifeway coincides with the Medieval Warm period when the changing climate permitted plant cultivation in areas that were previously unsuitable for horticulture (Wood, 2001). The Coalescent period is marked by the migration of the central Plains Village Tradition cultures to the Missouri River Valley in South Dakota (Blakeslee, 1993), and is ancestral to the Arikara tribe (Krause, 2001).

The Coalescent groups practiced an economy that was balanced between horticulture and bison hunting, much like the Middle Missouri groups (Johnson, 1998). The Coalescent sites South Dakota are located on bluffs overlooking the Missouri River with fortifications, suggesting Warfare between groups. During the latter Coalescent Tradition, sites are located along the Missouri River and its tributaries. These later period sites are unfortified and contain circular earth lodges (Johnson, 1998; Krause, 2001; Lehmer, 1971).

EUROPEAN CONTACT

The French were the first European power to explore the northern Great Plains, in the 18th century. In 1738 Pierre Gaultier de Varennes Siure de la Verendrye traveled from New France to the Missouri River in North Dakota and westward to the Black Hills and helped establish the fur trade within the region (Schulenberg, 1957). In 1807, the St. Louis Missouri Fur Company established a trading post at the mouth of the Bighorn River and by 1809 they had built posts all along the Missouri River. Other Fur Trade Companies followed, such as the Northwest Company, Hudson Bay Company, the Columbian Fur Company, and the American Fur Company. These posts were short lived but had a large impact on the Native populations through introduced trade items and communicable diseases.

Further exploration by Meriwether Lewis and William Clark lead to the first permanent settlement in North Dakota near Mandan resulting in contact with Indian tribes in the surrounding area such as the Mandan, Hidatsa, and Arikara. In addition to these tribes that developed out of the Middle Missouri and Coalescent Traditions many other groups utilized the Great Plains and the Missouri River including the Assiniboine whom were active in the fur trade along the northern Missouri, the Cheyenne located along the Missouri River in the middle of the eighteenth century. The Plains Cree, Plains Chippewa, and the Crow tribes were also known to travel to the Missouri River to trade with the Mandan and Hidatsa near the Missouri River (Schulenberg, 1957).

The Dakota (Sioux) originated from the southwest Great Lakes region and were living on the Great Plains hundreds of years before European contact (DeMallie, 2001). The Assiniboine parted from the Dakota around the mid seventeenth century (Hanson, 1998). The Teton Dakota are subdivided into seven tribes; the Oglala, Brule, Sans Arc, Hunkpapa, Blackfeet, Miniconjou, and Two Kettles (Hanson, 1998). The Teton Dakota moved west following smallpox epidemics from 1771 to 1781 that destroyed the Arikara villages and left the area around the Missouri River open to migration. Likewise, the Yankton and Yanktonai Dakota occupied the prairies east of the Missouri River and north into Minnesota in the mid seventeenth century. By the mid nineteenth century they were pushed out of Minnesota and spread across the plains east of the Missouri River (DeMallie, 2001).

In the 1860s the first reservations were established by the United States government in an attempt to eliminate Native American traditions, convert tribes to Christianity, and to retain land for Euro-American settlement. Forced relocation, boarding schools for children, and banning Native American ceremonies occurred throughout the Great Plains (Limerick, 1987). During this time, the Native American population rapidly declined due to the introduction of diseases and violent attempts to terminate tribes.

In the 1887 Congress passed the first allotment policy, the General Allotment Act or Dawes Act (24 Stat. 388). The Dawes Act was established in an attempt to assimilate Native Americans into mainstream American society. The Act authorized the government to survey and divide tribal land into allotments for individuals. The Native Americans who accepted their allotment of land and lived separately from their respective tribe would be granted citizenship and later the full ownership of their allotted land (Limerick, 1987).

EUROPEAN AND AMERICAN HOMESTEADING

In the late 1800s, the Great Plains was open public land available for settlement. Settlement in the area was gradual with the first homestead established in South Dakota in 1868 and subsequent homesteads developing in 1871. The expansion of the Northern Pacific Railroad in 1885 and the establishment of a series of roads and trails spurred a land rush and the first large-scale settlement in South Dakota and North Dakota. Crowding in eastern cities and the high cost of land caused many to seek better opportunities on the Great Plains (Hudson, 1976). A main draw to the Great Plains was the dry climate, which was ideal for farming grain. The most common crop grown during the settlement period was spring wheat following the development of improved methods for processing the grain. This significantly increased the market for spring wheat and advanced agricultural development in South Dakota. In addition, ranching and livestock production established a presence in South Dakota during this time. As areas of settlement expanded and the Great Plains' population grew, the demand for beef increased. Because Native Americans were restricted to reservation land, large tracts of land were available for cattle grazing allowing the ranching market to expand and transport beef to eastern markets via rail (McLaughlin, 1994).

The homestead boom in the late 1870s to the early 1880s consisted primarily of Americans of British, Scottish, and French descent. Following this initial development in the Great Plains, large quantities of additional settlers arrived from various locations in Europe in the early 1900's. German-Russian and Scandinavians represented the largest number of immigrants making their way to the Great Plains during this time in search of land and financial prosperity.

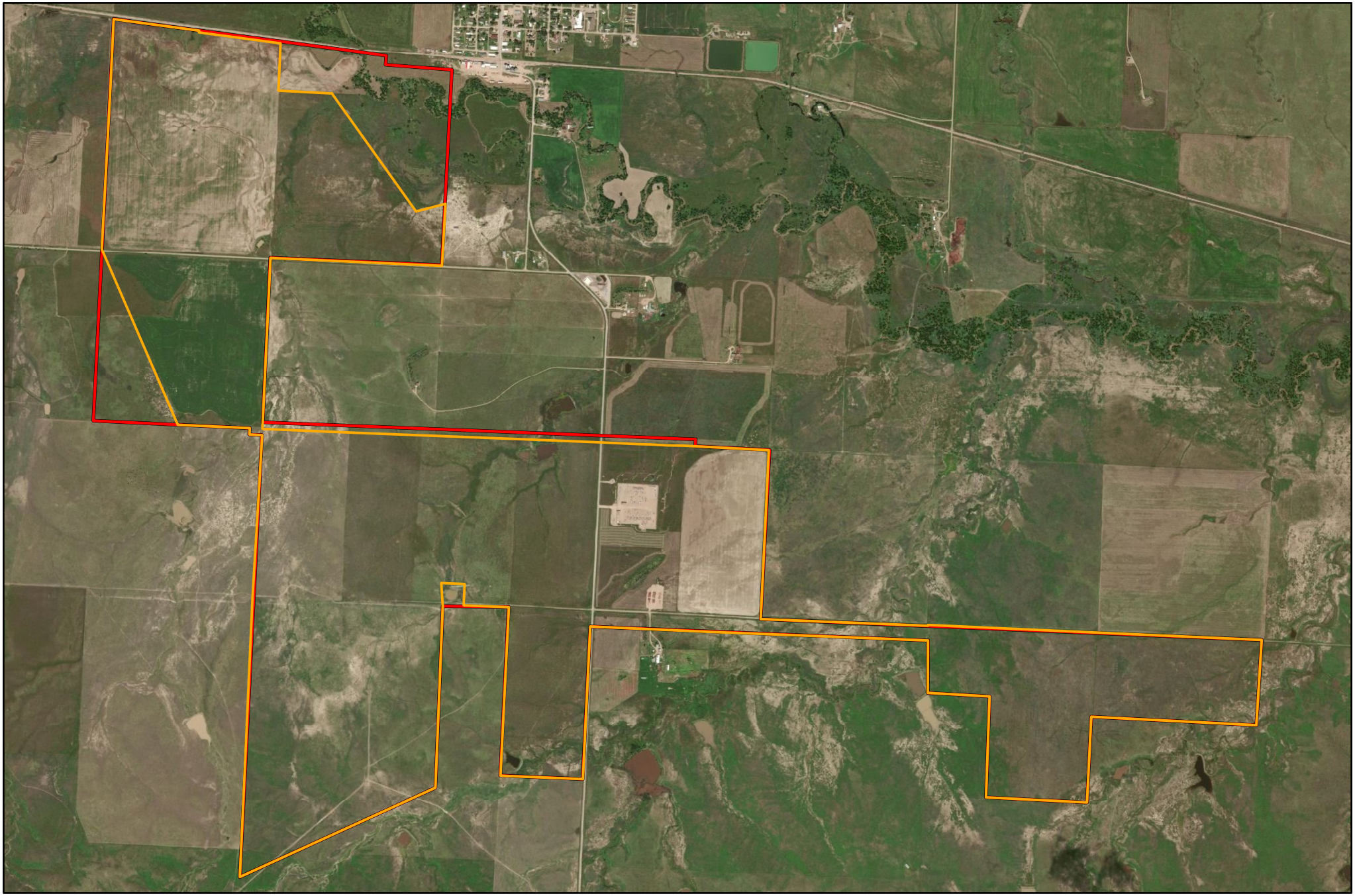

Figure 5. Aerial Sketch map

Wild Springs Solar

Pennington County, South Dakota

Total Survey Area

Current Project Site

0 1,000 2,000 4,000

1:24,000 Feet

N

AREA M

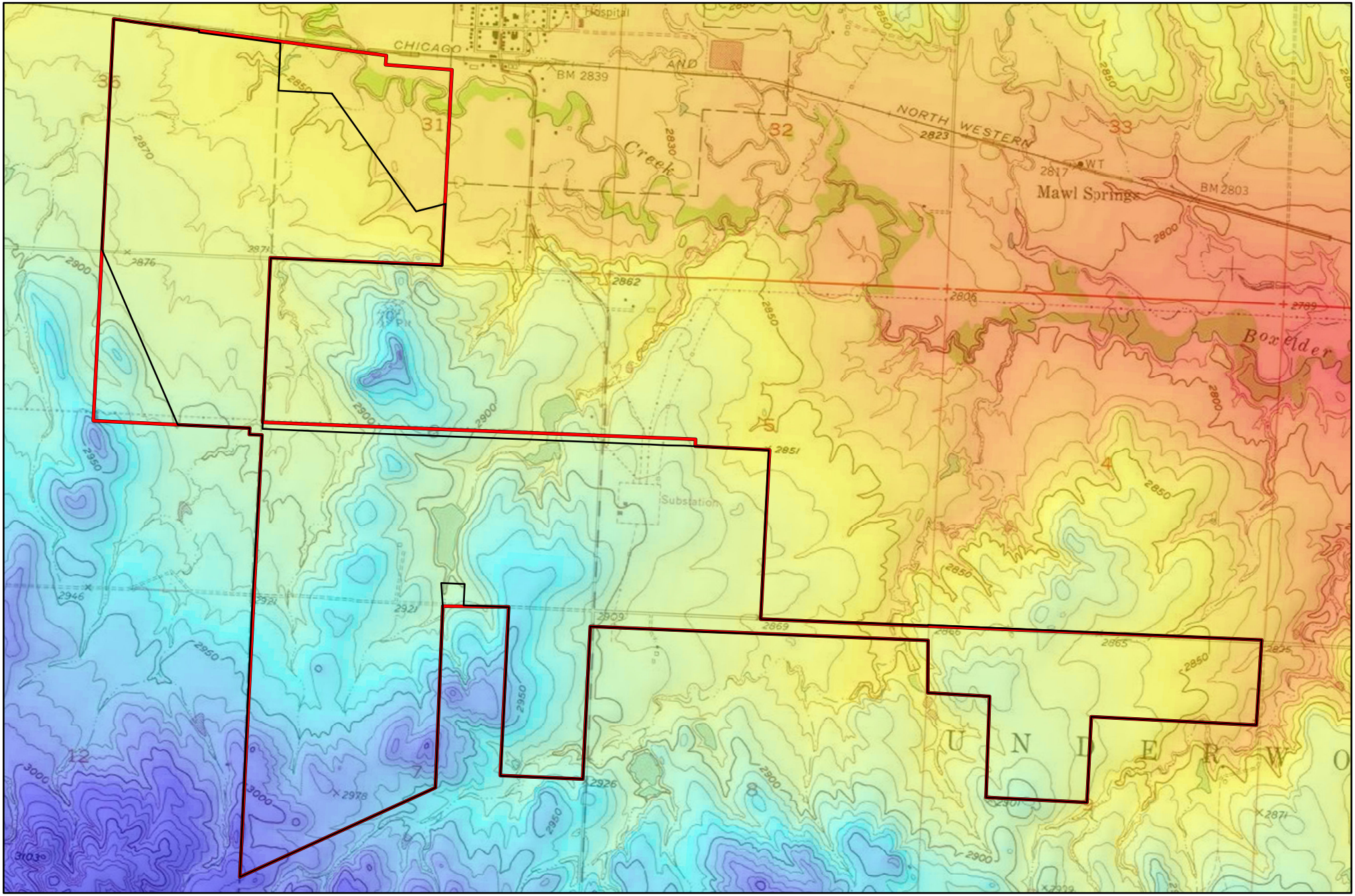

Figure 6. Lidar Sketch map

Wild Springs Solar

Pennington County, South Dakota

Total Survey Area

Current Project Site

0 1,000 2,000 4,000 Feet

1:24,000

N

AREA M

5. INVENTORY METHODS

LEVEL I METHODS

Standard Level I Cultural Resource Inventory methodologies were utilized: official SHPO cultural resources queries were administered and in-person research was conducted on files maintained at the SHPO in Rapid City, South Dakota in 2017 and 2019. Records queried and researched consist of a searchable digital database, Geographic Information System (GIS) based mapping and traditional paper files for site forms and manuscripts. In addition, General Land Office (GLO) maps, historical aerial photography, and other publicly-available records were consulted to help identify potential locations of previously unrecorded cultural resources.

LEVEL III METHODS

Archaeologists conducted the survey by walking parallel transects at 15 meter intervals across the Project Area. When possible, Area M's archaeologists examined subsurface exposures in erosional cut banks, road cuts, prairie dog towns, rodent burrow entrances, and anthills for artifacts or evidence of buried cultural deposits. In areas where surface visibility was less than 30 percent, tighter spaced transects were utilized, with spacing not exceeding 10 meters. In areas where the surface visibility was less than 10 percent, 5 meter transects were employed.

Standard survey methods dictate that shovel probes are conducted in areas of high-probability for buried cultural resources or where surface visibility is below 5 percent: such areas occurred in the Project Area only in fallow areas adjacent to Box Elder Creek.

Standard survey methods dictate that when cultural material are encountered, closely spaced transects are walked and artifacts were marked with pin flags. The distribution of pin flags are then used to define the extent of the cultural material on the surface and to document artifact frequency and distribution. Sites, structures, features and select isolated finds are photographed. Only resources that appeared to be more than 50 years old are recorded. Site locations and boundaries are mapped using a Trimble Geo XT 6000 Global Positioning System (GPS) unit and are provided in North American Datum (NAD) 83, and Universal Transverse Mercator (UTM) projection.

6. INVENTORY RESULTS

LEVEL I RESULTS

During the Project Level I inventories, seven Cultural Resources inventories were identified that had been completed within one-half mile of the Project Area (see Table 2).

Table 2: Previous Cultural Resources Inventory within 1/2 mile of Project Area

Manuscript Number	Title	Authors	Year
APN-0080	Cultural Resources Survey of Two Proposed Microwave Tower Sites, Pennington County, South Dakota. CIS No. 66	Buechler, Jeffrey V.	1982
APN-0579	A Cultural Resources Inventory of the Basin Electric Rapid City Tie Project, Pennington County, South Dakota	Haug, James	2001
APN-0972	Cultural Resources Investigations for a Proposed Asphalt Milling Stockpile Area and a Millings Stockpile/Hot Mix Plant Site for Hills Material near New Underwood, Pennington County, South Dakota. IM 090229144)62, PCN 01QQ. CIS No. 2490	Williams, Roger	2010
BLH-0049	A Short Format Report of an Intensive Cultural Resource Inventory Survey of West River Electric Association, Inc.'s 1987 Projects in Meade and Pennington Counties, South Dakota. Project No. 87-18	Buechler, Jeffrey V.	1987
WSD-0175	A Level III Cultual Resource Inventory of Proposed Buried Cable Routes for Golden West Telecom, Inc. in Meade and Pennington Counties, South Dakota. Project No. 97-3	Miller, Paul V., and William Ranney	1997
WSD-0390	Letter Format Report of a Cultural Resources Inventory Survey of Four West River Electric Association Inc. Service Lines in Meade and Pennington Counties, South Dakota. Project No. 09-59	Buechler, Jeffrey V.	2009
WSD-0459	Letter Format Report of a Cultural Resources Inventory Survey of Two Underground Converison Projects for West River Electric Associaiton, Inc. in Meade and Pennington Counties, South Dakota (W.O. 31626 & 31627). Project No. 15-10	Buechler, Jeffrey V.	2015

Three previously-recorded archaeological sites were identified within one-half mile of the Project Area (Including 39PN3777, identified and documented during initial phases of survey in 2017; see Table 3).

Table 3: Previously-recorded Cultural Resources sites within 1/2 mile of Project Area

SHPO ID	Type	Eligibility
39PN2578	Foundation; euroamerican depression; euroamerican artifact scatter	Unevaluated
39PN1976	Foundation	Not Eligible
39PN37777	Prehistoric lithic scatter	Unevaluated

Four previously-recorded historical structures were identified within one-half mile of the Project Area (see Table 4).

Table 4: Previously-recorded historical structures within 1/2 mile of Project Area

SHPO ID	Type	Eligibility
PN00000672	Bridge	Not Eligible
PN00000673	Bridge	Not Eligible
PN00000341	Structure	NR Eligible
PN00000344	Structure	Not Eligible

CLASS III RESULTS

Field investigations for the Project included an intensive pedestrian Level III Cultural Resource Inventory (Level III) of all potential Project areas throughout the design phase; an area approximately 1,643 acres in size.

One new site, 39PN3777, was recorded and described in the initial phases of this this study, although subsequent changes to Project layout and design removed its location from the current APE.

Surface visibility ranged from 10% to 100% across the APE, with surface visibility above 50% over 85% of the Project area (Table 4).

Table 5: Surface Visibility within the Project Area

<10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	>100%
1%	1%	1%	1%	1%	5%	20%	30%	20%	10%

7. PREVIOUSLY RECORDED CULTURAL RESOURCES

Zero previously-recorded cultural resource occur within the current Project APE.

8. PREVIOUSLY-UNRECORDED CULTURAL RESOURCES

One newly-recorded site was identified during initial Level III survey: 39PN3777. However, this site is located largely outside the current Project APE, and Project designs avoid the slight encroachment by over 50 ft.

39PN3777

39PN3777 is a prehistoric artifact scatter identified during systematic pedestrian survey over crop and pasture land in the northern portion of the Project area adjacent to Box Elder Creek. The site measures 300m from North-South and 800m E-W. Approximately 50 flakes were located, representing a variety of material types, including: Knife River Flint, jasper, chalcedony, quartzite, and various cherts. Ten informal unifacial and bifacial tools were were located, as well as three non-diagnostic end blades. A transect of ten shovel tests were placed across center of the artifact distribution; each shovel test was negative. Stratigraphic profiles here consisted of ten cm of topsoil over clayey silt.

