Bluestem Energy Solutions, LLC

Madison, Madison County, Nebraska

Olsson Project Number 023-03812

DRAFT ENVIRONMENTAL ASSESSMENT (EA)

Madison County Solar Array

July 2024

Prepared by: Olsson, Inc.

For: United States Department of Agriculture – Rural Utilities Service

This Environmental Assessment (EA) has been prepared for the United States Department of Agriculture (USDA) – Rural Development (Agency) by Olsson, Inc. (Olsson). It is intended to assess the impacts of the proposed project on the human and natural resources of the environment. The report was prepared in general conformance with the requirements defined in *Guidance to Applicants for Preparing Environmental Assessments*, RD Instruction 1970-C, Exhibit B. This report will be the environmental documentation that will be released to the public for review. If needed, it will be adopted by the Agency's Applicant.

Chase Jelden – Olsson, Inc.	07/18/2024
Name of Preparer	Date
Bluestem Energy Solutions, LLC	07/18/2024
Name of Rural Development Applicant	Date

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1. PROJECT OVERVIEW

1.1 National Environmental Policy Act

Bluestem Energy Solutions, LLC (Bluestem/Applicant) has requested to submit a loan application to the USDA, Rural Development (RD), and Rural Utilities Service (RUS) for the Madison Solar Array Project (Project). Securing a RUS guaranteed Federal Financing Bank Loan, specifically from the Powering Affordable and Clean Energy (PACE) Program as authorized by the Inflation Reduction Act (IRA), is considered a Federal action that is subject to review under the National Environmental Policy Act of 1969 (NEPA), and all Federal environmental laws and regulations. RUS is the lead Federal Agency for this document.

The EA has been prepared in accordance with NEPA (42 United States Code [U.S.C] 4321 et seq and is implementing regulations (40 Code of Federal Regulations [CFR] 1500-1058), the regulations promulgated by the Council on Environmental Quality (CEQ) for implementing NEPA.

This EA also addressed other laws, regulations, executive orders (EO), and guidelines established to protect and enhance environmental quality including, but not limited to, the National Historic Preservation Act (NHPA), the Endangered Species Act (ESA), the Farmland Protection Policy Act (FPPA), the Clean Water Act (CWA), and EOs governing floodplain management, protection of wetlands, and environmental justice.

The purpose of the EA is to analyze the potential environmental impacts of the Proposed Action in comparison to alternatives considered and the No Action Alternative to determine whether an Environmental Impact Statement (EIS) or Finding of No Significant Impact (FONSI) would be issued. The EA provides a detailed project description of the Proposed Action, a purpose and need statement, and identifies natural resources within the project area. Discussion of the potential environmental consequences, summaries of agency coordination, and mitigation comments are also included, as they are applicable to the environmental resource.

Based on the information provided in the EA, RUS will decide:

- Whether to proceed with either the Proposed Action or the No Action Alternative.
- Whether or not the selected alternative would have a significant impact on the quality of the human environment.

If, after circulating the document for public and agency comment, RUS finds the Proposed Action would not have a significant impact on the quality of the environment, the Agency would prepare a FONSI. If at any point in the preparation of the EA, RUS determines that the Proposed Action would result in a significant impact on the quality of the environment, it would initiate preparation of an EIS.

Olsson, Inc. (Olsson), on behalf of the Applicant, prepared this EA in accordance with 7 CFR Part 1970 and RD Instruction 1970-C Exhibit B: Guidance to Applicants for Preparing Environmental Assessments. RUS has conducted an independent evaluation of the EA and finds that it accurately assesses the impacts of the Proposed Action.

1.2 Purpose and Need

Per RD Instruction 1970-C Exhibit B Section 2.3.1: "USDA, Rural Development is a mission area that includes three (3) federal agencies – Rural Business-Cooperative Service, Rural Housing Service, and Rural Utilities Service. The agencies have more than 50 programs that provide financial assistance and a variety of technical and educational assistance to eligible rural and tribal populations, eligible communities, individuals, cooperatives, and other entities with a goal of improving the quality of life, sustainability, infrastructure, economic opportunity, development, and security in rural America. Financial assistance can include direct loans, guaranteed loans, and grants to accomplish program objectives."

For the Proposed Action, Bluestem is seeking financial assistance from USDA RD RUS under its PACE program, as authorized by the IRA to finance the construction of electric distribution, transmission, and generation facilities, including system improvements and replacement required to furnish and improve electric service in rural areas, as well as demand side management, energy efficiency and conservation programs, as well as on-grid and off-grid renewable energy systems.

The purpose of this project is to construct an electric generating facility that would provide 2.00 MW to the rate payers within Madison County.

1.3 Project Description

The Project would provide the rate payers of Madison, Nebraska, members of a publicly owned utility district, with a competitively priced alternative energy source. The Project would provide locally generated energy and enhance the economy and tax base for Madison County.

Nebraska has identified the advancement of renewable energy and energy efficiency as a statewide goal. The State of Nebraska adopted the Net-Zero Carbon Emissions from generation resources by 2050. Nebraska is the only state served solely by publicly owned utilities and a vast majority of the utilities have adopted 100% clean energy goals.

The Project is needed to meet the growing demand for energy production from environmentally friendly and renewable resources. Bluestem, and similar solar energy facilities, are essential to achieving the sustainability goals of the Nebraska. Each solar energy facility that can be placed in Nebraska can help offset carbon dioxide emissions annually and contribute to the Nebraska Net-Zero Carbon emissions goal from generation resources. Solar energy facilities such as the Bluestem Madison Solar Project also demonstrate a commitment to renewable energy by Madison, Madison County, and the State of Nebraska.

In summary, the Proposed Action would satisfy the following objectives:

- Provide a local supply of solar energy for rate payers of the publicly owned utility district.
- Provide cost-effective commencement of delivery of local utility-scale solar energy to support attainment of Nebraska Net-Zero Carbon Emission from generation resources by 2050.
- Meet the demand for energy production from environmentally friendly and renewable resources while demonstrating the commitment the public utility district has to its customers in Madison, Madison County, and the State of Nebraska.

Bluestem is a developer, owner, and operator of renewable energy resources and works to identify, develop, and implement local energy solutions for utilities. Bluestem has proposed the Madison County Solar Array (Project, Proposed Action). The proposed Project includes the construction of a 2.00 megawatt (MW) alternating current (AC), 2.88 MW direct current (DC) solar array located just north of the City of Madison, Nebraska. The solar array would interconnect to the City of Madison's electric distribution system, and 100 percent of the electricity would be used locally by their rate payers. The Project is positioned on an existing parcel that is approximately 68 acres and is located north from the City of Madison, Madison County, Nebraska. More specifically, the Project is located on parcel number 590137032, and the legal property description of PT E1/2 SE1/4 LESS HWY 29-22-1. (Figure 1, Appendix A).

The Project is located southeast of North Main Street and west of United States Highway 81 (US-81). The solar array would encompass the northwest portion of the property and occupy approximately 15 acres of the 68-acre parcel. Underground conduit would extend south beyond the solar array to 829th Road.

1.3.1 Site Description

The 68-acre Project site is currently located on a row crop agricultural ground. The topography of the property slopes from the northwest to the southeast. Elevations range from 1,630 feet above sea level on the northwest corner to 1,590 feet above sea on the southeast corner of the property. There are no existing structures on the property and the area is generally surrounded by row crop agriculture in all directions. The northwest portion of the property directly abuts the North Main Street right-of-way (ROW). The southwest corner abuts a rural residential property, and the southern boundary extends to 829th Road. An aerial view of the existing parcel and the Project area are depicted on the Site Map (Figure 2, Appendix A). Additional information on land use is included in Chapter 3.1 below.

1.3.2 Generating Facility Description

The Project would contain a solar array with approximately 32 rows and approximately 7,488 Photovoltaic (PV) modules. There would be 26 PV modules per string, 288 strings, 16 strings per inverter, and 16 inverters. The modules would sit approximately five (5) to seven (7) feet above the ground. The modules would be positioned on a single axis tracking system rotating east to west following the path of the sun throughout the day. Row spacing would be approximately 20 feet between each row.

At each PV array, the DC produced by the array would be collected at inverters (power conversion devices) where DC power is converted to AC. A total of 16 inverters would be used on the north end of the array in four (4) locations, each location containing four (4) inverters. The voltage of the electricity would be increased by a medium voltage transformer that would be located at the northwest corner of the Property, which would then be transmitted to the electrical grid through the buried interconnection route that extends south of the array. The interconnection route would be installed at a depth of approximately 36 to 48 inches through the row crop agricultural field and would connect to the existing overhead power lines along 829th Road.

A white rock or gravel access road would be located at the entrance to the array near the northwest corner of the property for access from North Main Street. The entire 15-acre parcel would be enclosed with a six (6)-foot tall chain link fence and locked gate that would also contain three (3) strands of barbed wire on top of the fence to provide additional security to the property. An interconnection route would extend south of the property line from the southeast corner of the property to connect to the existing overhead power lines along 829th Road. The proposed Project is depicted in the Design Plan Map attached (Figure 3, Appendix A).

The Project would not include additional facilities that would require a supply of water, wells, sewer, telecommunications, or additional cellular service. Additionally, there would be no battery storage systems proposed for this Project.

1.3.3 Site Preparation and Construction

Bluestem would own, operate, and maintain the solar array. The Project would be constructed in approximately six (6) months during fiscal quarter 1 and fiscal quarter 2 of 2025.

Typical construction work hours would be expected to be from 6:00 am to 5:00 pm. Nighttime work would not be permitted. Delivery of equipment and supplies would be variable throughout the construction process and may result in up to 50 deliveries a day. Deliveries would typically be on tractor trailers and would utilize United State Highway 81 (US-81) and North Main Street. US-81 is a major 4 lane divided highway for the purpose of interstate commerce. North Main Street is the primary truck route into the City of Madison and would provide adequate transportation need for the Project. Grading for site preparation would be limited to the maximum extent practicable. The 15-acres for the Project are positioned in an area that already has little topographic relief compared to the overall 68-acre parcel of ground. The Project would have no direct impact or fill to aquatic resources. All grading activities and fill material would be limited to the footprint of the project area. No fill or borrow soil would be anticipated from outside of the Project boundary and excess fill is not anticipated. White rock or gravel would be utilized for the Project entrance and used below the transformers. Up to 100 cubic yards of white rock or gravel may be required for the Project and would be supplied from a local sand and gravel mine or limestone quarry. Temporary equipment staging, storage, and stockpiling would occur during the construction process and would be near the Proposed 15-acre solar array but would stay within the 68-acre parcel of property identified as the Proposed Action Area. Generators utilizing the interconnected power may be required for temporary construction trailers and/or commissioning of the Project. After construction of the solar array, the soil would be stabilized

with a recommended native Nebraska pollinator seed mix to provide an herbaceous cover below the solar array. Portable water tanks would be used during the construction process for fugitive dust control. The water would be sourced from the municipal supply.

The general construction sequence for the solar arrays is assumed to be as follows:

- Prior to the start of foundation installation, any grading necessary to support the installation of the single axis trackers would be completed, after which the areas would be properly seeded to support early vegetative growth.
- Following grading and seeding, the racking foundations would be installed. Foundations generally consist of steel pilings and are installed with small pile driving equipment.
- After foundation piles are installed, bearing assemblies would be installed on top of each pile, with the center pile in a tracker receiving the motor and slew drive which would rotate the torque tube (racking) and modules to follow the sun's path across the sky.
- Modules would be attached to the torque tube with the corresponding racking supplier's module clamps. Modules would be aligned and secured accordingly. Following installation of the modules, the module whips (electrical wires) would be connected and securely fastened to the modules and torque tubes with the DC cables leading back to the combiner boxes and then to the inverters or directly to the inverters at the end of the strings.
- During the installation of the foundations and racking, a separate crew would trench and install an interconnection route south to the existing overhead lines. The interconnection route would be installed within the trenches 36 to 48 inches below the soil surface as required by the National Electric Code.
- Concurrently, the Project substation would be constructed such that it would be complete roughly one (1) month prior to the completion of the solar array.

1.3.4 Operations and Maintenance

The Project is expected to be in operation during daylight hours, seven days a week, 365 days per year. Upon completion, the Project would require routine maintenance that would be performed by offsite labor personnel on a monthly basis or as needed. The area surrounding the solar array would be fenced and locked, as previously described. Lighting is not anticipated but if required at a later date, lighting would be minimal. Lighting is typically isolated to the location of the transformer, as to minimize light pollution. Additional landscaping, outside of the vegetation seed mix below the solar array, is not anticipated. Other maintenance activities may include:

- Maintenance of transformers, inverters, or other electrical equipment
- Access road or fence repairs
- Vegetation management
- Weed management, as needed
- Project operations (primarily remote)

Pannel washing may occur several times per year, if warranted, to maintain efficiency of the PV system. Typical washing may be complete in a one (1)-week period and may require up to 10

personnel to complete the task. Water used for cleaning would be brought to the facility by a subcontractor. Annual water consumption from the Project would be variable and has been estimated to use an annual consumption of two (2) gallons per megawatt hour (River Network, 2012), or approximately 1,300 gallons of water per year for PV cleaning.

1.3.5 Project Permits

The Project would be compliant with the following federal and regulations outlined in Table 1. Regional and county requirements or compliance efforts are beyond the scope of the NEPA document and will not be discussed unless the information has been previously provided.

Table 1. Bluestem Permits and Compliance.

Organization Type	Agency	Permit, Regulatory Compliance, or Coordination
Federal	US Fish and Wildlife Services (USFWS)	Section 7 of the Endangered Species Act, Migratory Bird Treaty Act of 1918, and Bald and Golden Eagle Protection Act of 1972
Federal	US Army Corps of Engineers (USACE)	Section 401 and 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899.
Federal	USDA – Natural Resources Conservation Services (NRCS)	Farmland Conversion Form – Form AD-1006
Federal, State, and Tribal	Historic State Preservation Officer/Tribal Historic Preservation Officer	National Historic Preservation Act (NHPA) - Section 106 Consultation with State and Tribal Interest
State	Nebraska Department of Environment and Energy (NDEE)	National Pollutant Discharge Elimination System (NPDES), Title 117 Waters of the State, Section 401 of the CWA, and Invasive Species Management,
State	Nebraska Game and Parks Commission (NGPC)	Nebraska Threatened and Endangered Species
State	Nebraska State Historic Preservation Officer (NeSHPO/History Nebraska)	Section 106 of the NHPA, State Agency Preservation
County	Madison County	Conditional Use Permit
County	Interconnection Agreement	Interconnection agreement with the electrical utility service.

1.3.6 Decommissioning and Reclamation

The Project would operate for approximately 35 years. At the end of the useful life, Bluestem would assess whether to cease operations at the site or replace equipment and continue operations. Should operations cease at the site, the Project would be decommissioned, dismantled, and the Project site would be restored and returned to agricultural use. This process may take up to 12 months. In general, the majority of the decommissioned equipment would be recycled. Materials that cannot be recycled would be disposed of at approved facilities.

General decommissioning and reclamation activities are described below. Decommissioning activities typically include:

- Dismantling and removing aboveground equipment (solar panels, panel supports, transformers, project substations, et cetera).
- Removal of below ground electrical connections and utilities to a depth of 48 inches.
- Removal of pilings would include breaking up and removal of the concrete pads and foundations, removal of the access roads, stabilization of the site soils (per NPDES), and scarification of compacted soils within the area.

2. ALTERNATIVES EVALUATED INCLUDING THE PROPOSED ACTION

This chapter describes each alterative evaluated for the Project (including the Proposed Action and the No Action Alternative), as required by NEPA. These details serve as the basis for comparison of environmental consequences in Chapter 3.

2.1 Alternatives and Site Identification Process

Bluestem considered potential sites in the area with the goal to meet the Purpose and Need of the project as outlined in Chapter 1.2 above. Bluestem used the following screening criteria to develop the alternatives:

Meets the Purpose and Need for the Project: The alternative must meet the Purpose and Need statement in Chapter 1.2.

Location: The City of Madsion approached Bluestem about the potential need for renewable energy and the proposal was unanimously approved by the commissioners during the Madison County Joint Planning Commission public hearing. The project must be close to the City of Madison and serve the rate payers of Madison and Madison County.

Infrastructure, Land Use, and Zoning: Existing infrastructure from roadways for construction equipment to transmission lines to connect to must be in the vicinity of the project. In addition, the area must be zoned for either commercial, agricultural, or industrial uses to meet the county permitting and zoning requirements. Suitable sites must be near Madison, Nebraska.

Source for Electrical Generation: To attain of Nebraska Net-Zero Carbon Emission from generation resources by 2050 as part of the objective for this project, the source of electrical generation options would be limited to a solar array or wind turbines.

Environmental Impact: The site should require minimal grading and low habitat suitability. Agricultural sites are preferred due to the extensive and routine disturbance which may include a flat topography and a lack of support for environmental resources. Suitable areas would avoid floodplains, wetlands, streams, and those which would require tree clearing. Social impacts were also considered with the site selection to avoid potential socio-economic impacts, residential displacements, and adverse community response to the Project.

Site Suitability: The site must have excellent solar attributes, providing high direct normal irradiance. Identifying a landowner who would be willing to sell or lease their land to accommodate the project is essential.

Reasonable Timing: Land must be available for within the project timeline.

Adjacent Lands Alternatives: The Applicant evaluated adjacent land in the vicinity of the Project Site. This alternative would result in impacts to one or more of the attributes in the above environmental impacts screening criteria.

