Appendix C

Vegetation Management Plan

LAKE CHARLOTTE SOLAR ENERGY CONVERSION FACILITY AND BATTERY ENERGY STORAGE SYSTEM

MARTIN COUNTY, MINNESOTA

VEGETATION MANAGEMENT PLAN

Solar Facility Docket No. IP-7159/GS-25-206
BESS Facility Docket No. IP-7159/ESS-25-205

Prepared for:

LAKE CHARLOTTE SOLAR

8400 Normandale Lake Blvd., Suite 1200
Bloomington, MN 55437

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Prepared by:

merjent

EXECUTIVE SUMMARY

Lake Charlotte Solar, LLC (Lake Charlotte), a wholly owned subsidiary of Geronimo Power, LLC (Geronimo Power) proposes to construct the Lake Charlotte Solar Facility (Solar Facility) and Battery Energy Storage System (BESS), collectively the Project, in Rutland Township, Martin County, Minnesota (see Figure 1). The Solar Facility is proposed as a solar energy conversion facility with a 150-megawatt (MW) alternating current (AC) nameplate capacity. The associated BESS will consist of a stand-alone structure with a 150 MW / 600 megawatt hour (MWh) nameplate capacity and ancillary support infrastructure.

If approved, the Project will operate under a Site Permit issued by the Minnesota Public Utilities Commission in accordance with the Minnesota Power Plant Siting Act (Minnesota Statutes §216E) and Minnesota Administrative Rules Chapter 7850, in addition to other required federal, state, and local permits. Currently, the Project is scheduled to commence construction activities in the third quarter of 2027, with commercial operations anticipated to begin in the fourth quarter of 2029.

Lake Charlotte has obtained leases and purchase options for 1,276.7 acres of privately-owned land (Land Control Area). Based on preliminary design, the area needed to construct and operate the Project (i.e., the Preliminary Development Area or Site) will cover up to 1,004.0 acres of the Land Control Area.

The Land Control Area is primarily comprised of agricultural land (99.4 percent) in a rural landscape. Land use aerial imagery indicates that the Land Control Area is primarily managed for row-crop production of predominantly corn and forage crops. The Project Land Control Area consists of gently rolling ground moraines composed of till plains, with areas of end moraines and lake plains.

A comprehensive Vegetation Management Plan (VMP) has been developed to manage soil and vegetation across all phases of the Project, from site preparation to ongoing long-term maintenance, and to aid qualified contractors. This VMP outlines steps for installing prescribed native seed mixes, controlling invasive and noxious weeds, and mitigating erosion and sedimentation.

The VMP covers the Preliminary Development Area (see Figure 2, Land Cover/Land Use), which includes both the solar facility and surrounding lands that may be impacted, with designated zones of perennial native vegetation beneath and between solar panels and in a buffer outside the perimeter fence. The VMP's primary objective is to support Lake Charlotte's restoration and vegetation propagation goals by establishing resilient, site-specific vegetation that enhances soil stability, biodiversity, and aligns with local ecological goals, while also minimizing long-term maintenance costs.

This document is a working document, and revisions will be made as new information on vegetation management practices becomes available or if the Project layout changes.

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ACRONYMS AND ABBREVIATIONS

AC	alternating current
AIMP	Agricultural Impact Mitigation Plan
AUM	animal unit month
BESS	Battery Energy Storage System
BWSR	Board of Water and Soil Resources
DC	direct current
General Permit	Construction Stormwater General Permit
Geronimo Power	Geronimo Power, LLC
GIS	geographic information system
Land Control Area	1,267.7 acres of privately-owned land for which Lake Charlotte Solar, LLC has leases and purchase options to allow siting and construction of the Project.
MDA	Minnesota Department of Agriculture
MDNR	Minnesota Department of Natural Resources
Merjent	Merjent, Inc.
MPCA	Minnesota Pollution Control Agency
MW	megawatt
MWh	megawatt hour
NLCD	National Land Cover Database
NRCS	Natural Resources Conservation Service
Preliminary Development Area	Approximately 1,004.0-acre area that falls entirely within the Land Control Area where Lake Charlotte Solar, LLC proposes to build the Lake Charlotte Solar Project facilities, also referred to as the Site.
Project	Lake Charlotte Solar, LLC
USDA	U.S. Department of Agriculture
Site	Approximately 1,003.8 acres of the Land Control Area, also referred to as the Preliminary Development Area
Solar Facility	Lake Charlotte Solar Facility
SSURGO	Soil Survey Geographic Database
Lake Charlotte	Lake Charlotte Solar, LLC
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VMP	Vegetation Management Plan

1.0 GOALS AND OBJECTIVES

Merjent Inc. (Merjent), on behalf of Lake Charlotte Solar, LLC (Lake Charlotte), developed this Vegetation Management Plan (VMP) to guide site preparation, develop and install prescribed seed mixes, manage undesirable species, implement erosion and sediment controls, and establish vegetation goals. This VMP incorporates best practices for establishing native vegetation, guided by the Minnesota Board of Water and Soil Resources (BWSR) (2019) and the Minnesota Department of Commerce (2021). Lake Charlotte's primary vegetation management goals are outlined below, with corresponding steps to achieve each goal.

1.1 Short-Term Goals

Short-term goals are goals applicable to the post-construction Establishment Phase of the proposed Lake Charlotte Solar Project (Project) in Years 1 to 5. The general goal is to establish a sustainable, diverse, perennial grassland community, appropriate to site conditions and safe operation, maintenance, and inspection that complies with all permits and regulations pertaining to the Site (approximately 1,004.0 acres of the Land Control Area, also referred to as the Preliminary Development Area). The primary short-term goals are:

- Comply with permit conditions for site revegetation, per the Minnesota Pollution Control Agency (MPCA) Construction Stormwater General Permit (General Permit).
- After the first growing season, vegetate at least 70 percent of the Site, and ideally 80 percent of the Site.
- Establish sustainable, diverse, perennial grassland community, appropriate to conditions on 70 percent of the Site and comprised of 90 percent native vegetation by Year 5.
- Implement cover crops to effectively assist in establishment of native vegetation, if practicable.
- Manage invasive species and noxious weeds per Minn. Stat. Sections 18.75 to 18.78, and 18.86.
- Install and establish vegetative screening as requested. The landscaping screening area should be established, with limited ongoing plant mortality, within one year of installation. At the end of the Establishment Phase, 80 percent of the installed shrubs and trees shall be present in the landscaping/screening area.

1.2 Long-Term Goals

Long-term goals are defined as goals beyond Year 5, following implementation of the short-term goals. Lake Charlotte will implement adaptive management of vegetation cover, guided by strategic integration of site-specific environmental conditions to maintain a perennial grassland community that keeps the soils on the Site stabilized, improves soil conditions and preserves the Site for agricultural use in the future. The primary long-term goals include:

- Maintain 95 percent of the Site in a vegetated state, and at least 90 percent of the cover comprised of native species.

- Establish 6 or more species of planted native graminoids and 12 or more species of planted native forbs across the Site.