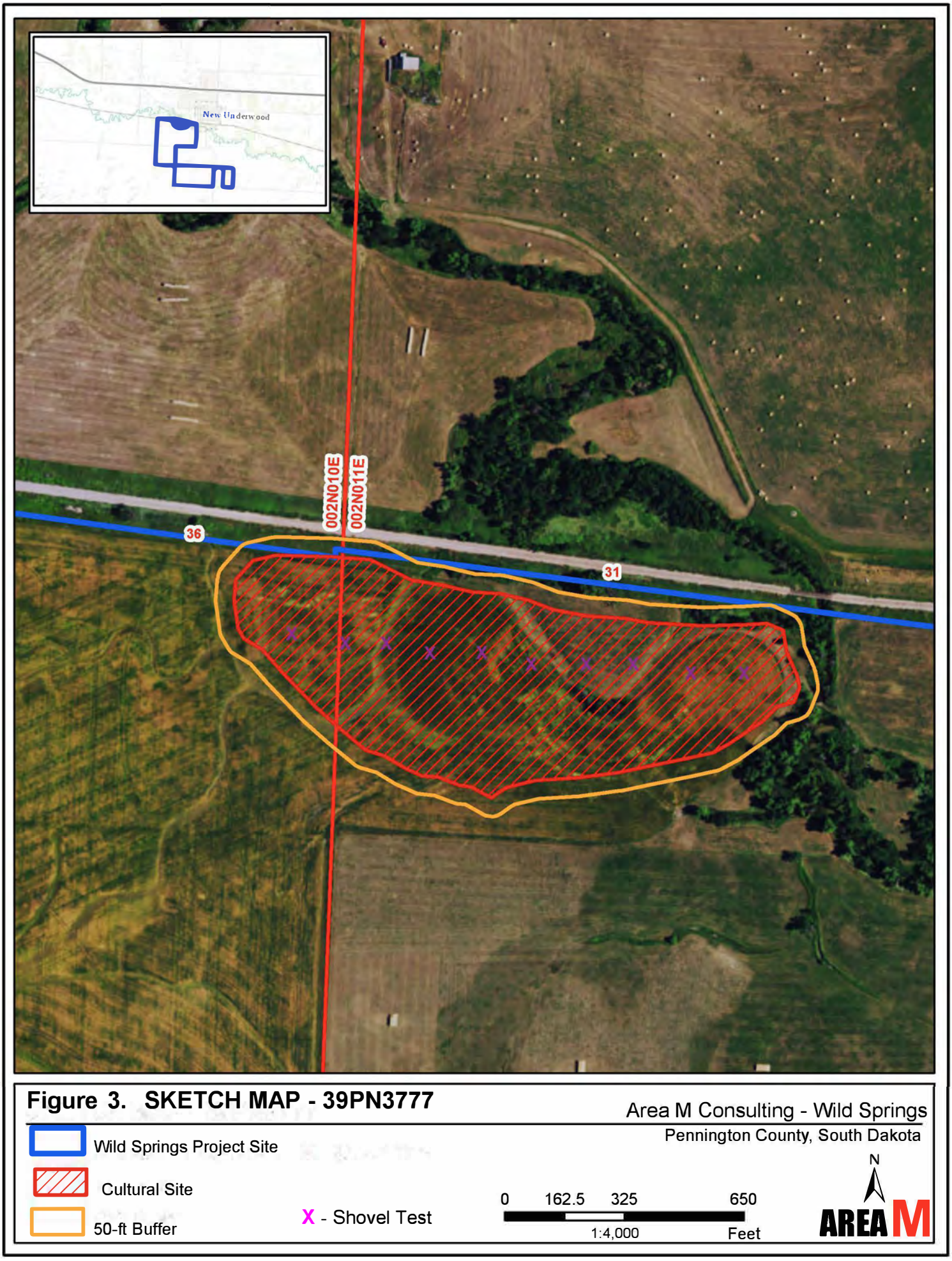

Figure 3. SKETCH MAP - 39PN3777

Area M Consulting - Wild Springs

Pennington County, South Dakota

*as of 5/7/2017

Image 2. Artifact Photos (Tools)

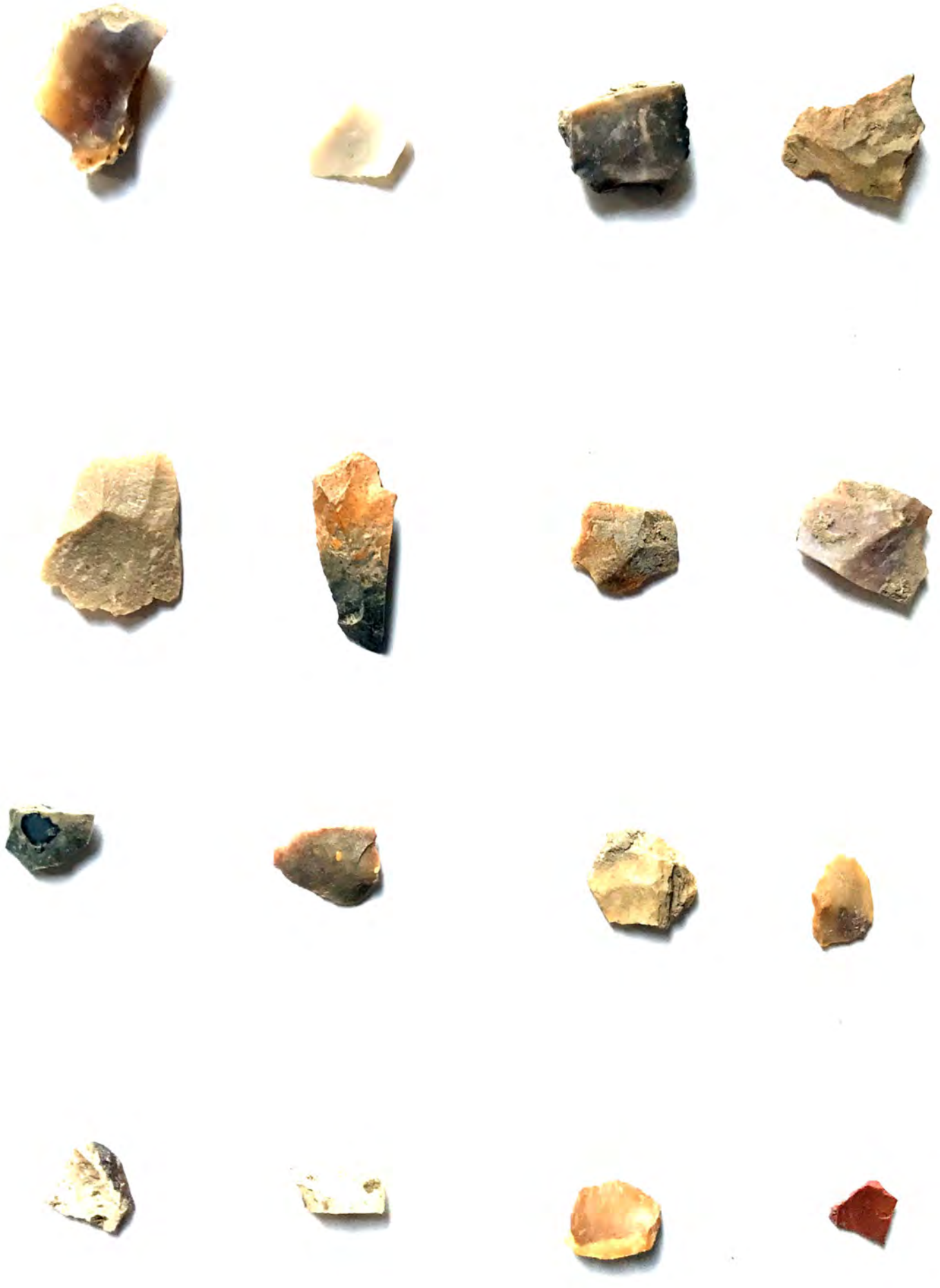

Image 3. Artifact Photos (flakes)

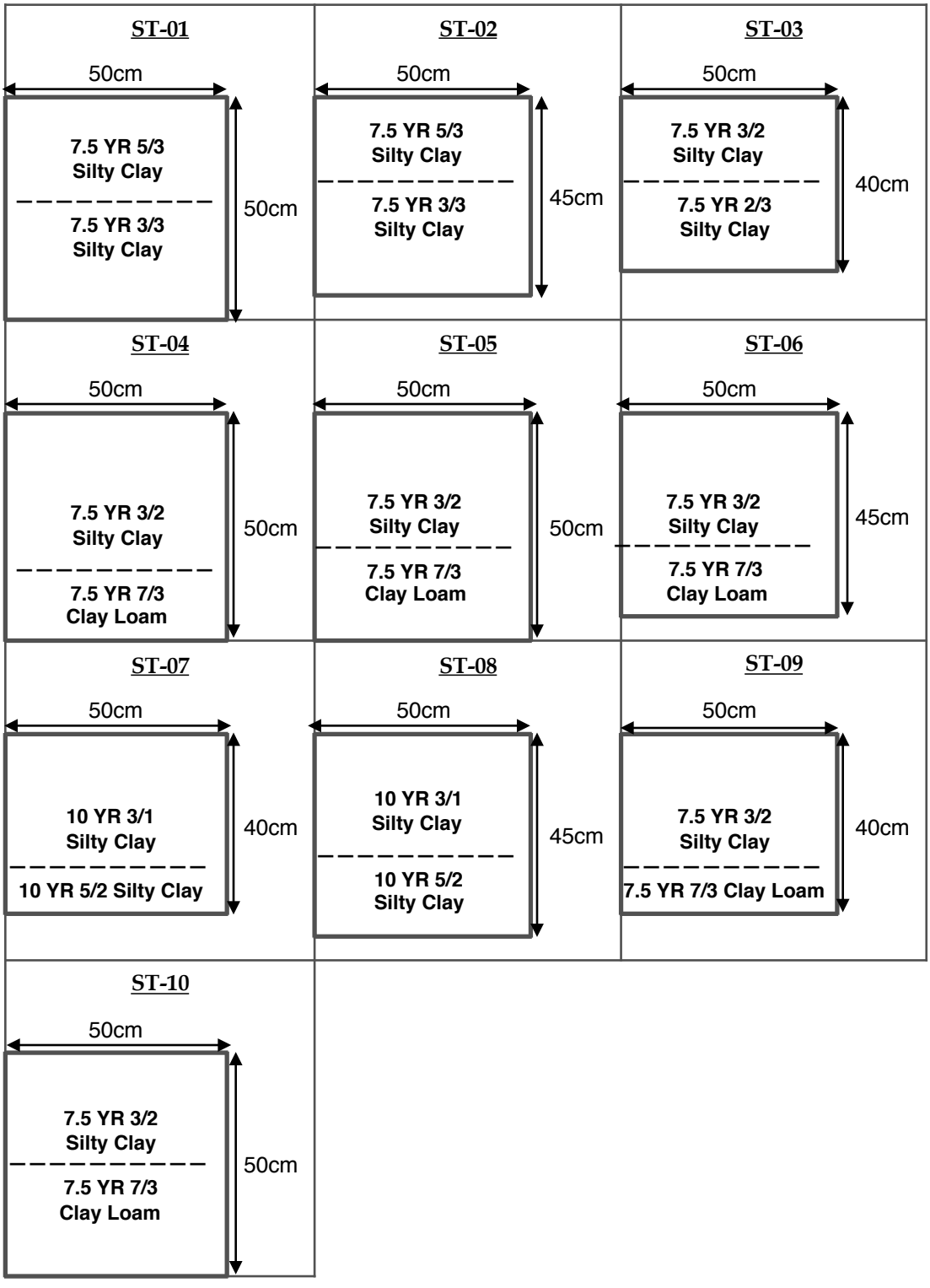

Figure 6. Shovel Test Profiles

9. CONCLUSION

The current APE 1,140-acre Wild Springs Solar Project was inventoried for cultural resources in its entirety; approximately 500 additional acres were inventoried which fall outside of the final APE. This Level I and Level III Cultural Resource Inventory contains the complete results of these investigations. Zero previously-recorded prehistoric cultural resources were documented in the current Project APE. One previously-unrecorded site, 39PN3777, was documented during this investigation; this site falls mostly outside the current Project APE (project design avoids the slight encroachment of the site by over 50 feet). The Project, as currently defined, will have ***no adverse effect*** on cultural resources.

10. RECOMMENDATIONS

It is recommended that the Project avoids 39PN3777 by employing a 50-foot buffer beyond delineated site boundaries. If this is observed, Area M concludes that the Project will have no adverse effects to cultural resources. Should the Project boundaries or layouts change, additional Level I and Level III Cultural resources inventories should be conducted for any areas added to the Project.

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Wild Springs Solar Project
Natural Resource Strategy
Pennington County, South Dakota

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Appendix 1. Agency Correspondence

1 INTRODUCTION

Wild Springs Solar, LLC (Wild Springs), a wholly owned subsidiary of Geronimo Energy, LLC (Geronimo), a National Grid Company, is developing the Wild Springs Solar Project (Project), a photovoltaic (PV) ground-mounted solar energy project on private land in Pennington County, South Dakota. Wild Springs has requested support from Western EcoSystems Technology, Inc. (WEST) in developing this preliminary Natural Resource Strategy (NRS) for the Project. The purpose of the NRS is to provide a written record of the natural resource issues at the site as well as Wild Springs' commitment to environmental management and sustainable development.

From an energy policy perspective, utility scale ground-mounted solar PV installations present numerous societal and environmental benefits, including reduced greenhouse gases, an inexhaustible source of energy, and energy security. However, ground-mounted solar, similar to other energy and industrial land uses, can potentially introduce some adverse environmental impacts. Although the nature, magnitude, and extent of impacts varies based on land use intensity and other structural characteristics that are different from other forms of development, evaluation of potential effects is still good due diligence and provides an opportunity to minimize negative outcomes and further consider potential benefits. For example, ground-mounted solar projects present a unique opportunity for dual land use and maintaining or even enhancing ecological integrity through appropriate project siting, design, construction, and ongoing operational management.

1.1 Wild Springs' Commitment to Environmental Sustainability

Wild Springs is committed to responsibly developing, constructing, and operating the Project in a manner that balances the need for clean, renewable energy with consideration for on-site natural resource protection. This NRS was developed to support that commitment and document specific steps taken to assess natural resource conditions and plan for appropriate and sustainable site development and ongoing management.

1.2 Project Description

The proposed Project is an up to 128 megawatt (MW) PV ground-mounted solar facility located near the city of New Underwood, South Dakota (Figure 1). The Project will span approximately 1,499 acres (ac; 607 hectares [ha]) and will include solar modules (panels), racking, inverters and on-site underground electrical collection lines, fencing, access roads, a substation, operation and maintenance building, laydown yard(s), and weather station(s), as well as a 115-kilovolt transmission line to connect to the Western Area Power Administration (WAPA) owned New Underwood substation, located approximately 250 feet from the leased lands. The WAPA substation parcel has been included in the Project boundary and surveyed to allow for future routing of transmission structures to interconnect the Project. Construction is anticipated as early as the fall of 2021 with commercial operations beginning by the end of 2022.

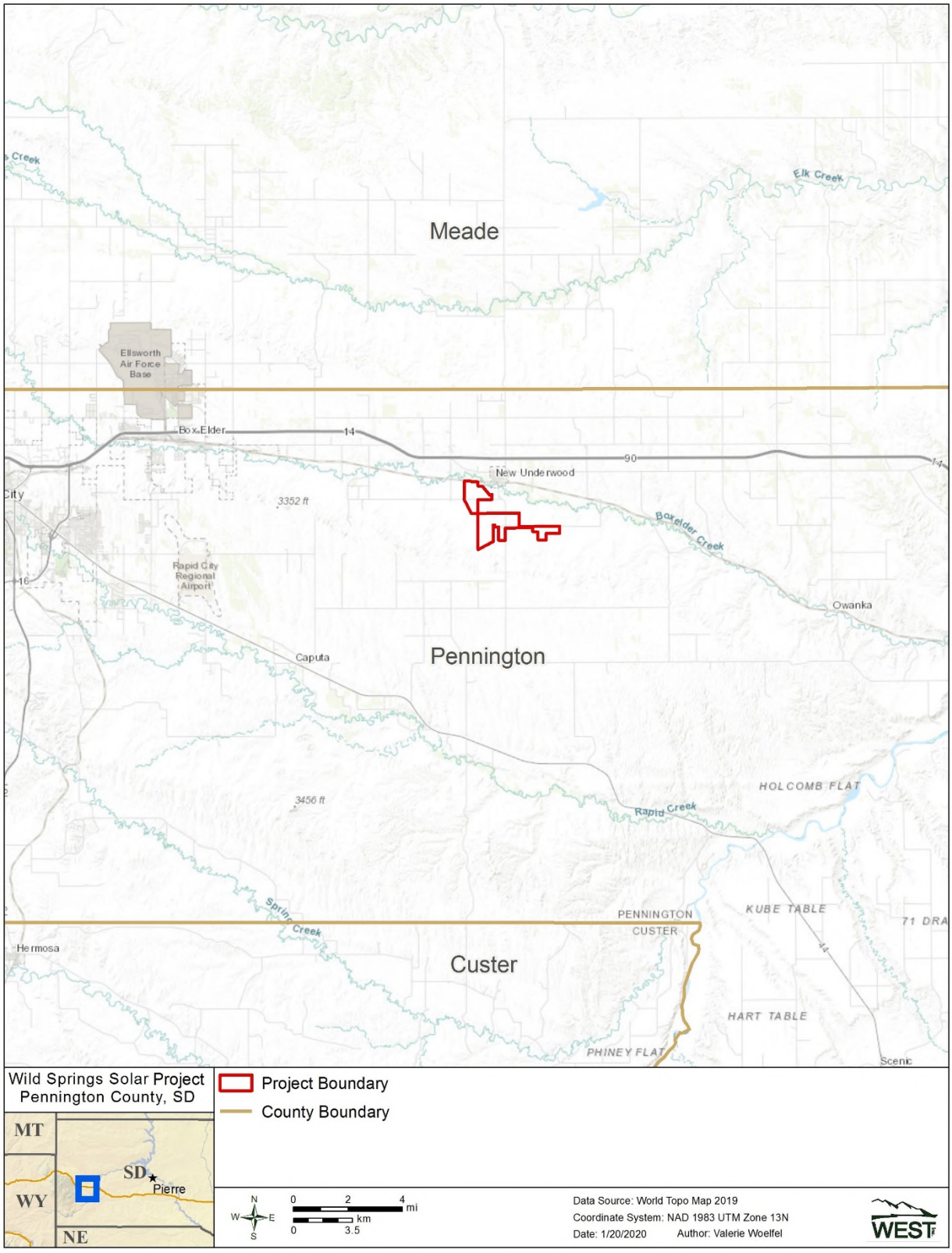

Figure 1. Location of the Wild Springs Solar Project, Pennington County, South Dakota.

1.3 Goals and Objectives for the Site

Wild Springs intends to develop and operate the Project in a way that it complies with regulatory requirements, maintains the ecological integrity of the site, and considers key natural resource stakeholder feedback.

1.3.1 Regulatory Compliance

Wild Springs intends to develop and operate this Project in compliance with appropriate natural resource regulations. Included below are key regulations that were considered in developing this NRS.

Endangered Species Act

Federal law protects endangered and threatened species listed under the Endangered Species Act of 1973 (ESA; 16 US Code [USC] 1531-1544 [1973]). The ESA is administered by the US Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries). Federally listed species and their designated critical habitats are protected under the ESA, which prohibits the take or trade of listed animals; however, there is a mechanism to grant permission for take that is incidental to an otherwise lawful activity.

State Endangered Species Law

State law protects endangered and threatened species under South Dakota Codified Law 34A-8. This law prohibits the take, possession, purchase, sale, transportation, exportation, or shipment of endangered or threatened plants and animals. Although the state of South Dakota has a process by which take of endangered and threatened species can be authorized (South Dakota Codified Law 34A-8-8), it is designed to authorize take associated with scientific, zoological, or educational purposes and does not include take associated with otherwise lawful activity (typically referred to as incidental take).

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (MBTA; 16 USC 703-712 [1918]) assigns legal authority to the USFWS to protect over 800 species of raptors, diurnal migrants, and passerine migratory birds from take. Unlike the ESA, the MBTA only regulates direct take of migratory birds, it does not prohibit modification of habitat. On December 22, 2017, the Office of Solicitor of the US Department of the Interior (DOI) released a new legal opinion, M-37050, addressing the issue of incidental take under the MBTA. According to M-37050, the policy of the DOI is that incidental take of migratory birds that results from the operation of a solar project is not regulated by the MBTA. Furthermore, the USFWS does not have a permit for incidental take of migratory birds under the MBTA associated with otherwise lawful activities, such as commercial or industrial operations.

Bald and Golden Eagle Protection Act

Bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles are afforded legal protection under authority of the Bald and Golden Eagle Protection Act of 1940 (BGEPA; 16 USC 668–668d [1940]). BGEPA prohibits the take, sale, purchase, barter, offer of sale, purchase, or barter, transport, export or import, at any time or in any manner of any bald or golden eagle, alive or dead, or any part, nest, or egg thereof. Take is defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb" (16 USC 668c [1940]). Disturb is defined as agitating or bothering an eagle to a degree that causes, or is likely to cause, injury, or either a decrease in productivity or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior (16 USC 668c [1940]).

Clean Water Act and Waters of the US

Pursuant to Sections 404 and 401 of the Clean Water Act (CWA), the US Army Corp of Engineers (USACE) regulates the discharge of dredge and/or fill material into Waters of the US (WUS). Section 404 requires that any entity proposing an activity that would discharge such materials into a WUS must obtain a permit from USACE. Section 401 requires states (in this case, South Dakota) to review projects and federal permits to ensure they will not violate surface water quality standards. USACE has final and legal authority in determining the presence of jurisdictional WUS and the extent of their boundaries. The South Dakota Department of Environment & Natural Resources has the responsibility of reviewing and approving Section 401 Water Quality Certification for activities occurring outside of Indian Country within South Dakota.

1.3.2 Maintain Ecological Integrity

One of Wild Springs' goals for the Project is maintaining ecological integrity at the site to the degree practicable. Ecological functions of the land on which the Project is sited can be valuable for both human land use and other natural resource values. In addition to operating a carbon-free energy facility, the Project lands can be managed with consideration for long-term soil health, water quality, vegetation structure and composition, and wildlife habitat. Even with the high density of Project facility structures, it is intended that the ecological value of the land will be maintained to the greatest extent practicable. This NRS, including the best management practices and adaptive management strategies herein, was developed to be employed during facility design, construction, and operations to fully consider the opportunity presented to maximize the ecological functions of the land within the Project boundary.

1.4 Early Stakeholder Communication

Early coordination with state and federal natural resource agencies and other stakeholders during the development process is critical to determine and address Project-specific environmental concerns. As such, Wild Springs has coordinated with the USFWS, the South Dakota Game, Fish and Parks (SDGFP), and the South Dakota Natural Heritage Program (SDNHP) throughout the siting and development processes (Table 1). This NRS reflects the comments and recommendations made during the coordination process with these agencies. As additional recommendations and comments are received from the agencies, this NRS may be updated accordingly.

Table 1. Summary of agency coordination regarding the Wild Springs Solar Project in Pennington County, South Dakota.

Date	Agency	Coordination Summary
April 2017	SDGFP	On April 6, 2017, Melissa Schmit (Geronimo) contacted Silka Kempema (SDGFP) via email on Wild Spring's proposed lek survey protocol and requested information on known leks within or near the Project. The SDGFP responded on April 17, 2017 with general comments on the proposed protocol that did not require revisions to the survey methodology.
July 3, 2017	USFWS	Melissa Schmit (Geronimo) received a letter from Scott Larson (USFWS) providing comments on the proposed Project. The federally endangered whooping crane (*Grus americana*) and the federally threatened northern long-eared bat (*Myotis septentrionalis*) were identified as potentially occurring within the Project. The USFWS also recommended pre- and post-construction surveys for migratory birds and eagles. The letter advised that wetlands be avoided and the APLIC guidelines for power lines be followed.
July 7, 2017	SDGFP SDNHP	Melissa Schmit (Geronimo) received a letter from Leslie Murphy (SDGFP) providing comments on the proposed Project. The letter advised both pre-construction wildlife surveys to document current conditions and post-construction mortality surveys to assess actual impacts. This included breeding grassland birds (songbirds and grouse) and bats. The SDGFP advised that any remnant native prairie tracts be avoided, and the APLIC guidelines for power lines be followed. A search of the SDNHP indicated that there are no known records of threatened, endangered, or rare species in the Project boundary. A joint meeting with the agencies was recommended.
October 22, 2019	SDGFP	Melissa Schmit (Geronimo) received a letter from Silka Kempema (SDGFP) providing comments on the proposed Project, in response to a letter dated October 4, 2019. The SDGFP reiterated the same concerns and recommendations as the July 2017 letter, and recommended an updated review of the Natural Heritage Database.
October 29, 2019	SDNHP	Area M, on behalf of Geronimo, received a response from the SDNHP for an updated Natural Heritage Data Request. The search of the database resulted in no documented threatened, endangered, or rare species within the Project boundary.
January 22, 2020	USFWS SDGFP	Melissa Schmit (Geronimo) and WEST met with representatives of the USFWS (N. Gates) and SDGFP (H. Morey) to provide an update on the Project and to discuss wildlife issues, surveys and avoidance/minimization approaches.
February 13, 2020	SDNHP	Area M, on behalf of Geronimo, received a response from the SDNHP for an updated Natural Heritage Data Request. The search of the database resulted in no documented threatened, endangered, or rare species within the Project boundary.
March 9, 2020	USFWS	WAPA received a comment letter on the proposed Project as a part of the National Environmental Policy Act (NEPA) environmental scoping process referencing the 2017 comment letter.
April 3, 2020	SDGFP	WAPA received a comment letter on the proposed Project as a part of the NEPA environmental scoping process referencing the 2017 and 2019 comment letters.