2.2 Alternatives Site Selection

Early in the site selection process, the Applicant explored alternative locations throughout the Madison County, Nebraska region that were located adjacent to existing infrastructure with capacity for interconnection, with minimal land use and environmental resource constraints, and that minimize environmental impacts using the criteria described above. A suitable site and willing landowner were identified directly adjacent to City of Madison infrastructure on previously disturbed lands at the proposed Project Study Area (described in Section 2.3). More distant sites were not analyzed further. More distant sites not adjacent to City of Madison infrastructure would increase project costs. Additionally, these more distant sites would likely increase potential environmental impacts due to the need for a new transmission line route to interconnect the project to the City of Madison infrastructure. Finally, identification of alternative sites would be difficult to develop and permit on a timeline that meets goals of Bluestem and the City of Madison. Ultimately, the Applicant does not own or have the ability to easily acquire other sites in the region in order to provide a viable alternative site location.

A solar array was selected as the most viable alternative for generating the energy demand for the City of Madison based on the eight (8) screening criteria listed in Section 2.1. The solar array was selected as a source of energy generation that could be placed in close proximity to interconnect to the existing infrastructure and provide electricity to the City of Madison. Additionally, due to the proximity of the available land for the project to the City of Madison, the wind turbine option would likely increase potential environmental impacts and would not conform to the zoning regulations.

2.3 Proposed Action

The Project proposes to construct a solar array that would encompass 15 acres of a 68-acre parcel. The Project includes the construction of a 2.00 MW AC and 2.88 MW DC solar array located just north of the City of Madison, Nebraska. The solar array would interconnect to the City of Madison's electric distribution system, and 100 percent of the electricity would be used locally by their rate payers. The Project is located southeast of North Main Street and west of US-81. The solar array would encompass the northwest portion of the property and occupy approximately 15 acres of the 68-acre parcel. Underground conduit would extend south beyond the solar array to 829th Road. The Project site is surrounded by row crop agriculture in all directions. A small area on the northwest portion directly abuts the North Main Street ROW. The southwest corner abuts a rural residential property, and the southern boundary extends to 829th Road. An aerial view of the existing parcel and the Project area are depicted on the Location Map and Site Map in Appendix A.

The Project is positioned on private property that would be owned by Bluestem. The location of the Proposed Action was selected to avoid floodplains, wetlands, streams, and minimize the need for clearing and grading. The site is also adjacent to existing powerlines to provide ease of connection to the electric grid.

The Construction phase of the Project, which includes grading, would be planned, and designed to minimize the use of mechanized grading and fill materials procured off site. Controls used, such as silt fence and soil stabilization, would be used during and after construction as needed to minimize indirect and adverse environmental impacts.

The Proposed Action was selected as it minimized all potential negative social and environmental impacts and meets all the screening criteria from the alternatives analysis in Chapter 2.1.

2.4 No Action Alternative

Under the No Action Alternative, USDA-RUS would not provide funding for the Madison Solar Array, and the project may seek other financial resources. For the propose of this EA, it is assumed that the project would not be constructed. This alternative would consist of the property remaining as an agricultural property and would not provide clean and renewable energy to the existing electrical grid that would service the rate payers of Madison County, Nebraska. For these reasons, the No Action Alternative would not fulfill the Purpose and Need for the Project.

For this EA, the No Action Alternative is carried forward through the environmental analysis for comparison to the Proposed Action.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the current conditions of the environmental resources, either man-made or natural, that would be affected by the implementation of the Proposed Action or alternatives. This chapter also describes the potential environmental impacts that are likely to occur as a result of the project compared to the No Action Alternative. Environmental impacts include direct and indirect impacts, temporal impacts, scale of impacts, or beneficial impacts from the implementation of the Proposed Action. The No Action Alternative provides a baseline against which the impacts of the Proposed Action can be compared.

Long-Term or Short-Term: These characteristics do not refer to any rigid time period. Short-term impacts would be those that are temporary and short-lived. Long-term impacts would be those that are more likely to be persistent and chronic.

Direct or Indirect: A direct impact would be caused by and occur contemporaneously at or near the location of the action. An indirect impact would be caused by a proposed action and might occur later in time or be farther removed in distance but could still be a reasonably foreseeable outcome of the action.

Negligible, Minor, Moderate, or Major: These relative terms are used to characterize the magnitude or intensity of an impact. Negligible impacts would generally be perceptible but would be at the lower level of detection. A minor impact would be slight, but detectable. A moderate impact would be readily apparent, but less than major. A major impact would be significant; an impact having major unfavorable or undesirable outcomes on the man-made or natural environment.

Beneficial: A beneficial impact would be one having positive outcomes on the man-made or natural environment. A single act might result in major impacts on one environmental resource and beneficial impacts on another resource.

Federal actions are subject to Federal environmental laws and regulations; however, the project must comply with applicable state and local regulations. The impact analysis addressed Federal, state, and local requirements were applicable and the various environmental resources and coordination efforts to determine the environmental consequences on the resources described in this chapter. When multiple regulations apply to a similar environmental resource, the more stringent regulations are used to evaluate the environmental consequences.

3.1 Land Use

3.1.1 General Land Use

This section describes the land use, ownership, and zoning regulations occurring in the Project area and the potential impacts due to the Project implementation.

3.1.1.1 Affected Environment

The Project is in the southwest quadrant of Section 29 in Township 22 North, Range 1 west, 1/4-mile northeast from the city limits of Madison, Madison County, Nebraska. A United States

Geologic Survey (USGS) map of the area is attached (Figure 1, Appendix A) (USGS, 2021a). The parcel is approximately 68-acres and is referred throughout the document at the Property Boundary. Within the Property Boundary, 15-acres of land are slated for development; this area is referred to as the Project Boundary. The parcel is not within the city limits, but it does have a territorial zoning classification of "Agricultural" (Madison County, 2023). The property for the Project is currently privately owned.

Based on a review of recent aerial photography, the land use within the Property Boundary is dominated by row crop agriculture. The row crop agricultural production consists of rotations between corn and soybean cultivation. Between harvest seasons the ground is left fallow and may be is used for livestock grazing. Northwest of the Property, approximately 0.2 miles from the Project, there is a rural residential property that is located west of North Main Avenue. A second rural residential property is located south of the Project along 829 Road, approximately 0.6 miles from the Project. The land use characterizations were confirmed during the site reconnaissance on February 2, 2022.

There are no known development plans for the Property outside of the Proposed Action. An aerial map depicting the Property boundary and the Project Boundary is included as the Site Map – Appendix A.

3.1.1.2 Environmental Consequences

No Action

The No Action Alternative would have no impact to the general land use.

Proposed Action

The parcel for the proposed Project is zoned as agriculture and would not require rezoning as per Madison County, Nebraska zoning regulations (Madison County, 2023). Construction of the Project would require a solar building permit from Madison County. The Property is currently under private ownership. Bluestem would purchase the 68-acre parcel, develop the solar array on the 15 acres located in the northwest corner of the parcel, and lease the remainder of the property for row crop agricultural production. With the implementation of county permits, the Proposed action would not result in an adverse effect to the general land use.

The primary environmental consequence associate with the construction of the Project would be converting 15-acres of land from the primary land use of row crop agriculture to the proposed solar array. Section 3.1.2 below details farmland resources in more detail.

A Conditional Use Permit for Solar Energy was obtained through Madison County at https://madisoncountyne.gov/wp-content/uploads/2022/07/Adopted-Solar.pdf. The permit application included the following information, and the Conditional use permit is included in Appendix B:

1. A plot plan, drawn to scale, of the property indicating the total site acreage, landscape and buffer areas, tree preservation, location of all structures, the proposed location of the solar panels, the distances of the solar panels to structures on the property as well as distances to the property lines.
2. The plot plan shall include any roads, electric lines and/ or overhead utility lines.

3. A description of the electrical generating capacity and means of interconnecting with the electrical grid as coordinated and pre-approved with the appurtenant Power District.
4. A copy of the interconnection agreement with the local electric utility or a written explanation outlining why an interconnection agreement is not necessary.
5. Drawings or blueprints of solar panels and arrays in conjunction with the application for a building permit for a solar farm/solar power plant.
6. Structural engineering analysis for a solar panel, array, and its foundation, as applicable.
7. Manufacturer's recommended installations, if any.
8. Documentation of land ownership and/or legal authority to construct on the property.
9. A decommissioning plan shall be required to ensure that facilities are properly removed after their useful life. Decommissioning of solar panels must occur in the event they are not in use for 12 consecutive months. The plan shall include provisions for removal of all structures and foundations, restoration of soil and vegetation and a plan ensuring financial resources would be available to decommission the site. The Board may require the posting of a bond, letter of credit or the establishment of an escrow account to ensure proper decommissioning.

A Generator Interconnection Agreement was signed between Bluestem and the City of Madison on November 17, 2021, for the use, purchase, and distribution of electricity from the Proposed Action. The interconnection agreement provides a legal document about the responsibilities of each party in regard to the installation, testing, inspections, operations, maintenance, emergencies, insurance, and responsibilities inherent with the Proposed Action. The interconnection agreement is included in Appendix B.

3.1.1.3 Mitigation

The Conditional Use Permit does not waive the requirements of any state or Federal codes, electrical codes, or other technical codes as applicable (Madison County, 2023).

3.1.2 Important Farmland

The Farmland Protection Policy Act (FPPA), PL 97-98, and USDA Department Regulation No. 9500-3, Land Use Policy, provide protection for important farmland, prime forestland, and prime rangeland. The USDA regulations 7 CFR 658 implements the FPPA. The FPPA, 7 U.S.C. 4201m was enacted in 1981 to minimize the loss of prime farmland and unique farm, forest, and range lands as a result of Federal actions by converting these lands to non-agricultural uses. Additional laws protecting farmlands are covered by 7 CFR § 657.5(a)(1) Prime Farmlands, 7 CFR § 657.5(b)(1). Unique Farmlands, 7 CFR § 657.5€. Additional Farmland of Statewide Importance, and 7 CFR § 657.5(d). Additional Farmland of Local Importance.

3.1.2.1 Affected Environment

The Project site contains the soil type identified by the numerical Map Unit Symbol (MUSYM)-soil name, and slope percent. The soil types identified on the property include:

- 6808 – Moody silty clay loam, 0 – 2 percent slopes.
- 6767 – Nora silty clay loam, 6 – 11 percent slopes.
- 6603 – Alcester silty clay loam, 2 – 6 percent slopes.
- 6811 – Moody silty clay loam, 2 – 6 percent slopes

The NRCS Soil Survey Geographic Database (SSURGO) depicted soil types within the 15 acres of the proposed Project (UNL, 1990). The soil survey is included in Appendix B.

The State Conservationist of the USDA Natural Resource and Conservation Service (NRCS) identified all the soil types within the area of the solar array as prime farmland and MUSYM 6767 is classified as Farmland of Statewide Importance. The NRCS determined on June 13, 2023, that the land would be under the provisions of the Farmland Protection Policy Act (FPPA) B.

3.1.2.2 Environmental Consequences

No Action

The No Action Alternative would have no impact on prime farmland.

Proposed Action

The primary impact from the development proposed in this document would be on the conversion of farmland into solar arrays. This process would result in temporary disturbance to the soil during construction activities as well as the removal of farmland from active production. The NRCS completed the Farmland Conversion Impact Rating form (AD-1006) for the proposed site and determined that the combined rating for the site is 156. The FPPA states that sites with a rating of less than 160 will need no further consideration for protection and no additional evaluation is necessary. The concurrence letter from the NRCS and the Farmland Conversion Impact Rating From AD-1006 form are included in Appendix B. Through the NRCS concurrence and the calculations completed on the Farmland Conversion Impact Rating From AD-1006, the conversion of prime farmland for the solar array would not require additional protection and the Proposed Action would not result in an adverse effect to prime farmland.

3.1.2.3 Mitigation

If the area of impacts were to change, additional consultation with the NRCS would be required to avoid potential impacts to important farmland.

3.1.3 Formally Classified Lands

Formally classified lands are areas with special protection through legislative designations and are administered by Federal, state, or local agencies, tribes, or private parties. Formally classified lands include, but are not limited to, national parks, state parks, national monuments, state recreation areas, wildlife refuges, wild and scenic trails, recreational rivers, Native American owned lands, and areas of state or local significance.

The Nebraska Game and Parks Commission (NGPC) Publica Access Data, The Environmental Protection Agency (EPA) NEPAssist Tool, ProtectedLands.net, the National Register of Historic Places, and the Land Water Conservation Fund were referenced for the location and proximity of classified lands to the Project.

3.1.3.1 Affected Environment

There are no known local, State, or Federally classified lands within the Property, directly adjacent to the Property, or within a 3-mile buffer from the Property. The nearest public formally

classified lands to the proposed project include Wood Duck State Wildlife Management Area (>8 miles from the Property) and Oak Valley State Wildlife Management Area (>10 miles from the Property) (US-EPA, 2023a). A map of formally classified lands in the vicinity of the Property is included in Appendix C.

3.1.3.2 Environmental Consequences

No Action

The No Action Alternative would have no impact to the resources attributed to formally classified lands.

Proposed Action

The Proposed Action is located on privately-owned agricultural property in Madison County, Nebraska. The Proposed Action is not anticipated to impact areas outside of the immediate Project boundaries. The nearest formally classified land is more than 3 miles beyond the Property. Due to the lack of formally classified lands within a 3-mile boundary of the Project, there would be no impact to formally classified lands. In addition to the database research, a consultation letter was sent to the National Parks Service (NPS) on June 12, 2023, to confirm that the Proposed Action would have no impact to formally classified lands under their jurisdiction. To date, no response has been received from the NPS. The NPS coordination letter is included in Appendix C. A letter was sent to the NGPC for their review of any formally classified lands within the area of the Project. NGPC responded on July 10, 2023, that the project would have no impact to any state lands or lands protected by the Land and Water Conservation Fund grant. The Proposed Action would not result in adverse effects to formally classified lands. The concurrence letter from NGPC is included with the Threatened and Endangered Species information in Appendix H.

3.1.3.3 Mitigation

No mitigation is required for formally classified lands.

3.2 Floodplains

Protection of floodplains and floodplain development is protected by Executive Order 10584: Prescribing rules and regulations relating to the administration of the Watershed Protection and Flood Prevention Act and EO 11988: Floodplain management.

3.2.1 Affected Environment

The Federal Emergency Management Agency (FEMA) has identified the Project area as not being within a designated floodplain. A floodplain permit would not be required for this Project (FEMA, 2005). FEMA floodplain maps are included in Appendix D.

The Nebraska Department of Natural Resources (NeDNR) did not identify any potential impacts to jurisdictional dams, groundwater wells, stream gauges, or surface water rights and concurred with the findings on June 29, 2023, that the Project would have no impact to floodplains in the area. The concurrence letter from the NeDNR and the NeDNR Floodplain Map are included in Appendix D.

The Lower Elkhorn Natural Resource District (LENRD) was contacted on June 12, 2023, regarding their concurrence with the project. During the 30-day comment period there was no response returned from LENRD that indicated conflicts with floodplains or other resources under their jurisdiction associated with the Project. The correspondence letter sent to LENRD is included in Appendix D.

3.2.2 Environmental Consequences

There would be no adverse effects to floodplain function or existence from this project as there are no designated floodplains within the project area.

3.2.3 Mitigation

If the area of impacts were to change, additional consultation with the NeDNR and a review of floodplain resources would be required to avoid potential impacts to floodplains.

3.3 Wetlands

The United States Army Corps of Engineers (USACE) defines a wetland as an area that is covered by shallow water or has waterlogged soils for a long period of time during the growing season in most years. Prolonged saturation provides the hydrology and soil chemistry to support hydrophytic vegetation to grow in these areas The USACE has established three (3) criteria for identifying a wetland including hydric soils, wetland hydrology, and hydrophytic vegetation, all of which are defined in the 1987 USACE Wetland Delineation Manual (Environmental Laboratory 1987).

Under the Clean Water Act (CWA), both wetlands and waterbodies may be considered Waters of the United States (WOTUS). Activities in WOTUS are regulated by the USACE under Section 10 of the Rivers and Harbors Act and Section 404 of the CWA. On December 20, 2022, USACE and the EPA announced the final “Revised Definition of WOTUS” rule. The WOTUS rule became effective on March 20, 2023. Under the new rule WOTUS are defined as:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
- All interstate waters including interstate wetlands.
- All other waters such as interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds.
- All impoundments of waters otherwise defined as WOUTS under this definition.
- Tributaries of waters identified above.
- The territorial sea.
- Wetlands adjacent to WOTUS as described above. Waste treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds) are not considered WOTUS.

It is unlawful to dredge or fill wetlands and WOTUS without a permit (33 USC S1331(a)). Only the USACE has the authority to confirm the presence of a wetland boundary considered to be WOUTS through a Jurisdictional Determination (JD).

3.3.1 Affected Environment

The Project area is currently a row crop agricultural lot that gradually slopes from north to south. According to the National Wetland Inventory (NWI), riverine wetlands are in the northeast corner of the parcel and no wetlands are preliminarily mapped in the 15-acre area of the proposed Project (USFWS 2022). The NRCS SSURGO depicts all soils within the property as being less than 5 percent hydric (USDA 2020a). See the Natural Resources Map in Appendix A for the NWI and SSURGO. The full custom soil report for the Project is included in Appendix B.

A wetland delineation has not been completed for the site due to the assumption that wetlands are not anticipated in the area where the Project activities and disturbance would occur. Wetlands are not anticipated due to the sloping topographic relief of the Project site, the lack of soils rated to be hydric in the SSURGO results, and the lack of mapped NWI or National Hydrography Dataset (NHD) features in the Project boundary. The disturbance of the project would not extend beyond the limits of the project plans in areas where there is no evidence of wetlands. Should Project activities extend northeast of the Project area into the area of a NWI mapped riverine feature on the northeast corner of the parcel, the Project would be re-evaluated for wetland impacts and a wetland delineation would be completed prior to construction.