- Establish a Site that is suitable for haying and/or grazing during facility operations, if determined to be a viable management strategy following construction. Accommodate vegetative management of the Site using traditional vegetative management methods for areas not managed by haying or grazing.

- Prioritize the implementation of all required vegetation management activities for safe and efficient operations support, including woody species control, height control of herbaceous species, wet area management, and landscape/screening management.

The Project's vegetation management program is eligible for the Minnesota BWSR Habitat Friendly Solar Program. The Project meets and exceeds the minimum habitat friendly standards when scored using the Habitat Friendly Solar Site Assessment Form for Project Planning (see Attachment A).

1.3 Vegetation Management Phases

The VMP describes the Establishment, Maintenance, and Long-term Maintenance and Monitoring Phases in detail.

- The Establishment Phase addresses the initial three years of vegetation installation and management. The first year of establishment is focused on consistent undesirable plant control on a Site-wide basis through a variety of management techniques. The second year of establishment continues undesirable plant control but generally employs more targeted techniques. In the third and fourth years of the Establishment Phase, undesirable plant control will consist of spot treatment to control the remaining small patches of undesirable species.

- The Maintenance Phase, which generally begins in the fifth year after initial seed mix installation, promotes and maintains the desired vegetation community, controls the reestablishment or spread of any undesired species, and combats the establishment of invading trees and shrubs**.**

- The Long-term Maintenance and Monitoring Phase includes quantitative and qualitative measures to assess how well the Project goals and performance standards are being achieved. During these years, the frequency of maintenance is greatly reduced and dependent on yearly soil moisture and vegetation growth.

2.0 SITE DESCRIPTION

To understand the ecosystem and landform characteristics surrounding the Project, a baseline Site analysis was conducted to inform the appropriate seed mix composition(s), anticipated period(s) of establishment, and maintenance perspectives required for a successful Establishment Phase. The baseline Site analysis consists of a desktop review of publicly available

datasets, such as soil characteristics, land use, landform, historical aerial photographs, linear hydrology, wetlands, and historical climate data. Additional considerations, such as annual precipitation, weather, and historical climate data inform the likelihood of adequate establishment of propagated seed mixtures.

2.1 Project Location and Size

2.1.1 Project Location

Lake Charlotte is proposing to build a 150 megawatt (MW) alternating current (AC) Solar Facility in Township 103N, Range 30W, Sections 5, 8, 9, 16, 17, 20, and 21 in Rutland Township, Martin County, Minnesota (see Figure 1). Lake Charlotte is proposing to build up to a 150 MW / 600 megawatt-hour MWh Battery Energy Storage System (BESS) adjacent to the Solar Facility Substation in Rutland Township, Township 103N, Range 30W, Section 17. Collectively, the Solar Facility and BESS are the Project.

Lake Charlotte has obtained leases and purchase options for 1,276.7 acres of privately-owned land (Land Control Area). Based on preliminary design, the Project will cover approximately 1,004.0 acres of the Land Control Area (Preliminary Development Area or Site).

2.1.2 Vegetation and Land Use

Prior to Euro-American settlement, vegetation in this area was almost entirely tallgrass prairie. Wet prairies were restricted to narrow stream margins and forests were similarly restricted to ravines along a few streams, such as the Redwood River. Land in this area is currently used for agricultural activity and there are few remnants of pre-settlement vegetation left (Minnesota Department of Natural Resources [MDNR], 2024).

Based on the National Land Cover Database (NLCD) land use/cover data as presented in Table 2.1.2-1 and on Figure 2, the Preliminary Development Area would affect predominately agricultural land (997.8 acres/ 99.4 percent). Developed lands make up approximately 6.16 acres (less than one percent) of the Site. In addition, the NLCD data indicates potential wetland impacts; these impacts are further discussed in Section 2.1.5.

TABLE 2.1.2-1

Land Use Within the Preliminary Development Area

Land Use Type	Acres in Land Control Area	Percent of Total Acreage
Agricultural [a]	997.8	99.4%
Developed [b]	6.16	0.6%
Project Total	**1,004.0**	**100%**

[a] Agricultural land consists of the NLCD categories cultivated cropland.
[b] Developed includes low intensity and open space.
Source: USGS, 2023

In the NLCD data used for Lake Charlotte's environmental analysis, agricultural land in the Land Control Area is used for cultivated crop production of predominantly corn and soybean crops.

2.1.3 Topography

The Project is in a region characterized by gently rolling ground moraines composed of till plains, with areas of end moraines and lake plains. Topography ranges from level, flat ground to steep kames and slopes along the Minnesota River and Big Stone Moraine. Approximately 100 to 400 feet of glacial till sits over Paleozoic-aged bedrock (MDNR, 2025). The Minnesota Geological Survey County Atlas indicates the depth to bedrock within the Land Control Area ranges from approximately 132 feet to 393 feet, with an average of 245 feet (Minnesota Geological Survey, 2025x) (see Figure 3). The annual precipitation ranges from 25 inches in the west to 30 inches in the east, with 11 to 13 inches of growing-season precipitation. See Attachment B to reference historical climate data (National Oceanic and Atmospheric Administration 1981-2010; U.S Environmental Protection Agency [USEPA], 2021).

2.1.4 Soil Characteristics

The characteristics of the soil influences revegetation. A full understanding of the affected soil profiles on a project provides insight into vegetative growth, compaction, erosion, and the types of equipment required to implement seeding requirements. A soil analysis determines the ground's slope, hydric and flooding capabilities, and overall vegetative parameters for seed root penetration.

Soil characteristics within the Land Control Area were assessed using the Soil Survey Geographic Database (SSURGO) (Soil Survey Staff, 2025). The SSURGO database is a digital version of the original county soil surveys developed by Natural Resources Conservation Service (NRCS) for use with Geographic Information System (GIS). It provides the most detailed level of soils information for natural resource planning and management available. Soil maps are linked in the SSURGO database to information about the component soils and their properties (U.S. Department of Agriculture [USDA], NRCS, 2025). Table 2.1.4-1 lists the soil types located within the Land Control Area, which are also shown on Figure 4.