Area M = Area M Consulting; Avian Power Line Interaction Committee (APLIC); Geronimo = Geronimo Energy; Project = Wild Springs Solar Project; SDGFP = South Dakota Department of Game, Fish, and Parks; SDNHP = South Dakota Natural Heritage Program; USFWS = US Fish and Wildlife Service.

2 SITE ASSESSMENTS AND SURVEYS

2.1 Habitats in Project Area

2.1.1 Land Cover and Use

The Project is located south of New Underwood in Pennington County, South Dakota (Figure 1), within the Northwestern Great Plains Level III Ecoregion and the Semiarid Pierre Shale Plains Level IV Ecoregion (US Environmental Protection Agency 2017). The Northern Great Plains is characterized by semiarid plains of shale, siltstone, and sandstone with occasional buttes and badlands (Bryce et al. 1998). Native grasslands have persisted in areas of steep or broken topography, but have largely been replaced by spring wheat and alfalfa, although agriculture is limited in the region due to erratic precipitation and irrigation limitations (Bryce et al. 1998). The Semiarid Pierre Shale Plains are dry, with only one or two inches of precipitation per year (Bryce et al. 1998).

The Project comprises 1,499 ac of mainly herbaceous rangeland and cultivated agricultural land. Based on National Land Cover Data (NLCD; Yang et al. 2018, Multi-Resolution Land Characteristics [MRLC] 2019) and reconnaissance surveys conducted by Area M Consulting (Area M) on October 8-11 and November 22-26, 2019, 75.5% of the Project is composed of herbaceous/grasslands and 21.4% is cultivated cropland (Table 2; Figure 2). Less prominent land cover types include developed (2.5%), barren land (0.4%), open water (0.1%), shrub/scrub (0.1%), and emergent herbaceous wetland (less than 0.1%). Review of true-color satellite imagery suggests that some portions of the Project have been cultivated periodically over the past 20 years; however, the primary land use appears to be rangeland grazing along with perennial haying, with the cultivated areas being pasture grasses for livestock feed.

Table 2. Field verified land cover types, coverage, and percent composition within the Wild Springs Solar Project, Pennington County, South Dakota.

Land Use	Field Observations	Acres	% Composition
Grassland/Herbaceous	Includes pasture, hay, and fallow grassland areas	1131.2	75.5
Cultivated Crops	Alfalfa, hay, and wheat	320.3	21.4
Developed, All Categories	Generally roads bisecting the Project area	38.0	2.5
Barren Land	Associated with the WAPA substation	6.0	0.4
Emergent Herbaceous Wetlands	Delineated wetlands	0.4	<0.1
Open Water	Delineated wetlands	1.3	0.1
Shrub/Scrub	Associated with WAPA substation	1.3	0.1
Total [a]		**1,498.6**	**100**

Yang et al. 2018, Multi-Resolution Land Characteristics 2019, Area M 2019a

[a] Sums may not equal values shown due to rounding.

2.1.2 Wetlands and Waterbodies

Desktop Review

Area M reviewed the National Wetlands Inventory (NWI) and National Hydrography Dataset (NHD) and identified one NHD basin, seven intermittent drainages, and 24 NWI polygons intersecting the Project boundary (Area M 2019a). Altogether, the NWI and NHD datasets contain eight unique palustrine wetlands and six unique drainages/flowlines.

Wetland delineations

Wild Springs contracted with Area M to conduct wetland delineations for the Project in 2017 and 2019 to assist the USACE in determining jurisdiction and to support Sections 404 and 401 permitting. Note that the USACE issued a Jurisdictional Determination for the wetlands and waterbodies that occur within the Project boundary on March 18, 2020.

The current Project boundary contains 26 wetlands, all classified as either palustrine emergent or embanked ponds (Area M 2019a; Figure 2). Most wetlands within the Project are associated with minor drainages flowing into Boxelder Creek, some ephemeral, or clearly excavated basins for ranching/farming purposes.

Area M provided a baseline characterization of the general Project area in 2017. The existing landscape was identified as a mixture of pastureland, cropland, disturbed grassland, and riparian areas, with the majority of the land currently being used as cattle pasture. Area M identified the primary soil types within the Project to be Kyle clay with either a 0-2 or 2-6% slope with greater than 80 inches depth to water table (Area M 2017c).

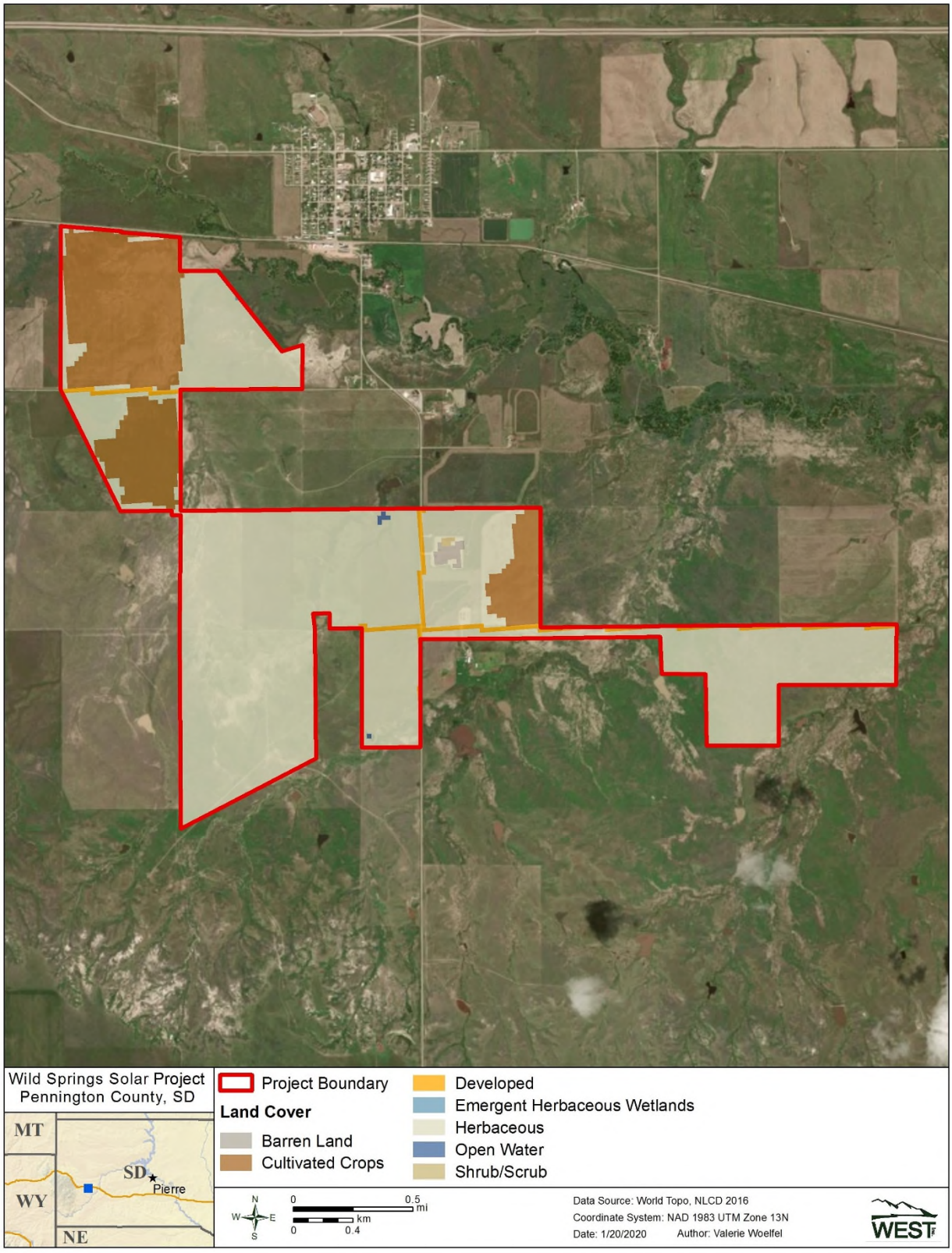

Figure 2. Field verified land cover and wetlands at the Wild Springs Solar Project, Pennington County, South Dakota.

2.1.3 Cultural Context and Public Lands

Indigenous Cultural Land Use

The Northern Great Plains have a rich history of American Indian tradition dating back to pre-historic times. The cultural history of the Northern Great Plains incorporates how American Indian tribes used the land over time and includes a variety of traditions. This includes the first bands of migratory hunters on the periglacial fringe, through adaptations of increasingly diversified hunter-gatherers due to rapid changes in climate and environment, to the tribal organizations and semi-permanent or permanent food-producing communities after A.D. 1000 to the equestrian adaptation of the early historic period (Area M 2017a). Native grasslands persisted and evolved under the pressure of grazing by huge herds of bison (*Bison bison*), and it was not until European settlers began to convert native prairies and grassland to agricultural land in the mid-1800s that native grasslands began to experience rapid declines (Sampson and Knopf 1994).

Area M conducted a Level I and Level III cultural resources inventory for the current Project boundary and surrounding area (Area M 2017a; Area M 2019b). Level I inventory conducted in April/May 2017 and November/December 2019 identified seven previously-completed cultural resources surveys within one-half mile (mi) of the proposed Project area. Three previously-recorded archaeological sites and four recorded architectural resources are located within one-half mi of the Project boundary (Area M 2017a; Area M 2019b). Zero previously-recorded cultural resources were identified within the current Project boundary (Area M 2017a; Area M 2019b).

The Level III inventory, conducted in May 2017 and October/November 2019, included ground-based field surveys of the proposed Project boundary in 15-meter (maximum) transects. These survey efforts identified one newly-recorded cultural resource within the 2017 Project boundary along Boxelder Creek (39PN3777; Area M 2017a). Area M recommended that the Project avoid 39PN3777 by employing a 50-foot buffer beyond the delineated site boundaries. Wild Springs has since shifted the Project boundary to exclude this cultural resource area.

Contemporary Cultural Land Use

In South Dakota, grassland conservation has become an important cultural value. Organizations such as the South Dakota Soil Health Coalition and the South Dakota Grassland Coalition are working to increase sustainable agriculture through improved soil health and to promote conservation of grasslands through sustainable and profitable management, respectively. Some of these sustainable practices include annual crop rotation and increasing rangeland productivity with rotational and strategic grazing. In South Dakota, grazing occurs on both ruderal and native rangelands and is managed by many different stakeholders and agencies.

Public Lands

The US Forest Service manages two major conservation areas in Western South Dakota: the Buffalo Gap National Grasslands and the Black Hills National Forest, both of which extend into Pennington County, located approximately 20 mi south and 27 mi west of the Project,

respectively. The US National Parks Service manages Badlands National Park and Wind Cave National Park, located approximately 25 mi southeast and 40 mi southwest of the Project, respectively. These areas are integral aspects of the contemporary cultural importance of natural areas and grasslands in South Dakota.

There are no federally or state-managed lands located within or adjacent to the Project boundary. The closest federally managed land is a National Public Lands Office located approximately 1.0 mi (1.6 kilometers [km]) south of the Project (Table 3; Figure 3). The New Underwood Dam State Conservation Area is located 0.9 mi (1.4 km) north of the Project, and is associated with a waterbody that may support waterfowl production and also has the potential to provide suitable habitat for birds and other wildlife. There are four State Resource Management Areas located within 5-mi the Project boundary (Table 3; Figure 3). These state-managed lands are subject to extraction (e.g., mining) or off-highway vehicle use.

Table 3. Public lands within 5 miles of the Wild Springs Solar Project, Pennington County, South Dakota

State-Managed Land Name	Distance/Direction from Project
New Underwood Dam (State Conservation Area)	0.9 mile/north
National Public Lands Office (National Public Lands)	1.0 mile/south
SD Public Land (State Resource Management Area)	1.1 mile/southeast
SD Public Land (State Resource Management Area)	3.5 miles/northeast
SD Public Land (State Resource Management Area)	4.5 miles/northeast
SD Public Land (State Resource Management Area)	4.8 miles/southeast

Data Source: US Geological Survey Protected Areas Database of the US 2019

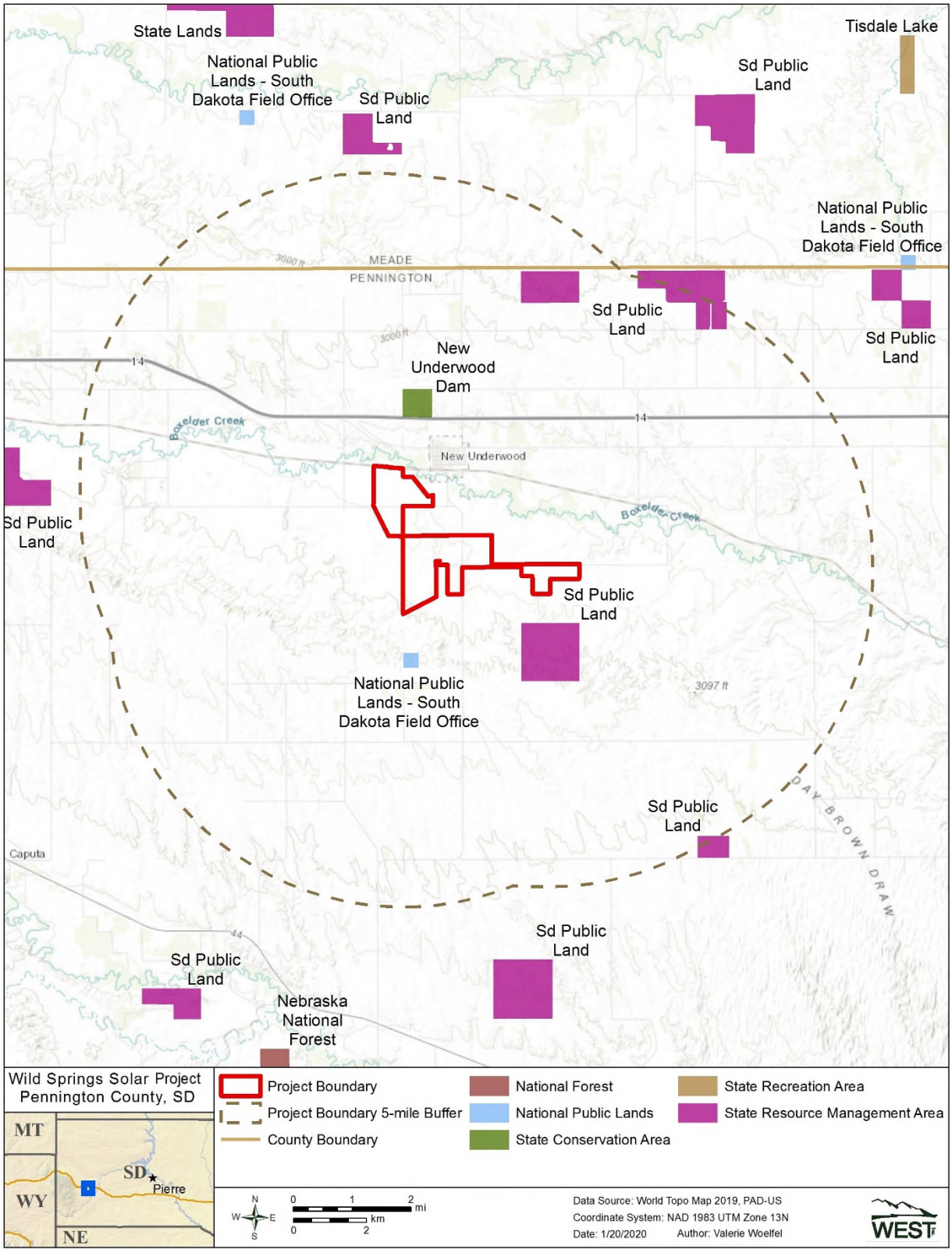

Figure 3. Public Lands in the vicinity of the Wild Springs Solar Project, Pennington County, South Dakota.

2.1.4 Vegetation

Characterizing the vegetation at a PV solar facility has two purposes: 1) assessing current and future potential wildlife habitat value, and 2) planning for restoration and ongoing land management. The combination of site-specific wildlife use data and vegetative cover and quality provides the complete picture for assessing wildlife habitat, and the opportunities for avoiding impacts and maintaining wildlife habitat. Site-specific mapping of vegetative cover and quality provides the information for developing a vegetation management plan intended to maintain the type and integrity of the existing vegetation even with a change in land use from ranching to energy operations. The following sections provide detail on available site-specific vegetation data collected, and recommendations for additional surveys to fill any information gaps that might exist.

Rare Plant Species

WEST consulted the USFWS county distribution list (USFWS 2017), USFWS Information, Planning and Consultation (IPaC) Environmental Conservation Online System (USFWS 2019a), South Dakota Natural Heritage Program (SDNHP 2019) and county distribution lists (2016) to identify state and federally listed plant species that may occur in or near the Project within Pennington County. Only one plant was identified by the USFWS county distribution list (USFWS 2017), Leedy's roseroot (*Rhodiola integrifolia* ssp. *leedyi*). Leedy's roseroot is a federally protected species that grows on rocky cliffsides, with only one documented occurrence in South Dakota, in the central Black Hills (SDNHP 2018). As such, this species has minimal potential to occur at the Project.

Site-Specific Field Characterization of Vegetation

The reconnaissance field surveys conducted by Area M in October and November of 2019 generally characterized the vegetation within the Project area (Area M 2019a). The Project is described as a mosaic of disturbed, grass-dominant plant communities containing dominant or co-dominant grass species including western wheat grass (*Pascopyrum smithii*), crested wheatgrass (*Agropyron cristatum*), blue grama (*Bouteloua gracilis*), buffalograss (*Bouteloua dactyloides*), and Poa spp. (*bluegrass*). In general, areas with less-intensive grazing and on ridgetops with shallow soils are plant associations dominated by the native shortgrass species blue grama and buffalograss, whereas the more heavily grazed and disturbed areas have plant associations that are dominated by the non-native crested wheat grass or bluegrass. The Project area also contains cultivated crops including alfalfa, hay, and wheat.

Low-lying forbs, shrubs, and sub-shrubs are present in varying densities, and include the native forbs fringed sage (*Artemisia frigida*), broom snakeweed (*Gutierrezia sarothrae*), curlycup gumweed (*Grindelia squarrosa*) and white sagebrush (*Artemisia ludoviciana*) which are frequently co-dominant with grasses, in their respective stratum. Only a few trees are present within the Project area: willow (*Salix* sp.) and boxelder (*Acer negundo*) stands surrounding embanked wetlands and lone cottonwoods (*Populus deltoides*) in the shallow drainage ways which retain moisture throughout the warm season. Few wetland communities are present within the general Project area, but those that occur grow within small drainage swales or around embanked ponds

and typically contain a small fringe component of sedge (*Carex* spp.) or cattails (*Typha* spp.) depending on wetland type.

Additional invasive plant species observed onsite include Canada thistle (*Cirsium arvense*), located primarily along roadsides, disturbed areas, and wetland perimeters. Russian thistle (*Kali tragus*), Russian olive (*Elaeagnus angustifolia*), cheatgrass (*Bromus tectorum*), and Japanese brome (*Bromus japonicus*) were also observed. Canada thistle is the only species on the State noxious weed list; however, the presence of cheatgrass and Japanese brome are significant concerns. 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.

USDA Ecological Site Descriptions

Based upon the US Department of Agriculture (USDA) Major Land Resource Areas (MLRAs) of the United States (USDA 2006), the Project falls within the Western Great Plains Range and Irrigated Region – Pierre Shale Plains. The native vegetation in this MLRA consists primarily of cool- and warm-season grasses and forbs, with some trees and shrubs occurring along streams. Dominant land uses of the area are primarily ranching and, to a lesser extent, farming. The average annual precipitation for the eastern side receives 16 to 18 inches. Major resource concerns to this MLRA are wind erosion and surface water quality. Review of true-color satellite imagery of the Project and the site-specific surveys conducted by Area M confirm this characterization. A suite of 27 Ecological Site Descriptions (ESDs) have been developed for this MLRA, all of which are classified as rangeland. Five of these ESDs have been identified by WEST biologists to have a higher potential for occurrence within the Project based on field-verified soil types obtained from wetland delineations.

1. Dense Clay (*Pascopyrum smithii – Elymus lanceolatus*)
2. Clayey (*Pascopyrum smithii – Nassella viridula*)
3. Loamy (*Pascopyrum smithii – Hesperostipa comata* subsp. *comata*)
4. Thin claypan (*Pascopyrum smithii – Bouteloua gracilis*)
5. Wet Land (*Spartina pectinate – Calamagrostis Canadensis*)

The Area M field characterization identified the thin claypan (*Pascopyrum smithii – Bouteloua gracilis*) ESD association but none of the other associations. Soil surface textures in this ESD are fine sandy loam to clay loam, 1 to 5 inches thick. The natric (Btn) horizon typically occurs within 4 inches of the surface and is extremely hard clay, high in sodium creating a whitish coloration, and has prismatic or columnar structured subsoil creating a rounded or “biscuit-shaped” top. The vegetation in reference is a mix of cool- and warm-season grasses, mostly rhizomatous wheatgrass, blue grama, and buffalo grass. Prickly pear (*Opuntia polyacantha*) or fragile cactus (*Opuntia fragilis*) are often present.

US National Vegetation Classification System

WEST biologists reviewed the US National Vegetation Classification (USNVC) database and determined that vegetation at the Project is classified under the Central North American Grassland and Shrubland Division (2.B.2.Nb; USNVC 2019). Three groups within this division were identified as potential vegetative cover at the Project, described below.

1. Central Great Plains Mixedgrass Prairie Group
2. Northern Great Plains Mesic Mixedgrass Prairie Group
3. Northern & Central Great Plains Ruderal Grassland & Shrubland Group

2.2 Wildlife in Project Area

Characterizing wildlife within the general Project area is important for assessing potential impacts and risk and establishing management goals. WEST reviewed publicly available site-specific data to assess potential wildlife at the Project, and to provide site-specific field survey recommendations to further assess species risk and appropriate avoidance/minimization techniques.