The United States Army Corps of Engineers (USACE) was contacted on June 13, 2023, for Project concurrence. The letter received from USACE on June 21, 2023, outlines the procedures and recommendations to follow to avoid adverse impacts to wetlands should they occur. The USACE concurrence letter is included in Appendix E.

3.3.2 Environmental Consequences

No Action

The No Action Alternative would have no impacts to wetlands or channels within the Study Area.

Proposed Action

Direct impacts to wetlands or Waters of the United States (WOTUS) under the Proposed Action would be unlikely due to the lack of wetland or water resources within the Project boundary. Indirect wetland impacts would be unlikely using erosion control best management practices required by the National Pollutant Discharge Elimination System (NPDES) Stormwater Pollution Prevention Plan (SWPPP). Details pertaining to the best management practices required for the NPDES and SWPPP are described in Section 3.4 below. With the implementation of mitigation measures, there would be no adverse effects to wetlands or WOUS.

3.3.3 Mitigation

In accordance with the general regulations pertaining to wetlands, if wetlands are identified prior to construction, impacts to wetlands would be avoided to the extent practicable and a Section 404 Permit would be obtained from the United States Army Corps of Engineers (USACE). The

Project would be constructed to comply with all general and regional permit conditions associated with the Clean Water Act Section 404 Nationwide Permits.

It is unlawful to dredge or fill wetlands and WOTUS without a permit (33 USC S1331(a)). Only the USACE has the authority to confirm the presence of a wetland boundary considered to be WOTUS through a Jurisdictional Determination (JD).

Should Project activities extend northeast of the Project area into the area of a NWI mapped riverine feature on the northeast corner of the parcel, the Project would be re-evaluated for wetland impacts and a wetland delineation would be completed prior to construction.

3.4 Water Resources

The topics within the designation of Water Resources address water quantity and quality issues related to the surface and subsurface water that may be present within the Study Area.

3.4.1 Affected Environment

Safe Water Drinking Act

The Nebraska Department of Environment and Energy (NDEE) division of groundwater and well water is charged with regulating the Safe Water Drinking Act (SDWA, 21 USC 349 Section. 1424€ of the Safe Drinking Water Act of 1974) and was contacted on June 29, 2023, regarding their opinion on the potential impacts of the Project. The Project would adhere to all State regulations and local ordinances regarding drinking water quality. A Title 179 construction permit may be required if well water or access to city water would be required for this project.

The project is located within a Wellhead Protection (WHP) area NE 3111916. WHP areas are controlled by the city and the Project would comply with all local ordinances regarding water quality (NDEE, 2012). See Appendix F for the map of the Madison Wellhead Protection Area.

Stormwater

The NDEE regulates construction storm water, wastewater, and waste disposal. In their response, NDEE stated that the proposed Project would require authorization under the Construction Stormwater General Permit. Excavation dewatering requires authorization under a general permit unless comprised entirely of storm water. NDEE requires notification if encountering contamination or in areas of known contamination when excavating.

Any existing sanitary manhole or sanitary sewers that are disturbed during construction must be returned to their original condition or a Title 123 permit may be required. Any new drinking water lines need to maintain the minimum separation distances specified in Title 123. If the proposed Project involves wastewater works construction, a Title 123 construction permit may be required. The only exceptions will be for activities included in Chapter 3, Section 002 of Title 123.

Ground Water

Sole Source Aquifers (SSAs) are important sources of fresh water in certain portions of the United States, yet none exist in Nebraska (Flaute 2020). See Appendix F for a map of listed Sole Source Aquifers.

According to the wells registered through NeDNR, the nearest well to the Project is an agricultural irrigation well. The well is located approximately 600 feet east from where the buried transmission line would connect to the existing transmission line in the ROW of 829 Road, or approximately 2,100 feet southeast from the solar array. The next closest well is a domestic well located within the City of Madison and is approximately 2,600 feet southwest from the solar array (NeDNR 2023). See Appendix F for registered wells in the vicinity of the Project.

Surface Water

The Nebraska Impaired Waters Map identifies the impaired waters and Total Maximum Daily Loads on Nebraska waterways. It is required by the Clean Water Act for states to prepare a list of surface waters and the impairments of Nebraska waterways every even numbered year. These waters do not support their assigned beneficial uses as listed in the Title 117 – Nebraska Surface Water Quality Standards and are rated between Class 1 for high quality and Class 5 for impaired quality. Outside of the impaired water bodies, surface waters also encompass rivers and lakes within the State. The NDEE 2022 Integrated Water Report list the nearest impaired water to the Project as Union Creek. Union Creek is located approximately 0.75 miles south from the nearest point of the Project and is identified as a Class 5 impaired water for recreation due to high levels of *E. coli* bacteria (NDEE 2023). See Appendix F for a Map of the impaired waters near the Project.

3.4.2 Environmental Consequences

No Action

The No Action Alternative would have no impact on water resources.

Proposed Action

Areas with more than one (1) acre of soil disturbance must obtain a SWPPP permit in accordance with NPDES best management practices to control stormwater runoff and pollution during construction. Best management practices include using controls such as silt fences, waddles, checks, barriers, permanent ground cover, and suppressing fugitive dust. Best management practices are used to prevent soil sedimentation and pollution from exiting the project boundary into downstream waters. The best management practices and controls must be in place for the duration of the project and would be routinely inspected by a certified party. Upon completion of construction the best management practices and controls would remain in place and routinely inspected until permanent vegetation covers 75 percent of the ground or a permanent surface is in place. With the implementation of the SWPPP and best management practices, there would be no adverse effect to surface water quality during construction of the Project.

The Project would not generate wastewater that could potentially contaminate ground water or surface water. As the solar panels would discharge stormwater directly to a pervious surface and the Project would not result in any new effluent discharge, stormwater quality is not anticipated to be affected by the Project upon completion of construction. Additionally, the Project would not require the withdrawal or use of groundwater and there would be no adverse effect.

The Project is within the City of Madison Wellhead Protection Area. The City of Madison controls the subsurface water quality within the Wellhead Protection Area through the local construction permitting process which contributes to protecting groundwater in the area. The Proposed Action would have no impact on groundwater or the wellhead protection area. With the implementation of local permits there would be no adverse effects on the wellhead protection area.

With the implementation of best management practices to prevent stormwater runoff, there would be no adverse effect to downstream waters, including Union Creek.

There are no Sole Source Aquifers in Nebraska; therefore, the project would have no adverse effect on that resource.

3.4.3 Mitigation

Prior to construction a SWPPP in accordance with Nebraska's Construction Stormwater General Permit Number NER2100000 would be implemented that incorporates best management practices to control off site stormwater pollution.

There is not a Title 117 stream or wetland on this site, but best management practices would be applied to the construction site to prevent possible runoff into the waterways. All waste generated or discovered on site must be properly handled, contained, and disposed of as per all the applicable regulations found in NE Title 128 – Nebraska Hazardous Waste Regulations and NE Title 132 – Integrated Solid Waste Management Regulations. This includes proper waste determinations and characterization before disposal. See Appendix E for NDEE consultation and contact information regarding stormwater, drinking water, wastewater, water quality, and waste disposal.

The Project would comply with all local ordinances regarding water quality as it relates to the Wellhead Protection Area.

3.5 Coastal Resources

The topics within the designation of Coastal Resources address water quantity and quality issues related to the protected aquatic habitat that may be present within the Project Area.

3.5.1 Affected Environment

Nebraska is land locked with the nearest freshwater being the Great Lakes, three (3) states away and the nearest ocean four (4) states away. As such, there are no areas in the Project Area or Nebraska that are impacted by the Coastal Zone Management Act of 1972 or Coastal Barriers Resource Act. See Appendix G for the map of Coastal Resources and the distance between the Project and the nearest resource.

3.5.2 Environmental Consequences

No Action

The No Action Alternative would have no impact to coastal resources or protected aquatic habitats.

Proposed Action

The Proposed Action would have no adverse effect to coastal resources or protected aquatic habitats.

3.5.3 Mitigation

No Mitigation is required for Coastal Resources.

3.6 Biological Resources

This section provides an overview of existing biological resources within the Bluestem Solar Project Study Area and the potential impacts to the resources that would be associated with the Proposed Action and the No Action Alternative. The biological resources that have been analyzed below are vegetation and habitat, wildlife, migratory birds, and threatened and endangered species.

3.6.1 General Fish, Wildlife, and Vegetation

Ecoregion

The Project is situated in the Tallgrass Prairie Ecoregion. The Nebraska Tallgrass Prairie Ecoregion historically covers the eastern quarter of the state and mainly consists of rolling hills that are bisected by the stream valleys. Prior to settlement and conversion of the land for agricultural practices, this area would be dominated by several native tall grass prairie forbs and grasses (Rolfsmeier and Steinauer 2010).

General Fish and Wildlife

More than 300 bird species historically have bene documented in the Tallgrass Prairie Ecoregion, including the greater prairie chicken, Henslow's sparrow, dickcissel, bobolinks, and Swainson's hawks (NGPC 2023c).

The tallgrass prairie may include up to 55 mammal species including prairie voles, Franklins ground squirrels, red foxes, southern flying squirrels, and long-tailed weasels (Hall 1981).

Streams, rivers, and lakes in the Tallgrass Prairie Ecoregion are home to nearly 75 species of fish, including channel catfish, flathead chub, and bluegill. The aquatic habitat is also home to 53 species of amphibians and reptiles that include two (2) salamanders, five (5) toads, six (6) frogs, eight (8) turtles, and 24 snake species (NGPC 2023c).

Biologically Unique Landscapes

The Nebraska Natural Legacy Project State Wildlife Action Plan identifies landscapes based on known occurrences of natural communities and at-risk species and sets goals for each community type and certain at-risk species (Schneider et at., 2011).

A set of 39 landscapes were determined that offer the best opportunity for conserving the full array for biological diversity in Nebraska and are designated as Biologically Unique Landscapes (BUL) (Schneider et.al., 2011).

Platte River System

The Platte River, its tributaries, and associated wetland habitats are resources of national importance. Due to the cumulative effect of water depletion projects in the Platte River basin, any direct or indirect depletion of flow from the Platte River System is considered significant and would continue to further deteriorate the already stressed habitat conditions (NeDNR 2008).

3.6.1.1 Affected Environment

Ecoregion

Most of the historic grasslands have been converted to agriculture, leaving approximately two (2) percent of unmodified tall grass habitat. There are no areas of known undisturbed remnant tallgrass prairie in or surrounding the Project Area under the existing conditions. Most of the land has been converted to row crop agriculture (Steinauer et al. 2010). Areas surrounding the Project that are not in agricultural production have been converted to non-native grasslands dominated by smooth brome *(Bromus inermis)* or reed canary *(Phalaris arundinacea)* for hay production, or the land has been development for human use.

General Fish and Wildlife

Due to the upland conditions and routine disturbance associated with the agricultural practices in the Project Area, there is no suitable habitat for the species of birds, mammals, or aquatic amphibians or reptiles that are common to the area. Occasionally mammals such as deer, fox, or rodents may traverse through the area but there is a lack of suitable cover for the species on the property and the occurrence would be temporary and infrequent. Birds present in the Project Area would be limited to occasional raptor species flying over the site. Due to the lack of vegetation on the property and routine disturbance in the spring, there is no habitat for bird species roosting or nesting in trees, or ground nesting activities.

Biologically Unique Landscapes

The nearest BUL is the Elkhorn Confluence, located approximately 5 miles directly east in Stanton County (NNLP, 2023).

Platte River System

The Platte River is located approximately 31 miles to the south of the Project; however, the Project is situated in the Lower Elkhorn Watershed (Seaber et. al. 1987). The Elkhorn Watershed confluence with the Platte River is in Sarpy County, Nebraska, approximately 78 miles directly southeast from the Project.

3.6.1.2 Environmental Consequences

No Action

The No Action Alternative would have no impact compared to the existing conditions.

Proposed Action

The Proposed Action Alternative would convert approximately 15-acres of row crop agriculture to a solar array. Upon completion of the solar array the topsoil would be returned to the area below the solar array and a native seed mix specific for the application of solar generation would be utilized to provide permanent vegetation cover on the site. Since the Proposed Action area is

situated in an area that is currently disturbed row-crop agriculture, there are not trees in positions in the area proposed for construction and no tree removal is anticipated for the Project.

Ecoregion

The native seed mix typically used for solar applications is specifically formulated to consist of short grasses and forbs so as not to interfere with the production of electricity. Although the area is in the Tallgrass Ecoregion, many of the species of low growing vegetation utilized for the seed mix would be similar to the species composition historically found in the area. The native seed mix would also develop deep roots that would retain more water runoff during heavy storms and would also retain moisture in the soil during periods of drought, unlike the disturbed soils used for agricultural production in the existing conditions. Additionally, with the establishment of native grasses and forbs, the area would outcompete invasive plant species and thus prevent invasive plant species from establishing in the area. Additional information on invasive plant species is included in Section 3.5.6.

During construction, the area would be graded, and the soil would be disturbed. Soil disturbance would be managed through implementation of BMPs in the SWPPP and through fugitive dust control. The existing conditions of the property consist of a monoculture of row crop vegetation during the growing season and typically bare soil while crops are not growing. Upon completion of the Project or as portions of the Project can be stabilized, the native seed mix would be utilized for site and soil stabilization.

By utilizing the native seed mix for permanent vegetation below the solar array, the project would have no adverse effect to vegetation or the ecoregion and may result in a beneficial impact to the characteristics of the Tallgrass Prairie Ecoregion.

Animals

The implementation of native permanent grasses and forbs would provide vegetation that would attract bees and other pollinators to the area. The beneficial habitat for pollinators would attract additional pollinators to the area and could provide a beneficial impact to improve yield to nearby farms. The Proposed Action would not result in adverse effects to animals in the area.

Although the fence surrounding the Project Area would prohibit large mammals from entering the property, the native vegetation would provide habitat to numerous species of rodents, reptiles, and may provide nesting habitat for some species of migratory birds.

During construction there would be an increase in construction noise and traffic to the area. The existing conditions lack suitable habitat for the species of birds, mammals, or aquatic amphibians and reptiles common to the area. Construction would only occur during the daytime hours. Occasionally there may be mammals such as deer, fox, or rodents that may temporarily traverse through the area outside of the typical construction hours. Due to the lack of suitable cover for the species on the Property, the presence of general wildlife on the property would be temporary and infrequent under existing conditions. During construction, birds present in the Project Area would be limited to occasional raptor species flying over the site. The Project would require a SWPPP and NPDES that would utilize BMPs to protect aquatic species during

construction. There are currently no mitigation conditions or BMPs in place to prevent exposed soil and sedimentation runoff during storm events.

When compared to the existing conditions, the Proposed Action would have no adverse effects to animals native to the area and may provide a beneficial impact to pollinating insects, small mammals, and terrestrial reptiles. Since the project does not include aquatic habitat, there would be no impact to aquatic species. Additionally, the Project is not anticipated to attract invasive animal species. Information on invasive animal species is included in Section 3.6.5 below.

BULs

There would be no improvements outside the footprint of the Project Area. With the nearest BUL located approximately 5-miles away, the Proposed Action would have no adverse effect to this sensitive area.

Platte River System

Stormwater runoff would be managed during construction and upon completion of construction the property would be properly stabilized to prevent stormwater runoff or downstream pollution. In addition, the Project would not deplete water resources to the downstream networks of streams and rivers that eventually drain into the Platte River. The Proposed Action have no adverse effect on the Platte River and would not contribute to Platte River Depletions.

3.6.1.3 Mitigation

Upon completion of construction, the Project area would be seeded with a native seed mix containing a mixture of grasses and forbs that would be suitable for application of establishing permanent cover below a solar array.

3.6.2 Listed Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 and the Nebraska Nongame and Endangered Species Conservation Act were designed to protect species and the critical habitat of listed species by designating species as threatened or endangered on a state or Federal level. If a species is susceptible to extinction to all or a significant portion of the population, the species is designated as “endangered.” Species that have the potential to become endangered or have a foreseeable future impact that could occur to the population are designated as “threatened.” If the project is present within the range of a threatened or endangered species and impacts to habitat is possible, coordination with the NGPC and/or USFWS should be conducted. The agency coordination and review will result in an effects determination. The following are the effects determinations made by the agencies regarding the project impact:

- No effect means the project would have no impact, positive or negative to a threatened and endangered (T&E) species or their designated critical habitat.
- May affect, but not likely to adversely affect means all effects are beneficial, insignificant, or can be discounted through the implementation of mitigation measures to avoid the incidental impact to a T&E species or their designated critical habitat.

- May affect, likely to adversely affect means listed resources are likely to be exposed to the action or its environmental consequences and would respond in a negative manner to the exposure.

Section 7 of the ESA directs all Federal Agencies to use their existing authority to conserve T&E species and, in consultation with the United States Fish and Wildlife Service (USFWS), to ensure that their actions (funded or carried out) do not jeopardize listed species or destroy or adversely modify critical habitat. Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with USFWS further to avoid a significant impact. Similarly, it is the responsibility of the Federal action agency or project proponent, not the USFWS, to make a "no effect" determination. According to the USFWS, if a "no effect" determination has been made for a proposed project, it is not necessary to seek concurrences from USFWS. However, if a "may affect" determination has been made for a proposed project, consultation with USFWS and Nebraska Game and Parks Commission (NGPC) would be necessary.

3.6.2.1 Affected Environment

According to the USFWS Information for Planning and Consultation (IPaC) and the NGPC Conservation Environmental Review Tool (CERT), there are six (6) federally protected species and one (1) state listed species (USFWS 2024 & NGPC 2024) with the potential to be present in the area. No critical habitat or refuges are known to be present on or in the vicinity of the site (NGPC 2023a). IPaC and State CERT information is included in Appendix H. Additionally there is no critical habitat in or near the Project Action Area.