TABLE 2.1.4-1

Summary of Soils within the Land Control Area

Map Unit Symbol	Map Unit Name	Land Control Area (acres / %)	Farmland Designation [a]	Hydric Soil [a]	Wind Erodible [b]	Water Erodible [c]	Compaction Prone [d]	Slope Range [e]
102B	Clarion loam, 2 to 6 percent slopes	0.4 / 0.0%	All areas are prime farmland	No	No	No	No	0-5%
112	Harps clay loam, 0 to 2 percent slopes	6.4 / 0.5%	Prime farmland if drained	Yes	No	No	Yes	0-5%
118	Crippin loam, 1 to 3 percent slopes	150.5 / 11.8%	All areas are prime farmland	No	No	No	No	0-5%
1834	Coland clay loam, 0 to 2 percent slopes, frequently flooded	0.2 / 0.0%	Not prime farmland	Yes	No	No	Yes	0-5%
336	Delft clay loam, 0 to 2 percent slopes	7.7 / 0.6%	Prime farmland if drained	Yes	No	No	Yes	0-5%
86	Canisteo clay loam, 0 to 2 percent slopes	0.8 / 0.1%	Prime farmland if drained	Yes	No	No	Yes	0-5%
886	Nicollet-Crippin complex	16.9 / 1.3%	All areas are prime farmland	No	No	No	Yes	0-5%
887B	Clarion-Swanlake complex, 2 to 6 percent slopes	209.9 / 16.4%	All areas are prime farmland	No	No	No	No	0-5%
921C2	Clarion-Storden complex, 6 to 10 percent slopes, moderately eroded	30.2 / 2.4%	Farmland of statewide importance	No	No	No	No	>5-8%
960D2	Omsrud-Storden complex, 10 to 16 percent slopes, moderately eroded	3.4 / 0.3%	Not prime farmland	No	No	No	No	>8-15%
L107A	Canisteo-Glencoe complex, 0 to 2 percent slopes	815.1 / 63.8%	Prime farmland if drained	Yes	No	No	Yes	0-5%
L84A	Glencoe clay loam, 0 to 1 percent slopes	23.7 / 1.9%	Prime farmland if drained	Yes	No	No	Yes	0-5%
L85A	Nicollet clay loam, 1 to 3 percent slopes	11.4 / 0.9%	All areas are prime farmland	No	No	No	Yes	0-5%
PROJECT TOTAL		**1,276.7 / 100.0%**						

[a] Obtained directly by query of the Soil Survey Geographic geospatial database.

[b] Includes soils in wind erodibility groups 1 and 2.

[c] Includes soils with a slope >15 percent or soils with a K value of >0.35 and slopes greater >5 percent.

[d] Includes soils that are somewhat poorly drained to very poorly drained soils in loamy sands and finer textural classes.

[e] Representative slope values are taken directly from the SSURGO database. The SSURGO database provides representative slope values for all component soil series. Slope classes represent the slope class grouping in percent that contains the representative slope value for a major component soil series. For example, a soil mapped in the 2-6% slope class has an average slope of 4%, which is within the 0-5% slope range.

Source: Soil Survey Staff, 2025.

Approximately 66.9 percent of the Land Control Area is underlain by hydric soils or soils containing hydric inclusions, indicating some wetlands are likely to be present as one of many wetland characteristics is hydric soil. None of the soils in the Land Control Area are prone to wind or water erosion. Approximately 69.1 percent of the Land Control Area is underlain by soils that are prone to compaction. Additional discussion about the soil map units within the Land Control Area and their corresponding soil characteristics can be found in the Agricultural Impact Mitigation Plan (AIMP) (see Appendix E) within the Joint Permit Application.

Soils vulnerable to compaction and rutting often undergo major and damaging changes to their structure and pore space because of the pressure and from construction equipment. Compaction and rutting are related to moisture content and texture and are worse when medium and fine textured soils are subject to heavy equipment traffic when wet. Soils in the Land Control Area are prone to compaction and rutting.

Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, and oilseed crops, and is also available for these uses; the land could be cropland, pasture, woodland, or other lands. Urbanized land and open water cannot be designated as prime farmland. Prime farmland typically contains few or no rocks, is permeable to water and air, is not excessively erodible or saturated with water for long periods, and is not subject to frequent or prolonged flooding during the growing season. Soils that do not meet the above criteria may be considered prime farmland if the limiting factor is mitigated (e.g., by draining or irrigating) (USDA NRCS, 2025).

The NRCS also recognizes farmlands of statewide importance, which are defined as lands other than prime farmland that are used for production of specific high-value food and fiber crops (e.g., citrus, tree nuts, olives, fruits, and vegetables). Farmlands of statewide importance have the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods. Farmland of statewide importance is similar to prime farmland but with minor shortcomings such as greater slopes or less ability to store soil moisture. The methods for defining and listing farmland of statewide importance are determined by the appropriate state agencies, typically in association with local soil conservation districts or other local agencies.

As shown in Table 2.1.4-2, most of the soils within the Site are classified as prime farmland, prime farmland if a limiting factor is mitigated, or farmland of statewide importance; however, it is important to note that the prime farmland designation is independent of current land use (USDA NRCS, 2025).

TABLE 2.1.4-2

Farmland Classifications within the Preliminary Development Area

Farmland Classification	Preliminary Development Area (acres / %)
Prime Farmland	318.0 / 31.7%
Prime Farmland if Drained	658.8 / 65.6%
Farmland of Statewide Importance	23.9 / 2.4%
Not Prime Farmland	3.2 / 0.3%
PROJECT TOTAL	**1,004.0 / 100.0%**

Source: Soil Survey Staff, 2025.

For additional information regarding soils, best practices for segregation of topsoil and subsoil, as well as decompaction methods that will foster long term soil health and vegetative outcome success, refer to the AIMP in Attachment E. The contractor is encouraged to visit the NRCS web soil survey to review detailed information about the soils across the Site in more detail.

2.1.5 Hydrological Characteristics

The hydrology of a site proposed informs the locations where specific seed mixes might need to be developed, along with the parameters for implementation. Upland and lowland/wetland/riparian seed mixes can greatly differ in seeding species, rates, application techniques, and timing due to how much water, saturation, or inundation a vegetation species can tolerate.

Hydrologic features within the Land Control Area include wetlands, waterways, and waterbodies. The Project is within the Blue Earth River watershed (HUC8: 07020009) (MDNR, 2023). Upon review of FEMA's National Flood Hazard Layer, the Site is categorized as a minimal flood hazard (FEMA, 2021).

Tetra Tech, Inc, conducted wetland and other waters delineations between October 18 and 26, 2022, to identify and characterize wetlands and waterways per U.S. Army Corps of Engineers (USACE) methodology. The delineation encompassed the entirety of the Land Control Area, which identified 21 wetlands totaling 16.5 acres. All wetlands are associated with roadways or are located within agricultural fields, with five of the wetlands occurring along 160th Street, six of the wetlands occurring south of 160th Street within agricultural fields, three of the wetlands occurring along 210th Avenue, one wetland occurring along 170th Street, and the remaining six wetlands occurring south of 170th Street within agricultural fields (see Figure 5).

The Project has been designed to minimize impacts to surface waters to the extent practicable. The proposed Site contains six wetlands totaling 2.36 acres in size. These wetlands are located within the fenced solar facility areas but will not be impacted by Project components. Therefore, all wetlands are anticipated to be avoided. These wetlands are all currently farmed and will be enhanced through seeding and management in accordance with this VMP.

3.0 MANAGEMENT UNITS

The Site is anticipated to be separated into smaller construction and management units for a common point of communication in management. For ease of reference, the management units will likely be designated by the array block numbering system already established as a part of the final engineering process. Each array block, which consists of an approximately 10- to 20-acre area of panels, is designated per the direct current (DC) collection system from the solar modules to a common inverter. Using an array block is a common point of understanding for onsite managers to quickly and effectively communicate the area undergoing final Site stabilization, requiring noxious weed treatment, or other vegetation management needs. As restoration progresses, a more simplified set of management units may be established by aggregating array blocks into larger units. This will be determined by onsite managers based on Site outcomes and monitoring reports.