Some of the wildlife species in this area are mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), pronghorn (*Antilocapra americana*), coyote (*Canis latrans*), badger (*Meles meles*), beaver (*Castor canadensis*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), muskrat (*Ondatra zibethicus*), mink (*Neovison vison*), white-tailed jackrabbit (*Lepus townsendii*), eastern cottontail (*Sylvilagus floridanus*), black-tailed prairie dog (*Cynomys ludovicianus*), wild turkey (*Meleagris gallopavo*), ring-necked pheasant (*Phasianus colchicus*), partridge (*Perdix perdix*), mourning dove (*Zenaida macroura*), mallard (*Anas platyrhynchos*), killdeer (*Charadrius vociferus*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), and red-winged blackbird (*Agelaius phoeniceus*; USDA 2006, SDGFP 2019). Opportunistic sightings of vertebrate species were recorded by Area M biologists in order to assemble an ongoing inventory of species which occur within the Project area. In total, 35 vertebrate species were detected during field surveys, including 27 birds and 8 mammals (Area M 2019a).

Area M identified two active black-tailed prairie dog colonies within the Project boundary, with the larger of the two being approximately 44 ac in size (Area M 2019a). The colonies are likely associated or satellite colonies based on review of true-color satellite imagery which shows that the colonies were contiguous in previous years across a larger area. While black-tailed prairie dogs are not protected under federal or state laws, their colonies can provide suitable habitat for other sensitive species, including burrowing owls (*Athene cunicularia*), swift fox (*Vulpes velox*), and black-footed ferrets (*Mustela nigripes*). Area M incidentally detected three burrowing owls within the prairie dog colonies in 2017 (Area M 2019a).

2.2.1 Federal and State-Listed Species

WEST consulted the USFWS county distribution list (USFWS 2017), USFWS IPaC Environmental Conservation Online System (USFWS 2019), the SDNHP (2019), and county distribution lists (SDGFP 2016) to identify state and federally listed wildlife species that may occur in or near the

Project within Pennington County (Table 3). Based upon review of suitable habitat for the species discussed in Table 3, and the habitat conditions at the Project, it is unlikely that any federal or state-threatened or endangered species will occur at the Project.

Table 4. Federally and state-listed threatened and endangered animal species and species of special concern with known or potential for occurrence in Pennington County, South Dakota.

Species	Status	Habitat	Potential Occurrence within the Project
MAMMALS			
Black-footed ferret[1] *Mustela nigripes*	FE, SE	Requires black-tailed prairie dog colonies; estimates of 100-150 acres of prairie dog colony are required to support one ferret.	The Project contains marginal suitable habitat for the black-footed ferret; due to the lack of occurrences outside of the reintroduced populations, it is unlikely this species will occur at the Project.
northern long-eared bat[2] *Myotis septentrionalis*	FT	Roosts and forages during spring and summer in mature forest interior and riparian areas. May roost in old buildings, and typically avoids open habitats. Swarms in wooded areas surrounding caves and mines in autumn, and hibernates in caves and mines.	The Project does not contain suitable summer habitat for the northern long-eared bat; the riparian corridor of Boxelder Creek just to the north of the Project may provide some roosting and foraging habitat, and the species may pass through the Project during migration.
northern river otter *Lontra canadensis*	ST	Utilizes streams and rivers that flow through tallgrass, mixed grass, and shortgrass prairies. Dens in hollow logs, underground space among roots, overhangs, beaver lodges or dens, and other animal burrows.	The Project contains no suitable habitat for this species; river otters are more likely to occur in larger rivers outside of the Project.
swift fox *Vulpes velox*	ST	Heavily grazed shortgrass or mixed-grass prairies with open gently rolling topography for high visibility; usually associated with prairie dog or ground squirrel colonies.	Suitable habitat exists within the Project; however, known records of the Swift fox are associated with Buffalo Gap National Grasslands and Badlands National Park in Pennington County, and therefore the species is unlikely to occur at the Project.
BIRDS			
American dipper *Cinclus mexicanus*	ST	Prefers clean, cold, fast flowing mountain streams with abundant aquatic insects.	The Project does not contain the preferred habitat for the American dipper. The species is associated with the Black Hills National Forest in Pennington County, and is unlikely to occur at the Project.

Table 4. Federally and state-listed threatened and endangered animal species and species of special concern with known or potential for occurrence in Pennington County, South Dakota.

Species	Status	Habitat	Potential Occurrence within the Project
interior least tern[2] *Sternula antillarum*	FE, SE	Nests on barren to sparsely vegetated sandbars along rivers, sand and gravel pits, and lake and reservoir shorelines. May be found on lakes, rivers, and reservoirs during spring and fall migration.	The Project does not contain suitable breeding habitat for this species. Although interior least terns may pass through during migration, this is unlikely due to lack of preferred stopover habitat.
osprey *Pandion haliaetus*	ST	Always found near water – rivers, lakes, ponds; large open-top trees used for nesting and roosting.	The Project does not contain suitable breeding habitat for this species. Although osprey may pass through during migration, this is unlikely due to lack of preferred stopover habitat.
peregrine falcon *Falco peregrinus*	SE	Open grasslands with suitable nesting cliffs and rock outcroppings near a concentrated prey base such as waterfowl or colonial ground squirrels.	The Project contains suitable grassland habitat; however, the lack of cliffs and outcroppings make it unlikely that this species will occur at the Project.
red knot[2] *Calidris canutus rufa*	FT	Require stopover habitats rich in easily digested foods, such as invertebrates with thin or no shell.	Suitable stopover habitat is not present, and therefore the red knot is unlikely to occur at the Project.
whooping crane[2] *Grus americana*	FE, SE	Migrates through South Dakota; migration habitat includes marshes and submerged sandbars in rivers with good horizontal visibility, water depth of 12 in or less, and minimum wetland size of 0.1 ac for roosting.	The general Project area contains limited migration stopover habitat for this species, and higher suitability habitat is located outside of the Project boundary; this species is unlikely to occur in within the Project boundary.
FISH			
longnose sucker *Catostomus catostomus*	ST	Prefers cool, clear, spring-fed streams and lakes.	Based on wetland delineations the Project does not contain suitable habitat for this species and it is unlikely to occur.
Sturgeon chub *Macrhybopsis gelida*	ST	Prefer areas with moderate to strong current on large rivers with rocks, gravel or coarse sand substrates.	Based on wetland delineations the Project does not contain suitable habitat for this species. More likely to occur in larger rivers outside of the Project.

Table 4. Federally and state-listed threatened and endangered animal species and species of special concern with known or potential for occurrence in Pennington County, South Dakota.

Species	Status	Habitat	Potential Occurrence within the Project

Source: Area M Consulting (Area M) 2019; South Dakota Department of Game, Fish and Parks (SDGFP) 2014, 2016; South Dakota Natural Heritage Program (SDNHP) 2019; US Fish and Wildlife Service (USFWS) 2017, 2019

FE = Federally listed as endangered, FT = Federally listed as threatened, SE = State-listed as endangered, ST = State-listed as threatened.

[1]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 species is not expected to occur within the Project.

[2]Species identified by the USFWS Information for Consultation and Planning (IPaC) tool; discussed in greater detail in the subsequent sections.

Interior Least Tern

The interior least tern (*Sternula antillarum*) is a federal and state-endangered species. This species prefers open areas for feeding and nesting; feeding occurs in the shallow water of lakes, ponds, and rivers located close to nesting areas with an abundance of small fish; nesting habitat is bare or sparsely vegetated sand, shell, and/or gravel beaches, sandbars, islands, and salt flats associated with rivers or lakes (SDGFP 2014; USFWS 2019). The Project does not contain suitable breeding or stopover habitat for this species; therefore, it is unlikely that this species will occur at the Project.

Northern Long-eared Bat

The northern long-eared bat (NLEB; *Myotis septentrionalis*) was once found commonly throughout its range; on January 14, 2016, the USFWS published a final rule in the Federal Register (FR; 81 FR 1900) designating the NLEB as a threatened species throughout its geographic range as a response to the documentation of white-nose syndrome (WNS) in the United States (81 FR 1900). The USFWS's WNS Zone map, dated July 25, 2019, shows Pennington County is within 150 mi of several known WNS-infected hibernacula (USFWS 2019); therefore, the Project falls within the WNS-buffer zone, per the Final 4(d) Rule (81 FR 1900).

No forested habitat was identified within the Project based on NLCD data. WEST conducted additional desktop analysis of the general Project area using true-color aerial imagery and identified scattered patches of shrubs and trees within the Project comprising approximately 0.19 ac and would not be considered suitable for NLEB. 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. Due to the paucity of suitable summer forested habitat and migration corridors, it is likely that NLEB is absent from the Project in the summer, although the NLEB could pass through the general area during migration.

Red Knot

The red knot (*Calidris canutus rufa*) is a federally listed threatened species that has one of the longest known migration distances, traveling between breeding grounds in the central Canadian

arctic to wintering areas primarily in South America (USFWS 2019b). Due to the comparatively long migration, red knots require stopover habitats rich in easily digested foods, such as invertebrates with thin or no shell (USFWS 2013). Red knots typically rely on key stopover areas in coastal regions, but also use stopover areas along the Northern Plains of the Midwest during migration (Baker et al. 2013). Although the USFWS IPaC report generated for the Project indicates that there is potential for this species to occur within Pennington County, the red knot has not been reported in the general Project area and has rarely been observed in the surrounding region (eBird 2019, SDNHP 2019). Because suitable stop-over habitat is not present within the general Project area and the red knot is a rare migrant in the spring and fall along the Missouri River corridor, the potential for the red knot to occur within the Project is minimal.

Whooping Crane

The USFWS defined both a national and South Dakota state-specific migration corridor, which contain 95% of the whooping crane observations documented during migration from the early 1960s through 2007 (Tacha et al. 2010). The Project is located within the outer limits of the USFWS state-specific corridor, and over 45 mi west of the USFWS national corridor. The U.S. Geological Survey (USGS) has also defined a national migration corridor based on both historical sightings from 1942–2016 and more refined location data from 58 telemetered birds from 2010–2016 (Pearse et al. 2018). The Project is located approximately 13 mi west of the more recent USGS corridor. From available data through Spring of 2018, the closest documented observation of a whooping crane is approximately 11.4 mi west of the Project boundary (Cooperative Whooping Crane Tracking Project 2018; Figure 4).

Suitable whooping crane stopover habitat includes marshes and submerged sandbars in rivers with good horizontal visibility, water depth of 12 inches or less, and minimum wetland size of 0.1 ac for roosting (SDGFP 2014). The Project is located in an area with the lowest potential for whooping crane use, according to the USFWS decile model for North and South Dakota (Niemuth et al. 2018; Figure 4). While some of the field delineated wetlands could be suitable stopover habitat for the whooping crane, higher suitability habitat is located outside of the Project boundary, and it is unlikely that this species will occur at the Project.

2.2.2 Birds

USFWS Birds of Conservation Concern and Birds of Fragmentation Concern

The USFWS lists 28 species as Birds of Conservation Concern (BCC) within the Badlands and Prairies Bird Conservation Region (BCR) where the Project is located (USFWS 2008) and five additional BCC species within the nearby Shortgrass Prairie BCR (USFWS 2008); the USFWS has determined that two of these species are of potential concern at the Project location: golden eagle and lark bunting (*Calamospiza melanocorys*; USFWS 2019a). Additionally, due to prairie dog use of the area and the potential for burrowing owls (BCC and a species of greatest conservation need in South Dakota [SDGFP 2014]) to use prairie dog burrows for nesting, this species is also of higher concern at the Project location.

A review of eBird data (2019) indicates that golden eagles have been sighted within one mi of the Project as recent as 2013, but that sightings are infrequent and primarily occur west of the Project

near the Black Hills National Forest (eBird 2019). Lark buntings have also been sighted within one mi of the Project as recent as 2014, but the majority of sightings occur south and west of the Project in the Black Hills National Forest, Buffalo Gap National Grasslands, and Badlands National Park (eBird 2019). One burrowing owl observation was recorded just to the west of the Project along Boxelder Creek in 2013 and three other burrowing owls were observed at prairie dog colonies within the general Project area in 2017 (Area M 2019a); however, similar to lark buntings, the majority of sightings of burrowing owls in the area occur south of the Project in the Buffalo Gap National Grasslands and Badlands National Park (eBird 2019).

In addition to BCC, the USFWS also has specifically identified several grassland birds that are considered South Dakota *Species of Habitat Fragmentation Concern* (Bakker 2020). These are species of concern for which a relevant federal, state, tribal, and/or local agency has found that 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. Although intensive avian surveys have not yet been completed of the Project area, several grassland birds that were specifically identified as of habitat fragmentation concern are known or likely occur in the Project area (e.g., burrowing owl, lark buntings, several species of grassland sparrow, etc.).

USGS Breeding Bird Survey

The USGS North American Breeding Bird Survey (BBS) is a collaborative effort between the USGS Patuxent Wildlife Research Center and Environment Canada's Wildlife Service. The objective of the survey is to monitor the status and trends of North American bird populations via standardized protocol collected by participants along thousands of randomly established roadside routes throughout the continent. The closest BBS routes, Railroad Butte and Owanka, are approximately 10 mi southwest and 11 mi southeast of the Project, respectively.

The Railroad Butte BBS route has been monitored a total of 22 years between 1995 and 2018. A total of 72 bird species have been observed along this route, with annual species numbers ranging from 19 in 2008 to 31 in 1996 (Pardieck et al. 2019). The most common species were western meadowlark (*Sturnella neglecta*), mourning dove, and lark bunting. One golden eagle observation has been recorded along this route, in 2017. Eight additional raptor species have also been observed along the route, including the American kestrel (*Falco sparverius*), burrowing owl, ferruginous hawk (*Buteo regalis*), northern harrier (*Circus hudsonius*), red-tailed hawk (*Buteo jamaicensis*), short-eared owl (*Asio flammeus*), Swainson's hawk (*Buteo swainsoni*), and turkey vulture (*Cathartes aura*). Both of the BCC species identified above have been documented along the Railroad Butte BBS route.

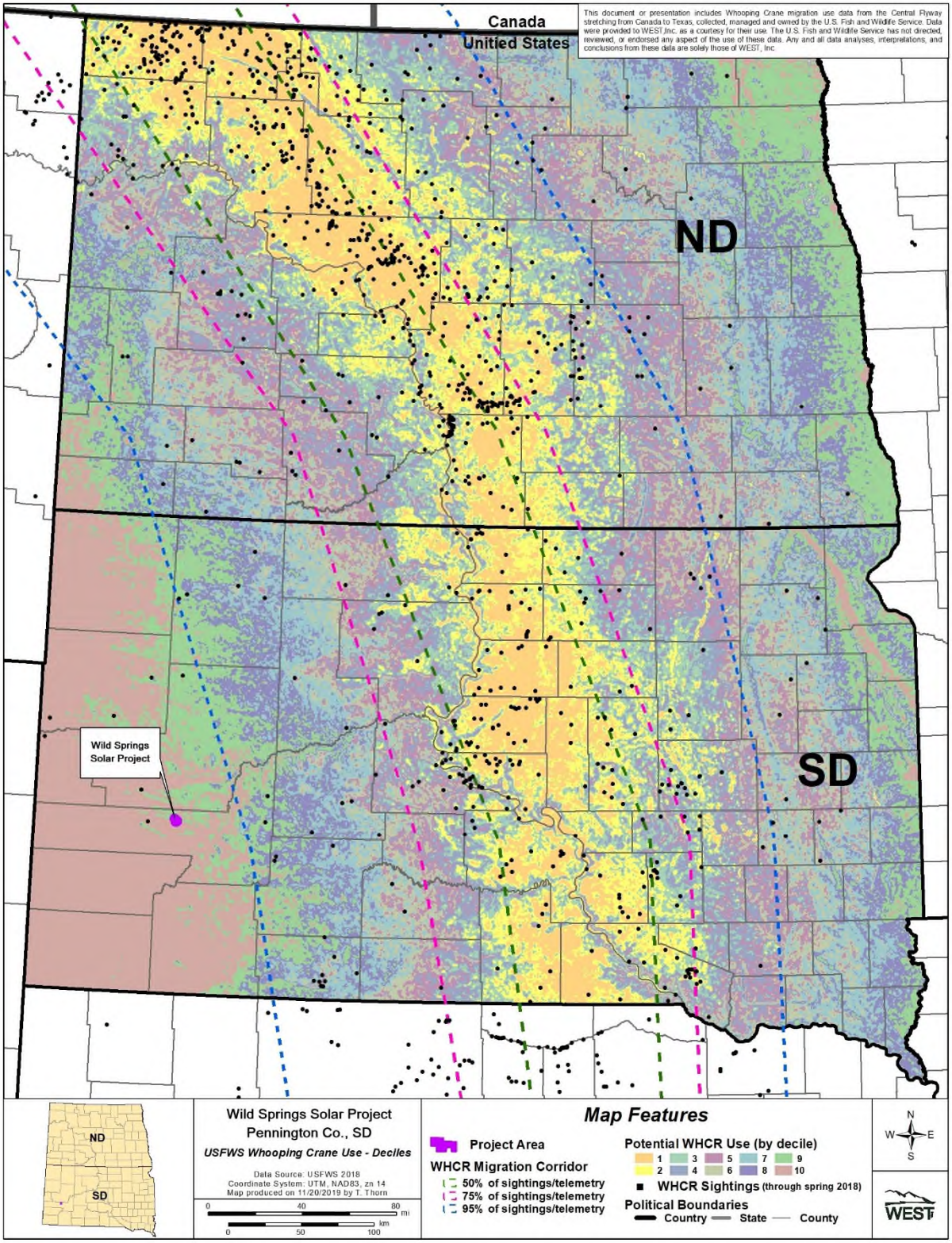

Figure 4. US Fish and Wildlife Service Whooping Crane Use by Deciles Model for North and South Dakota and the location of the Wild Springs Solar Project, Pennington County, South Dakota.

The Owanka BBS route has been monitored a total of 37 years between 1967 and 2014. A total of 100 bird species have been observed along this route, with annual species numbers ranging from 25 in 2009 to 45 in 2002 (Pardieck et al. 2019). The most common species were western meadowlark, lark bunting, and red-winged blackbird. Golden eagles were infrequently seen along this route, with golden eagles observed in 1983, 1984, 1985, 1990, 1993, 1994, and 2001, for a total of 10 observations, and none were observed all other years that the route was surveyed. All raptor species observed along the Railroad Butte BBS route were also observed along the Owanka BBS route, with the exception of turkey vulture and the addition of great horned owl (*Bubo virginianus*), and both BCC species identified above were also documented.

During the reconnaissance surveys in 2019 and previous surveys in 2017, the most common species observed by Area M biologists were western meadowlarks, horned larks (*Eremophila alpestris*), and vesper sparrows (*Pooecetes gramineus*).

Raptors

Based on the publicly available data sources discussed in the previous two sections, multiple raptor species may use the general Project area for foraging and nesting. During field surveys conducted at the Project, 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 (*Buteo lagopus*), and burrowing owls. Ground-based raptor nest surveys were conducted in 2017, 2019, and 2020. As of early April 2020, there were no raptor nests within the Project boundary and nine raptor stick nests located within about 1 mile of the current Project boundary. Three of these nests were occupied by red-tailed hawks, two of these nests were occupied by great horned owls, and the remaining stick nests appeared unoccupied. Based on the overall size, stick composition, and nesting substrate, these unoccupied nests nest were likely built by red-tailed hawks. Note that large owl species frequently use unoccupied buteo nests. Therefore, if these nests become active at a later time, likely occupants would be red-tailed hawks, Swainson's hawks, great horned owls, or long-eared owls. Regardless, none of these nests would be directly impacted by Project construction. .

Prairie Grouse

Greater prairie-chicken (*Tympanuchus cupido*) and sharp-tailed grouse (*Tympanuchus phasianellus jamesi*) are the most common grouse species in South Dakota (SDGFP 2017). However, 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 utilize 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).

Greater prairie-chickens are likely absent from Pennington County, while sharp-tailed grouse leks are known to occur within Pennington County (SDGFP 2017). Prairie grouse leks or booming grounds are historic areas where males annually display for courtship and mating. Leks are typically located on small rises with shorter vegetation, allowing maximum visibility for courtship activities and predator vigilance. Males begin establishing territories on leks in late February to

early March, with females typically beginning to attend in late March to early April (Johnson et al. 2011, Connelly et al. 1998).

Area M conducted lek surveys for prairie grouse for the 2017 Project boundary following protocols established by SDGFP and the Wyoming Game and Fish Department (WGFD) from April 10-14, 2017. These surveys consisted of a hybrid of techniques including point observations on topographic rises, pedestrian transects (in conjunction with conducting the cultural resource survey; Area M 2017a), and field investigation for sign on high-quality potential lek habitat (SDGFP 2017, Christiansen 2007). Area M concluded that prairie grouse leks were not present within the 2017 Project boundary based on a low number of observed prairie grouse, the absence of observed lekking behavior, and the lack of concentrated sign (Area M 2017b).

Following similar protocols as used previously, Area M also conducted prairie grouse lek surveys during the week of April 6th, 2020. This survey covered the most recent Project boundary (see Figure 2). No leks or lekking behavior was observed during these surveys.

2.2.3 Bats

Six bat species occur in eastern South Dakota (Harvey et al. 2011, Bat Conservation International 2016; Table 5). These species could potentially occur in the Project vicinity during all seasons except winter, when they are hibernating or have migrated to warmer places. More detailed information on the federally listed NLEB is provided in Section 2.2.1, above.

Table 5. Bat species with potential to occur in or near the Wild Springs Solar Project, Pennington County, South Dakota.

Common Name	Scientific Name
Big brown bat	*Eptesicus fuscus*
Eastern red bat	*Lasiurus borealis*
Hoary bat	*Lasiurus cinereus*
Little brown bat	*Myotis lucifugus*
Northern long-eared bat [1]	*Myotis septentrionalis*
Silver-haired bat	*Lasionycteris noctivagans*

[1] Federally listed as a threatened species

As stated above, no forested habitat was identified within the Project based on NLCD data. WEST conducted additional desktop analysis of the general Project area using true-color aerial imagery and identified scattered patches of shrubs and trees within the Project comprising approximately 0.19 ac and would likely not be considered suitable for the bat species listed in Table 5. The nearest potentially suitable habitat is the forested corridor along Boxelder Creek, located within one mi and to the northeast of the Project. Due to the paucity of forested habitat and migration corridors, it is unlikely that these bat species will exhibit high use of the Project.