Northern Long-eared Bat (*Myotis septentrionalis)*- State and Federally *Endangered*

The northern long-eared bat (NLEB) is a resident bat species in Nebraska that occurs mostly in the eastern portion of the state and westward throughout wooded riparian corridors (NNHP 2019) Wintering habitat (hibernacula) for NLEB includes caves and mines with constant temperatures, high humidity, and no air currents (USFWS 2023f). The nearest known hibernaculum is Robbers Cave in Lincoln, Nebraska.

Suitable habitat for the NLEB is defined by USFWS as forest and woodlots containing trees that have exfoliating bark, cracks, crevices, or hollows, and live tree snags > 3 inches in diameter at breast height. Trees in urban settings would not represent suitable habitat for the NLEB unless they include the following characteristics:

- A tract of wooded habitat over 10 acres in size, AND
- The wooded habitat contains traditional uneven-aged forest structures with understory and trees with loose or flaking bark that can provide roosting habitat (not a park-like setting with large trees and mowed grass below), AND
- Wooded tract is connected by a wooded travel corridor to larger tract of roosting or foraging habitat (USFWS IPaC 2023).

NGPC records do not document NLEB within or near the Project area; however, potentially suitable habitat may be present in the vicinity of the Project. Trees are not present in the Project boundary, so no tree removal will be performed. Additionally, NGPC recommends avoiding the use of insecticide that targets prey species of the NLEB.

Tricolored Bat (*Perimyotis subflavus*) – Proposed to List

During the non-hibernating seasons such as the spring, summer and fall, the tricolored bats primarily roost among live and dead leaf clusters of live or recently dead deciduous hardwood trees in dense growth and underbrush covering a large tract of land. Tricolored bats have been observed roosting during summer among pine needles, eastern red cedar (*Juniperus virginiana*), within artificial roosts like barns, beneath porch roofs, bridges, concrete bunkers, and rarely within caves. Female tricolored bats exhibit high site fidelity, returning year after year to the same summer roosting locations. Female tricolored bats form maternity colonies and switch roost trees regularly. Males roost singly (Simmons 2020).

During the winter, tricolored bats hibernate in caves and mines. Tricolored bats exhibit high site fidelity with many individuals returning year after year to the same hibernaculum (UWFWS 2023b).

NGPC records do not document the tricolored bat within or near the Project area; however, potentially suitable habitat may be present in the vicinity of the Project. Trees are not present in the Project boundary, so no tree removal will be performed. Additionally, NGPC recommends avoiding the use of insecticide that targets prey species of the tricolored bat.

Monarch Butterfly (*Danaus plexippus*) – Candidate

The monarch butterfly is a migratory species and may be found throughout Nebraska during the summer and fall months (NGPC 2010). Habitat for the species generally includes various grasslands such as prairies, meadows, and roadsides (Dankert et.al. 2005). During the breeding season, adults lay their eggs exclusively on milkweeds (*Asclepias sp.*). Once larvae (i.e., caterpillars) hatch, they continue to rely only on species of milkweed to feed. Adults are generalists and will feed on a variety of flowering plants (NGPC 2010). Multiple generations are produced during the breeding season with the lifecycle timeframe from egg laying to adult emergence spanning approximately 17 to 37 days. Adult butterflies then live for approximately two (2) to five (5) weeks; however, overwintering adults (typically the last generation of a season) suspend reproduction to migrate and live approximately six (6) to nine (9) months (NGPC 2010).

Monarch butterflies may use grassland areas and its associated drainages within the Study Area. The species may also be found along roadside ditches or other patches of grassland containing flowering plants throughout the Study Area. While the species may be found within the watershed, the USFWS has no Section 7 requirements for candidate species.

Based on the IPAC biological assessment, the Project would result in an effects determination of Not Likely to Adversely Affect for the monarch butterfly due to the lack of habitat in the Project area.

Pallid Sturgeon (*Scaphirhynchus albus*) – Endangered
The pallid sturgeon is a species of fish that inhabits large, deep turbid river channels, usually in strong currents over firm sand or gravel (USFWS 2023c). based on the USFWS habitat description this species is not expected to be present at the site or within the vicinity of the Project due to absence of suitable habitat.

Topeka Shiner *(Notropis topeka (=tristis))* – Endangered
The Topeka shiner is a species of fish that inhabits slow-moving, small to midsize prairie streams with sand, gravel, or rubble bottoms. They prefer pool and oxbow areas that are outside main channel course that are usually in contact with groundwater (USFWS 2023d). Based on the habitat description provided by USFWS this species is not expected to be present at the site due to absence of suitable habitat.

Suitable habitat for the Topeka shiner is located within 1 mile of the Project. Practices that allow soil to runoff into waterways following rainfall events cause additional siltation of streams and increase turbidity, which can result in a lowering of water quality and thus a loss in the diversity of natural aquatic systems. There is no aquatic habitat present within the Project boundary, nevertheless, the NGPC recommends that the Project proponent incorporate rigorous soil erosion control practices both during and after the proposed construction and alignment procedures in order to avoid impacts to fish and other aquatic organisms.

Piping Plover (*Charadrius melodus*) – Threatened
A species of shorebird that prefers gravel beaches and shorelines (USFWS 2023a). Piping plover is not expected to be present at the site due to the absence of suitable habitat.

Western Prairie Fringe Orchid (*Platanthera praeclara*) – State Threatened
The western prairie fringed orchid occurs in moist tallgrass prairies and sedge meadows. The western prairie fringed orchid is well adapted to survive fires. Light grazing does not appear to negatively affect the western prairie fringed orchid, although researchers are still studying the relationship (USFWS 2023e). Due to the Project area being extensively cultivated, this species is not expected to be present at the site due to the lack of suitable habitat.

3.6.2.2 Environmental Consequences

No Action
The No Action Alternative would result in no effect to State or Federally listed T&E species or their critical habitat.

Proposed Action
According to the USFWS- IPaC and the NGPC-CERT, this Project is unlikely to affect biological resources such as threatened, endangered, and candidate species, species of concern or critical habitat. The CERT and IPaC biological assessments are included in Appendix H.

Specific reasoning behind the determination of potential effects on species listed on the federal IPaC biological analysis is broken down by species as follows:

Northern Long-eared Bat (*Myotis septentrionalis*) – Endangered. No suitable habitat is present in or nearby the Project area for this species. This Project would have “No Effect” to the northern long-eared bat. If tree clearing becomes part of the Project action or if tree clearing is required outside of the Project Action Area evaluated in this EA, additional consultation with NGPC and USFWS will be required to avoid adverse impacts to this species.

Tricolored Bat (*Perimyotis subflavus*) – Proposed to List. No suitable habitat is present in or nearby the Project area for this species. This Project would have “No Effect” to the tricolored bat. If tree clearing becomes part of the Project action or if tree clearing is required outside of the Project Action Area evaluated in this EA, additional consultation with NGPC and USFWS will be required to avoid adverse impacts to this species.

Monarch Butterfly (*Danaus plexippus*) – Candidate. The site is currently heavily disturbed by agricultural cultivation and has limited natural vegetation present. Suitable habitat for the monarch butterfly may be present along the fence line of the Property or in the roadside ditch of North Main Street. The Project would avoid these areas; any impacts to these areas would be temporary. This Project would result in “Not Likely to Adversely Affect” to the monarch butterfly.

Pallid Sturgeon (*Scaphirhynchus albus*) – Endangered. The nearest habitat (Lower Platte River or Missouri River) is >100 miles away from the Project site with no perennial channel through the Project connecting the two. This Project would have “No Effect” to the pallid sturgeon.

Topeka Shiner *(Notropis topeka (=tristis))* – Endangered. The nearest habitat in Nebraska is the Cherry County wetlands and the North Loop River Streams (>100 miles from the Project). This Project would have “No Effect” to the Topeka shiner.

Piping Plover (*Charadrius melodus*) – Threatened. There is no suitable habitat on the Project site with the nearest sandbar or sand/gravel pit to serve as suitable habitat being 25 miles away from the site near the Elkhorn River. This Project would have “No Effect” to the piping plover.

Western Prairie Fringe Orchid (*Platanthera praeclara*) – State Threatened. There is no suitable habitat at the Project site. The area is row crop agriculture with heavy disturbance and weed species dominating what vegetation does exist. This Project would have “No Effect” to the western prairie fringed orchid.

The Project would comply with the required of the Migratory Bird Treaty Act and/or the Bald and Golden Eagle Protection Act. The USFWS and NGPC response letters are included in Appendix H.

The Proposed Action would result in an effects determination of Not Likely to Adversely Affect the monarch butterfly and would have no effect to all other State or Federally listed T&E species or their critical habitat.

NGPC reviewed the project and determined on May 3, 2024, “Overall, this site appears to be a reasonable area for solar development with regards to wildlife if it is developed properly and if appropriate conservation measures are implemented.”

3.6.2.3 Mitigation

Minimize ground disturbance during construction and decommissioning. After construction is complete, restore disturbed areas which are not needed for facility operations (e.g., roads, staging sites, laydown yards, et cetera). After a project becomes decommissioned, restore the site such that the habitat is better-than or equal-to the original habitat conditions present at the site. Use site-appropriate native species on previously undisturbed or grazed ground when replanting or seeding areas that have been disturbed.

Bury all collection lines from solar arrays within the energy facility. Any above ground power lines (i.e., from the solar array to the power grid), riser poles, transformers, and conductors should be constructed according to current Avian Power Line Interaction Committee (APLIC) standards. Bird flight diverters should be installed on the overhead power lines associated with the Project.

Minimize the number and intensity of lights associated with the solar project, including operation and maintenance facilities and substations. Use lights that are hooded downward (i.e., downshielded). Train personnel to be aware of wildlife in the area, reduce vehicle speed, and avoid disturbing wildlife.

Use a fence design that would allow for wildlife passage and would not impede migratory movements. Larger openings along the bottom would allow foxes and other small animals to pass through the solar facility. Use C-style pipe or cap open pipes to minimize bird deaths during construction.

3.6.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA; 16 USC §§ 668-668d) prohibits the take of bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) unless authorized by a permit. The BGEPA defines the take of an eagle to include “to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest or disturb.” The term “disturb” is defined in 50 CFR § 22.3 to include agitation or bothering a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

The BGEPA authorizes the Secretary of the Interior to permit the take of bald or golden eagles for several defined purposes, including when “necessary to permit the taking of such eagles for the protection of wildlife or of agricultural or other interests in any particular locality.” Based on this authority, the USFWS published a final rule (Eagle Permit Rule) on December 14, 2016 (50 CFR § 22.26), which authorizes permits for the take of bald eagles and golden eagles where take (1) is compatible with the preservation of the bald and golden eagle; (2) is associated with—and not the purpose of—an otherwise lawful activity, and (3) cannot practicably be avoided.

3.6.3.1 Affected Environment

Bald Eagles

Bald eagles may occur as migrants, breeders, winter residents, or year-round residents in Nebraska. During the nesting or wintering months (from mid-December through late February), bald eagles are found in close association with large bodies of water such as rivers, lakes, or reservoirs that are free of ice and provide a reliable food source and isolation from disturbances (e.g., human activity). Large trees and snags along shorelines and riverine corridors provide feeding and loafing perches, as well as potential nest sites. All bald eagle nests in Nebraska have been constructed in cottonwood trees. The primary prey for bald eagles is fish, but depending on availability, this species will also feed on waterfowl, small mammals, and carrion (Silcock et. al. 2021).

Golden Eagles

Golden eagles are common, permanent residents in the western quarter of Nebraska (the panhandle) and occur as spring and fall migrants and winter visitors in central Nebraska (Silcock et. al. 2021). Golden eagles are commonly associated with open and semi-open country including open grasslands, canyons, and riverside bluffs and cliffs. Their preferred breeding habitat includes expansive open grassland, and their nest sites are typically on escarpments; however, they will occasionally nest in trees. Winter habitat generally consists of open country where there is abundant prey, such as rabbits, ground squirrels, and prairie dogs. The Project area is outside of the range for the golden eagle and therefore is not expected to be present.

3.6.3.2 Environmental Consequences

No Action

The No Action Alternative would have no effect on bald eagles or golden eagles.

Proposed Action

Based on the site reconnaissance and desktop survey of the Project area, there are no trees in the vicinity of the Project that would provide habitat for eagle nesting or roosting. Impacts during construction are unlikely as construction noise and the lack of suitable habitat would likely cause eagles to avoid the area. No new overhead powerlines are planned for this Project. New powerlines would be buried below the solar array. There would be no new overhead lines constructed in association with the solar array or other features of the Project. Construction of these underground utilities reduces the potential for the birds to interact with high voltage lines.

The Proposed Action would have no effect on bald eagles or golden eagles.

3.6.3.3 Mitigation

Due to the lack of suitable habitat, there are no mitigation measures for bald eagles or golden eagles or their habitat.

3.6.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA; 16 USC §§ 703-711) prohibits the taking of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. The word

"take" is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 Code of Federal Regulations [CFR.] § 10.12). The United States Fish and Wildlife Service (USFWS) maintains a list of all species protected by the MBTA at 50 CFR § 10.13. This list includes more than 1,000 species of migratory birds, including eagles and other raptors, waterfowl, shorebirds, seabirds, wading birds, and passerines. At present, there is no MBTA permit authorizing the incidental or non-purposeful take of an MBTA-protected species.

The MTBA also protects other species of migratory birds as does the Nebraska Revised §§37-540, which probits the take and destruction of nest or eggs of protected birds (as defined in Nebraska Revised Statute §§37.237.01). Most migratory bird nesting activity occurs during the period of May 1 to July 15. However, some migratory birds are known to nest outside of the aforementioned primary nesting period.

3.6.4.1 Affected Environment

Based on the reconnaissance on February 2, 2022, there are no trees or native tall grass areas that would provide habitat for migratory bird nesting or roosting. Additionally, the Project Area is row crop agriculture, which is regularly disturbed and does not provide suitable habitat for ground nesting birds.

There are no sensitive areas in the vicinity of the Project Area that are mapped by the Western Hemisphere Shorebird Reserve Network (WHSRN). See Appendix H for the WHSRN map.

3.6.4.2 Environmental Consequences

No Action

The No Action Alternative would have no effect on migratory birds.

Proposed Action

Avian interactions with solar array facilities are not well understood. A collection of solar panels may create a reflective glare that may be mistaken as a body of water by the birds in flight and their insect prey, a phenomenon referred to in the ornithological community as "Lake Effect" (Hathcock 2018). If a bird attempts to land on the Lake Effect area this may result in longer flight paths, injury, or direct mortality. To avoid and adverse effect to migratory birds, the USFWS recommends low reflective panels to reduce avian conflicts.

The Proposed Action would not remove any trees or disturb area where grass nesting birds may be present. With the implementation of low-glare solar panels and avoiding potential migratory bird nesting areas, the Proposed Action would have no effect to migratory birds.

3.6.4.3 Mitigation

Low reflective solar panels must be used to avoid adversely impacting migratory birds.

3.6.5 Invasive Species

Invasive species are defined as non-native species that negatively affect the economy, the environment, or human health where they establish. Noxious weeds are invasive plant species

that are monitored because of their tendency to degrade natural ecosystems and native plant communities. Heavy equipment usage and soil disturbance associated with construction activities have the potential to introduce noxious weeds and other invasive plant species into a project area. EO 13112 Invasive Species (64 FR6183) prevents the introduction of invasive species and provides for their control and the minimization of economic, ecological, and human health impacts that invasive species cause.

3.6.5.1 Affected Environment

According to the Nebraska Invasive Species Program (NISP) eastern Nebraska contains numerous invasive plants, fishes, and invertebrates. The geographic scope of analysis for invasive species includes the tall grass prairie ecoregion. Nebraska Invasive Species Council (2017) has developed a watch list specific to ecoregions in Nebraska. Plants considered priority species on the watch list are currently established, but eradication is still possible for new and existing populations. The tall grass prairie ecoregion includes a species watch list for terrestrial species that includes three (3) category tiers. Category 1, future invasives species includes two (2) species. Category 2, priority species, includes 17 species. Category 3, established species, includes three (3) species. Nebraska regulates noxious weeds through regulations and guidelines set forth in the Nebraska Noxious Weed Control Act (Nebraska Department of Agriculture [NDA] 2014), and Nebraska Noxious Weeds Regulations (NDA 2014). The list of noxious weeds of Nebraska can be found at https://neinvasives.com/species and Table 2.

The possible introduction of invasive plant species does exist in this project. During construction, the disturbance of the soil and vegetation in the project area provides an opportunity for invasive seeds to find a home in the disturbed former agricultural lands. This is often a negative side-effect of land development if appropriate mitigation measures are not followed. Table 2 lists the possible invasive species that could be present in the Project area.

Tallgrass Prairie Ecoregion Weed Watch List

Antelope, Boone, Burt, Butler, Cass, Cedar, Clay, Colfax, Cuming, Dakota, Dixon, Dodge, Douglas, Fillmore, Gage, Hamilton, Jefferson, Johnson, Knox, Lancaster, Madison, Merrick, Nance, Nemaha, Otoe, Pawnee, Pierce, Platte, Polk, Richardson, Saline, Sarpy, Saunders, Seward, Stanton, Thayer, Thurston, Washington, Wayne, and York counties.

Table 2. Invasive Plants Watch List 2023.