Generally, three distinct types of management are possible on the Site. These include the possibility of haying, mowing, or grazing, and these methods are laid out in more detail later in the VMP. This VMP has been drafted to allow a 'scaling' of each management measure based

upon availability at the time such a management measure could be deployed. The goals and objectives for each management unit are the same and are provided in Section 1.0 of this VMP.

4.0 VEGETATION INSTALLATION

The purpose of site preparation is to create optimal growing conditions for seeding while controlling invasive species and erosion, while preserving undisturbed areas. All preparation activities must comply with the SWPPPs and other permit conditions. Flagging and signage will be installed prior to construction to clearly mark any identified wetlands or waterbodies. The permanent seed mixes are tailored to the site conditions, with the seeding plan detailed on Figure 6.

4.1 Site Preparation and Vegetation Clearing

Prior to vegetation installation, management techniques can be used that will lead to more successful vegetation establishment to meet the short- and long-term goals. Most of the soil and vegetation disturbances will occur during the first phase of construction when the grading activities take place. The construction contractor will follow the recommendations of the AIMP to ensure that best practices are used during construction and to prepare the Site for final stabilization. Additionally, to stabilize the soils, existing vegetation or plant material will be retained on the surface in areas that do not need to be graded. Any topsoil that is stripped or otherwise stockpiled during construction will be replaced and spread or otherwise stockpiled prior to seed bed preparation activities. Recommendations for weed control and implementation of cover crops to assist in Site stabilization prior to construction are provided in Section 5.1.

Following soil disturbing activities, any compacted areas, such as laydown areas, heavily travelled corridors, or portions of the access road corridors that were used as temporary roadbeds will be decompacted as described in the AIMP.

4.1.1 Seeding Contractors Qualifications

Seeding contractors must possess a minimum of five years of experience in native seed installation, with specific expertise in utility-scale solar projects in Minnesota or the Upper Midwest. Contractors are required to provide references that demonstrate their capability to successfully execute similar projects, including vegetation establishment under and around solar panels.

4.1.2 Permanent Seeding Prior to Solar Installation

There are two permanent seeding timing options to consider. One of the options is to seed prior to the installation of solar infrastructure. The advantage to this approach is that it establishes vegetation to help reduce potential erosion by establishing ground cover. Additionally, the restoration contractor will be able to avoid solar panels during seeding, which reduces labor costs. The disadvantage is the potential for additional seeding in heavily trafficked areas.

Permanent seeding should occur two to three months ahead of the installation of solar panels to allow the vegetation to establish. Prior to seeding, an herbicide treatment is recommended to treat undesired plant species and noxious or invasive weeds. Soil tillage can create an optimal seed bed and may be required at select locations based on soil profiles. If tillage occurs, rock picking may be required for rock equal to or larger than four inches in diameter. If tillage is necessary, seeding options include Brillion, Trillion, broadcast, or drill seeding. With most of the land currently

being farmed, it is anticipated that drill seeding directly after herbicide treatment will be adequate for a large portion of the Site. The seeding method will be determined at the time of installation and will be dependent on soil conditions, weather, and time of year. If tillage is not needed, the vegetation may need to be mowed once depending on the height and density of the vegetation during seed installation.

During solar installation, there is a likelihood that portions of the Site will require reseeding. To minimize seedling disturbance, it is recommended that specialized low-impact equipment and/or construction mats be used on heavily traveled areas during construction to minimize soil compaction.

4.1.3 Permanent Seeding After Solar Installation

The other permanent seeding option occurs after the solar panels are installed. This creates challenging seeding conditions and requires specialized equipment and more time to complete. The advantage of this method is that only one mobilization for the restoration contractor is required and no reseeding due to construction activities will be required

4.2 Temporary Seed Mixes

A temporary cover crop will help mitigate erosion, decrease the need for erosion control devices, increase soil moisture, and suppress weed growth. Cover crops assist in Site stabilization during construction activities and are especially helpful in areas that do not require grading activities. Early season cover crop installation is typically seed oats (*Avena sativa*), but Lake Charlotte will work with the Project Contractor to select the best option. A cover crop will not be planted prior to construction unless there is adequate time between the start of the growing season and the start of construction for the cover crop to grow to a sufficient height to provide soil surface protection during construction. Cover crop recommendations vary by location and season; however, oats and/or winter wheat (*Triticum aestivum*) are recommended for Martin County. Suggested cover crop seeding rates per season are given in Table 4.2-1 below.

TABLE 4.2-1

Temporary Cover Crops

Season	Seed	Seeding Rate as Nurse Crop [a]	Seeding Rate as Cover Crop [a]
Spring and Summer	Oats (*Avena sativa)*	16-32 pounds/acre	96 pounds/acre
Fall	Winter Wheat (*Triticum aestivum*)	10-60 pounds/acre	90-120 pounds/acre
Fall	Cereal Rye (*Secale cereale* L.)	10-60 pounds/acre	90-120 pounds/acre

[a] Seed rates are based on drill seed application and will vary based on site-specific conditions, final seed mix, and seasonal considerations.

4.3 Seeding Timing

An optimal planting time for native species is in the fall (October to November). Fall planting allows seeds to naturally go through the cold stratification process, which many native species need to break dormancy (University of Minnesota Extension, n.d.a). Spring planting can occur between and early spring (April to early June). In their *Native Vegetation Establishment and Enhancement Guidelines,* BWSR encourages monitoring soil temperatures and adjusting planting schedules based on local conditions (BWSR, 2022).

Below is breakdown of seeding recommendations based on time of year:

- Spring Seeding: May 1 to June 15 when soil temperatures are at least 60 degrees Fahrenheit or higher.
- Fall Seeding: Should occur when soil temperatures fall below 50 degrees Fahrenheit for a consistent period (usually around November 1).
    - Fall dormant seedings can help reduce weed pressure during the first year of growth because cool season grasses and forbs germinate earlier and start competing with weed species right away. Frost seedings are also an option if the snow cover is not too deep.
    - For frost seeding, seeding rates may need to be increased by 25 percent due to lower germination rates and loss of seed that is consumed by wildlife over the winter months.

If Site preparation and grading is completed between the summer and early fall, dry soils may pose a challenge and require deeper soil tilling to create a good seed bed. If delaying seeding until late fall is an option, a temporary cover crop will be planted after construction is complete (see Section 4.2). Installation of a temporary cover crop will help mitigate erosion, reduce the requirement for sediment control structures, and suppress weed growth. Recommended applications of temporary cover crops vary by season, as described in Table 4.2-1 above.

A late fall or winter seeding is referred to as dormant seeding. When seeding in late fall the seeding is timed to avoid germination. To prevent seed germination, seeding should occur after soil temperatures fall below 50 degrees Fahrenheit for a consistent period. Seeding that occurs before the soil is frozen is planted with a shallow-seeding drill. When seeding after soils have frozen, a broadcast seeder is used since the freeze-thaw cycle in winter causes soil cracks to open and draw seed into the soil (BWSR, 2022).