2.2.4 Additional Field Surveys

Based upon WEST's review of available site-specific data to assess potential wildlife use at the Project, additional site-specific field surveys are recommended to further assess wildlife use and species risk at the Project, discussed further below.

Wild Springs will conduct a rigorous breeding bird survey during the avian breeding and nesting season (May/June of 2020) to gather information on species presence, distribution, and relative abundance within the Project area. In particular, this survey will assess the presence of any BCC species that might nest at the site. The survey would involve point-count methodology similar to Ralph (1993) and Rosenstock et al. (2002). Sampling locations for point-count surveys will be identified within the Project area using a two-stage randomized process and to maximize the area covered. Appropriate data will be recorded to provide estimates of bird diversity, species richness, bird count, percent of count, and frequency of occurrence. Wild Springs will conduct a single seasonal survey prior to construction. After the Project goes into operation, two breeding bird surveys will be completed within the Project boundary. To help fully assess potential Project impacts, adjacent but similar habitats in reference areas outside of the Project boundary will also be surveyed for comparison (at two years and four years after construction). These pre- and post-construction surveys will be designed to allow for an assessment of the wildlife habitat value and function within an operating solar facility. The inclusion of reference sites during each year of this study will be particularly important to control for any temporal variation that might be observed in wildlife use.

3 RISK ASSSESSMENT

From available research, PV solar facilities are one of the most benign forms of energy generation technology available today, with many impacts being neutral, to even beneficial (Archambault 2012). A 2009 study assessed 32 impacts from PV solar facilities under the themes of land use intensity, human health and wellbeing, plant and animal life, geohydrological resources, and climate change and found that 22 of the considered 32 impacts were beneficial (Turney and Fthenakis 2011). Of the remaining 10 impacts the study found four were neutral and six required further research before the impacts could be fully assessed, with none of the impacts being negative relative to traditional power generation (Turney and Fthenakis 2011).

Although solar power has been identified as providing a positive effect on the environment when replacing or reducing certain other energy sources, research is on-going to understand the potential direct (e.g. mortality) and indirect (e.g. habitat modification) impacts of these facilities on nearby natural resources including wildlife (Moore-O'Leary et al. 2017). However, studies related to the interaction of wildlife species with human disturbance offers lessons for proper development of solar projects. The following sections examine the known and potential impacts associated with the construction / decommissioning and the operation of these facilities, as well as planning and design measures to minimize these concerns throughout all phases of the project life cycle.

3.1 Impacts due to Construction and Decommissioning

The construction and later decommissioning of solar facilities requires ground disturbance. Similar to other construction projects, there are potential associated impacts to habitat and wildlife, including mortality, disturbance, and habitat modification due to the installation and removal of equipment (e.g., arrays, substation) and other construction-related activities, such as road

installation, dust suppression, and transporting of equipment from off-site locations (Lovich and Ennen 2011). The Project has proposed best management practices for sustainable development of solar facilities that will reduce the potential for direct impacts during construction (see Section 4.2).

3.2 Impacts due to Operation

The literature generally suggests that, with proper planning, the ecological impacts of ground-mounted solar panels will be relatively limited and location-specific (Moore et al., 2017; Taylor et al. 2019). The extent of these impacts is primarily dependent on the sensitivity of proximate species, the location and extent of disturbance, and the infrastructural design (Hernandez et al. 2014). Consultation with stakeholders (such as the USFWS and SDGFP) have specifically identified potential concerns related to birds and mammals, which are discussed further below.

3.2.1 Impacts on Avian Species

Direct Impacts

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). In 2020, WEST synthesized public avian fatality data associated with the only publicly available studies of PV utility-scale solar facilities (Kosciuch et al. 2020). This summary included fatality monitoring data from 13 studies at 10 PV solar facilities in the Southwestern US located in the Sonoran and Mojave Deserts bird conservation regions (x10), the Coastal California bird conservation regions (x2), and the Great Basin bird conservation region (x1). Although relatively low numbers of bird fatalities were found during these studies, passerines were the most represented bird type at these facilities (54.7%). The majority of these passerine fatalities were horned lark, house finch, and western meadowlark (common resident species found near these projects). Doves and pigeons had the next highest percentage of birds detected (15.4%). Although water associates (e.g., ducks, geese, rails, herons) and water obligates (e.g., loons, grebes, cormorants) did not occur consistently across sites, these groups of birds were also found (6.3 and 7.8%, respectively). Bird fatalities were reported within the PV array but also in areas away from array search plots, fences, and power lines, suggesting that a portion of the fatalities found during these studies were natural background mortality (over 60% of fatalities were feather spots where the cause of death was unclear and only about 16% of avian fatalities appeared associated with panel collisions). The overall fatalities rates were 2.49 bird fatalities/MW/year. As a point of comparison, Sovacool (2009) estimated a fatality rate of 74.2 birds/MW/year from fossil fuel power plant operations. Preliminary reports from similar studies conducted at PV facilities in Florida indicate similarly low avian fatality rates (Golder in press). The Project is not anticipated to experience a higher-than-average mortality, given the abundance of comparable habitat in close proximity.

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 (Kosciuch et al. 2020). In total, 36 grebe, 13 loon, 24 coot, and 10 duck deaths have been identified across 10 solar facilities. The highest number of water-obligate birds found seem to be found near the Salton Sea, an important site in an arid region that provides migratory stop-over and winter habitat for hundreds of thousands of water-associated and water-obligate birds. South Dakota and the Wild Springs

Project are not located in a desert with comparable concentrations of water-obligate birds occurring in the area. Given the large amount of solar now installed across the country and the lack of reports or anecdotes of significant water-obligate bird discoveries suggests that solar facilities are not a widespread or significant cause of waterbird mortality.

Based on the comparatively sparse data available in the peer-reviewed literature (and none currently available for the norther Great Plains), generalizations of direct impacts of PV solar energy development to birds are somewhat limited. However, two of the studies from the Coastal California bird conservation region described above were in areas dominated by arid grasslands similar to the Project area. In these two studies, water associate or water obligate birds were not found. Additionally, the most common birds found were mourning dove, horned lark, and western meadowlark, resident species common to those grassland areas. Furthermore, no large fatality events were documented and the cause of bird death in a majority causes was unclear. Given this information, it seems unlikely that significant avian fatalities would be expected at the Wild Springs Project.

Indirect Impacts

Several studies have documented altered avian use patterns at PV solar facilities, with mixed results. A study of eleven solar sites in the southern United Kingdom found a significantly higher diversity of birds within the solar plots compared to the adjoining land (Montag et al. 2016). A 2019 study published in Germany collected data from 75 solar facilities on “derelict” land and found that the installation of these PV solar facilities could improve biodiversity. In contrast, the Jasper PV solar facility in South Africa reported that bird species richness and density within the PV facility tended to be lower than the boundary zones and adjacent undisturbed land, suggesting that birds may avoid solar facilities once they are operational (Visser et al. 2019). A study conducted at PV arrays and nearby airport grasslands in Arizona, Colorado, and Ohio observed lower species diversity at solar arrays, but there were twice as many birds per hectare in the solar arrays than in the nearby airfield grassland areas (DeVault et al. 2014).

In terms of raptors, preliminary findings from avian point-count studies conducted at the California Valley Solar Ranch in south-central California documented no use of constructed solar arrays by raptors (Smith 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 finding 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. The results of these studies suggest that some avian species, such as large birds and raptors, likely avoid operational solar facilities while other species may actually prefer the artificial or restored habitat to the available natural habitat in the area.

Two additional studies have collected data to support this hypothesis. Avian point counts were conducted at the Topaz Solar Farms in San Luis Obispo County, California, both during construction and for three years post-construction (Griffiths et al. 2019). This study documented no negative impacts to avian use from construction or operation of the solar farm, and documented an increase in species richness (Griffiths et al. 2019). Overall wildlife and habitat

studies conducted at the same facility documented higher vegetation productivity on site than in surrounding reference sites (Sinha et al. 2018). Additionally, numerous wildlife species, including 27 bird species, eight mammal species, and four reptile species, with six of the total species having special conservation status, were recorded using habitat at the solar facility (Sinha et al. 2018). These studies suggest that the development of the solar farm can create habitat that may benefit wildlife species through providing resources that would not normally be available within the surrounding habitat, and can potentially increase habitat quality through strategic restoration and land management.

There is currently no data available on avian use within operating solar facilities in the northern Great Plains. However, based on the information available from the studies described above, it seems likely that native birds (small birds in particular) will continue to occur within the Project boundary after the facilities are constructed. The diversity and density of the avian community will likely largely depend on a specific species' response to facility structures (and shading from PV panels) as well as the vegetation community and vegetation management approach within the facility. To maximize the potential for a diverse and healthy bird community after construction, Wild Springs will emphasize the use of native plant species for site restoration within the Project solar arrays and other areas within the fenceline (see section 4.3) and include habitat enhancement measures to encourage ongoing wildlife use of the areas within the Project boundary (see section 4.3.2). Furthermore, Wild Springs will use this opportunity to conduct a series of pre- and post-construction avian use surveys to help better understand avian impacts and to inform decisions around future solar development in the region (see section 2.2.4)

3.2.2 Fencing

Utility-scale PV solar energy facilities must comply with the National Electrical Code and National Fire Protection Code, which include protective fencing that is at least seven feet high or six feet high with at least one foot of barbed wire at the top of the fence around generating stations and substations (Ode 2016). This fencing will act as a barrier to prevent large mammals (e.g., white-tailed or mule deer, pronghorn) from using areas within the Project boundary. Siting design should account for anticipated ground-based wildlife movement through and adjacent to the Project while ensuring the safe and reliable operation of the infrastructure. Due to the presence of prairie dog colonies in the Project boundary, exclusionary fencing options may be utilized for the Project such as chicken-wire below the chain link fence extending below grade. In general, fencing that creates open travel areas between solar facilities allows the most effective big game movement (American Planning Association 2019).

While research on best practices to improve access is still on-going (The Nature Conservancy 2019), proper fencing design will need to consider multiple objectives. For example, ingress and egress by smaller mammals could be facilitated with shorter fencing, woven-wire type fencing with wide wire grid, and/or gaps at the bottom of the fence. However, to prevent deer from becoming entrapped in fencing enclosures, resource agencies recommend higher fencing and installing the fences tight to the ground with no gaps (Wyoming Game & Fish Department 2004).

4 AVOIDANCE, MINIMIZATION, AND MITIGATION

4.1 Pre-construction Siting and Design

Information gathered during the site assessments and field surveys will be used for PV array and infrastructure siting to minimize impacts to birds, bats, species of concern, and their habitats. Additionally, the Project is sited with consideration for the efficiency of selected PV array models and minimizing impacts to area residents. Wild Springs has incorporated setback and constraint information from literature reviews, site-specific studies, and agency recommendations.

4.1.1 Project Siting Measures Used to Reduce Impacts

- The Project was sited to avoid the 2019 mapped prairie dog colonies and cultural resources.
- The Project was sited to avoid and minimize impacts to wetlands and streams.
- Detailed pre-construction wildlife and habitat surveys have been conducted, and additional surveys are proposed to further inform Project siting and restoration goals.
- The Project boundary went through multiple iterations including a reduction in the northwest portion of the Project to exclude Boxelder Creek and the newly identified cultural area, and an expansion of the Project boundary to the south and to the east to provide additional land area for solar arrays and other infrastructure within the boundary to avoid the 2019 mapped prairie dog colonies through micro siting.

4.1.2 Project Design Measures Used to Reduce Impacts

- The Project was designed to minimize the infrastructure required in the planning of access roads, power lines, fences, and associated facilities.
- The Project design for electrical facilities will be based upon the Avian Power Line Interaction Committee's (APLIC) suggested practices for minimizing risk of electrocution of birds from power lines.
- To the extent practicable, the AC collector system will be placed underground, thereby eliminating the risk of bird electrocution.
- On-site/substation lighting will be minimized in order to not disorient nocturnal wildlife species, particularly birds and bats (e.g., down-shielded lighting).
- Project fencing will be designed to enclose a series of distinct Project blocks/arrays. As such, big game will be allowed to move through the general Project area.
- Based on pre-construction vegetation characterization, a vegetation management plan will be developed. This will include incorporation of a grass mix, and strategies to restore and manage vegetation at the site in an ecologically sound and economically efficient way (discussed in more detail in Section 4.3, below).

4.2 Project Construction

4.2.1 Construction Best Management Practices

- Vegetation clearing, excessive site grading, and timelines for which soils are exposed will be minimized to the extent practicable.
- All trash and food-related waste will be placed in closed containers and removed daily from the site so as not to attract wildlife during construction.
- The Project's Storm Water Pollution Prevention Plan (SWPPP) will be utilized to ensure control measures are taken to prevent erosion and runoff during construction of the Project. Of particular concern is runoff into sensitive habitats as well as into streams and roadside ditches. The measures within the SWPPP will comply with the requirements of the National Pollutant Discharge Elimination System/State Disposal System Permit Program.
- To minimize the risk of unintentionally starting a wildfire that could destroy bird and bat habitat, or that could be injurious to construction personnel, construction crews will exercise proper caution and safety measures while handling and storing flammable chemicals, petroleum, and other materials with the potential for combustion.
- Construction teams will be informed of invasive species and take measures to prevent their propagation via the movement of people, materials, and equipment into and out of the site. Control measures include washing off any soil, dirt, and debris on vehicles, equipment, and personal clothing and footwear prior to construction activities.
- Big game will be driven outside of the Project boundary prior to completion of fencing construction to avoid trapping big game within the fenceline.
- The timelines between completion of construction and vegetation restoration will be shortened and minimized as much as possible, potentially through dormant seeding in the winter months or a cover crop if necessary.

4.2.2 Wildlife Best Management Practices

- Site personnel will receive training on wildlife awareness and response procedures.
- To minimize disturbance, all construction and operation vehicle traffic will be restricted to established roads, construction areas, and other designated areas. Construction and operation traffic will adhere to reasonable speed limits to minimize the risk of wildlife collisions.
- Dust suppression will occur during construction activities when necessary to meet air quality standards and protect biological resources.

- The Project has been sited to avoid the 2019 mapped prairie dog colonies. If construction commences in the Fall of 2021, isolated burrows that could be used by burrowing owls for nesting outside the 2019 mapped colonies' extent and within the fenceline will 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) will be left intact and 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 burrows that could be used by burrowing owls for nesting or larger burrows that could be used by a badger or Swift fox will be collapsed outside of the nesting and denning season in the early Winter of 2021. Collapsing burrows prior to construction should minimize the potential for sensitive species like burrowing owls and Swift fox to use the Project area and potentially be disturbed by construction.
- If an active burrowing owl nest or Swift fox natal den are discovered in the Project area, Wild Springs will avoid construction within a quarter mile of the nest or den until after the nesting and/or natal denning season.
- During construction of the Project, if a whooping crane is sighted by on-site personnel, the sighting will be reported to the USFWS South Dakota Ecological Services Field Office.
- Materials such as wooden pallets, wooden power poles, and metal tubing, providing nesting and shelter habitat for birds during the nesting season and artificial refugia for other special-status species will be visually inspected before use during nesting season to ensure the absence of nests. Disturbance to any new and active nests found during these inspections will be avoided to the extent practicable.
- During construction, personnel will visually inspect each open trench or pit daily to determine if any animal has become trapped in the trench or pit. If an animal has become trapped, the Site Manager will be notified and appropriate action taken to safely remove and release the animal and/or allow the animal to escape unimpeded.

4.3 Project Operations

Solar project operations combine energy facility management with vegetation management due to the high density of solar facility structures on the landscape. This is in contrast to wind projects, in that wind turbines are widely spread across the landscape, and leaseholders can continue their existing land use practices once wind projects are operational. This unique situation for solar projects requires an obligation on behalf of the Project operators to be good stewards of the land throughout the life of the facility thus allowing the leaseholder to return to "in-kind" land quality and cover after decommissioning.

The current land use at the Project is predominantly rangeland grazing along with perennial haying. Additionally, the current land cover provides habitat for wildlife use. Ecological functions of the land that are valuable for both human land use and wildlife use, including soil health properties, riparian areas, connectivity with external habitat, and vegetation structure and composition, have been considered in facility planning. Even with the high density of facility structures, it is intended that the ecological functions will be maintained to the greatest extent

practicable. The adaptive management strategy to be employed during facility operations will enable adjustments in facility vegetation management to address the site ecological functions.

The vegetation management plan will build upon data collected during development of the Wild Springs NRS. The plan will largely reflect the fact that the existing perennial vegetation is an asset to be built upon. By minimizing mass grading and ground disturbance generally, the existing sod layer will be left in place to the extent possible and the need for time consuming and expensive dust suppression, erosion control, and revegetation options will be lessened. This approach will focus on maintaining a viable vegetation layer and existing bud bank that will allow for rapid revegetation and soil stabilization. While some site preparation may include decompaction and overseeding, this will be minimized to utilize existing desired existing vegetation rather than to completely "start from scratch" with seed.

The overall vegetation management strategy would thus be to use seeding to augment the perennial vegetation that is viable after construction. The pattern and composition of existing vegetation should be understood at a level to allow for customizing seed mixes to match (e.g., grass seed may be used to assist in restoring areas where pre-construction vegetation cover includes alfalfa or wheat). In some locations there may be existing grassland with a relatively high level of ecological integrity, whereas other areas may be poor (e.g., cultivated areas). This pattern might also serve as a plan for construction to employ sustainable practices in some areas in order to retain the higher quality patches. The Vegetation Management Plan (VMP) consists of proposed seed mixes developed in coordination with the local NRCS office to ensure the mixes are local to the area and will have a high probability of establishment success.

Vegetation management will be expected to use the professional oversight of a restoration professional, and when selecting landscape service contractors, give preference to those with qualifications as stated below.

Restoration Professional: The Restoration Professional (Project Restorationist) will be or have equivalent qualifications to a Certified Ecological Restoration Practitioner (CERP)[1], and will evaluate the site, design the restoration, oversee landscape contractors, monitor using SMART criteria, convey adaptive management needs to contractors, and prepare any summary reports that may be a condition of permits.

Restoration Contractor: The landscaping or Restoration Contractor(s) perform seeding and vegetation management under the oversight of the Project Restorationist. The contractor(s) should be qualified by demonstrating direct experience performing seeding and management.

Restoration Professionals within the same contracting firm must act as independent agents. Potential measures for independence include secured data storage folders, separate supervisors, and employee affirmative statements that they will avoid potential conflict.

[1] Certified Ecological Restoration Practitioner Program https://www.ser.org/general/custom.asp?page=Certification

4.3.1 Operational Best Management Practices

- Site operational personnel will receive training on wildlife awareness and response procedures.
- Long-term rodent and/or prairie dog management will minimize the use of rodenticides. This management could include maintaining vegetation at heights that would be unlikely to attract prairie dog colonization (e.g., black-tailed prairie dogs prefer open patches of grassland, and will move into heavily grazed patches of grassland).
- Project access roads will be posted with a 25-mi per hour speed limit to avoid vehicle-wildlife collisions.
- Fire risk will be minimized by utilizing spark arrestors on all electrical equipment, and by restricting smoking to designated areas.
- During operations, tree trimming will be prioritized over tree removal, all tree trimming will occur in such a manner as to avoid impacting nesting or migrating birds and roosting bats.
- As described in section 2.2.4, a post-construction avian study to assess potential project impacts to the bird community will be conducted. Given the relatively low level of avian fatalities that have been found at PV fatalities to date (Kosciuch et al. 2020; Golder in press), a formal post-construction avian mortality monitoring study is not proposed at this Project. However, operational staff will be trained to identify and report birds or other wildlife that are incidentally discovered within the site during ongoing Project operations.

4.3.2 Habitat Mitigation

During operation of the Project, Wild Springs will maintain vegetation in the areas of the Project outside of the arrays but within the fenceline with native vegetation that does not contain Project infrastructure. While within the fenceline, these areas will be maintained as habitat for those wildlife species that will not be excluded by the fences (e.g., small birds, small mammals, amphibians, reptiles, etc.). Enhancements may be added to these areas to promote wildlife use (e.g., kestrel and other bird nest boxes, bat boxes). As has been shown at several studies of PV facilities thus far (DeVault et al. 2014; Visser et al. 2018), the wildlife community using the areas and PV panel array areas may change but will not be eliminated after the Project begins operations. As such, the habitat within the Project boundary may be altered but will not be lost for ongoing use by wildlife, including small birds and mammals.

5 ADAPTIVE MANAGEMENT

Natural resource agencies view adaptive management as a flexible decision-making framework to address uncertainties in ecological restoration as outcomes from prior management actions become better understood (Williams et al. 2009), with a particular focus on landscape-scale restorations that involve managing widespread invasive species. There is no universal approach to land management and restoration, and flexibility is key for selecting management actions that are appropriate for the state of the managed system at the time of the decision. Each management action will influence the managed system into the future, and therefore management strategies

should, to the extent practicable, account for both the current and future impacts of management decisions. Oftentimes stakeholders can have differing views about the most appropriate management strategy, and the purpose of an adaptive management approach is to incorporate the various viewpoints into the decision making process. Through appropriate adaptive management, understanding of the resource can be enhanced over time, and management can be improved.

Adaptive management is a systematic approach for improving restoration and land management by learning from past mistakes. Management actions will be selected based upon the response of the undesirable condition (e.g., erosion, weed, or noxious species) to the preceding action. Additionally, any unexpected findings pertaining to potential adverse impacts to wildlife could potentially trigger an adaptive management response from Wild Springs; any such adaptive management response would be evaluated in coordination with appropriate state and federal agencies.

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Appendix 1. Agency Correspondence

From:	Morey, Hilary
To:	Gomer, Christina
Subject:	[EXTERNAL] Wild Springs Solar Scoping Comments
Date:	Friday, April 3, 2020 2:32:07 PM
Attachments:	To Geronimo Fr SDGFP_comments on Wild Springs_2019-10-22.pdf WildSpringsSolar-GFP comment Letter 7-17.pdf Wild Springs Solar WAPA Scoping Comments-SDGFP-4-3-20.pdf

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Hi Christina-

Attached, please find South Dakota Game, Fish and Parks' comments for consideration and inclusion in the preparation of a draft Environmental Assessment for Wild Springs Solar Project in Pennington County, South Dakota. I have included three attachments to this e-mail. The file dated 4-3-20 is our official comment letter for the draft EA. The other two attachments, dated 7-7-17 and 10-22-19 are two letters sent directly to Geronimo Energy, LLC from biologists at Game, Fish and Parks. In our letter dated 4-3-20, I referenced these letters, and wanted to attach them to this email. If you have any questions, please let me know. Thanks!