Species	Categories	Scientific Name	Common Name(s)
Terrestrial Plant Species	Category 1: Future Invasive Species	*Galium verum*	Yellow Bedstraw
Terrestrial Plant Species	Category 1: Future Invasive Species	*Sonchus arvensis*	Perennial Sow Thistle
Terrestrial Plant Species	Category 2: Priority Species	*Acroptilon repens*	Russian Knapweed
Terrestrial Plant Species	Category 2: Priority Species	*Artemisia absinthium L.*	Absinth Wormwood
Terrestrial Plant Species	Category 2: Priority Species	*Arundo donax L.*	Giant Reed
Terrestrial Plant Species	Category 2: Priority Species	*Bothriochloa bladhii and ischaemum*	Caucasian and Yellow Bluestem
Terrestrial Plant Species	Category 2: Priority Species	*Butomus umbellatus*	Flowering Rush
Terrestrial Plant Species	Category 2: Priority Species	*Celastrus orbiculatus*	Oriental Bittersweet
Terrestrial Plant Species	Category 2: Priority Species	*Centaurea moncktonii*	Black Knapweed

Species	Categories	Scientific Name	Common Name(s)
Terrestrial Plant Species	Category 2: Priority Species	*Cynoglossum officinale*	Houndstongue
Terrestrial Plant Species	Category 2: Priority Species	*Daucus carota*	Queen Anne's Lace
Terrestrial Plant Species	Category 2: Priority Species	*Dipsacus fullonum**	Common Teasel
Terrestrial Plant Species	Category 2: Priority Species	*Dipsacus laciniatus**	Cutleaf Teasel
Terrestrial Plant Species	Category 2: Priority Species	*Euonymus fortunei*	Wintercreeper
Terrestrial Plant Species	Category 2: Priority Species	*Falcaria vulgaris*	Sickleweed
Terrestrial Plant Species	Category 2: Priority Species	*Iris pseudacorus*	Yellow Flag Iris
Terrestrial Plant Species	Category 2: Priority Species	*Lonicera japonica, morrowii, morrowii x tatarica,* and *maackii*	Japanese, Morrow, Showy Fly and Amur Honeysuckle
Terrestrial Plant Species	Category 2: Priority Species	*Pastinaca sativa*	Wild Parsnip
Terrestrial Plant Species	Category 2: Priority Species	*Rhamnus cathartica*	Common Buckthorn, European Buckthorn
Terrestrial Plant Species	Category 3: Established Species	*Allaria petiolata*	Garlic Mustard
Terrestrial Plant Species	Category 3: Established Species	*Pyrus calleryana*	Callery Pear
Terrestrial Plant Species	Category 3: Established Species	*Securigera varia*	Crown Vetch
Floating Aquatic Plant Species	Category 1: Future Invasive Species	*Egeria densa*	Brazilian Elodea
Floating Aquatic Plant Species	Category 1: Future Invasive Species	*Hydrilla verticillata*	Hydrilla
Floating Aquatic Plant Species	Category 1: Future Invasive Species	*Myriophyllum aquaticum*	Parrot's Feather
Floating Aquatic Plant Species	Category 1: Future Invasive Species	*Nitellopsis obtusa*	Starry Stonewort
Floating Aquatic Plant Species	Category 1: Future Invasive Species	*Salvinia molesta*	Giant Salvinia
Floating Aquatic Plant Species	Category 2: Priority Species	*Eichhornia crassipes*	Water Hyacinth
Floating Aquatic Plant Species	Category 2: Priority Species	*Ludwigia peploides*	Creeping Water Primrose, Floating Primrose-Willow
Floating Aquatic Plant Species	Category 2: Priority Species	*Najas minor*	Brittle Naiad
Floating Aquatic Plant Species	Category 2: Priority Species	*Nymphiodes peltata*	Yellow Floating Heart
Floating Aquatic Plant Species	Category 2: Priority Species	*Pistia stratiotes*	Water Lettuce
Floating Aquatic Plant Species	Category 2: Priority Species	*Potamogeton crispus*	Curly-Leaf Pondweed
Floating Aquatic Plant Species	Category 3: Established Species	*Myriophyllum spicatum*	Eurasian Watermilfoil

Source: https://neinvasives.com/species.

3.6.5.2 Environmental Consequences

No Action

The No Action Alternative would not impact invasive species. The row crop agricultural field likely has small populations of thistle species *(Carduus sp.)* that would be continually managed by the occasional haying. The invasive species present on the site would continue to persist; however, management actions such as spot spraying or herbicide treatment may be implemented by the landowner if the established invasive species become more prevalent.

Proposed Action

Under the Proposed Action, there is a potential for invasive herbaceous species to establish within the Study Area due to the ground disturbing activities associated with the grading and construction of the project. State listed noxious weeds and invasive herbaceous species that establish in the disturbed portion of the property could spread into the areas that were not disturbed by construction. However, as part of the Proposed Action, all disturbed ground would be reseeded upon completion of the Project and would be monitored until vegetation density is at least 70 percent coverage. Allowing for the re-seeded portions of the property to establish would restrict the establishment of invasive species on the property; therefore, the project would have no adverse effect or a potential beneficial effect to prevent the establishment of invasive species compared to the No Action Alternative.

3.6.5.3 Mitigation

Pursuant to the Noxious Weed Control Act, Section 2-955, subsection 1(a), every person who owns or controls land in Nebraska where noxious weeds are being grown, or growing on is responsible for controlling the weeds at such frequency as to prevent establishment, provide eradication, or reduce further propagation or dissemination of such weeds.

The contractor would be responsible for maintaining clean equipment before and after the construction of the Project to prevent the potential spread of invasive species transfer.

3.7 Cultural Resources and Historic Properties

Cultural resources include prehistoric and historic archaeological sites, standing structures, objects, districts, and traditional cultural properties associated with native people or historic events. Section 106 of the National Historic Preservation Act of 1966, as amended (54 USC § 306108) and its implementing regulations (CFR Part 800) requires federal agencies to identify and assess the impacts on the historic properties that may be affected by federal undertakings. Historic properties as defined in the NHPA [54 USC 300308] as any “prehistoric or historic district, site, building structure, or object included in, or eligible for inclusion on the National Register of Historic Places, including artifacts, records and material remains related to such a property or resource.” For a cultural resource to be eligible for the NRHP, it must be 50 years in age; retain physical integrity; be associated with events significant to the broad patterns of history; associated with the lives of persons significant in the past; embody distinctive characteristics of a type, period, or method of construction, represent the work of a master, possess high artistic value, or represent a significant and distinguishable entity; and/or must yield or be likely to yield information that can answer questions important to history or prehistory of the region (36 CFR 60.4). If an undertaking would alter, damage, or destroy a historic property, the agency has a responsibility to avoid, minimize, or mitigate the adverse effect.

The affected environment for cultural resources is identified as the area of potential effect (APE) which is confined to the limits of the Project Area for direct effects. The APE also includes a quarter-mile buffer for the geographic area within which federal actions may indirectly cause alterations in the character or use of historic properties if present (36 CFR 800.16(d)).

3.7.1 Affected Environment

Due to the ground disturbance activities associated with the project The Nebraska State Historic Preservation Officer (NeSHPO), also referred to as History Nebraska, requested a Phase II archeological survey for the property on June 20, 2023.

Olsson retained the Archaeology Laboratory at Augustana University to perform the archeological (Phase II) survey, which was completed on July 27, 2023. Augustana first conducted a desktop survey or literature review for the APE or within a 1-mile buffer. No previously recorded cultural resources archaeological sites were noted in the records; however, three (3) previously eligible structures were noted within the one (1) mile of the APE. No standing structures would be demolished as part of the Project. In addition to the records search, Augustana completed a field investigation within the APE where they inspected rodent holes, areas of wind and water, and performed five (5) subsurface bucket auger tests for cultural resources. No archaeological sites or isolated occurrences were identified within the APE. Augustana recommended no further archaeological work for the Project. Based on this report, RUS determined *No Historic Properties Affected* by the construction of the proposed action, and this finding was sent to the NeSHPO (History Nebraska) for their concurrence.

On August 9, 2023, History Nebraska completed their review of the Phase II archeological report and concurred that the project would result in *No Historic Properties Affected*. The effects determination from History Nebraska includes visual impacts associated with the eligible historic properties in the vicinity of the APE. See Appendix I for historical and cultural maps of the APE, correspondence with Nebraska History, and the archeological survey.

The following federally recognized American Indian Tribes identified by the Tribal Directory Assessment Tool (TDAT) for Madison County, Nebraska were notified of the undertaking on June 12, 2023, via letters mailed through the United States Postal Service. Project details were provided to the Apache Tribe of Oklahoma, Cheyenne and Arapaho Tribes of Oklahoma, Pawnee Nation of Oklahoma, and the Ponca Tribe of Nebraska. Each of these tribes hold historical range or interest in the area. The letters provided the tribes the opportunity to review the Project and comment on any concerns. To date, no tribal response has been received that indicated potential tribal conflicts that may be associated with the Project. Initial letters sent to the tribes are included in Appendix I.

USDA-RD Section 106 conclusion memos were sent to these tribes on February 9, 2024, with the recommendation of an RUS finding that the Project would result in *No Historic Properties Affected*. To date there has been no response from the tribes on the conclusion memos. The finding letters sent to the tribes are included in Appendix I.

Nebraska has opted into EO 12372 and required Intergovernmental review. The Northeast Nebraska Development District, Executive Director was notified of the undertaking on December 22, 2023. The letter sent for intergovernmental review and consultation form is included in Appendix I. To date, there has been no response received from the intergovernmental review consultation request. The Nebraska Development District, Executive Director was requested to respond within 30 days of receiving the letter.

3.7.2 Environmental Consequences

No Action

The No Action Alternative would have no impact on historic or cultural resources.

Proposed Action

No excavated borrow sites are planned for the Proposed Action. White rock or gravel would be obtained for the access road from a licensed mining company. Additional details on the on-site preparation and grading associated with the Proposed Action are included in Chapter 1.3.3.

RUS determined that there would be no significant cultural resources impacted by construction of the Project, with NeSHPO concurrence. To date, there has been no response received from the intergovernmental review consultation request. The Nebraska Development District, Executive Director was requested to respond within 30 days of receiving the letter. The 30 days has past and therefore, no further response is expected. As of the date of this document, consultation with the Native American Tribes is complete and RUS has concluded that Section 106 is complete with the result of *No Historic Properties Affected* by construction of the Proposed Action.

3.7.3 Mitigation

Because RUS determined with NeSHPO concurrence that *No Historic Properties Affected* as a result of this project, no mitigation measures are required. However, although not expected, if subsurface cultural resources are uncovered during construction of the project, all work shall stop. The NeSHPO and RUS shall then be immediately notified. Further, if the resources are Native American, all tribes identified through TDAT will be included in additional consultation in the event of an unexpected discovery. Bluestem shall immediately inform the History Nebraska, RUS, and the Tribal Historic Preservation Officers of the findings. Construction on the project shall not commence until the magnitude of the discovery has been assessed and project clearance has been provided by all responsible parties.

3.8 Aesthetics

3.8.1 Affected Environment

The Project is located on agricultural ground that is in crop production during the growing season and is fallow or used for cattle grazing during the winter months. The Property is currently privately owned. The Project Area would be located on the agricultural land outside of any aesthetically sensitive location such as a scenic park or area.

3.8.2 Environmental Consequences

No Action

The No Action Alternative would have no impact on the aesthetics of the area.

Proposed Action

The Proposed Action would place photovoltaic panels over a 15-acres area as shown in the project plans in Appendix A. The area is surrounded by agricultural properties or county road

ROW and there are no scenic or otherwise aesthetically sensitive areas or otherwise in the vicinity of the Project. The height of the photovoltaic panels would not exceed the height of seasonal vegetation and the Proposed Action would not include the installation of overhead transmission lines. Due to the limited height of the photovoltaic panels, the existing height of the transmission lines in the ROW, and the routinely disturbed agricultural field the Project would be placed on, no adverse effect upon the aesthetics of the area is anticipated by the Project.

3.8.3 Mitigation

No mitigation is required for aesthetics.

3.9 Air Quality

3.9.1 Affected Environment

On December 29, 2023, Olsson accessed the EPA Greenbook, which list the Nonattainment Areas for Criteria Pollutants (US-EPA 2023b). The Greenbook did not list Madison County, Nebraska as a non-attainment or maintenance area. The only area of Nebraska listed in the Green Book was Douglas County, which was considered in “Nonattainment Status” from 1992 until 2000 but has since regained “Maintenance Status” in 2001 (US-EPA 2023b). Note that the Project site is in Madison County, approximately 70 miles from Douglas County, and bears no consequences for this Project. The Greenbook is located in Appendix J.

3.9.2 Environmental Consequences

No Action

The No Action Alternative would have no impact on air quality.

Proposed Action

Other than temporary emissions from construction equipment during installation of the facility, no negative environmental consequences associated with air quality would arise from this project. Temporary dust emissions would be similar to the agricultural practices surrounding the Project and would be controlled through the use of best management practices as outlined in the SWPPP. Small amounts of vehicle traffic would continue to occur during the project lifespan but compared to the existing conditions would be considered negligible. The facility itself would not emit any carbon dioxide or other waste products into the atmosphere. The facility would also provide a supplement of clean electricity compared to the existing supply of coal or natural gas-powered electrical generation, thus contributing to lower greenhouse gas emissions for electrical generation in the area. The Proposed Action would have no adverse effect on air quality for the Project Area or the surrounding vicinity.

3.9.3 Mitigation

The NDEE regulates air quality in Nebraska. All grading and construction activities would apply to Fugitive Dust Title 129 Chapter 32 regulations. See Appendix J for NDEE consultation and contact information regarding air quality. Any storage tanks within the proposed Project area may be subjected to federal regulations.

3.10 Socioeconomics and Environmental Justice

Applicants are required to determine if their proposal has or may have disproportionately high and adverse human health or environmental effects on minority and low-income populations under E.O. 12898 *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* and USDA Departmental Regulation DR 5600-2, *Environmental Justice.*

3.10.1 Affected Environment

The U.S. Environmental Protection Agency (EPA) Environmental Justice Screening and Mapping Tool (EJScreen) Report was generated for the Project Area with a two (2)-mile buffer (Study Area). The report revealed there is an approximate population of 2,369 within the study area. Table 3 summarizes the Demographic Indicators of the City of Madison, Madison County, State of Nebraska, and the United States.

Table 3. Demographic Indicators.

Characteristics	Project Study Area* Value	Madison Value	Madison County Value	State of Nebraska Value	United States Value
Approximate Population	2,369	2,217	35,023	1,961,504	331,449,281
Demographic Index	49%	50%	27%	25%	35%
People of Color Population	56%	57%	21%	22%	40%
Low-income Population	42%	42%	34%	28%	30%
Limited English-Speaking Household	11%	11%	4%	3%	5%

*Perimeter of the lot plus 2-mile buffer
Source: US-EPA 2022

The Agency Specialist is completing an RD 2006-38 to document no adverse socio-economic issues. The results of the Environmental Justice Analysis from the EPA's EJ Screen are included in Appendix K.

3.10.2 Environmental Consequences

No Action

The No Action Alternative would have no impact on Socioeconomic or Environmental Justice resources.

Proposed Action

The Proposed Action is presented as option to provide the area and local rate payers the ability to supplement the energy demands with a clean and renewable source of energy.

Based on the small scale of the Project, compared to the overall energy demand, the Proposed Action would not result in new jobs for the area. The area within the parcel not utilized for the solar array would be returned back to agricultural land and rented or leased to an interested party. Because there would be no local employment opportunities associated with the Proposed Alternative, the Project would have no impact on the local, state, or national unemployment

rates. Because the Project would not result in an increased need for local jobs, the Proposed Action is not expected to have a direct impact the economy or result in a change to the population of the Project Study Area, Madison, Madison County, or the United States.

The Project is in a rural area and in the vicinity of Madison, Nebraska. The demographic indicators for the Project Study Area are similar to Madison; however, they are higher than Madison County, Nebraska, and the United States.

The Proposed Action would not result in residential displacements, nor has there been any public controversy related to the Project to the date of this EA. It is further anticipated that the Proposed Action would not have any impact on, or would be influenced by, civil rights, ethnic origins, sex, or social status of the people near the Project or the rate payers that receive the electricity from the Project. The Project is not considered an environmental risk and would not adversely impact local public facilities, public services, transportation facilities, traffic patterns or intensity, or create adverse environmental conditions for the populations that are provided in the vicinity of the Project.

Bluestem intends to purchase the entire 68-acre parcel of property of the Proposed Action. The land would be purchased at a fair market value from a landowner interested in selling their property. The Project would not use imminent domain or condemnation of land to secure the property. Upon completion of the 15-acre solar array, the remaining land would be available to rent or lease for row-crop agricultural production, providing the area with the existing income source and continual business to the surrounding farm support services. With securing the land at fair market value from a willing seller and providing the opportunity to rent or lease the remaining land for agricultural production, the Proposed Action would have no impact on businesses or business districts in the Proposed Action Area.

Financial assistance for this project is anticipated to result in a finding of no adverse effect to Socioeconomic or Environmental Justice populations.

3.10.3 Mitigation

Due to the high demographic index for the Project Study Area and the City of Madison compared to Madison County, Nebraska, and the United States, additional targeted outreach to low-income and people of color would be necessary to ensure that the Project would have no adverse effect to these populations. Targeted outreach to the sensitive populations could consist of one (1) or more of the following outreach tactics:

- Free newspaper publications for the City of Madison and the 2-mile Project Study Area during the 3-day release of the Notice of Availability. The free publications would be placed at publicly available locations, libraries, grocery stores, or gas stations.
- Free newspaper publications for the City of Madison and the 2-mile Project Study Area that would be delivered to each address during the 3-day release of the Notice of Availability.
- Dynamic Message Signs and advertisements placed near the Project Study to notify the public about the Proposed Action and list when and where the Notice of Availability can be found.