4.4 Permanent Seed Mixes

Reestablishing native vegetation can serve multiple purposes, including soil stabilization, reducing erosion, lessening the sediment load to any nearby ditches or streams, increasing nutrient retention through deep root systems, carbon sequestration, and providing wildlife habitat. A mixture of native grasses that includes forbs will produce a high-quality prairie habitat that is more resilient to drought, pests, and disease than monoculture grasslands or low diversity vegetation stands.

An **Array Mix** is used to establish vegetation within the solar arrays, as shown in Figure 6. This seed mix will consist of short-statured (less than 24 inches) grasses, sedges, and forbs adapted to full sun and partial shade and may include flowering species that bloom in spring and summer. Outside of the arrays and to the fence line, a **Perimeter Mix** is used (see Figure 6). This seed mix contains greater plant diversity and provides increased benefits to pollinators. A diverse mix of forbs and grasses in the perimeter will provide natural screening of the array and could include flowering species across the spring, summer, and fall. A **Wet Mix** is used in moist soil conditions and selected species will tolerate damp soil environments (see Figure 6). This seed mix will consist of medium length grasses, sedges, and forbs that are flowering and adapted to full sun and partial shade.

Specific species were selected that align with local climate and particular soil conditions found throughout the Site, as identified in Attachment C, and on the seeding plan shown on Figure 6. The seed mixes were tailored to the regional soil conditions, each incorporating a unique selection of low-growing, low-maintenance prairie grasses and forbs adapted to the Project region. The genetic source origin of all native seed must be local, preferably sourced within a 150-mile radius of the Site. Plant species should be native to Martin County (BWSR, 2019), though considerations of range shifts due to climate change may necessitate adjustments to this guidance. Species shall be true to their scientific name as specified in Attachment C. Seed tags or nursery confirmation of the order must be provided to Lake Charlotte prior to installation. Any species eliminations, substitutions, or source origin exceptions must be approved by Lake Charlotte prior to installation. If necessary, seeds shall be properly stratified and/or scarified to break seed dormancy. If applicable, all legumes shall be inoculated with proper rhizobia at the appropriate time prior to planting.

The Array Native Seed Mix includes grasses, sedges, and forbs that are low growing, will not impact on the operation of the solar arrays, and are adaptable to full sun and partial shade. In addition, the Array Native Seed Mix offers a diverse variety of forage species suitable for sheep grazing. Outside of the arrays, a Perimeter Native Pollinator Seed Mix will be used. The Perimeter Native Pollinator Seed Mix is more diverse and includes grasses, sedges, and forb species of greater height which provide increased benefits for high quality prairie and pollinator habitat. To ensure the Perimeter Native Pollinator Seed Mix does not impact operations, it will be planted 12 feet from the solar arrays. In addition, the Perimeter Native Pollinator Seed Mix offers a diverse variety of forage species suitable for sheep grazing. Seeding of temporary and permanent sediment basins, as well as contractor laydown yards or other disturbed areas if included in final Contractor design, may require additional seed mixes suitable to those applications to ensure appropriate vegetation coverage and viability.

4.5 Seed Mix Substitutions

Procurement of seeds can be difficult to obtain in quantities necessary for large solar sites. Sourcing of proposed seed mixes should be done as soon as practicable. Substitutions to seed mixes will be completed by a qualified professional with sufficient botanical experience in identifying native plants, native plant communities, invasive species, and non-native species typical of Minnesota. Any substitution will be approved by Lake Charlotte prior to implementation, and substitutions will have no effect on the short- and long-term goals of this VMP.

For consistency in management across the Site, it is desired that the uniform seed mix recommended in the VMP be used. However, should sourcing issues arise, Lake Charlotte has developed alternative species to use should procurement be problematic. Seed mix substitutions are listed beneath each seed mix shown in Attachment C.

4.6 Seed Installation

Native seeds require special considerations related to planting depth and application method. Many native grasses and larger-seeded forbs require a shallow planting depth of 0.125 inch to a maximum depth of 0.25 inch. For small seeds, 0.125 inch is the maximum depth and surface sowing is the ideal method. Equipment may require modification so the small seed is not drilled at all, but dropped on the surface, as some seeds planted too deep may never be able to emerge. Depending on site conditions and timing of seeding, a variety of specialized seeding methods will be considered on a site-by-site basis; the Contractor shall evaluate the site and determine which

technique will produce the best results. Seeding options include drill, Brillion, Trillion, and broadcast seeding. Equipment capable of handling seeds of varying sizes is required. Drill seeding typically produces higher observed plant density, so broadcast seeding might require an increased seeding rate or overseeding during the establishment period to achieve performance standards. Seed installed into a previous cover crop or other vegetation must be installed with a seed drill. Prior to installation, seed shall be divided into two equal parts. The first half shall be installed in one pass, and the second half installed in a second pass (perpendicular to the first pass, where possible). In areas where broadcast seeding is employed, raking, harrowing, or culti-packing of seeded areas shall be used to ensure good seed-to-soil contact. After seeding, an application of mulch will be required to prevent erosion and promote seed germination.

If a cover crop has been installed at any time during the calendar year, native seed mixes will be installed the same year with a late fall dormant seeding, unless Lake Charlotte gives permission to the Contractor for a spring seeding. Prior to seeding into a cover crop, the Contractor shall evaluate the planting area and determine if any preparation is required prior to installation. Mowing may be required if the cover crop is too dense/robust. Soil Amendments

A preliminary desktop evaluation of the soil substrates within the Site determined it was unlikely that lime or fertilized implementation will be required to adequately restore soils and achieve vegetation goals.

The Contractor will conduct soil sampling to confirm soil profiles and determine if soil amendments are warranted.

4.7 Wet Weather Considerations

During seed installation, certain activities may be suspended in saturated soil conditions. Rainfall between 0.25 and 0.5 inch could have the potential to cause soil rutting. If rutting occurs, the Contractor will cease work in rutting-prone areas until site conditions improve. Weather forecasts will be monitored daily to help determine if the above rainfall amount is anticipated during seed or solar panel installation. Construction site managers will ultimately decide if wet weather shutdown is necessary. Incidental damage, such as tire ruts, should be repaired in accordance with the General Permit.

4.8 Pesticide Drift

During the Establishment Phase, Lake Charlotte will contact each owner of land surrounding the Site to inform them of the native plants planted pursuant to this VMP, the likely use of the vegetation by pollinators, and the need to avoid and minimize pesticide drift from land that is adjacent to the Land Control Area. The installation of access roads on the periphery of the entire Site will operate as a buffer from potential pesticide spraying adjacent to the Land Control Area.

4.9 Landscape Screening

The Project might involve landscape screening as a requirement through the regulatory process or landowner requests, which could include a combination of planted trees and shrubs to block the view from roads or nearby landowners. This Plan will be updated to include landscape screening species, installation, and maintenance if applicable

5.0 VEGETATION MANAGEMENT

5.1 Undesirable Species

Following permanent seeding, a variety of undesired species may germinate in the Site as native species are establishing. Lake Charlotte will manage undesirable species defined as follows:

1. Noxious Weeds according to Section 18.78 of the 2025 Minnesota Statutes
2. Invasive Species according to Part 6216.0250 of the Minnesota Administrative Rules
3. Project-designated “weeds” or undesired plants as further defined in the following sections

Tables 5.1.1-1, 5.1.1-2, and 5.1.1-3 provide lists of invasive and weed species of concern for the Site. Because each site is unique, an adaptive management approach to managing invasive and weedy populations will be used.