Hilary Morey | Environmental Review Senior Biologist
South Dakota Game, Fish and Parks
523 East Capitol Avenue | Pierre, SD 57501
605.773.6208| Hilary.Morey@state.sd.us

SOUTH DAKOTA DEPARTMENT OF
GAME, FISH AND PARKS
523 EAST CAPITOL AVENUE | PIERRE, SD 57501

22 October 2019

Mellissa Schmit
7650 Edinborough Way, Ste 725
Edina, MN 55435

RE: Wild Springs Solar Energy Project
Pennington County, South Dakota

Dear Melissa,

The South Dakota Department of Game, Fish and Parks, Division of Wildlife has reviewed the information provided in your letter dated 4 October 2019 regarding the Wild Springs solar energy project. This project would involve the construction and operation of a proposed utility scale solar energy project in Pennington County, South Dakota.

As in our letter dated 7 July 2017, we continue to have the same concerns and recommendations regarding the proposed project. In particular, we reiterate the conservation value of untilled grasslands. We also recommend a search of the South Dakota Natural Heritage Database since almost two years has passed since our last correspondence and new data are continually entered into the database.

The proposed siting and operation of solar projects have the potential to directly and indirectly impact area wildlife. This may occur by altering habitats, influencing behavior patterns and directly killing individuals. To insure impacts remain at a minimum, we would recommend conducting at least two years of appropriately-timed pre-construction wildlife surveys to document current conditions and help assess any potential impacts to wildlife. If major impacts are predicted, development in the area should be avoided. If less serious impacts are anticipated, mitigation is recommended to reduce these impacts. Post-construction studies should be conducted to assess actual impacts, evaluate mitigation effectiveness and evaluate predictions. Bird and bat mortality surveys should be conducted at least two years post-construction.

We recommend avoiding areas of untilled grasslands. The project area should be surveyed for untilled tracts of native prairie and every effort should be made to avoid placement of solar panels, roads, collection lines, and facilities in these areas.

In North America, grassland birds have experienced consistent and long term declines (Peterjohn and Sauer 1999). Placement of a solar farm in the proposed project area may reduce habitat suitability for grassland birds by increasing habitat fragmentation and introducing invasive species. Some grassland bird species have been shown to favor large grassland patches and sensitivity to habitat fragmentation. We recommend properly timed, species-appropriate surveys for breeding grassland birds (songbirds and grouse) be conducted. Many privately owned areas in South Dakota have not been surveyed for grassland songbirds or prairie grouse leks. We respectfully request a written summary of the first round of grouse surveys that were conducted in April of 2017, if they have not already been provided. Post-construction surveys should monitor lek presence and document the number of grouse attending each lek.

We recommend that any new power lines or transmission lines be buried. If this is not possible, placement of above-ground transmission lines should be located along existing corridors such as within existing disturbed areas. Electrocution of birds that perch, roost, or nest on power lines continues to be a source of mortality, especially for eagles, hawks, and owls (Avian Power Line Interaction Committee 2006). The Avian Power Line Interaction Committee (APLIC) has developed two documents that provide useful information on how to reduce power line strikes and electrocutions: 1) Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 and 2) Mitigating Bird Collisions with Power Lines. Both of these documents are available from the Edison Institute (http://www.aplic.org).

A least thirteen bat species occur in South Dakota, including the federal threatened Northern long-eared bat. We suggest pre-construction surveys of the area for potential bat habitat and bat activity levels using acoustic detectors. Avoiding bat habitat (especially water and wooded areas) and areas with high bat activity are recommended.

If surveys indicate that state endangered, threatened, or rare species may occur in the project area, South Dakota Codified Law 34A-8-8 allows for only limited and specific authorized take of threatened and endangered species for scientific, zoological, or educational purposes. For more information, please visit https://gfp.sd.gov/licenses/other-permits/endangered-species-permit.aspx.

If survey and monitoring activities include live trapping or the collection of wildlife species, you must first obtain a collection permit from our agency. If these activities include bats, specific sampling and collection protocols must be followed for a collectors permit to be issued. More information can be found at the following websites:

- Scientific Collectors Permit -https://gfp.sd.gov/licenses/other-permits/scientific-collectors.aspx
- Bat Sampling and Collection Protocol Guidelines and Requirements - https://gfp.sd.gov/wildlife/docs/bat-protocol.pdf

Our agency has concerns regarding direct and indirect impacts to wildlife and habitats in association with the proposed project. If development of this project continues to be pursued, a joint meeting with

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523 EAST CAPITOL AVENUE | PIERRE, SD 57501

SDGFP and U.S. Fish and Wildlife Service representatives is recommended to further discuss project details and wildlife concerns. This may be especially pertinent before transmission line, rack and access road layout is finalized. We appreciate the opportunity to provide comments.

Sincerely,

Silka Kempema

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SOUTH DAKOTA DEPARTMENT OF
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523 EAST CAPITOL AVENUE | PIERRE, SD 57501

April 3, 2020

Christina Gomer
Western Area Power Administration
2900 4th Avenue North
Billings, MT 59101

RE: Proposed Wild Springs Solar Project

Dear Christina,

Thank you for contacting the South Dakota Department of Game, Fish and Parks (SDGFP) regarding the above-mentioned project involving the construction of a 128 megawatt solar energy system, substation, underground transmission line, access roads and a maintenance and operation center in Pennington County, South Dakota. We have prepared the following comments and suggestions to be considered as part of the environmental assessment (EA) to be prepared by Western Area Power Administration.

Siting and operation of solar projects has the potential to directly and indirectly impact area wildlife. This may occur by altering habitats, influencing behavior patterns and directly killing individuals through collisions with project infrastructure. In particular, SDGFP is concerned about habitat alteration as a result of this proposed project, and effects on grassland dependent species. SDGFP has provided two letters (dated 7/7/17 and 10/22/19) to the project developer (Geronimo Energy LLC; hereafter the developer) stating our concerns regarding habitat alterations. We ask that these two letters from SDGFP are incorporated by reference.

In a January 22nd, 2020 meeting with the project developer, representatives of SDGFP and the US Fish and Wildlife Service South Dakota Ecological Services Office discussed the project and potential impacts to wildlife. During this meeting, SDGFP made the developer aware of concerns regarding alteration of grassland habitat, potential sensitive species that could occur in the project area, exclusion of big game from the project area and urged the developer to exclude prairie dog colonies from the project. We have included additional information related to these concerns below.

The developer is proposing to conduct one year of pre-construction breeding bird surveys at the project site. In our letter dated October 22 2019, SDGFP recommended completing two years of pre-construction surveys. Pre-construction survey data usually incorporates a small snap-shot in time but is used to assess risks for the life of a project (~30 years) therefore, it is important to perform surveys with a high degree of scientific rigor, and to capture temporal variation in wildlife use of the project area. SDGFP would prefer if a minimum of two years of pre-construction breeding bird surveys were completed within the project area.

If major impacts are predicted from these surveys, development in the area should be avoided. If less serious impacts are anticipated, mitigation is recommended to reduce these impacts. The developer proposed that post-construction wildlife use studies may be completed in-lieu of post-construction mortality monitoring. SDGFP believes that some level of post-construction mortality monitoring would still be useful to determine impacts to wildlife. We recommend that post-construction wildlife use studies be designed and conducted to assess impacts of the project, compare to predictions from pre-construction surveys, and to evaluate potential mitigation measures. We also recommend that post-construction surveys use methods that are directly comparable to pre-construction survey methods. Little research exists on the impacts of solar energy facilities sited in grassland and herbaceous habitat, and post-construction wildlife use studies would be valuable to assist with future project review and planning. Information on efforts to survey for and document sensitive species and habitats, as well as how risk will be avoided or mitigated should be included in the EA.

Landcover and Landuse

A desktop review of the project indicated that most of the proposed area is classified as grassland/herbaceous cover in the 2011 National Land Cover Database (https://www.mrlc.gov/). Remnant prairie tracts have high conservation value, especially those that contain a high diversity of both plant and animal species, and rare or non-existent invasive species. The project area could contain untilled native grasslands. Impacts to these habitats may be unavoidable, but SDGFP would still recommend the project area be surveyed for untilled tracts of native prairie and recommend efforts be taken not to place solar panels, roads, collection lines and facilities in these areas. The EA should provide information on the extent of grassland in the area, ways to avoid direct loss of grassland acres and ways to reduce degradation and fragmentation.

Rare and Protected Species

We have conducted a search of the SD Natural Heritage Database (NHD) within the project boundary. This database monitors species at risk, specifically those species that are legally designated as threatened or endangered or rare. Rare species are those that are declining and restricted to limited habitat or a jurisdiction, may be isolated or disjunct due to geographic or climatic factors that are classified as such due to lack of survey data. A list of monitored species can be found at http://gfp.sd.gov/natural-heritage-program.

No records of threatened, endangered or rare species were found in the project area. Many places in South Dakota have not been surveyed for rare or protected species and the absence of a species from the database does not preclude its presence from the project area. If surveys indicate that state endangered, threatened or rare species may occur in the project area, South Dakota Codified Law 34A-8-8 allows for only limited and specific authorized take of threatened and endangered species for scientific, zoological or educational purposes. For more information, please visit https://gfp.sd.gov.licenses/other-permits/endangered-species-permit.aspx.

Avian Species

In North America, grassland birds have experienced consistent and long-term declines (Peterjohn and Sauer 1999, Rosenberg et al. 2019). The USFWS publishes a list of bird species of habitat fragmentation concern (Bakker 2020). These species are those which research and literature indicate are negatively affected by loss and fragmentation of habitat. Fragmentation includes cutting habitats into smaller, more isolated blocks and the creation of barriers (such as the inclusion of trees in prairies, barren land in forested areas, wind turbines, roads, etc.). The effects of fragmentation on species of concern include avoidance of fragmented areas or decreased density, survival, and/or reproduction in fragmented habitats. Species of habitat fragmentation concern that may inhabit the project area include:

Burrowing owl (*Athene cunicularia*)
Upland Sandpiper (*Bartramia longicauda*)
Longbilled Curlew (*Numenius americanus*)
Western Meadow Lark (*Sturnella neglecta*)
Lark Bunting (*Calamospiza melanocorys*)
Sharp-tailed grouse (*Tympanuchus phasianellus*)
Grasshopper Sparrow (*Ammodramus savannarum*)
Northern Harrier (*Circus cyaneus*)
Sprague's Pipit (*Anthus spragueii*)
Chesnut-collared Longspur (*Calcarius ornatus*)
Savannah Sparrow (*Passerculus sandwichensis*)

Additionally, a search of the NHD indicated that there are nesting burrowing owl (*Athene cunicularia*) located west of the project. Although no records of burrowing owl were found in the immediate project area, the presence of prairie dog towns within and adjacent to the project boundary could provide suitable habitat for this species. In addition to being a species of habitat fragmentation concern, the burrowing owl is listed as a species of greatest conservation need in South Dakota. Burrowing owls nest in grasslands with few trees, and inhabit prairie dog towns larger than 25 acres (Griebel and Savidge 2007, Thiele et al. 2013). The breeding season in South Dakota is mid-May to early August. SDGFP suggests avoiding construction within 0.25 miles of an active burrowing owl nest, if any are identified during breeding bird surveys. These recommendations for burrowing owl nest avoidance measures should be included in the EA

Prairie Grouse

SDGFP generally recommends two years of prairie grouse lek surveys in a project area prior to development. Prairie grouse (sharp-tailed grouse and greater prairie chicken (*T. cupido*)) inhabit large intact blocks of native grassland. Development (roads, power lines, solar panels, buildings, etc.) in and around prairie grouse habitat can fragment otherwise suitable habitat and displace birds. Prairie grouse are indicators of high quality grassland habitat and a robust ecological community due to their specific habitat needs. The developers of the project completed an initial prairie grouse lek survey in 2017 and

plan to conduct an additional year of surveys in 2020. If prairie grouse leks are found during the 2020 surveys, we suggest a two mile no construction buffer during the lekking and subsequent nesting season (1 March to 30 June). Sharp-tail grouse are sensitive to noise, and construction near leks could cause birds to abandon leks. If the developer determines it is not feasible to cease construction within the two mile buffer during the lekking season, SDGFP asks that construction activities are limited to the period 3 hours after sunrise to 1 hour before sunset. These recommendations for sharp-tailed grouse lek avoidance measures should be included in the EA.

Avian Mortality and Powerlines

The developer proposes to use underground transmission lines, which will reduce impacts to avian species. We include the following information for the reviewers and developers to consider if any above-ground power lines will be a part of the project. Avian use of energized poles includes perching (for hunting and roosting), nesting, and resting (including shelter during inclement weather). Large birds (e.g. eagles, hawks) that use energized poles can be electrocuted if energized equipment is not insulated properly to minimize risks. Other avian species could potentially collide with the lines, including waterfowl, and sharp-tailed grouse, which do not generally perch on tall transmission lines. If any above-ground transmission lines are built in addition to the proposed underground transmission line, SDGFP recommends all new construction should follow or exceed Avian Power Line Interaction Committee (APLIC) construction design standards for avian-safe passage and use. See https://www.aplic.org/ for specific guidance on how to mitigate collision and electrocution risks to avian species. Ways to reduce or mitigate the impacts of power line strikes and electrocutions should be provided in the EA, including the suggestions from APLIC.

Mammals

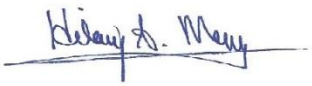
Swift fox (*Vulpes velox*) are listed as state threatened by SDGFP. Swift fox typically inhabit short grass to midgrass prairies with gently rolling topography. Swift fox will enlarge burrows of other burrowing animals (e.g. black tailed prairie dogs) or create their own dens in loose soils (Higgins et al. 2000). Habitat loss is the greatest threat to swift fox populations throughout its range. No records of swift fox occur within the project area, however swift fox can be difficult to detect. If a swift fox den is discovered during construction of the project, SDGFP recommends avoiding construction in the immediate area (0.25 mile buffer), if feasible.

During the January 2020 meeting, the developer indicated that prairie dog towns were identified in the project area. We recommend not siting project components within prairie dog colonies (if feasible) to reduce disturbance to swift fox and burrowing owl habitat, as well as to reduce the risk of collision for avian predators that may forage in prairie dog colonies. Collisions with vehicles associated with construction, operation, and maintenance activities are also a concern if swift fox are found in the project area. We recommend reducing speed limits within the project during construction, operation and maintenance activities. SDGFP requests that recommendations for avoiding risks to swift fox are included in the EA.

The project area is also home to populations of mule deer (*Odocoileus hemionus*), whitetail deer (*O.virginianus*) and antelope (*Antilocapra americana*). We do not anticipate this project to pose a significant impact to these species. However, the developer indicated that a security fence will be installed around the project boundary. We suggest a woven wire/chain link fence be at least 7-8' tall to exclude deer and antelope. We also request that biologists and/or construction crews assure big game animals (particularly fawns, depending on construction timing) are void of the facility before fencing is permanently closed. The wire should be installed tight to the ground, or possibly buried. For more information on building wildlife-friendly fencing please see: https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_026389.pdf. SDGFP requests that recommendations for avoiding impacts to deer and antelope are included in the EA.

We appreciate the opportunity to provide comments on this project. Please keep SDGFP involved in all future correspondence. For any additional questions or information, please feel free to contact me at 605.773.6208 or Hilary.Morey@state.sd.us.

Sincerely,



Hilary Morey
Environmental Review Senior Biologist
523 East Capitol Avenue
Pierre, SD 57501
hilary.morey@state.sd.us

cc: Natalie Gates (USFWS)

Literature Cited

Bakker, K.K. 2020. South Dakota Species of Habitat Fragmentation Concern: Grassland Birds. Report developed for: U.S. Fish and Wildlife Service, South Dakota Ecological Services Field Office, Pierre, SD, 38 pp.

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SOUTH DAKOTA DEPARTMENT OF
GAME, FISH AND PARKS
523 EAST CAPITOL AVENUE | PIERRE, SD 57501

July 7, 2017

Ms. Melissa Schmit
Geronimo Energy, LLC
7650 Edinborough Way, Suite 725
Edina, MN 55435

RE: Wild Springs Solar Energy Project
Pennington County, South Dakota

Dear Melissa,

The South Dakota Department of Game, Fish and Parks, Division of Wildlife, has reviewed the above project involving the construction and operation of a proposed utility scale solar energy project in Pennington County, South Dakota. At this time, the transmission line route, racking layout, access roads, and electrical connections have not been finalized.

The proposed siting and operation of solar projects have the potential to directly and indirectly impact area wildlife. This may occur by altering habitats, influencing behavior patterns and directly killing individuals. To insure impacts remain at a minimum, we would recommend conducting at least two years of appropriately-timed pre-construction wildlife surveys to document current conditions and help assess any potential impacts to wildlife. If major impacts are predicted, development in the area should be avoided. If less serious impacts are anticipated, mitigation is recommended to reduce these impacts. Post-construction studies should be conducted to assess actual impacts, evaluate mitigation effectiveness and evaluate predictions. Bird and bat mortality surveys should be conducted at least two years post-construction.

A drive-by site visit of the project revealed that most of the study area appears to be farmed or hayed. However, if any remnant prairie tracts remain, we recommend avoidance of these areas. Remnant prairie tracts have high conservation value, especially those that contain a high diversity of both plant and animal species with non-native, invasive plant species being rare or absent. The project area should be surveyed for untilled tracts of native prairie and every effort should be made to not place solar panels, roads, collection lines, and facilities in these areas.

In North America, grassland birds have experienced consistent and long term declines (Peterjohn and Sauer 1999). Placement of a solar farm in the proposed project area may reduce habitat suitability for grassland birds by increasing habitat fragmentation and introducing invasive species. Some grassland bird species have been shown to favor large grassland patches and sensitivity to habitat fragmentation. We recommend properly timed, species-appropriate surveys for breeding grassland birds (songbirds and grouse) be conducted. Many privately owned areas, such as the project site, have not been surveyed for grassland songbirds or prairie grouse leks. It is my understanding that the first round of grouse surveys were conducted in April of 2017. Our agency would respectfully request a written summary of these survey findings when they become available. Post-construction surveys should monitor lek presence and document the number of grouse attending each lek.

We recommend that any new power lines or transmission lines be buried. If this is not possible, placement of above-ground transmission lines should be located along existing corridors such as within existing disturbed areas. Electrocution of birds that perch, roost, or nest on power lines continues to be a source of mortality, especially for eagles, hawks, and owls (Avian Power Line Interaction Committee 2006). The Avian Power Line Interaction Committee (APLIC) has developed two documents that provide useful information on how to reduce power line strikes and electrocutions:

Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 and *Mitigating Bird Collisions with Power Lines*

Both of these documents are available from the Edison Institute (http://www.aplic.org).

Several bat species, hoary, silver-haired, eastern red, and northern long-eared, are known to occur in South Dakota. We suggest pre-construction surveys of the area for potential bat habitat and species followed by post-construction mortality surveys.

A search of the Natural Heritage Database indicated that there are no known threatened, endangered or rare species in the project boundary, therefore we anticipate that the project as described will have no effect to listed or proposed protected species. However, please note that many places in South Dakota have not been surveyed for rare or protected species and the absence of a species from the database does not preclude its presence from your project area. If surveys indicate that state endangered, threatened, or rare species may occur in the project area, South Dakota Codified Law 34A-8-8 allows for only limited and specific authorized take of threatened and endangered species for scientific, zoological, or educational purposes. For more information, please visit https://gfp.sd.gov/licenses/other-permits/endangered-species-permit.aspx. If survey and monitoring activities include live trapping or the collection of wildlife species, you must first obtain a collection permit from our agency. If these activities include bats, specific sampling and collection protocols must be followed for a collectors permit to be issued. More information can be found at the following websites:

Scientific Collectors Permit –
https://gfp.sd.gov/licenses/other-permits/scientific-collectors.aspx

Bat Sampling and Collection Protocol Guidelines and Requirements –
https://gfp.sd.gov/wildlife/docs/bat-protocol.pdf

Our agency has concerns regarding direct and indirect impacts to wildlife and habitats in association with the proposed project. If development of this project continues to be pursued, a joint meeting with SDGFP and the U.S. Fish and Wildlife Service representatives is recommended to further discuss project details and wildlife concerns.

We appreciate the opportunity to provide comments. If you have any questions, please contact me at 605.773.6208.

Sincerely,

Leslie Murphy

Leslie Murphy
Environmental Review Coordinator
523 East Capitol Avenue
Pierre, SD 57501
Leslie.Murphy@state.sd.us

SOUTH DAKOTA DEPARTMENT OF
GAME, FISH AND PARKS
523 EAST CAPITOL AVENUE | PIERRE, SD 57501

Literature Cited

Avian Power Line Interaction Committee. 2006. Suggested Practices for Avian Protections on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC and the California Energy Commission, Washington, D.C. and Sacramento, CA.

Peterjohn, B.G, and J.R. Sauer. 1999. Populations status of North American grassland birds from the North American breeding bird survey. Studies in Avian Biology No. 19:27-44.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Dakota Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

IN REPLY REFER TO:
WILD SPRINGS
SOLAR PROJECT

March 9, 2020

Christina Gomer
Western Area Power Administration
Upper Great Plains Customer Service Region
2900 4th Avenue North
Billings, Montana 59101

Dear Ms. Gomer:

This letter is in response to your request dated February 11, 2020, for environmental comments regarding the proposed Wild Springs Solar Project, a photovoltaic ground-mounted solar energy system and associated facilities, potentially generating up to 128-megawatt (MW). The project is proposed on private lands south of New Underwood in Pennington County, South Dakota.

We previously provided a letter to the developer of this project, Geronimo Energy, dated July 3, 2017, that had been copied to your office; a second copy is enclosed for your convenience. That letter provides information regarding the species and resources of concern that may occur in the project area (federally listed species, eagles, migratory birds, Birds of Conservation Concern, wetlands) as well as some recommendations to reduce impacts to those resources. The comments in that July 3, 2017, letter still apply to this project, with exception of language regarding incidental take of migratory birds per the December 17, 2017, U.S. Department of Interior, Solicitor's Opinion, M-37050 (online: https://www.doi.gov/solicitor/opinions/). Note, that M-37050 addresses incidental take of migratory birds under the Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA), but incidental take does not include habitat impacts such as removal of habitat nor displacement of wildlife from habitat.