3.11 Miscellaneous Issues

3.11.1 Noise

Noise is an unwanted or unwelcome sound added to the natural acoustic setting of a locale. The most common unit of sound is the decibel (dB), a logarithmic measure of sound pressure. However, the human ear is not equally sensitive to all sound frequencies. The A-weighted decibels (dBA) scale, weighted approximately to the sensitivity of the human ear, quantifies this subjective noise level perception. Approximating the range of human hearing, the dBA scale ranges from 0 dBA to about 140 dBA. The softest sound heard by a person with average hearing is 0 dBA, 60 dBA is the level of normal conversation, 90 dBA is a motorcycle at 20 feet, and 110 dBA is equivalent to thunder. With respect to noise levels, a 1-dBA increase is imperceptible, a 3-dBA increase is barely perceptible, a 6-dBA increase is clearly perceptible, and a 10-dBA increase is subjectively perceived as approximately twice as loud (NDOT 2024a).

In addition, noise levels are perceived differently at night, between 10pm and 7am, with noise levels perceived as more disruptive during normal sleeping hours. This difference is reflected by artificially increasing the perceived volume by 10 dBA. The day-night-sound level is measured in Ldn, a weighted 24-hour average noise level to describe a receptor's cumulative noise exposure. An Ldn at or below 65 dBA is typically applied as suitable for residential use. Similarly, the Community Noise Equivalent Level (CNEL) weights 7pm to 10 pm with an additional 5 dBA along with the Ldn weight of 10 dBA between 10pm and 7am. The CNEL is typically approximated as 0.5 dBA higher than the Ldn. The EPA recognizes noise levels below an Ldn of 55 dBA as having no adverse impact (EPA 1974).

The Federal Noise Control Act of 1972 (Public Law 92-574) established that all Federal agencies administer their programs to promote an environment free of noise that would jeopardize public health or welfare. In 1974, in response to the requirements of the Federal Noise Control Act, the EPA identified indoor and outdoor noise level limits to protect public health and welfare (communication disruption, sleep disturbance, and hearing damage). Outdoor and indoor noise exposure limits of 55 dB Ldn and 45 dB Ldn, respectively, are identified as desirable to protect against speech interference and sleep disturbance for residential, educational, and healthcare areas. The sound-level criterion identified to protect against hearing damage in commercial and industrial areas is 70 dB 24-hour Ldn (both outdoors and indoors).

3.11.1.1 Affected Environment

The Project is located on land previously disturbed and used for agricultural activities. The land and surrounding properties are zoned for agricultural use (Madison County, 2023) and are not considered to be noise sensitive land use areas (NDOT, 2024a). The current noise levels in the area of the Project are typical of a rural, agricultural landscape situated next to a county road. Ambient noise for this area is estimated to be between 40 and 50 dB, which is generally considered to be normal ambient noise for a rural setting according to the Federal Highway Administration (FHWA, 2017). A majority of the noise occurring on the site is generated for temporary agricultural practices or noise generated from North Main Street. The National

Transportation Noise Map generalizes noise levels for all transportation sources in the United States and estimates that highway traffic noise at the ROW of North Main Street may be approximately 45-50 dB (US-DOT, 2023). The transportation Noise map is included in Appendix L.

Sensitive receptors (e.g., schools, parks, hospitals, areas zoned for residential use) (NDOT 2024a) are not located within 0.1 miles of the proposed Project. The nearest potentially noise sensitive receptors to the Project include a rural residential property that is positioned on the west side of North Main Street, approximately 0.2 miles from the Project and a second rural residential property is located just north of 829 Road, approximately 0.50 miles south of the Project.

3.11.1.2 Environmental Consequences

No Action

The No Action would have no impact to noise in the area.

Proposed Action

Any noise produced by construction of the facility would be localized and temporary for the extent of the construction activities. Manual equipment installation would be utilized whenever possible to reduce the need for mechanized equipment that would increase the ambient noise during the construction phase of the Project. The temporary noise produced from construction of the Project would be limited to normal working hours and the noise generated from construction within the normal working hours would also be temporary in terms of intensity and duration throughout the construction phase. The construction of the project would result in a minor increase to the existing noise levels. The temporary noise generated by construction would be permitted within the general land use of the property and would have adverse effect on noise sensitive receptors within the vicinity of the Project.

The level of noise that is anticipated to be produced by the Project upon completion of construction would not be greater than current ambient noise levels in the area. The proposed Project would have no adverse effect compared to the existing noise levels.

3.11.1.3 Mitigation

Construction of the Project would generate noise; however, this would temporary and would be limited to daylight hours. Most of the construction noise would be from grading the landscape and moving materials for construction. Explosives would not be used on the project. Bluestem and the contractor would have an operational plan in place to avoid unreasonable generation of noise using best management practices. Use of flammables would not be likely, and the contractor is responsible for safe handling practices and best management practices regarding noise generated during construction. Noise generation from construction would be temporary in respects to the duration of the overall construction of the Project. Upon completion of the Project the ambient noise surrounding the Project would be similar to existing conditions. Because the Project construction is not located near residentially zoned areas, sensitive noise receptors, and the temporary duration of the construction noise; noise mitigation or modeling would not be required.

3.11.2 Transportation

3.11.2.1 Affected Environment

North Main Street is a two (2)-lane paved road that is located along the north and east side of the Project area and serves as an access point to US-81. North Main Avenue is maintained by the City of Madsion within the City limits. North of the City limits, North Main Avenue is maintained by the County. Road 829 is a gravel county road that is present south of the Project Area. East of the Project area is US-81. A four (4)-lane divided highway that serves as a major north-south route through Nebraska.

There is only a small amount of local traffic along North Main Street as the Project Site is located in rural Madison County, Nebraska. The Nebraska Department of Transportation (NDOT) measures the Annual Average Daily Traffic (AADT) data throughout the state of Nebraska on Major roadways. There is minimal AADT data for the Project Area and the nearest data is at the intersection of Nebraska Route 32 and North Main Street, in Madison, Nebraska, which is approximately 3 miles south of the Project. The intersection in Madison has a AADT of 3,225 from 2023 (NDOT 2023). Given the rural location of the Project Site and the additional information from Nebraska Route 32, it is anticipated that North Main Street near the Project has a lower AADT. North Main Street is classified as an Other Arterial roadway (NDOR, 1994) in a rural setting. The NDOT Roadway Classification Map is included in Appendix L. According to the FHWA Classification standards, the purpose of a rural arterial roadway is to be spaced at intervals consistent with population density, to collect traffic from Local Roads and bring all developed areas within reasonable distance of a Collector, to provide service to smaller communities not served by a higher-class facility, and to link locally important traffic generators with their rural hinterlands (FHWA, 2013).

Norfolk Regional Airport is the nearest airport registered with the Federal Aviation Administration and is located south of Norfolk, Nebraska, approximately 16 miles north of the Project. Appendix J shows the proximity of the Project to Norfolk Regional Airport.

3.11.2.2 Environmental Consequences

No Action

The No Action Alternative would have no impact on transportation.

Proposed Action

Typical transport shipping and container tractor trailers would be used to transport equipment to the site. Typical trailers are 53 feet in length and the tractor trailer combination can legally reach 73 feet in length without special permits. None of the transport vehicles should exceed 45,000 pounds in cargo weight and typically hold between 34,000 to 44,000 pounds of cargo. The tare weight (unloaded weight) of a shipping vehicle or container is typically around 15,000 pounds without any contents and not including the weight of the truck. Transport deliveries of the solar equipment would account for about a third of the daily trips, or eight (8) to nine (9) vehicles per day. All transport vehicles would comply with the NDOT Maximum Legal Dimensions and Weights on State, Federal, and Local Routes without necessary permitting. Transportation impacts to public roads such as unreasonable congestion or unsafe conditions would not be

caused as a result the Project. The Project components, including the solar modules, mounting system, inverters, transformers, electrical cabling, and ancillary construction equipment would be transported to the site using standard trucking methods as described above during construction. Bluestem would coordinate with Madison County, as appropriate, to assure construction traffic does not place any undue burdens on the community. Additionally, the Project does not include the installation of public roadways or additional transportation infrastructure. Additionally, trips of the delivery trucks would be staggered over time in order to keep traffic light and avoid congestion. The solar modules, mounting system, electrical cabling, and inverters are all of appropriate size, shape, and weight to be transported to the site on north Main Street, US-81, and other state or local roads using shipping vehicles as described. It is not anticipated that oversize/overweight loads would be needed. Once construction is complete, there would be no long-term traffic impacts from the Project. One (1) or two (2) employees would visit the Project Site as needed for scheduled/preventative maintenance and for unscheduled maintenance or outages during operation of the solar facility. A once per year washing of the solar panels would increase this number by up to 10 employees, and water trucks would be present on-site temporarily for approximately seven (7) days. Significant impacts on local roadways are not anticipated due to the increased traffic.

The Project is anticipated to minimally increase traffic in the immediate vicinity of the proposed Project during the 6-month window for construction. However, the increase in construction traffic is not expected to exceed the roadway capacities of the roadways in the immediate vicinity and the surrounding roadways during that time. The increase in construction traffic would be temporary and would return to normal traffic operations upon completion of construction. The area of the Proposed Project is located in a predominately rural area. Additionally, the functional classification of North Main Street serves the purpose of the functional highway classification assigned by NDOT and FHWA (NDOT 2023).

Upon completion of construction, transportation would be limited to brief traffic into and out of the facility for maintenance and other associated work monthly or as needed. As such, it is not expected that the consequences of increased traffic would be significant after construction is completed. There would be no traffic signals, roadway improvements, or delays associated with the Project.

The Project would have no impact on traffic patterns, nor would it have any impact upon the existing roadway. In total, project construction is anticipated to last up to six (6) months and no obstruction to traffic is anticipated during construction. Periodic inspections of the site and maintenance activities for the site would be required upon completion of construction but would be negligible in terms of long-term impact to current traffic patterns and amounting to less than one (1) average daily trip. US-81 is designated as an Expressway for the purpose of transporting goods and interstate travel and is currently operating with an AADT of 8,815 (NDOT 2023), much lower than the anticipated level of service for this road of approximately AADT of 15,000 (NDOT 2023). The Proposed Action would have no effect on US-81.

Bluestem does not propose erecting any tall structures such as elevated water storage tanks, communications towers, transmission poles, or towers that would emit steam or smoke. Additionally, the Project would use modern low-reflective solar panels. Therefore, no

interference with airport and aircraft communication, navigation, and surveillance facilities would be anticipated. In addition, in accordance with 14 CFR Part 77.9, the Project does not have any construction or alteration that is more than 200 feet above ground level at its site as the tallest structure would be built to match the elevation of the existing building. Thus, no Federal Aviation Administration (FAA) notice is required as the Project as proposed is in compliance with the regulations.

The Proposed Action would result in no adverse effects to all transportation resources in the vicinity of the Project.

3.11.2.3 Mitigation

The Project shall not erect any tall structures such as elevated water storage tanks, communications towers, transmission poles, or towers that would emit steam or smoke. Additionally, the Project would use modern low-reflective solar panels.

3.11.3 Public Notice

3.11.3.1 Affected Environment

The public has been made aware of Bluestem's intention to construct a solar array on the property and details were disclosed to the Madison County Joint Planning Commission though a public hearing in February 2022. The Commissioners voted unanimously for project approval. On February 18, 2022, the Norfolk Daily Newspaper published the details from the Madison County Joint Planning Commission in both printed and digital copies. To date, no negative comments regarding this project have been discovered. See Appendix M for the digital copy of the Norfolk Daily Newspaper article regarding this Project.

3.11.3.2 Environmental Consequences

No Action

The No Action Alternative would have no impact and would not require public notice.

Proposed Action

To date there are no recorded objections to the Project based on the release of publicly available information and public meetings. Additional public notice for the draft EA will be published in the Norfolk Daily Newspaper for three (3) consecutive days. After the newspaper publication for the notice of the draft EA, the public will have the opportunity to submit comments to either the USDA-Representative or Bluestem during a 30-day comment period. A Draft Publication of the notice that would be sent to the Norfolk Daily News Paper is included in Appendix M.

3.11.3.3 Mitigation

A public notice for the draft EA will be published in the Norfolk Daily Newspaper for three (3) consecutive days. After the newspaper publication for the notice of the draft EA, the public will have the opportunity to submit comments to either the USDA or Bluestem representative during a 30-day comment period.

3.12 Human Health and Safety

3.12.1 Electromagnetic Fields and Interference

3.12.1.1 Affected Environment

The Project is situated on a rural and agricultural tract of land with the nearest residential structure being 0.2 miles from the Project boundary.

Electromagnetic fields (EMF) contain both electric and magnetic fields. Electric fields are forces that electric charges exert on other electric charges. Electric fields are produced by voltage, the potential to do work, and are measured in volts per meter (V/m) or kilovolts per meter (1000 V/m or kV/m). Flow of current results in a magnetic field measured in gauss (G) or milligauss (mG). While an electric field is easily shielded by conducting objects (including magnetic soil, trees, and buildings), a magnetic field is not easily weakened by most materials. There are several sources of EMF in common items that are used every day. See Table 4 for the common sources of magnetic fields and the EMF intensity they can generate.

Table 4. Common Source of Magnetic Fields (mG) [1.]

Sources*	Distance from Source (6 inches (mG)	Distance from Source (24 inches (mG)
Microwave Ovens	100 – 300	1 – 30
Dishwasher	10 – 100	2 – 7
Refrigerators	Ambient – 40	Ambient – 10
Fluorescent Lights	20 – 100	Ambient – 8
Copy Machines	4 – 200	1 – 13
Drills	100 – 200	3 – 6

Source: NIEHS, 2002

* Different makes and models of appliances, tools, or fixtures will produce different levels of magnetic fields. These are generally accepted ranges.

The strength of EMF from transformers, capacitor banks, and substations decreases rapidly with distance. Typically, the EMF produced from a substation is indistinguishable from background beyond the fence. Generally, the strongest EMF around the outside of a substation is generated from the power lines connected to the substation (NIEHS 2002), which for the Project would be buried below the ground. Table 5 depicts the strength of both electric and magnetic fields decreasing rapidly with distance from the source. Table 6 depicts the distance EMFs travel and the decrease in intensity for underground transmission lines.

Table 5. Typical US Magnetic Field Levels Associated with Transmission Lines.

Sources*	Usage	Typical Magnetic Field Measurement (mG) Maximum in ROW	Approximate Distance from Centerline – 50 Feet	Approximate Distance from Centerline – 100 Feet	Approximate Distance from Centerline – 200 Feet
115 kV (Overhead)	Average	30	7	2	0.4
115 kV (Overhead)	Peak	63	14	4	0.9
230 kV (Overhead)	Average	58	20	7	1.8
230 kV (Overhead)	Peak	118	40	15	3.6
500 kV (Overhead)	Average	87	29	13	3.2
500 kV (Overhead)	Peak	183	62	27	6.7

Table 6. Typical Magnetic Field Levels Associated with Underground Transmission Lines in the UK.

Underground Transmission Lines Voltage	Details	Load	Maximum in ROW	Approximate Distance from Centerline – 16 Feet	Approximate Distance from Centerline – 33 Feet	Approximate Distance from Centerline – 33 Feet
132 kV (underground)	Singe Cable Buried 1-meter below the surface	Typical	50	7	2	0.4
275 kV (underground)	Direct Buried with 0.5 meter spacing and at 0.9 meter deep	Typical	241	33	9.0	2.3
275 kV (underground)	Average	Maximum	962	131	36	9.2

3.12.1.2 Environmental Consequences

No Action

The No Action Alternative would have no impact from electromagnetic fields and interference.

Proposed Action

Because a correlation between EMF exposures and public health hazards has not been established, Federal and most state health regulatory agencies have determined not to set numeric exposure limits for EMFs. An American organization, the International Commission of Electromagnetic Safety/Institute of Electrical and Electronics Engineers, publishes exposure limits including a general public exposure limit of 2,000 mG or 5 kV/m (TasNetworks, 2023). Nebraska does not have an exposure limit to EMFs.

The Project would not include overhead high-voltage electric transmission lines, substations, cell, or microwave towers. The current scientific literature suggests that electromagnetic fields that are generated from similar solar facilities operate below acceptable exposure levels, with the highest EMFs present at three (3) feet of distance from the inverter units used. The proposed solar array for this Project is located over 1,000 feet from the nearest occupied residence and a security fence would be installed around the perimeter of the property to prevent unauthorized access on the Property. As a result, the Project would have no impact to human health and safety because of EMFs.

Possible negative impacts from the project to human health would be mainly limited to the dangers associated with the construction and installation of the facility itself. Post-construction,

little to no danger would be posed by the facility beyond that of the potential for electric shock. Prevention measures regarding electrical safety would be followed just as with any commercial scale energy facility.

3.12.1.3 Mitigation

There are no mitigation measures related to Electromagnetic fields and interference.

3.12.2 Environmental Risk Management

3.12.2.1 Affected Environment

A Phase I Environmental Site Assessment (ESA) was completed for the site on February 2, 2022. The ESA revealed no evidence of recognized environmental conditions (RECs), historic recognized environmental conditions (HRECs), controlled recognized environmental conditions (CRECs), or de minimis conditions in connection with the Property or immediately surrounding the Property. The Phase I Environmental Site Assessment is included in Appendix N.

3.12.2.2 Environmental Consequences

No Action

The No Action Alternative would have no impact for environmental risk management.

Proposed Action

As noted in the Phase I ESA there is no evidence of a recognized environmental condition on the Property. The project would not produce any hazardous waste or materials or consist of a new RCRA hazardous material holding facility. The Project would have no effect to environmental risk management.