Site management will be conducted, as needed, to reduce the spread of invasive and weedy species, improve establishment and success of permanent seed mixes, and minimize vegetation interference with solar infrastructure. This may include cleaning and inspecting equipment prior to use at the Site.

Invasive and weed plant populations must be effectively managed during the Establishment Phase to ensure that the desired species are given the opportunity to establish. Management activities in the first three years strongly determine the success of planting and are referred to as the Establishment Phase, while Long-Term Maintenance Phase refers to management activities occurring after the first three years. Sections 5.2, 5.3 and 5.4 describe the management activities that will be implemented during these three phases, respectively.

5.1.1 Prescribed Treatment for Common Invasive Species and Weeds

This VMP describes common techniques to manage a variety of invasive plants and common weeds growing in Southwest Minnesota and Martin County, although actual techniques required are dependent on Project conditions. During each site visit, the site will be photo-documented and general notes collected regarding site conditions, species present, and areas of bare soil. Management techniques for five categories of weeds are described in the following sections.

5.1.1.1 Annual Weeds

Annual weeds include all unwanted species that grow for a single year, set seeds, and die. A list of problematic and common annual weeds that may be encountered on the site are shown in Table 5.1.1-1 below.

TABLE 5.1.1-1

Problematic Annual Cropland Weeds [a]

Species	Growth Form
Common cocklebur (*Xanthium strumarium*)	Annual Forb
Common lamb’s-quarters (*Chenopodium album*)	Annual Forb

TABLE 5.1.1-1

Problematic Annual Cropland Weeds [a]

Species	Growth Form
Common ragweed (*Ambrosia artemisiifolia*)	Annual Forb
Common sunflower (*Helianthus annuus*)	Annual Forb
Eastern black nightshade (*Solanum ptychanthum*)	Annual Forb
Field pennycress (*Thlaspi arvense*)	Annual Forb
Giant ragweed (*Ambrosia trifida*)	Annual Forb
Green foxtail (*Setaria viridis*)	Annual Grass
Horseweed (*Conyza canadensis*)	Annual Forb
Kochia (*Bassia scoparia*)	Annual Forb
Large barnyard grass (*Echinochloa crus-galli*)	Annual Grass
Redroot pigweed (*Amaranthus retroflexus*)	Annual Forb
Shepherd's purse (*Capsella bursa-pastoris*)	Annual Forb
Velvetleaf (*Abutilon theophrasti*)	Annual Forb
Woolly cupgrass (*Eriochloa villosa*)	Annual Grass
Yellow foxtail (*Setaria pumila*)	Annual Grass

[a] University of Minnesota Extension (n.d.b)

The goal of treating annual weeds is to prevent seed production. Beginning in spring, inspections will take place to evaluate the need for treating annual weeds (see Section 6.0 for discussion of monitoring protocols). It is recommended sites be mowed as described in Section 5.2.1 to prevent annual weeds from flowering and setting seed.

5.1.1.2 Perennial Weeds

Perennial weeds include all unwanted species that persist for two or more years after germination. Many of these weeds greatly diminish during the Establishment Phase with proper maintenance, but several require special attention when establishing native vegetation due to their highly competitive behavior. A list of common Minnesota perennial weeds that colonize and compete with native vegetation is provided in Table 5.1.1-2 below.

TABLE 5.1.1-2*

Problematic Perennial Cropland Weeds [a]

Species	Growth Form
Blackseed plantain (*Plantago rugelii*)	Perennial Forb
Common yarrow (*Achillea millefolium*)	Perennial Forb
Curly dock (*Rumex crispus*)	Perennial Forb
Dandelion (*Taraxacum officinale*)	Perennial Forb
Field bindweed (*Convolvulus arvensis*)	Perennial Forb
Ground ivy (*Glechoma hederacea*)	Perennial Forb
Horsenettle (*Solanum carolinense*)	Perennial Forb
Perennial sow thistle (*Sonchus arvensis*)	Perennial Forb
Quackgrass (*Agropyron repens*)	Perennial Grass
White clover (*Trifolium repens*)	Perennial Forb
Yellow nutsedge (*Cyperus esculentus*)	Perennial Sedge
Yellow wood sorrel (*Oxalis stricta*)	Perennial Forb
Yellow rocket (*Barbarea vulgaris*)	Perennial Forb

TABLE 5.1.1-2* **Problematic Perennial Cropland Weeds** [a]	
Species	Growth Form

[a] University of Minnesota Extension (n.d.b), the Minnesota Department of Agriculture (n.d),

Mowing is important to prevent seed production, but herbicide is generally required to prevent the spread of perennial weeds. Perennial grasses should be treated by spot-spraying or boom spraying, as warranted, with glyphosate or an appropriate grass-selective herbicide. Perennial broadleaf weeds should be treated by spot-spraying or boom spraying, as warranted, with glyphosate, triclopyr, clopyralid, or comparably effective herbicides. All herbicides will be applied by a licensed applicator, following instructions and prohibitions provided by the herbicide label.

5.1.1.3 Problematic Native Plants

Native species present in the soil seed bank or entering the Site from neighboring properties may have the potential to interfere with the functioning of the solar panels or ecological goals. Knotweed colonies can grow in dense clusters that crowd out any native species. Giant ragweed (*Ambrosia trifida*) grows tall enough to shade the panels. Several native vines have the potential to overgrow installations, including wild grape (*Vitis riparia*), wild cucumber (*Echinocystis lobata*), and Virginia creeper (*Parthenocissus* spp.). Giant ragweed and Phragmites or any other native species shading the arrays should be controlled by mowing. If growing under or near the solar panels, wild cucumber and bur cucumber will be pulled and removed manually, but woody vines such as wild grape and Virginia creeper will be cut to within one inch of the ground and the stump treated with glyphosate, triclopyr, or a comparable herbicide by a licensed applicator (BWSR. 2022) following instructions provided on the herbicide label. Other native plants with weedy tendencies will be controlled with the same methods as non-native weeds and invasive plants.

5.1.1.4 Woody Species

Woody species can shade or otherwise interfere with the operation of solar panels. Native tree seedlings of concern are box elder (*Acer negundo)*, sugar maple (*Acer saccharum*), and green ash (*Fraxinus pennsylvanica*). During the Establishment Phase, all woody plants require removal. This can be accomplished by mowing, herbicide application, or a combination of both methods. All woody plants over 0.5 inch in diameter at breast heigh should be cut to within one inch of the ground and the stump treated with triclopyr or a comparable herbicide by a licensed applicator and following instructions provided by the herbicide label. Cut brush will be removed from the Site.

5.1.1.5 State-Listed Noxious Weeds

Each state maintains a list of prohibited noxious plants that must be eradicated and controlled. All state-listed species should be treated by manual removal, mowing, herbicide application, or a combination of these methods, with the intention of preventing the weeds from setting seed. If using herbicide, a licensed applicator with knowledge of the herbicide treatments should apply herbicide at appropriately timed windows depending on target species. Table 5.1.1-3 below provides an abbreviated list of prohibited noxious plants in Minnesota.