We also recently provided you with a report titled *South Dakota Species of Habitat Fragmentation Concern: Grassland Birds*. Species listed in that document are likely to be affected by activities on the landscape that reduce the size of contiguous grasslands into smaller and more isolated patches. Some of these species are likely to occur at the Wild Springs Solar project area and placement of solar panels effectively blanketing grassland habitat will likely be to the detriment of these sensitive species. Many are also currently recognized as species of concern by our agency and the State of South Dakota.

Activities that alter or destroy grassland bird nesting habitat may fall under the Service's 1981 mitigation policy, available online at: https://www.fws.gov/policy/a1npi89_02.pdf. This policy

assures consistent and effective mitigation recommendations that facilitate mitigation by Federal action agencies and developers early in the action process, thereby avoiding delays and assuring equal consideration of fish and wildlife resources with other project features and purposes. Our policy adopts the definition of the term "mitigation" as stated in the NEPA regulations which includes: "(a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensating for the impact by replacing or providing substitute resources or environments."

During a January 22, 2020, meeting with Geronimo representative Melissa Schmit regarding this project, we reiterated a primary recommendation in our July 3, 2017, letter: to avoid intact grassland areas as much as possible. Grasslands compose the dominant habitat type (75.5% per reports provided to us by Geronimo) within the Wild Springs Solar Project area; ideally project boundaries would be shifted or a new location would be chosen to reduce this impact. We continue to recommend measures to reduce the footprint of this project on grassland habitats.

Also during that meeting, we reiterated another recommendation: to offset the impacts to migratory birds, particularly grassland nesting species, expected to result from this development. Some information is available from other solar farms regarding environmental impacts, but few project are established in South Dakota at this time. The Wild Springs project, should it proceed, provides an opportunity in South Dakota to gather data that could inform the level of offsets needed to address anticipated change in avian diversity, density, and/or species composition. Incidental take of migratory birds would also be valuable information to understand that aspect of solar project effects in South Dakota, but the primary focus would be the impact of this site to birds via habitat impacts. Geronimo has provided some information indicating post-construction surveys will be completed; we recommend the resulting information be used to develop a habitat offset plan for the benefit of grassland birds.

Our emphasis on grassland birds and habitat offsets is reinforced by the recent finding that the majority of North American bird species are in decline, exhibiting a 29% reduction in abundance or a loss of 2.9 billion birds across almost all biomes since 1970 (Rosenberg et al. 2019). Among those, grassland nesting birds have experienced the greatest population losses: approximately 53% declines in populations across North America, equating to more than 700 million breeding individuals encompassing 31 species (Rosenberg et al. 2019). Conserving native prairie for the benefit of grassland nesting birds is an environmental priority in South Dakota.

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service should be informed so that the above determinations can be reconsidered.

The Service appreciates the opportunity to provide comments. If you have any questions on these comments, please contact Natalie Gates of this office at (605) 224-8693, Extension 227.

Sincerely,

Natalie Gates

For Scott Larson
Field Supervisor
South Dakota Field Office

Literature Cited

Rosenberg, K. V., A. M. Dokter, P. J. Blancher, J. R. Sauer, A. C. Smith, P. A. Smith, J. C. Stanton, A. Panjabi, L. Helft, M. Parr, and P. P. Marra. 2019. Decline of the North American Fauna. Science 10.1126/science.aaw1313.

Enclosure

cc: SDDGFP, Pierre, SD, Attn: Hilary Morey

United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Dakota Ecological Services

420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

IN REPLY REFER TO:
Wild Springs Solar,
Pennington County

July 3, 2017

Ms. Melissa Schmit
Wild Springs Solar
7650 Edinborough Way, Suite 725
Edina Minnesota 55435

Dear Ms. Schmit:

This letter is in response to your request received June 5, 2017, for environmental comments regarding the above referenced Wild Springs Solar project near New Underwood, Pennington County, South Dakota. The project proposal includes solar facilities, fencing, roads, a substation, collection lines and weather station(s) as well as a 115 kV (presumably overhead) transmission line to connect to the existing New Underwood Substation (route yet to be determined). The federal nexus for this project is an interconnection with Western Area Power Administration's (Western) transmission system, thus we have provided a copy of this correspondence to Western's Billings, Montana, office.

Threatened/Endangered Species
In accordance with section 7(c) of the Endangered Species Act, as amended, 16 U.S.C. 1531 et seq., we have determined that the following federally listed species may occur in the project area (this list is considered valid for 90 days):

Species	Status	Expected Occurrence
Whooping Crane (*Grus americana*)	Endangered	Migration
Northern Long-eared Bat (Myotis septentrionalis)	Threatened	Summer resident, seasonal migrant, Black Hills winter resident

Whooping cranes migrate through South Dakota on their way to northern breeding grounds and southern wintering areas. They occupy numerous habitats such as cropland and pastures; wet meadows; shallow marshes; shallow portions of rivers, lakes, reservoirs, and stock ponds; and both freshwater and alkaline basins for feeding and loafing. Overnight roosting sites frequently require shallow water in which to stand and rest. Should construction occur during spring or fall migration, the potential for disturbances to whooping cranes exists. Disturbance (flushing the birds) stresses them at critical times of the year. We recommend remaining vigilant for these

birds. There is little that can be done to reduce disturbance besides ceasing construction at sites where the birds have been observed. The birds normally do not stay in any one area for long during migration. Any whooping crane sightings should be reported to this office.

The northern long-eared bat is a medium-sized brown bat listed as threatened under the Endangered Species Act. Northern long-eared bats are known to be present in South Dakota during the summer months, primarily roosting singly or in colonies underneath bark, in cavities or in crevices of both live and dead trees. Hibernacula have been documented in caves/mines in the Black Hills, and the species has been documented in other areas in the state during the summer months. White nose syndrome - a fungus affecting hibernating bats - is considered a significant threat to this species, but individuals may be harmed by other activities such as modifications to hibernacula, timber harvest, human disturbance, and collisions with wind turbines. A 4(d) rule has been published that exempts take of Northern long-eared bats in certain circumstances. For more information, see: https://www.fws.gov/Midwest/Endangered/mammals/nleb/index.html.

If Western or their designated representative determines that the project "may adversely affect" listed species in South Dakota, it should request formal consultation from this office. If a "may affect - not likely to adversely affect" determination is made for this project, it should be submitted to this office for concurrence. If a "no effect" determination is made, further consultation may not be necessary. However, a copy of the determination should be sent to this office.

Wetlands

According to National Wetlands Inventory maps, (available online at https://www.fws.gov/wetlands/) wetlands exist at the proposed construction area. If a project may impact wetlands or other important fish and wildlife habitats, the U.S. Fish and Wildlife Service (Service), in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) and other environmental laws and rules, recommends complete avoidance of these areas, if possible, then minimization of any adverse impacts, and finally replacement of any lost acres, in that order. Alternatives should be examined and the least damaging practical alternative selected. If wetland impacts are unavoidable, a mitigation plan addressing the number and types of wetland acres to be impacted, and the methods of replacement should be prepared and submitted to the resource agencies for review.

Migratory Birds

Land use of the project area was not provided in your letter, but satellite imagery suggests hayland, pasture, and cropground exist within the project boundaries. Of concern within intact grasslands on the site are migratory birds and nesting habitat. In accordance with Executive Order 13186 regarding migratory bird protection, we recommend avoidance, minimization, and finally replacement of habitat to reduce the impacts to species protected by the Migratory Bird Treaty Act (MBTA). Impacts resulting from this project could include displacement, avoidance, and/or mortality of birds that reside in the area or migrate through it. We recommend evaluation of the proposed project area for migratory bird use prior to construction, followed by post-construction monitoring and evaluation of impacts. Results should be reported to this office. A mitigation plan that specifically addresses direct and indirect take of birds during and after

construction is also recommended, particularly if project impacts must occur within intact native grasslands. Such a plan could include prairie restoration, establishment of easements, or purchase of fee title lands. We can provide further guidance in this regard if the proposed project progresses.

Our Birds of Conservation Concern 2008 document identifies grassland nesting birds that may occur at your proposed project site. This document (available at the following website: https://www.fws.gov/migratorybirds/pdf/grants/BirdsofConservationConcern2008.pdf) is intended to identify species in need of coordinated and proactive conservation efforts among State, Federal, and private entities, with the goals of precluding future evaluation of these species for Endangered Species Act protections and promoting/conserving long-term avian diversity. Primary threats impacting grassland species that occur in South Dakota are habitat loss and fragmentation; these impacts are anticipated as a result of this proposed project.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the MBTA has no provision for allowing unauthorized take, the Service realizes that some birds may be killed as a result of the proposed project even if all known reasonable and effective measures to protect birds are used. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to avoid take of migratory birds and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent and effective measures to avoid that take. Companies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans and/or avian protection plans, and to implement those measures prior to/during construction, operation, or similar activities.

Eagles

Eagles are also protected by the MBTA as well as the Bald and Golden Eagle Protection Act (BGEPA). Golden eagles (*Aquila chrysaetos*) are year-round residents in western South Dakota, and may be found throughout the state in winter or during migration, while Bald eagles (*Haliaeetus leucocephalus*) occur throughout South Dakota in all seasons. The MBTA and BGEPA protect eagles from a variety of harmful actions and impacts. The Service has guidance regarding means to protect eagles:

- Our 2007 *National Bald Eagle Management Guidelines* are available online: https://www.fws.gov/southdakotafieldoffice/NationalBaldEagleManagementGuidelines.pdf. We recommend reviewing these guidelines as they advise of circumstances where these laws may apply and assist you in avoiding potential violations.

- Our 2009 final rule (50 C.F.R. §§ 22.26 and 22.27) authorizing issuance of permits to

take bald and golden eagles, where the take is compatible with the preservation of the bald eagle and the golden eagle, is associated with and not the purpose of an otherwise lawful activity, has been avoided to the maximum degree practicable, and the remaining take is unavoidable. We recently amended the eagle permit regulations; see: https://www.gpo.gov/fdsys/pkg/FR-2016-12-16/pdf/2016-29908.pdf).

Power Lines

Your project includes construction of an overhead powerline, which are known to kill birds via electrocution and line strikes. Thousands of birds, including endangered species, are killed annually as they attempt to utilize overhead power lines as nesting, hunting, resting, feeding, and sunning sites. The Service recommends the installation of underground, rather than overhead, power lines whenever possible/appropriate to minimize environmental disturbances. For all new overhead lines or modernization of old overhead lines, we recommend incorporating measures to prevent avian electrocutions. The publication entitled *Suggested Practices for Avian Protection on Power Lines - The State of the Art in 2006* has many good suggestions including pole extensions, modified positioning of live phase conductors and ground wires, placement of perch guards and elevated perches, elimination of cross arms, use of wood (not metal) braces, and installation of various insulating covers. You may obtain this publication by contacting the Edison Electric Institute via their website at: http://www.eei.org/resourcesandmedia/products/Pages/products.aspx, or by calling 202-508-5000.

Please note that utilizing just one of the "Suggested Practices . . ." methods may not entirely remove the threat of electrocution to raptors. In fact, improper use of some methods may increase electrocution mortality. Perch guards, for example, may be only partially effective as some birds may still attempt to perch on structures with misplaced or small-sized guards and suffer electrocution as they approach too close to conducting materials. Among the most dangerous structures to raptors are poles that are located at a crossing of two or more lines, exposed above-ground transformers, or dead end poles. Numerous hot and neutral lines at these sites, combined with inadequate spacing between conductors, increase the threat of raptor electrocutions. Perch guards placed on other poles has, in some cases, served to actually shift birds to these more dangerous sites, increasing the number of mortalities. Thus, it may be necessary to utilize other methods or combine methods to achieve the best results. The same principles may be applied to substation structures.

Please also note that the spacing recommendation within the "Suggested Practices . . ." publication of at least 60 inches between conductors or features that cause grounding may not be protective of larger raptors such as eagles. This measure was based on the fact that the skin-to-skin contact distance on these birds (i.e., talon to beak, wrist to wrist, etc.) is less than 60 inches. However, an adult eagle's wingspan (distance between feather tips) may vary from 66 to 96 inches depending on the species (golden or bald) and gender of the bird, and unfortunately, wet feathers in contact with conductors and/or grounding connections can result in a lethal electrical surge. Thus, the focus of the above precautionary measures should be to a) provide more than 96 inches of spacing between conductors or grounding features, b) insulate exposed conducting features so that contact will not cause raptor electrocution, and/or c) prevent raptors from perching on the poles in the first place.

Additional information regarding simple, effective ways to prevent raptor electrocutions on power lines is available in video form. *Raptors at Risk* may be obtained by contacting EDM International, Inc. at 4001 Automation Way, Fort Collins, Colorado 80525-3479, Telephone No. (970) 204-4001, or by visiting their website at: https://www.edmlink.com/component/zoo/item/video-raptors-at-risk?Itemid=240.

In addition to electrocution, overhead power lines also present the threat of avian line strike mortality. Particularly in situations where these lines are adjacent to wetlands or where waters exist on opposite sides of the lines, we recommend marking them in order to make them more visible to birds. For more information on bird strikes, please see *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* which, again, may be obtained by contacting the Edison Electric Institute via their website at http://www.eei.org/resourcesandmedia/products/Pages/products.aspx, or by calling 202-508-5000.

Please note that, while marking of power lines reduces line strike mortality, it does not preclude it entirely. Thus, marking of additional, existing, overhead lines is recommended to further offset the potential for avian line strike mortality.

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service should be informed so that the above determinations can be reconsidered.

The Service appreciates the opportunity to provide comments. If you have any questions on these comments, please contact Natalie Gates of this office at (605) 224-8693, Extension 227.

Sincerely,

Field Supervisor
South Dakota Field Office

cc: Matt Marsh, Western Area Power Administration, Billings, MT

MEETING	**Wild Springs Solar Project Introduction and Review**
DATE/TIME	**January 22, 2020, 9:00 AM-11:00 AM CST**
LOCATION	**SDGFP Office, Pierre SD**
PARTICIPANTS	**Melissa Schmit (Geronimo Energy)**
	Todd Mattson (WEST)
	Natalie Gates (USFWS)
	Hilary Morey (SDGFP)

- Meeting with USFWS and SDGFP to provide an update on Wild Springs Solar and discuss wildlife survey efforts.
- Geronimo provided an overview of the Project including project schedule, land use permitting that would be required (conditional use permit through Pennington County, Facility Permit though the South Dakota Public Utilities Commission and an Environmental Assessment in coordination with WAPA due to proposed federal interconnection), and surveys completed to date.
    - Surveys completed: wetland delineations in 2017 and 2019, cultural resources survey in 2017 and 2019, lek surveys in 2017, ground-based raptor nest surveys in 2017 and 2019, site characterization study/habitat assessment in 2019.
    - Provided an overview of solar components and construction. Wild Springs will construct a 128 MW facility that will utilize below-ground DC and AC collection lines or above-ground DC cabling that will be strung below the panels on hanging brackets and below-ground AC collection to the project substation. The project will also include an onsite operation and maintenance facility co-located with the project substation and likely require 4 full-time staff.
    - Provided an updated project map that reflects an expanded project area which resulted from avoidance of prairie dog towns, wetlands, drainages, and cultural resources that were identified during field surveys and provided an overview of solar facilities.
    - At this point, Wild Springs anticipates the project will begin construction in late 2021 and be in commercial operations by the end of 2022.
- WEST provided an overview of avian studies that have been completed for solar facilities providing the distinction between wind energy and solar energy impacts to avian species.
    - Solar facilities have low levels of direct mortality and most impacts appear to be related to alteration of habitat.
    - Raptor and large bird avoidance may occur but small bird diversity and richness may increase.

- Impacts/bat mortality is not a concern for solar facilities as they do not collide with stationary objects. The only risk to bats is through the removal of roosting habitat. Wild Springs Solar will not result in tree removal and does not propose acoustic bat surveys.
- Extensive avian mortality monitoring has occurred at operating solar facilities in the southwestern U.S. Less than 4% of discovered fatalities could clearly be attributed to collision with solar panels.
- Because some water-associate or water-obligate birds have been found at a few solar sites in the desert southwest, there is a "Lake effect" hypothesis that these birds mistake solar panels to be large waterbodies. WEST is currently studying this issue in more detail in California, but thus far it appears to be limited to a relatively small number of individual birds at a few sites in the Mojave Desert near the Salton Sea (and large waterbird wintering or migratory stop over site); there have not been other reports of a "lake effect" at solar sites outside this region.

- WEST is preparing a Natural Resource Strategy for Wild Springs that outlines avoidance and minimization of impacts as well as best management practices for construction and operation activities. Wild Springs is avoiding cultural resources, wetlands, and a prairie dog town identified during field surveys. Avoidance of the prairie dog town eliminates the need for additional field surveys of species that may utilize the area.
- Discussion on existing conditions, wildlife, and landcover/vegetation:
  - Landcover confirmed with field reconnaissance is ~75% pasture/hay and fallow grassland areas and ~20% alfalfa, hay, and wheat. Remaining area is open water associated with delineated wetlands, and barren land and shrub/scrub associated with the WAPA substation parcel.
  - Wild Springs plans to minimize grading as the site conditions allow and will revegetate all areas of temporary construction disturbance with a native grass mix. This will stabilize the soil and create/maintain wildlife habitat.
  - SDGFP noted that big game would be excluded from the solar facility once it was constructed; SDGFP recommended that steps be taken to avoid trapping big game within the fence line during initial construction.
  - USFWS recommends that Wild Springs consider mitigation to offset impacts to grasslands.
    - Because of the lack of conclusive studies on how wildlife would be impacted by the project, Wild Springs proposes to conduct pre- and post-construction breeding bird surveys to determine if any displacement or change in avian use would occur.
    - It is possible some buffer areas around the facility could be protected from overgrazing, potentially enhancing some wildlife habitat at this site.

- Prairie dog use within and/or adjacent to the project facility should be carefully considered. Fencing or vegetation height could impact how prairie dogs use the area and, ideally, the need for prairie dog control would be minimized.

- Discussion on additional surveys:
  - Wild Springs plans to conduct the following surveys in 2020: additional round of ground-based raptor nest surveys, additional round of prairie grouse lek surveys, and a breeding bird survey.
  - In lieu of post-construction mortality surveys, Wild Springs proposes conducting breeding bird surveys once the project is operational and vegetation is established. These surveys would be designed to better assess the potential change in wildlife habitat value and function after the project is constructed.

- Next steps:
  - Geronimo will provide finalized survey reports for the project to USFWS and SDGFP and work on incorporating input from meeting into the Project's Natural Resource Strategy.
  - Natalie will provide SD species of habitat fragmentation concern list.
  - Hilary will provide information on known big game migration in the area.

Appendix L Vegetation Management Plan

Vegetation Management Plan

Wild Springs Solar, LLC

Prepared for

Wild Springs Solar, LLC

April 3, 2020

Prepared by

Benjamin Staehlin, M.S. & Eoghan O'Neill, M.S.

21938 Mushtown Road

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APPLIED ECOLOGICAL SERVICES

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Appendix 5. Revision Log

I. Goals and Objectives

Wild Springs Solar, LLC ("Wild Springs"), a wholly owned subsidiary of Geronimo Energy, LLC ("Geronimo"), a National Grid Company, is considering the development of the Wild Springs Solar Project ("Project"), a photovoltaic ("PV") ground-mounted solar energy project on private land in Pennington County, South Dakota that will generate up to 128 megawatts (MW) of energy. Wild Springs has developed this Vegetation Management Plan ("Plan") to guide site preparation, installation of prescribed seed mixes, management of invasive species and noxious weeds, and control of erosion/sedimentation. The goal of this Plan is to establish vegetative cover that complies with all permits and regulations. The establishment management is designed to continue for three years, with long-term maintenance continuing for the remainder of the Project.

This document is intended to be a working document. Revisions will be made as new information is obtained with respect to vegetation management, site characteristics, and availability of management practices at the time of procurement of services.

II. Vegetation Installation Plan

After the solar panels and other infrastructure are installed, a range land seed mix developed for the Project in coordination with the Natural Resources Conservation Service (NRCS) (Appendix 1) will be installed as described in the proposed planting plan for the site (in development). A wet mix has also been developed that should be used in areas with hydric soils or areas anticipated to hold water such as drainage basins (Appendix 1). It is possible Wild Springs could implement a vegetation management practice that uses sheep as grazers. Therefore, a grazing seed mix has been developed for the Project and is also presented in Appendix 1. All plant material must be installed as instructed, with regard for the time of installation, as described below. Any exceptions must be discussed with Wild Springs, and the Contractor shall receive written authorization for any changes prior to the start of work.

All seed mixes must adhere to the specifications described in the Plan and must meet the requirements of the South Dakota State Seed Laws and Regulations. To meet South Dakota NRCS standards, the Array Mix grass seed must originate from North Dakota, South Dakota, Nebraska, Montana, Wyoming, Minnesota, or Iowa. The Array Mix forb and legume seed must originate or be grown in North Dakota, South Dakota, Nebraska, Montana, Wyoming, Idaho, Washington, Oregon, Minnesota, Wisconsin, Iowa, Alberta, British Columbia, Manitoba, Ontario, or Saskatchewan. The plant species shall be native to the county where the site is located. Species shall be true to their scientific name as specified. Seed tags or nursery confirmation of the order must be provided to Wild Springs prior to installation. Any species eliminations, substitutions, or source origin exceptions must be approved by Wild Springs prior to installation. If planted in the spring, seeds shall have been properly stratified and/or scarified to break seed dormancy. All legumes shall be inoculated with proper rhizobia at the appropriate time prior to planting.

The protocol for installing the seed mixes is dependent on the time of the completion of construction. If construction is completed in spring, allowing for seeding between the time when the soil is free of frost

and in a workable condition but no later than June 30, seed mixes shall include 20 pounds per acre pure live seed (PLS) of oats (*Avena sativa*) as a cover crop. If construction is completed in summer, allowing for seeding between July 1 and August 15, the site shall be seeded immediately with 15 pounds per acre PLS of oats and 15 pounds per acre PLS of annual wheat (*Triticum aestivum*) to stabilize the soil and prevent erosion. In the same year, the seed mixes shall be installed as a fall dormant seeding (after November 1 but before the soil starts to freeze) with no additional cover crop added. If construction is completed in late summer or early fall, allowing for seeding between August 16 and October 31, the site shall be seeded immediately with 20 pounds per acre PLS of winter wheat to stabilize the soil and prevent erosion. In the same year, the seed mixes shall be installed as a fall dormant seeding with no additional cover crop added. If construction is completed in late fall, allowing for seeding after November 1 but before the soil starts to freeze, seed mixes shall include 30 pounds per acre PLS winter wheat to provide a cover crop for the following year. If agreed to by both Wild Springs and the Contractor, a spring seeding the following year can be substituted for a fall dormant seeding after a late fall completion of construction. If a cover crop has already been installed during the calendar year, seed mixes must be installed the same year with a fall dormant seeding.