3.12.2.3 Mitigation

There are no mitigation measures related to environmental risk management.

3.13 Corridor Analysis

3.13.1 Affected Environment

Connection to the existing electrical grid would be completed by Bluestem to the existing utility lines located south of the Project along 829 Road. The electrical lines would be buried in conduit starting at the south end of the solar array and would extend south approximately 0.75 miles to the ROW of 829 Road. A corridor analysis is not applicable for this Project as it does not follow a linear path nor does it have large electrical transmission lines, telecommunication lines, water, or wastewater pipelines leading to or away from it.

3.13.2 Environmental Consequences

No Action

The No Action Alternative would have no impact on a corridor analysis.

Proposed Action

The interconnection point would take place at the existing transmission lines along 829 Road and within the Project's area of potential effect, therefore the future interconnection is anticipated to have no impact outside of those listed for the existing project.

3.13.3 Mitigation

There are no mitigation measures related to the corridor analysis.

4. CUMULATIVE EFFECTS

Construction of the Project is anticipated to last six (6) months. After construction, the Project is expected to operate for 35 years. After decommissioning the project, Bluestem would reclaim the Project area. The temporal scale for cumulative impacts is 36 years to account for the construction and operation periods.

Cumulative impacts are defined as the incremental effects of the Proposed Action when considered together with other past, present, and reasonably foreseeable future actions within the potentially affected region regardless of the action.

Desktop research of potential past, present, and future actions in the vicinity of the proposed action area was completed. Resources examined included:

- Local newspapers
- Madison County Comprehensive Plans
- Madison County Public Notices

The overall impact of this project on the local environment when examined holistically mainly involves the disturbance of the agricultural lands, soils, and vegetation. The grading of the landscape and removal/re-distribution of the soils is the most vulnerable stage of the Project and would be associated with primarily negative environmental impacts such as surface water runoff increasing alongside erosion potential and encroachment of invasive plant species. However, these impacts would be temporary and long-term impacts can be avoided with the planting of a native seed mix beneath the panels to hold the soil in place and redevelop the soil profile as root matrices grow. The result would be increased water infiltration and competition with invasive species as well as the revitalization of soil bio-chemical nutrient cycles and horizon development. By the end of the project lifespan soil health would be expected to be similar to or better than existing conditions.

4.1 Future Projects

Desktop research of potential past, present, and future actions in the vicinity of the proposed action area was completed. Resources examined included:

- Local newspapers
- Madison County Comprehensive Plans
- Madison County Public Notices
- Madison County Proceedings

The City of Madison has proposed a future industrial park located approximately 2.4 miles south/southwest of the Project and south of Madison along the west side of US-81. The proposed industrial park is slated to be on 132 acres of land controlled by City Economic Development. Planning for the industrial park began in 2014 and has an undefined future date for construction. The goal of the industrial park is to provide accessibility and transportation options to a range of over 600 miles via the Nebraska Central Railroad and promote future commercial business to the City of Madison.

The Madison County Proceedings listed an applicant requesting to construct a two (2)-unit townhome on a property described as Lot 4 Horizon View Subdivision City of Madison, Madison County, Nebraska. The property is located at 108 West 14th St City of Madison, Nebraska (Parcel # 590288212), located approximately 2.2 miles south of the Proposed Project. It is assumed that the project would be constructed within two (2) years of the application.

4.2 Cumulative Effects Analysis

The cumulative effects analysis includes actions that meet the following criteria:

- The action impacts a resource potentially affected by the Proposed Action.
- The action causes impacts within all or parts of the same geographic scope of the Proposed Action.
- The action causes impacts within all or part of the temporal scope for the potential impacts from the Proposed Action.

The Proposed Action is not expected to have significant impacts to land use, floodplains, wetlands, water resources, biological resources, cultural and historic properties and cultural resources, aesthetics, air quality, socioeconomics/environmental justice, noise, transportation, health and safety, corridors, or soils. Impacts to the resources analyzed in Chapter 3 would mostly be localized to the project area, with most of the impacts occurring during the six (6)-month-long project construction period.

The future projects identified in Section 4.1 do not directly overlap the Project area and would have no cumulative impacts within the physical boundary of the Proposed Project. The construction of the proposed industrial park does not have an anticipated future construction date. In the event that the industrial park and the Proposed Project happen to be constructed at the same time, cumulative impacts are not anticipated due to the planning and permitting that has occurred since 2014 and the distance between the two projects. Additionally, the area of the industrial park is zoned for that specific activity and the information for the future plans have been available to the public since 2014. The application for a residential development is located approximately 2.2 miles south of the Proposed Project. The application for the residential townhome is within the City limits and to be expected as part of the community. The application for a single townhome does not reflect a major increase to the population of Madison and because it is within an area zone for residential development, is not expected to result in a cumulative effect to the Proposed Project. The two future development projects identified from publicly available information area not anticipated to result in cumulative impacts to the resources described in Chapter 3. A review of possible unexpected developments is included in the resource section below.

4.2.1 Land Use

The surrounding area is largely agricultural and undeveloped with some rural residential lots that includes agricultural support services (e.g., equipment storage and grain bins), which is not likely to change significantly over the life of the Project. It is possible the development of the Proposed Action could spur additional solar development in the area over time. However, given the State of Nebraska’s Net-Zero Carbon Emissions, additional solar development in the region

is likely regardless of the development of the Proposed Action. It is assumed other projects would result in similar land use changes in the vicinity. Therefore, the activities associated with the Proposed Action could have a minor cumulative effect on land use including prime farmlands in the vicinity when combined with other reasonably foreseeable planned and approved development actions.

4.2.2 Floodplains

Based on the Bluestem Solar site plans, no permanent structures would be placed in a 100-year floodplain. Structures and the solar panels would be outside the flood zone. Facilities would be decommissioned following the useful life of the solar facility. Other planned and approved development projects in the area also would be expected to adhere flood standards and regulations. As a result, no cumulative effects on floodplains and flooding are expected from the construction of the Proposed Action when combined with other reasonably foreseeable actions in the vicinity.

4.2.3 Wetlands

The Proposed Action was designed to avoid wetland impacts. It is assumed that other projects in the area would also comply with Federal, state, and local regulatory requirements to avoid or minimize wetland impacts for actions subject to regulatory requirements. The potential construction of additional developments in the area may add to incremental loss of wetlands but it is expected that the impacts to wetlands during the construction of other projects would be permitted and effects of the cumulative effects would be mitigated, as necessary, under applicable Federal, state, and local requirements and carried out in accordance with applicable construction permits. As a result, minor adverse cumulative effects to wetlands are expected from the construction of the Proposed Action when combined with other reasonably foreseeable actions in the vicinity.

4.2.4 Water Resources

Adherence to regulatory requirements during construction and operation of the Proposed Action and other reasonably foreseeable projects would not substantially degrade surface or groundwater quality. Implementation and adherence to BMPs and other measures employed by all reasonably foreseeable projects is expected to result in short-term negligible impacts to water resources during construction and decommissioning, and long-term negligible impacts to surface water during operations in their immediate vicinities. The Proposed Action would have negligible impacts on surface water and a minor impact with regard to groundwater storage reduction, drawdown, subsidence, and yield resulting in a minor incremental impact on water resources. As a result, minor adverse cumulative effects to surface water or groundwater are expected from the construction of the Proposed Action when combined with other reasonably foreseeable planned and approved development actions in the vicinity.

4.2.5 Biological Resources

4.2.5.1 Vegetation

Cumulative impacts to vegetation from the Proposed Action could occur where other existing and reasonably foreseeable trends and actions occur within the proposed area. Current conditions on the Project area and the surrounding areas are disturbed row crop agricultural ground which consists of disturbed ground and annual crop rotations. Reasonably foreseeable future actions in the Proposed Action Area could result in altered species composition; however, with the implementation of a native pollinator seed mix designed for solar application, an increase in the number of plant species and relative frequencies of occurrence for some plants and thus an increase in overall plant diversity may occur. Impacts to agricultural land would represent the largest vegetation community impacted. The Proposed Action could also influence factors affecting vegetation growth (e.g., revegetation, root formation, exposure to spills, and watering via dust abatement) and invasive species and noxious weed encroachment. However, BMPs and design features would be applied to minimize adverse impacts. The Proposed Action Area may be decommissioned, and the row crop agricultural conditions would be restored following the useful life of the solar facility. Therefore, the Proposed Action when combined with other present and reasonably foreseeable actions in the vicinity would have a negligible cumulative impact on vegetation.

4.2.5.2 Wildlife

Direct impacts to most wildlife species from the Proposed Action would be temporary and short-term and are considered to be minor. The Proposed Action has been designed to avoid sensitive wildlife habitat to the extent practicable. Additional development in the area would add to this threat to wildlife where development would result in permanent habitat loss or conversion. However, it is assumed that BMPs of planned or proposed projects in the area would use avoidance measures and adhere to Federal and state permit requirements. Adherence to permit requirements as well as application of BMPs would minimize potential cumulative adverse effects associated with new construction. As a result, no adverse cumulative effects to wildlife are expected.

4.2.5.3 Threatened and Endangered Species and Other Protected Species

The Proposed Action would not contribute to habitat loss from present and reasonably foreseeable project trends and actions. Project-related disturbance would be temporary and the potential for an increase in pollinator habitat is possible with the change in vegetation composition from row crop agriculture to native permanent vegetation. The Applicant would limit or minimize impacts to special-status species within the Project Study Area through the implementation of BMPs and design features and mitigation measures. Further, the USFWS did not identify any future non-Federal actions reasonably certain to occur in the action area as part of the Section 7 consultation (Appendix H) Therefore, the Proposed Action is not anticipated to result in cumulative impacts to threatened and endangered species when combined with reasonably foreseeable actions in the vicinity.

4.2.6 Cultural Resources

The Proposed Action would have no adverse effect on NRHP-eligible resources in the vicinity. The specific effects of the reasonably foreseeable projects on NRHP-eligible resources is unknown, however, it is assumed that impacts to such resources would be avoided to the extent practicable and that appropriate mitigation would be implemented if effects cannot be avoided; Therefore, the Proposed Action would not be expected to contribute to cumulative impacts to cultural resources in conjunction with other projects in the area.

4.2.7 Aesthetics

The Proposed Action would not exceed the existing height of the row crop agriculture and additional solar development that may be spurred by this project would have no effect on the surrounding aesthetics of the landscape.

4.2.8 Air Quality

Construction and decommissioning activities associated with the Proposed Action, as well as with the reasonably foreseeable projects, would result in a temporary increase in criteria pollutant and ozone precursor emissions in the form of both fugitive dust from ground disturbing activities and exhaust emissions from the use of construction equipment and operation of worker vehicles and vendor and haul trucks. With the implementation of BMPs to control emission and any mitigation measures as needed, cumulative impacts on air quality in association with construction and decommissioning of the Proposed Action in conjunction with the construction of other projects would have no effect on the overall air quality for the area.

4.2.9 Socioeconomics/Environmental Justice

The direct impact to the economy associated with the Proposed Action is expected to be minor, long-term, and beneficial. The development of other planned and approved projects is expected to have similar minor to moderate beneficial effects on the local economy depending on the size and type of project. Therefore, the Proposed Action is anticipated to contribute minor cumulative beneficial impacts and long-term beneficial socioeconomic impacts to the local economy when combined with reasonably foreseeable planned and approved actions in the vicinity. There would be no disproportionately high and adverse environmental or economic effects on minority or low-income populations. Given the distance between the reasonably foreseeable projects and the Proposed Action, it is not anticipated that project-related environmental justice impacts would coincide with those from other projects in the immediate vicinity of Proposed Action Area. Therefore, the Proposed Action is not anticipated to result in more than negligible cumulative impacts to the environmental justice communities when combined with reasonably foreseeable actions in the vicinity.

4.2.10 Noise

If construction of the Proposed Action overlaps construction of any unanticipated future projects in the vicinity, it is possible they may contribute to a temporary, cumulative increase in noise if construction vehicles utilize some of the same roadways. This impact would be minor and temporary. It is not anticipated that operational noise at the Bluestem Solar facility would

coincide with other planned and approved projects in the immediate vicinity of the Proposed Action Area. Therefore, the Proposed Action is not anticipated to result in more than minor contributions to cumulative noise impacts when combined with reasonably foreseeable actions in the vicinity.

4.2.11 Transportation

It is not anticipated that project-related traffic would coincide with that from other unanticipated future projects in the immediate vicinity of Proposed Action Area. With mitigation, the resulting long-term transportation related impacts associated with operation of the Proposed Action would be negligible. Therefore, the Proposed Action is not anticipated to result in more than minor contributions to cumulative impacts to transportation when combined with reasonably foreseeable actions in the vicinity.

4.2.12 Electromagnetic Fields

There are currently no other solar arrays planned for the area. The project may indirectly spur additional construction of solar arrays in the future. It is also assumed that the additional projects would be situated away from residential developments and the electromagnetic fields and interference would be evaluated; therefore, the potential for electromagnetic fields and interference effects would be minimal. For these reasons, the Proposed Action is anticipated to make a negligible contribution to cumulative effects from electromagnetic fields and interference.

4.2.13 Environmental Risk Management

Because the Proposed Action site includes property used for agricultural purposes, residual pesticides may remain in shallow soils. Similar conditions could be present at other planned and approved project sites. Public and worker health and safety hazards during construction and decommissioning activities would have an increased safety risk which would be mitigated through implementation of health and safety plans, BMPs, and adherence to OSHA regulations. It is assumed that other reasonably foreseeable projects in the vicinity would employ similar measures to mitigate health and safety risks. Minimal human health or safety hazards would be anticipated as a result of the Proposed Action operations. Overall, impacts to human health and safety in association with implementation of the Proposed Action would be short-term, occurring only when workers are present and working at the site, and would be minor. Therefore, the Proposed Action is not anticipated to result in more than minor contributions to overall health and human safety.

4.3 Summary of Environmental Effects

Table 7. Summary of Environmental Effects.

Environmental Resource	Determination of Effect for Proposed Action
Land Use	No known development plans for the area outside of the Proposed Action. No Adverse Effect.
Farmland	Conversion of approximately 15 acres of farmland. USDA consultation concluded No Adverse Effect.
Formally Classified Lands	No known formally classified lands within Project Area. No Adverse Effect
Floodplains	No floodplains within the Project Area. No Adverse Effect
Wetlands	No wetlands within the Project Area. No Adverse Effect.
Water Resources	Area is in a Wellhead Protection Area (WHPA). No Sole Source Aquifers, wells, or effluent discharge. The site would require a Stormwater Pollution Prevention Plan (SWPPP) for soil disturbance and storm water runoff. Proper permits would be obtained to construct in the WHPA. With the implementation of best management practices, permits, and mitigation measures there would be No Adverse Effect.
Coastal Resources	No coastal resources or special aquatic habitats are in the region of the Project. No Adverse Effect.
Biological Resources – Fish, Wildlife, and Vegetation	Little to no suitable habitat for native vegetation, aquatic species, or terrestrial wildlife within the Project Area. No Adverse Effect.
Biological Resources – Threatened and Endangered Species	No suitable habitat for state or Federally listed threatened or endangered species within the Project Area or the vicinity of the Project. USFWS and NGPC concurrence received. Not Likely to Adversely Affect the monarch butterfly and No Effect to all other state and Federally listed species.
Biological Resources – Migratory Bird Treaty Act	Little to no suitable habitat for migratory bird species within the Project Area or the vicinity of the Project. The Project would use low reflective solar panels to avoid “lake effect” for migratory birds. No Adverse Effect.
Biological Resources – Bald Eagle Protection Act	Little to no suitable habitat for Bald Eagles within the Project Area or the vicinity of the Project. No Adverse Effect.
Biological Resources – Invasive Species	Low potential for invasive herbaceous species to establish but would be prevented with native seed mix and mitigation conditions. No Adverse Effect., Potential beneficial effect for avoiding invasive species establishment.
Cultural Resources and Historic Preservation	Survey concluded with SHPO and tribes with a historical range in the area identified in the Tribal Directory Assessment Tool. No Adverse Effect.
Aesthetics	The project is outside of an aesthetically sensitive area. The solar array would not impose visual restrictions compared to the existing conditions. No Adverse Effect.
Air Quality	The Project is outside of any EPA-designated non-attainment or maintenance area for criteria pollutants that affect air quality. Short-term increase in dust from construction activities would be mitigated through the use of best management practices in the SWPPP but would have an overall negligible effect to the surrounding environment compared to existing conditions. No Adverse Effect. Minor beneficial impacts due the production of clean renewable energy source; however, would be negligible compared to the overall energy demand.

Environmental Resource	Determination of Effect for Proposed Action
Socioeconomic and Environmental Justice	The Project is not an environmental risk and there is no current or expected controversy related to the Project. There would be no residential displacements and would have no impact to local public facilities or services. No Adverse Effect.
Noise	Short-term noise may increase during construction, however, there are no areas zoned as sensitive noise receptors in the area. Post construction noise levels would return to existing conditions. No Adverse Effect.
Transportation	The Project is over 5 miles from the nearest airport. The project would have a minor increase in traffic off of North Main Street for the duration of construction, but the increased traffic would not disturb the capacity of the roadway. There would be no obstruction to the transportation network during or after construction. Routine maintenance on the facility would likely generate less traffic to the area than existing conditions. Low reflective solar panels would not disturb aircraft. No Adverse Effect.
Health and Human Safety	Electromagnetic fields would increase slightly; however, the solar array would be placed inside a security fence to prevent unauthorized access and the Project would be greater than 400 feet away from the nearest occupied residence. There are no hazardous material concerns on the Property. No Adverse Effect.
Corridor Analysis	The Proposed Action is not a corridor type project; therefore, a corridor analysis is not applicable.