TABLE 5.1.1-3

Abbreviated List of Minnesota Prohibited/Restricted Noxious Weeds and Invasive Plants

Species	Growth Form	Regulatory Category [a]
Amur maple (*Acer ginnala*)	Tree	SR
Bell's honeysuckle (*Lonicera X bella*)	Shrub	RN
Black locust (*Robinia pseudoacacia*)	Tree	RN
Canada thistle (*Cirsium arvense*)	Perennial Forb	PN
Common barberry (*Berberis vulgaris*)	Shrub	PN
Common or European buckthorn (*Rhamnus cathartica*)	Shrub/Tree	RN
Common reed – non-native subspecies (*Phragmites australis* subsp. *australis*)	Grass	PN, PPI
Common tansy (*Tanacetum vulgare*)	Perennial Forb	PN
Crown vetch (*Securigera varia*)	Perennial Forb	RN
Garlic mustard (*Alliaria petiolata*)	Biennial Forb	RN
Glossy buckthorn (*Frangula alnus*)	Shrub	RN
Japanese barberry (*Berberis thunbergii*)	Shrub	RN
Leafy spurge (*Euphorbia esula*)	Perennial Forb	PN
Morrow's honeysuckle (*Lonicera morrowii*)	Shrub	RN
Norway maple (*Acer platanoides*)	Tree	SR
Plumeless thistle (*Carduus acanthoides*)	Biennial Forb	PN
Poison hemlock (*Conium maculatum*)	Perennial Forb	PN
Purple loosestrife (*Lythrum salicaria*)	Perennial Forb	PN, PI
Siberian peashrub (Caragana arborescens)	Shrub	RN
Spotted knapweed (*Centaurea stoebe*)	Biennial Forb	PN
Tatarian honeysuckle (*Lonicera tatarica*)	Shrub	RN
Wild carrot/Queen Anne's Lace (*Daucus carota*)	Biennial Forb	RN
Wild parsnip (*Pastinaca sativa*)	Biennial Forb	PN
Winged burning bush (*Euonymus alatus*)	Shrub	RN

[a] SR = Minnesota Department of Agriculture (MDA) Specially Regulated Plant; RN = MDA Restricted Noxious Weed; PN = MDA Prohibited Noxious Weed; PPI = Minnesota Department of Natural Resources (MDNR) Proposed Prohibited Invasive Species; PI = MDNR Prohibited Invasive Species

5.2 Establishment Phase

Within the Establishment Phase, the first three years of vegetation management will consist of a concerted effort to remove any undesired species, while helping to establish planted seeds. Native perennial plantings will require several years to establish and will involve frequent site management to limit undesirable species, which could impact the growth of planted native seeds. Site management will focus on achieving the required Site goals and performance standards. An adaptive management approach will be used to respond to construction site conditions, challenges, and successes over time. As time progresses, the temporary cover crop will begin to subside, and the native species will start to germinate gradually.

Establishment Years one to five will require the most maintenance and monitoring to control any undesired species. Management activities in the first three years strongly determine the success of planting. Figure 7 portrays the Site conditions as the vegetation transitions from the Establishment Phase into the Long-Term Maintenance Phase.

Once the native seeds are fully established, the Site will require less yearly maintenance. Recommendations for Establishment Years one to five are outlined below.

5.2.1 General Tasks for Managing Vegetation

5.2.1.1 Establishment Year 1

Primary Focus: Weed suppression, soil stabilization, and early native species growth.

The first year of establishment is focused on consistent invasive plant control on a site-wide basis. Mowing the grassland areas during the first year should prevent invasive plants from adding new seeds to the soil and begin to exhaust the soil seed bank (a process that often requires several years to complete). From June 1 of the first Establishment Year, site-wide mowing to a height of 6 to 9 inches shall occur whenever vegetation reaches a height of 18 to 24 inches. The landscaped/screening area shall be spot sprayed during the Establishment Phase to control invasive plants. Attempting to mow between the landscaping plants could lead to unanticipated damages to the new plants. Mowing in wet areas will also be limited to those periods of time when the wet areas are not susceptible to rutting or compaction (i.e. frozen or dry conditions). Spot-spraying, use of a swing arm, brush saws, weed whips, or similar equipment will be used in wet areas as necessary to prevent soil damage when the soils are wet. During each mowing event, a fire break approximately 10 feet wide will be maintained around the BESS fenced area, with mowing to a short stubble height of less than 2 inches.

Monthly evaluations of the plantings shall be conducted by a botanist employed by the Contractor, during the growing season (May to September) to determine the appropriate treatment techniques to use and the timing of those treatments based on the presence and development stage of both invasive plants and the native plantings. Invasive species should be treated prior to such plants flowering or seeding, with the goal of preventing seed set by noxious and invasive species.

Repeated mowing could produce a buildup of organic thatch, which discourages the development and persistence of diverse native vegetation. To help prevent thatch buildup onsite, mowing shall be conducted with a flail-type mower to mulch the cut vegetation, or the Site shall be hayed so that cut vegetation is removed. A swing arm specifically designed for mowing under solar panels is recommended for cutting beneath panels, but spot-mowing with brush saws, weed whips, and similar equipment is also permitted. It may be possible to coordinate with Lake Charlotte to adjust the orientation of the panels to increase the ease of mowing, but the Contractor should not depend on this coordination to complete its work. Any other techniques must be approved by Lake Charlotte prior to the start of work. Mowing equipment shall be cleaned prior to use onsite to prevent the introduction and spread of invasive and non-native species. This mowing regime will prevent annual and perennial weeds from flowering and setting seed, prevent weeds from shading out the solar panels, and help control woody plant growth onsite. Additionally, noxious and perennial weeds shall be treated by spot-herbicide treatment, as described below, to prevent roots from resprouting.

5.2.1.2 Establishment Year 2

Primary Focus: Weed suppression, soil stabilization, and early native species growth.

The second year of establishment continues invasive plant control but generally employs more targeted techniques. Site-wide mowing to a height of 6 to 9 inches shall occur when vegetation height reaches 18 to 24 inches. During each mowing event, a fire break approximately 10 feet wide will be maintained around the BESS fenced area, with mowing to a short stubble height of less than 2 inches.

Spot-mowing will be employed to treat specific problem areas as needed. Noxious and perennial weeds shall be treated with spot-herbicide during the growing season, typically in late May/early June and late July/early August, with the focus on preventing seed set and achieving the required performance standards, described in Section 5.2.2.

The landscaped/screening area shall be spot sprayed during the Establishment Phase to control invasive plants. Attempting to mow between the landscaping plants will likely be difficult and may lead to unanticipated damages to the new plants. Mowing in wet areas will also be limited to those periods of time when the areas are not susceptible to rutting or compaction. Spot-spraying or use of brush saws, weed whips, or similar equipment may be employed in wet areas as necessary to prevent soil damage when the soils are wet.