Seeding may be conducted with a seed drill (preferred) and/or by broadcast seeding; the Contractor shall evaluate the site and determine which technique will produce the best results. However, seed installed into a previous cover crop or other vegetation must be installed with a seed drill. Prior to installation, seed shall be divided into two equal parts. The first half shall be installed in one pass, and the second half installed in a second pass (perpendicular to the first pass, where possible). If broadcast seeding is used, gentle raking of seeded areas may be needed to ensure good seed-to-soil contact.

III. Vegetation Management Tasks

After the land is cleared and the infrastructure is installed, a range of invasive plants will take advantage of the disturbed soil and germinate across the site. For the purpose of this Plan, “invasive plants” refers to both non-native species and native species that grow in an invasive manner or have the potential to negatively affect the development of planted native species and the success of the project. This list includes noxious weeds as designated in statute by both the State of South Dakota and Pennington County (Appendix 2). These weeds must be managed effectively during the first three years to ensure that native species are given the opportunity to flourish. Accordingly, Wild Springs will implement the Pennington County Weed & Pest Noxious Weed Management Plan (Appendix 4). The care taken in the first three years after installation strongly determines the quality of the resulting plantings. The work done during this initial period is referred to as the “establishment phase”, while management after that period is called the “perpetual maintenance phase”.

A. Establishment Phase

The first three years of vegetation management are a concerted effort to remove invasive vegetation from the site while also helping the planted native vegetation establish. If possible, grazing during this time should not occur. If grazing must occur, stocking should be light so that native plants can develop root systems that will enable them to survive future continuous grazing at higher stocking rates. Grazing during the establishment period may favor some invasive plant species, requiring more frequent monitoring and greater weed control efforts than if grazing were not occurring. Additional invasive species control, if required, will consist of mechanical or chemical methods, or a combination of the two, as needed to achieve desired outcomes and comply with the Wild Springs Pennington County Weed & Pest Noxious Weed Management Plan (Appendix 4). General tasks described below will be applied as directed, while other management techniques will be used only if required by the unique conditions at the Project.

1. General Tasks for Managing Vegetation

Establishment Year 1. The first year of establishment is focused on consistent invasive plant control on a site-wide basis. Mowing during the first year should prevent invasive plants from adding new seeds to the soil and begin to exhaust the soil seed bank (a process that often requires several years to complete). From June 1 of the first establishment year, site-wide mowing to a height of 6-9 inches shall occur whenever vegetation reaches a height of 18-24 inches. Care shall be taken during the nesting season (April 1 to August 1) to not destroy the nests of upland grassland birds.

Repeated mowings may produce a buildup of organic thatch, which discourages the development and persistence of diverse native vegetation. In order to help prevent thatch buildup onsite, either mowing shall be conducted with a flail-type mower to mulch the cut vegetation, or the site shall be hayed so that cut vegetation is removed. A swing arm specifically designed for mowing under solar panels is recommended for cutting beneath panels, but spot-mowing with brush saws, weed whips, and similar equipment is also permitted. It may be possible to coordinate with Wild Springs to adjust the orientation of the panels to increase the ease of mowing, but the Contractor should not depend on this coordination to complete its work. Any other techniques must be approved by Wild Springs prior to the start of work. Mowing equipment shall be cleaned prior to use on site to prevent the introduction and spread of invasive and non-native species. This mowing regime will prevent annual and perennial weeds from flowering and setting seed, prevent weeds from shading out the solar panels, and help control woody plant growth onsite. Additionally, noxious and perennial weeds shall be treated by spot-herbiciding, as described below, to prevent roots from resprouting.

Establishment Year 2. The second year of establishment continues invasive plant control but generally employs more targeted techniques. Site-wide mowing to a height of 6-9 inches shall occur when vegetation height reaches 18-24 inches. Care shall be taken during the nesting season (April 1 to August 1) to not destroy the nests of upland grassland birds.

Spot-mowing may be employed to treat specific problem areas as needed. Noxious and perennial weeds shall be treated with spot-herbiciding at least twice, with the focus on achieving the required performance standards (described below).

Establishment Year 3. In the third year of the establishment phase, invasive plant control should consist of spot-herbiciding to control the remaining small patches of persistent weeds. Efforts should be focused on achieving the required performance standards (described below). Additional onsite treatment with spot-mowing or hand weeding can be employed at the discretion of the Contractor.

2. Prescribed Treatment for Common Invasive Species

Every SEF will express a suite of invasive plant species determined by the makeup of the seed bank and the seed inputs from the surrounding environment, so management must be flexible and respond to the specific needs of the Project. This Plan describes common techniques to manage a variety of invasive plants and common weeds growing in South Dakota, but not every technique will be required. In the establishment period, monthly evaluations of the plantings during the growing season (May to September) shall be conducted to determine the appropriate treatment techniques to use and the timing of those treatments. Management techniques for five categories of weeds are described below.

The Contractor is required to have the botanical expertise to correctly identify plant species and know the difference between species that must be removed and similar native species being established.

a. Annual Weeds

Annual weeds include all unwanted species that grow for a single year, set seed, and die. Common annual weeds encountered on wind energy facilities include grasses like barnyard grass (*Echinochloa crus-galli*), cheatgrass (*Bromus tectorum*), and foxtails (*Setaria* spp.), and broadleaf weeds like lambsquarters (*Chenopodium* spp.), smartweeds (*Polygonum* spp.), and black nightshade (*Solanum nigrum*) (Clay, 2013).

The most important purpose and result of treating annual weeds is preventing seed production. Beginning around June 1, the site shall be mowed as described above to prevent annual weeds from flowering and setting seed. Repeated mowings, however, may produce a buildup of organic thatch, which discourages the development and persistence of diverse native vegetation by changing soil nutrient composition and keeping the soil cool. Thatch favors cool-season forage and turf grasses and many species of agricultural weeds. Raking, baling, and removing cut vegetation or using a flail mower can reduce thatch build-up.

b. South Dakota Department of Agriculture Noxious Weeds

The South Dakota Department of Agriculture maintains a list of noxious weeds for the state, and additional lists of weeds for Pennington County, all of which must be controlled to comply with state regulations (Appendix 2). All species of noxious weeds on site shall be treated by mowing, herbiciding, or a combination of both methods, with the intention of preventing the weeds from setting seed or spreading by rhizomes, stolons, or other vegetative means. Noxious weeds shall be treated by spot-spraying or boom spraying, as warranted, with glyphosate, triclopyr, clopyralid, or comparably effective herbicides. If work is carried out by anyone other than the property landowner, all herbicides shall be applied by a licensed applicator, following instructions provided by the manufacturer. The applicator shall know the effective residence

time of herbicides being used and shall apply herbicides so as to avoid inhibiting the germination and growth of the planted native species.

c. Perennial Weeds

Perennial weeds include all unwanted species that persist for 2+ years after germination, from biennials to those that live for many years. Many of these weeds greatly diminish with proper maintenance during the vegetation establishment phase, but several require special attention due to their highly competitive behavior. These include grasses like Kentucky bluegrass (*Poa pratensis*), smooth brome (*Bromus inermis*), and reed canary grass (*Phalaris arundinacea*). Broadleaf weeds in this category include sweet clovers (*Melilotus alba, M. officinalis*), thistles (*Cirsium arvense, C. vulgare*), and knapweeds (*Centaurea diffusa, C. repens*). A list of common South Dakota perennial weeds that colonize former cropland and compete with native vegetation is provided in Appendix 3.

Mowing is important to prevent seed production (as described above), but herbicide is generally required to prevent the spread of perennial weeds. Perennial grasses shall be treated by spot-spraying or boom spraying, as warranted, with glyphosate or comparably effective herbicide, or the aquatic formulation of the same if near open water. Perennial broadleaf weeds shall be treated by spot-spraying or boom spraying, as warranted, with glyphosate, triclopyr, clopyralid, or comparably effective herbicides. All herbicides shall be applied by a licensed applicator, following instructions provided by the manufacturer.

d. Problematic Native Plants

Several native species that are present in the soil seed bank or enter the site by seed rain from neighboring properties have the potential to interfere with the functioning of the solar panels. Giant ragweed (*Ambrosia trifida*) grows tall enough to shade the panels. Several native vines have the potential to overgrow installations, including wild grape (*Vitis riparia*), wild cucumber (*Echinocystis lobata*), bur cucumber (*Sicyos angulatus*), and woodbine (*Parthenocissus vitacea*). Giant ragweed, or any other native species shading the arrays, should be controlled by mowing (see above). If growing under or near the solar panels, wild cucumber and bur cucumber can be pulled and removed manually, but woody vines such as wild grape and woodbine shall be cut to within 1 inch of the ground and the stump treated with glyphosate, triclopyr, or a comparable herbicide by a licensed applicator, following instructions provided by the manufacturer.

e. Woody Species

Almost all woody species on site can shade or otherwise interfere with the operation of solar panels. During the establishment phase, all woody plants must be removed. This can be done by mowing, herbiciding, or a combination of both methods. All woody plants over 0.5 inches DBH (diameter at breast height, about 4.5 feet) shall be cut to within 1 inch of the ground and the stump treated with triclopyr or a comparable herbicide by a licensed applicator, following instructions provided by the manufacturer. Cut brush shall be removed from the site.

3. Re-seeding Bare Soil

Areas of bare soil are detrimental to successful establishment of native vegetation. Bare soil provides opportunities for the common invasive species described above to colonize and spread. Bare soil also contributes to soil loss by sheet erosion and may prevent Wild Springs Solar from discharging its SWPPP permit in a timely fashion. If areas of bare soil greater than 75 ft^2 are found on site, the Contractor shall remedy the issue at its own expense by re-seeding the area, using the seed mix previously installed and following the timing instructions laid out in Section II (Vegetation Installation Plan).

B. Perpetual Maintenance Phase

1. Mowing for Perpetual Maintenance

Following the end of the Establishment Phase of vegetation management, yearly management is still required to control the re-establishment and spread of invasive species, combat the establishment of undesirable and invading trees and shrubs, and reduce biomass/fuel load on site. This management may take the form of mowing or haying, depending on Wild Springs' preference and site feasibility. Some degree of hand weeding, spot-mowing, and/or spot-herbiciding may be warranted thereafter to maintain vegetation quality and achieve the project goals.

Annual site-wide haying (preferred) or mowing to a height of 6-9 inches shall occur each October, or when prairie plants have gone dormant. Where feasible, mowed vegetation shall be raked, baled, and removed to prevent the buildup of organic thatch, which will discourage the development and persistence of diverse native vegetation. If vegetation removal is not achievable, mowing shall be conducted with a flail-type mower to finely chop plant material and accelerate decomposition. Should Wild Springs enter into a haying partnership for some or all of the site prior to construction, seed mixes will be reviewed and potentially revised to meet the local agricultural needs.

2. Grazing for Perpetual Maintenance

Wild Springs may decide to use grazing with sheep as a long-term vegetation management technique. Well-managed grazing can restrict woody vegetation and non-native species encroachment into grasslands, prevent excessive litter accumulation, improve forage production, and accelerate decomposition and nutrient cycling. Should grazing be selected as a management technique for some or all of the site, an additional section for this Plan will be developed that addresses methodology, stocking rate, water sources, and grazing objectives.

IV. Vegetation Quality Targets

Vegetation management should result in a diverse plant community dominated by native species, as envisioned in the planting plans. Permits and regulations impose additional requirements on the final quality and performance of native plantings.

A. Vegetation Targets

By the end of the first growing season of the vegetation establishment phase, at least 80 percent of the site shall be vegetated. In order to discharge the SWPPP permit for the site, at least 70 percent of the site must be covered with uniform perennial vegetation (note that the party responsible for obtaining

the SWPPP permit should consult with the South Dakota Department of Environment and Natural Resources to confirm the vegetation target for the Project based on the pre-construction and historical vegetation cover); the contractor shall endeavor to achieve this by the end of the first growing season and must achieve this in the second growing season. By the end of the vegetation establishment phase (approximately 36 months after vegetation installation), at least 95 percent of the site shall be vegetated, and at least 90 percent of the cover shall be comprised of native species. Six or more species of planted native graminoids and 12 or more species of planted native forbs shall be well-established across the site.

B. Noxious Weeds and Problem Plants

All South Dakota prohibited noxious weeds and other problem plants (Appendices 2 and 3) shall be treated repeatedly with herbicide and mowed where appropriate at a frequency sufficient to prevent seed set and remove target weeds over time. Each treatment shall show evidence of at least 90 percent of the target vegetation having been affected by herbicide or removed. Two weeks after treatment, at least 95 percent of all herbicided plants shall be dead or dying within any 100 square foot area.

By the end of the vegetation establishment phase (approximately 36 months after vegetation installation), all prohibited noxious weeds and other problem plants shall not exceed 5 percent aerial cover within any 100 square foot area across the site.

V. References

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Appendix 1. Seed Mixes for Wild Springs Solar

Range Land Array Mix

Scientific Name	Common Name	Oz/Acre	Lbs/Acre	% of mix by weight	Seeds/Sq Ft
Bouteloua curtipendula	Side oats grama	32.00	2.00	24.5	4.41
Bouteloua gracilis	Blue grama grass	4.00	0.25	3.1	3.67
Elymus trachycaulus	Slender wheatgrass	24.00	1.50	18.4	3.80
Koeleria macrantha	June grass	1.00	0.06	0.8	4.59
Nassella viridula	Green needlegrass	16.00	1.00	12.2	2.75
Pascopyrum smithii	Western wheatgrass	16.00	1.00	12.2	2.64
Poa compressa	Canada bluegrass	1.50	0.09	1.2	5.38
Schizachyrium scoparium	Little bluestem	16.00	1.00	12.2	5.51
	Graminoids	**110.50**	**6.91**	**84.5**	**32.76**
Achillea millefolium	Yarrow	0.50	0.03	0.4	2.05
Asclepias verticillata	Whorled milkweed	1.00	0.06	0.8	0.25
Dalea candida	White prairie clover	1.00	0.06	0.8	0.85
Dalea purpurea	Purple prairie clover	4.00	0.25	3.1	1.74
Echinacea angustifolia	Narrow purple coneflower	1.00	0.06	0.8	0.16
Liatris punctata	Dotted blazing star	0.75	0.05	0.6	0.12
Monarda fistulosa	Wild bergamot	1.50	0.09	1.2	2.41
Pulsatilla patens	Pasque flower	0.50	0.03	0.4	0.21
Ratibida columnifera	Upright coneflower	2.00	0.13	1.5	1.93
Rudbeckia hirta	Black-eyed Susan	4.00	0.25	3.1	8.45
Solidago nemoralis	Old-field goldenrod	0.25	0.02	0.2	1.72
Symphyotrichum ericoides	Heath aster	0.20	0.01	0.2	0.92
Tradescantia bracteata	Long-bracted spiderwort	1.00	0.06	0.8	0.23
Verbena stricta	Hoary vervain	1.50	0.09	1.2	0.96
Zizia aptera	Heart-leaved golden alexanders	1.00	0.06	0.8	0.28
	Forbs	**20.20**	**1.26**	**15.5**	**22.27**
	Total	**130.70**	**8.17**		**55.03**

Wet Mix

Scientific Name	Common Name	Oz/Acre	Lbs/Acre	% of mix by weight	Seeds/Sq Ft
Carex bebbii	Bebb's sedge	2.00	0.13	1.8	1.56
Carex hystericina	Bottlebrush sedge	4	0.25	3.7	2.75
Carex vulpinoidea	Fox sedge	2	0.13	1.8	4.59
Juncus dudleyi	Dudley's rush	0.06	0.004	0.1	4.41
Nassella viridula	Green needlegrass	32	2.00	29.3	5.51
Pascopyrum smithii	Western wheatgrass	32	2.00	29.3	5.28
Schizachyrium scoparium	Little bluestem	24	1.50	22.0	8.26
	Graminoids	**96.06**	**6.00**	**88.1**	**32.37**
Bidens cernua	Nodding bur marigold	2.5	0.16	2.3	1.21
Lycopus americanus	American water horehound	1	0.06	0.9	2.98
Mentha arvensis	Wild mint	0.25	0.02	0.2	1.72
Monarda fistulosa	Wild bergamot	1	0.06	0.9	1.61
Symphyotrichum lanceolatum	Panicled aster	1.25	0.08	1.1	1.26
Symphyotrichum novae-angliae	New England aster	1	0.06	0.9	1.52
Verbena hastata	Blue vervain	1	0.06	0.9	2.13
Zizia aurea	Golden alexanders	5	0.31	4.6	1.26
	Forbs	**13**	**0.81**	**11.9**	**13.69**
	Total	**109.06**	**6.82**		**46.16**

Low-Forb Array Mix – Grazing

Scientific Name	Common Name	Oz/Acre	Lbs/Acre	% of mix by weight	Seeds/Sq Ft
Bouteloua curtipendula	Side oats grama	60.00	3.75	30.3	8.26
Bouteloua gracilis	Blue grama grass	8.00	0.50	4.0	7.35
Elymus trachycaulus	Slender wheatgrass	34.00	2.13	17.2	5.39
Koeleria macrantha	June grass	2.00	0.13	1.0	9.18
Nassella viridula	Green needlegrass	32.00	2.00	16.2	5.51
Pascopyrum smithii	Western wheatgrass	32.00	2.00	16.2	5.28
Poa compressa	Canada bluegrass	2.00	0.13	1.0	7.17
Schizachyrium scoparium	Little bluestem	24.00	1.50	12.1	8.26
	Graminoids	**194.00**	**12.13**	**98.0**	**56.41**
Rudbeckia hirta	*Black-eyed Susan*	4.00	0.25	2.0	8.45
	Forbs	**4.00**	**0.25**	**2.0**	**8.45**
	Total	**198.00**	**12.38**		**64.86**

Appendix 2: State and County Noxious Weeds

South Dakota State Noxious Weeds	
Common Name	**Scientific Name**
Canada thistle	*Cirsium arvense*
Hoary cress	*Cardaria draba*
Leafy spurge	*Euphorbia esula*
Perennial sow thistle	*Sonchus arvensis*
Purple loosestrife	*Lythrum salicaria*
Russian knapweed	*Centaurea repens*
Salt cedar	*Tamarix* spp.
County Noxious Weeds (Pennington County)	
Common Name	**Scientific Name**
Absinth wormwood	*Artemisia absinthium*
Bull thistle	*Cirsium vulgare*
Chicory	*Cichorium intybus*
Common burdock	*Arctium minus*
Common mullein	*Verbascum thapsus*
Common tansy	*Tanacetum vulgare*
Dalmatian toadflax	*Linaria dalmatica*
Diffuse knapweed	*Centaurea diffusa*
Field bindweed	*Convolvulus arvensis*
Giant knotweed	*Polygonum sachalinense*
Hounds tongue	*Cynoglossum officinale*
Musk thistle	*Carduus nutans*
Oxeye daisy	*Leucanthemum vulgare*
Plumeless thistle	*Carduus acanthoides*
Poison hemlock	*Conium maculate*
Puncturevine	*Tribulus terrestris*
Scotch thistle	*Onopordum acanthium*
Spotted knapweed	*Centaurea maculosa*
Sulphur cinquefoil	*Potentilla recta*
St. John's wort	*Hypericum perforatum*
Yellow toadflax	*Linaria vulgare*

Appendix 3. Additional Problem Weeds to Remove

Plant Group & Priority	Common Name	Scientific Name
Top Priority Grasses to Remove	Smooth brome	*Bromus inermis*
	Reed canary grass	*Phalaris arundinacea*
	Giant reed	*Phragmites australis*
	Kentucky bluegrass	*Poa pratensis*
Top Priority Forbs to Remove	Creeping Charlie	*Glechoma hederacea*
	Birds-foot trefoil	*Lotus corniculatus*
	White sweet clover	*Melilotus alba*
	Yellow sweet clover	*Melilotus officinalis*
	Japanese knotweed	*Polygonum cuspidatum*
	Crown vetch	*Securigera varia*
	Bird vetch	*Vicia cracca*
	Hairy vetch	*Vicia villosa*
Weeds Toxic to Livestock	Nightshades	*Solanum* spp.

Any tree, shrub, or vine outside screening plantings should be removed as well.

Appendix 4. Pennington County Noxious Weed Management Plan

Noxious Weed Management Plan
For
Wild Springs Solar, LLC – Geronimo Energy

Legal Description: T1N, R10E, Section 1; T1N, R11E, Sections 5,6,7,8,9; T2N, R10E, Section 36; T2N, R11E, Section 31; BHM, Pennington County, South Dakota

The property in question has a history of a Canada Thistle infestation. Canada Thistle is a state declared noxious weed in South Dakota. State law requires landowners to control state and local declared weeds on their property. *(SDCL 38-22-16.2)* The follow plan is a guideline to control and minimize the spread of any state and local declared noxious weeds on the property and within the county. *(38-22-23-10)*

1. Any gravel, timber, hay, or any other earthen material removed from the property should be free of noxious weed plant material and/or seeds. *(SDCL 38-22-33)*

2. Any equipment used in disturbing the ground on the property should be cleaned of any soil or earthen material before leaving the property. *(SDCL 38-22-13)*

3. Any disturbed ground should be re-seeded with a native or ornamental lawn grass mix. *(SDCL 38-22-23.10)*

4. Use an intergraded noxious weed plan for controlling existing noxious weeds on the property to prevent the spread onto neighboring properties. *(SDCL 38-22-16.2)* Contact Pennington County Weed & Pest for proper management recommendations on specific weeds. *(SDCL 38-22-23.10)*

The above steps meet the requirements of the noxious weed management plan set forth by the Pennington County Weed & Pest Board.

7/16/2020
Applicant, Melissa Schmit - Director, Permitting

07/12/2020
Scott Guffey, Pennington County Natural Resources Director

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Appendix 5. Revision Log

Date	Editor	Content
3/24/20	Melissa Schmit	
4/3/20	Benjamin Staehlin	Review Melissa edits, finalize
7/16/20	Melissa Schmit	Added reference and appendix for Pennington County Noxious Weed Management Plan