4.4 Summary of Cumulative Effects

Table 8. Summary of Cumulative Effects.

Environmental Resources	Past/Current Use	Proposed Action	Future Action	Cumulative Effect
Land Use	Row Crop Agriculture – Rural Area	Covert 15 acres of the 68-acre parcel to a solar array- No Adverse Effect	No Adverse Effect	No Cumulative Effect Anticipated
Farmland	Row Crop Agriculture – Rural Area	Covert 15 acres from the 68-acre parcel from row crop to solar array. No Adverse Effect	The remaining 53 acres on the 68-acre parcel would be leased for agricultural production. No Adverse Effect	No Cumulative Effect Anticipated
Formally Classified Land	None Existing Near the Project Area	No Adverse Effect	No Adverse Effect	No Cumulative Effect Anticipated
Floodplains	No Floodplains Mapped in Project Area	No Adverse Effect	No Adverse Effect	No Cumulative Effect Anticipated
Wetlands	Not Present in Project Area	No Adverse Effect	No Adverse Effect	No Cumulative Effect Anticipated
Water Resources	No Known Wells in the Project	Permits, BMPs implemented during	Post Construction Mitigation Measures	No Cumulative Effect Anticipated

Environmental Resources	Past/Current Use	Proposed Action	Future Action	Cumulative Effect
	Area, Surface water resources are outside of the Project Area. Wellhead Protection Area Present. No Sole Source Aquifer.	construction/post construction, local permits, and mitigation measures would result in No Adverse Effect to Water Resources	would result in No Adverse Effect to Water Resources	
Coastal Resources	No Present Near Project Area	No Adverse Effect	No Adverse Effect	No Cumulative Effect Anticipated
Biological Resources - Fish, Wildlife and Vegetation	No Habitat Present within the Project Area. No indirect Effects to the Surrounding Area.	Minor Beneficial Effect for establishing permanent vegetation below the 15-acre solar array. No Adverse Effect to all other biological resources.	Minor Beneficial Effect for establishing permanent vegetation below the 15-acre solar array. No Adverse Effect to all other biological resources.	No Cumulative Effect Anticipated
Biological Resources – Threatened and Endangered Species	No Habitat Present for Listed Species Within the Project Area. No indirect Effects to the Surrounding Area.	No Effect.	No Effect	No Cumulative Effect Anticipated
Biological Resources – Migratory Bird Treaty Act	No Habitat Present for Listed Species Within the Project Area. No indirect Effects to the Surrounding Area.	Minor Beneficial Effect for Establishing permanent vegetation below the 15-acre solar array and use of low reflective solar panels. No Adverse Effect	Minor Beneficial Effect for Establishing permanent vegetation below the 15-acre solar array and use of low reflective solar panels. No Adverse Effect	No Cumulative Effect Anticipated
Biological Resources – Bald Eagle Protection Act	No Habitat Present for Listed Species Within the Project Area. No indirect Effects to the Surrounding Area.	No Adverse Effect	No Adverse Effect	No Cumulative Effect Anticipated

Environmental Resources	Past/Current Use	Proposed Action	Future Action	Cumulative Effect
Biological Resources – Invasive Species	Small Populations of Vegetation Considered Invasive Species are Likely Present Within the Project Area or Surrounding Area.	No Adverse Effect with The Implementation of Mitigation Conditions	No Adverse Effect with The Implementation of Mitigation Conditions.	No Cumulative Effect Anticipated
Cultural Resources and Historic Preservation	No Cultural Resources or Historic Properties Present in APE	No Cultural Resources or Historic Properties Present in APE	No Cultural Resources or Historic Properties Present in APE	No Cumulative Effect Anticipated
Aesthetics	Rural Row Crop Agriculture	Proposed Solar Array meets zoning requirements. No Adverse effect.	Proposed Solar Array meets zoning requirements. No Adverse effect.	No Cumulative Effect Anticipated
Air Quality	Area is Outside of EPA-Designated Non-Attainment or Maintenance Areas for Air Quality Criteria Pollutants.	No Adverse Effect to Air Quality.	Minor Beneficial Impacts due to Renewable Energy Source. Adverse Effect to Air Quality.	No Cumulative Effect
Socio-economic and Environmental Justice	No Socioeconomic and Environmental Justice Communities in Study Area	No Adverse Effect to Socioeconomic and Environmental Justice Communities. Minor beneficial in providing renewable power to the community.	No Adverse Effect to Socioeconomic and Environmental Justice Communities. Minor beneficial in providing renewable power to the community.	No Cumulative Effect Anticipated
Noise	Rural, Low Ambient Noise	No Adverse Effect. No change in ambient noise.	No Adverse Effect. No change in ambient noise	No Cumulative Effect Anticipated
Transportation	No Transportation Features in Study Area, Light rural traffic along North Main Street and	No Adverse Effect. No transportation features proposed. Traffic to the Proposed action would be less than existing conditions.	No Adverse Effect. No transportation features proposed. Traffic to the Proposed action would be less than existing conditions.	No Cumulative Effect Anticipated

Environmental Resources	Past/Current Use	Proposed Action	Future Action	Cumulative Effect
	Road 829. Airport located more than 5 miles to the north.			
Health and Human Safety	Row Crop Agriculture with Low Potential of Risk	Low Potential	Low Potential	No Cumulative Effect Anticipated
Corridor Analysis	No Corridor Present	Not a Corridor Project	Not a Corridor	No Cumulative Effect Anticipated

5. SUMMARY OF MITIGATION

Land Use

A Conditional Use Permit for Solar Energy must be obtained through Madison County at https://madisoncountyne.gov/wp-content/uploads/2022/07/Adopted-Solar.pdf. The permit must include the following information:

1. A plot plan, drawn to scale, of the property indicating the total site acreage, landscape and buffer areas, tree preservation, location of all structures, the proposed location of the solar panels, the distances of the solar panels to structures on the property as well as distances to the property lines.
2. The plot plan shall include any roads, electric lines and/or overhead utility lines.
3. A description of the electrical generating capacity and means of interconnecting with the electrical grid as coordinated and pre-approved with the appurtenant Power District.
4. A copy of the interconnection agreement with the local electric utility or a written explanation outlining why an interconnection agreement is not necessary.
5. Drawings or blueprints of solar panels and arrays in conjunction with the application for a building permit for a solar farm/solar power plant.
6. Structural engineering analysis for a solar panel, array, and its foundation, as applicable.
7. Manufacturer's recommended installations, if any.
8. Documentation of land ownership and/or legal authority to construct on the property.
9. A decommissioning plan shall be required to ensure that facilities are properly removed after their useful life. Decommissioning of solar panels must occur in the event they are not in use for 12 consecutive months. The plan shall include provisions for removal of all structures and foundations, restoration of soil and vegetation and a plan ensuring financial resources would be available to decommission the site. The Board may require the posting of a bond, letter of credit or the establishment of an escrow account to ensure proper decommissioning.

The Conditional Use Permit does not waive the requirements of any state or Federal codes, electrical codes, or other technical codes as applicable.

Farmland

If the area of impacts were to change, additional consultation with the NRCS would be required to avoid potential impacts to important farmland.

Floodplains

If the area of impacts were to change, additional consultation with the NeDNR and a review of floodplain resources would be required to avoid potential impacts to floodplains.

Wetlands

In accordance with the general regulations pertaining to wetlands, if wetlands are identified prior to construction, impacts to wetlands would be avoided to the extent practicable and a Section 404 Permit would be obtained from the United States Army Corps of Engineers (USACE). The Project would be constructed to comply with all general and regional permit conditions associated with the Clean Water Act Section 404 Nationwide Permits.

It is unlawful to dredge or fill wetlands and WOTUS without a permit (33 USC S1331(a)). Only the USACE has the authority to confirm the presence of a wetland boundary considered to be WOUTS through a Jurisdictional Determination (JD).

Should Project activities extend northeast of the Project area into the area of a NWI mapped riverine feature on the northeast corner of the parcel, the Project would be re-evaluated for wetland impacts and a wetland delineation should be completed prior to construction.

Water Resources

Prior to construction a SWPPP in accordance with Nebraska's Construction Stormwater General Permit Number NER2100000 would be implemented that incorporates best management practices to control off site stormwater pollution.

There is not a Title 117 stream or wetland on this site, but best management practices should be applied to the construction site to prevent possible runoff into the waterways. All waste generated or discovered on site must be properly handled, contained, and disposed of as per all the applicable regulations found in NE Title 128 – Nebraska Hazardous Waste Regulations and NE Title 132 – Integrated Solid Waste Management Regulations. This includes proper waste determinations and characterization before disposal. See Appendix J for NDEE consultation and contact information regarding stormwater, drinking water, wastewater, water quality, and waste disposal.

The Project would comply with all local ordinances regarding water quality as it relates to the Wellhead Protection Area.

Biological Resources – Fish, Wildlife, and Vegetation

Upon completion of construction, the Project area shall be seeded with a native seed mix containing a mixture of grasses and forbs that would be suitable for application of establishing permanent cover below a solar array.

Biological Resources – Listed Threatened and Endangered Species

Minimize ground disturbance during construction and decommissioning. After construction is complete, restore disturbed areas which are not needed for facility operations (e.g., roads, staging sites, laydown yards, et cetera). After a project becomes decommissioned, restore the site such that the habitat is better-than or equal-to the original habitat conditions present at the site. Use site-appropriate native species on previously undisturbed or grazed ground when replanting or seeding areas that have been disturbed.

Bury all collection lines from solar arrays within the energy facility. Any above ground power lines (i.e., from the solar array to the power grid), riser poles, transformers, and conductors should be constructed according to current Avian Power Line Interaction Committee (APLIC) standards. Bird flight diverters should be installed on the overhead power lines associated with the Project.

Minimize the number and intensity of lights associated with the solar project, including operation and maintenance facilities and substations. Use lights that are hooded downward (i.e., downshielded). Train personnel to be aware of wildlife in the area, reduce vehicle speed, and avoid disturbing wildlife.

Use a fence design that would allow for wildlife passage and would not impede migratory movements. Larger openings along the bottom would allow foxes and other small animals to pass through the solar facility. Use C-style pipe or cap open pipes to minimize bird deaths during construction.

Biological Resources – Migratory Bird Treaty Act

Low reflective solar panels must be used to avoid adversely impacting migratory birds.

Invasive Species

Pursuant to the Noxious Weed Control Act, Section 2-955, subsection 1(a), to every person who owns or controls land in Nebraska where noxious weeds being grown, or growing on is responsible for controlling the weeds at such frequency as to prevent establishment, provide eradication, or reduce further propagation or dissemination of such weeds.

Cultural Resources and Historic Preservation

All tribes identified in the Tribal Directory Assessment Tool will be included in additional consultation in the event of an unexpected discovery during all phases of the construction. Bluestem shall immediately inform the History Nebraska, the Tribal Historic Preservation Officers and RUS of the findings. Construction on the project shall not commence until the magnitude of the discovery has been assessed and project clearance has been provided by all responsible parties.

Air Quality

The Nebraska Department of Environment and Energy (NDEE) regulates air quality in Nebraska. All grading and construction activities would apply to Fugitive Dust Title 129 Chapter 32 regulations. See Appendix J for NDEE consultation and contact information regarding air quality. Any storage tanks within the proposed Project area may be subjected to federal regulations.

Socioeconomic/Environmental Justice

Due to the high demographic index for the Project Study Area and the City of Madison compared to Madison County, Nebraska, and the United States, additional targeted outreach to low-income and people of color would be necessary to ensure that the Project would have no adverse effect to these populations. Targeted outreach to the sensitive populations could consist of one (1) or more of the following outreach tactics:

- Free newspaper publications for the City of Madison and the 2-mile Project Study Area during the three (3)-day release of the Notice of Availability. The Free publications would be placed at publicly available locations, libraries, grocery stores, or gas stations.
- Free newspaper publications for the City of Madison and the two (2)-mile Project Study Area that would be delivered to each address during the three (3)-day release of the Notice of Availability.
- Dynamic Message Signs and advertisements place near the Project Study to notify the public about the Proposed Action and list when and where the Notice of Availability can be found.

Noise

Construction of the Project would generate noise; however, this would temporary and would be limited to daylight hours. A majority of the construction noise would be from grading the landscape and moving materials for construction. Explosives would not be used on the project. Bluestem and the contractor would have an operational plan in place to avoid unreasonable generation of noise using best management practices. Use of flammables would not be likely, and the contractor is responsible for safe handling practices and best management practices regarding noise generated during construction. Noise generation from construction would be temporary in respects to the duration of the overall construction of the Project. Upon completion of the Project the ambient noise surrounding the Project would be similar to existing conditions. Because the Project construction is not located near residentially zoned areas, sensitive noise receptors, and the temporary duration of the construction noise; noise mitigation or modeling would not be required.

Transportation

The Project shall not erect any tall structures such as elevated water storage tanks, communications towers, transmission poles, or towers that would emit steam or smoke. Additionally, the Project would use modern low-reflective solar panels.

Public Notice

A public notice for the draft EA will be published in the Norfolk Daily Newspaper for three (3) consecutive days. After the newspaper publication for the notice of the draft EA, the public will have the opportunity to submit comments to either the USDA-Representative or Bluestem during a 30-day comment period.

6. COORDINATION, CONSULTATION, AND CORRESPONDENCE

Table 9. Consulting Agencies.

Organization Type	Agency/Tribe	Letter Date	Response Date	Comment
Federal	United States Fish and Wildlife Service	June 12, 2023	July 7, 2023	See Appendix H
Federal	United States Army Corps of Engineers	June 12, 2023	June 21, 2023	See Appendix E
Federal	National Park Service	June 12, 2023	-	-
Tribal	Apache Tribe of Oklahoma (Initiation)	June 12, 2023	-	-
Tribal	Cheyenne and Arapaho Tribes, Oklahoma (Initiation)	June 12, 2023	-	-
Tribal	Omaha Tribe of Nebraska (Initiation)	June 12, 2023	-	-
Tribal	Pawnee Nation of Oklahoma (Initiation)	June 12, 2023	-	-
Tribal	Ponca Tribe of Nebraska (Initiation)	June 12, 2023	-	-
Tribal	Apache Tribe of Oklahoma (Finding)	February 7, 2024	-	-
Tribal	Cheyenne and Arapaho Tribes, Oklahoma (Finding)	February 7, 2024	-	-
Tribal	Omaha Tribe of Nebraska (Finding)	February 7, 2024	-	-
Tribal	Pawnee Nation of Oklahoma (Finding)	February 7, 2024	-	
Tribal	Ponca Tribe of Nebraska (Finding)	February 7, 2024	-	-
State	NDEE	June 12, 2023	June 29, 2023	See Appendix J
State	NeDNR	June 12, 2023	-	-
State	Nebraska Game and Parks Commission	June 12, 2023	July 10, 2023	See Appendix H
State	Nebraska State Historical Society (History Nebraska)	June 12, 2023	August 9, 2023	See Appendix I
State	Natural Resources Conservation Service	June 12, 2023	June 13, 2023	See Appendix B
Local	Lower Elkhorn Natural Resource District	June 12, 2023	-	-
Local	Northeast Nebraska Development District, Executive Director	December 22, 2023	-	-

All letters sent to the consulting agencies are included in the corresponding appendix.

7. REFERENCES

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7 CFR § 657.5(b)(1). Unique Farmlands.
7 CFR § 657.5€. Additional Farmland of Statewide Importance.
7 CFR § 657.5(d). Additional Farmland of Local Importance.
16 United States Code (USC) §§ 661-666. Fish and Wildlife Coordination Act of 1934.
16 USC §§ 668-668d. The Protection of Bald and Golden Eagles Act of 1990.
16 USC §§ 703-712, 40 Stat. Section 755. The Migratory Bird Treaty Act of 1918.
16 USC §§ 1001-1008. Watershed Protection and Flood Prevention.
16 USC §§ 1531 et seq. Endangered Species Act of 1973.
21 USC 349 Section. 1424€ of the Safe Drinking Water Act of 1974.
33 U.S.C §§ 1344 - Permits for dredged or fill material
36 CFR § 60.4. Criteria for Evaluation.
36 CFR § 800. Protection of Historic Properties.
40 CFR § 230 – Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material.
40 CFR § 1501.7. NEPA and Agency Planning. Lead Agencies.
42 USC §§201, 300 et. seq. Section 1424€ of the Safe Drinking Water Act of 1974.
42 USC §§ 4321 et seq. National Environmental Policy Act (NEPA)
42 USC §§ 7401-7671q. The Clean Air Act.
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8. LIST OF PREPARERS

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Mr. Jelden has over nine (9) years of experience in natural resources consultation and has completed NEPA documentation for multiple federal agencies over the course of his career. Additionally, Mr. Jelden has a comprehensive skill set which includes wetland delineations, Section 404 permitting, noise analysis and NEPA documentation.

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Mr. Doty is a seasoned environmental permitting and remediation professional. His skill set includes completing numerous hazardous material reviews: Phase I and II Environmental Site Assessments (ESAs); spill prevention control and countermeasures (SPCC), noise analysis, soil, and ground water sampling.

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Ms. Davenport is an environmental scientist with seven (7) years of experience in wetland delineations, Section 404 permitting, threatened and endangered species, Phase I and II Environmental Site Assessments, and NEPA. She has a bachelor's degree in environmental studies and life science from the University of Nebraska.

Thomas Leihsing

Mr. Leihsing is an environmental scientist with one (1) year of professional expertise. His areas of specialization include wetland delineations, Section 404 permitting, and threatened and endangered species. Additionally, he has experience in avian and plant identification, along with expertise in various surveying methodologies.

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BLUESTEM ENERGY SOLUTION, LLC

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