Monthly evaluations of the plantings shall be conducted by a qualified botanist during the growing season (May to September) to determine the appropriate treatment techniques to use and the timing of those treatments based on the presence and development stage of both invasive plants and the native plantings. Invasive species will be treated prior to such plants flowering or seeding, with the goal of preventing seed set by noxious and invasive species.

5.2.1.3 Establishment Years 3-5

Primary Focus: Native species dominance and reduced mowing frequency.

In the third, fourth, and fifth years of the Establishment Phase, invasive plant control should consist of spot-herbicide treatment to control the remaining small patches of persistent weeds. Efforts will be focused on achieving the required performance standards (refer to Section 6.2-1).

Site-wide mowing to a height of 6 to 9 inches shall occur when vegetation height reaches 18 to 24 inches. Spot-mowing should be employed as needed to prevent vegetation interference with energy generation and infrastructure. Additional onsite treatment with spot -mowing or hand weeding may be employed at the discretion of the Contractor. During each mowing event, a fire break approximately 10 feet wide will be maintained around the BESS fenced area, with mowing to a short stubble height of less than 2 inches.

5.2.2 Herbicide Specifications

All herbicide treatments shall be restricted to those pesticides and methods of application approved by the Minnesota Department of Agriculture, MDNR, and USEPA. Spraying should be conducted by certified applicators holding all necessary permits and licenses. All herbicides shall be applied in accordance with the applicable regulations and the label requirements and in a safe and cautious manner to avoid damaging adjacent properties. Herbicide shall be applied selectively where applicable to avoid damaging existing native vegetation.

Approved pre-emergent herbicides include indaziflam (trade name Esplanade) and aminopyralid/metsulfuron-methyl (trade name Opensight) or equivalent. Additionally, pre-emergent formulations are recommended to include an adjuvant such as trade name Grounded or equivalent. Approved foliar herbicides include glyphosate (trade name Aquaneat), triclopyr (trade name Garlon), and aminopyralid (trade name Milestone) or equivalent. The Contractor shall submit a list of all herbicides to be used on the project to Lake Charlotte for written approval prior to the start of work.

Pre-emergent herbicides are recommended to be applied in the spring once the temperature is above 55 degrees Fahrenheit. Foliar herbicides shall be applied during the growing season as a control measure to prevent noxious weeds and invasive species from flowering or setting seed. The Contractor shall have knowledge of the phenology of species to treat on site to conduct herbicide treatments at the appropriate time and shall submit a schedule of planned visits each year prior to May 1.

Each landowner will be contacted at least 14 days prior to any application of herbicide on their property. Apiaries known by Lake Charlotte Lake to be present within three miles of the Project will be notified of any herbicide spraying at least 14 days prior to such application. The herbicide applicator will keep documentation of location and timing of herbicide use, weather conditions on site during application, type of herbicide used, volume of herbicide used, number of acres treated, and species of plants treated, and will submit a copy of all herbicide records to Lake Charlotte to be included in an annual report.

5.2.3 Reseeding Bare Soil

Areas of bare soil are detrimental to successful establishment of native vegetation. Bare soil provides opportunities for the common invasive and weed species described above to colonize and spread. Bare soil is also likely to contribute to soil loss by erosion. Site performance standards and goals may indicate reseeding is required in these areas using the seed mix previously installed and following the timing instructions laid out in Section 4.0. If bare soil is identified during monitoring such areas will be reseeded according to Section 3 and managed according to Section 4.

5.3 Transition Phase

Primary Focus: Native species dominance and reduced mowing frequency.

After the Establishment Phase of vegetation management, yearly management is required to control the spread of invasive species and combat the establishment of undesirable and invading trees and shrubs. Two trips during the growing season will occur for weed whipping, spot-mowing, or spot herbicide treatment to maintain vegetation quality and achieve the Site goals and performance standards. During each mowing event, a fire break approximately 10 feet wide will be maintained around the BESS fenced area, with mowing to a short stubble height of less than 2 inches.

5.4 Long-term Maintenance Phase (Years 6+)

Primary Focus: Self-sustaining vegetation with minimal intervention.

The Long-Term Maintenance Phase follows the end of the Transition Phase of vegetation management. This phase includes yearly management to promote and maintain the desired vegetation community, control the reestablishment, and spread of invasive species, combat the establishment of undesirable and invading trees and shrubs, and reduce biomass/fuel load onsite. The primary tools for this management are weed whipping, spot-mowing, and spot-herbicide treatment, which may be warranted thereafter to maintain vegetation quality and achieve the Project goals. It's likely that these activities could occur every other year depending on soil moisture and growth of vegetation. During each mowing event, a fire break approximately 10 feet wide will be maintained around the BESS fenced area, with mowing to a short stubble height of less than 2 inches.

5.5 Haying

Lake Charlotte may elect to use haying as a long-term management technique in a portion of the Project that is not otherwise occupied by the solar array. These areas are primarily located around the periphery of the facility (within the fence) and in areas that were used as laydown areas during construction. Annual haying to a height of 6 to 9 inches shall occur each September prior to prairie plants going dormant to maximize forage value of the hay crop.

5.6 Grazing

Grazing can be an effective vegetation management strategy, offering an eco-friendly alternative to mowing or herbicides to control plant growth around solar panels. Grazing animals naturally recycle nutrients back into the soil, which can improve soil health, reduce erosion, and support a more diverse ecosystem. Grazing can also restrict woody vegetation and non-native species encroachment into grasslands, prevent excessive litter accumulation, improve forage production, and accelerate decomposition and nutrient cycling. Managed grazing also supports pollinator -friendly habitats by maintaining a variety of plant species that can thrive under periodic grazing. Additionally, grazing programs can support local farmers by providing a seasonal grazing area. Careful planning is essential to ensure grazing is done at appropriate times and intensities to prevent overgrazing and maintain plant cover, ultimately contributing to both vegetation management goals and sustainability objectives for the solar project.

Lake Charlotte may decide to use grazing with sheep as a long-term vegetation management technique in portions of the Project occupied by the solar array or those areas surrounding the arrays. Grazing using livestock i.e. cattle is a developing management approach; therefore, the instructions in this VMP should be considered a guide, and actual practices must adapt year-to-year to the specific vegetation conditions at the Project Site. This VMP describes the grazing methods to be used on a small unit of the overall portion of the Project occupied by the array. These specifications can be scaled appropriately to accommodate grazing in larger or smaller portions of the array depending on the availability of sheep and appropriate partners to conduct the grazing operations. Any area that is not grazed can be managed using mowing or haying management techniques as outlined above. Should grazing be selected as a management technique for some or all of the Project Site, the following methodologies will be followed:

- Grazing should not be started until after the start of the third growing season after vegetation installation.
- Grazing should only be used if the Project is able to identify and form a partnership with a local sheep farmer who is willing and able to use a portion of the Site for grazing in accordance with this VMP. The chosen partner must be able to comply with Site management processes outlined in this VMP and Site security requirements.
- The partner must have sufficient insurance to cover any damages caused during grazing of the Site.
- The seed mix has been formulated to be used for grazing and to also function well if grazing is not used.

5.6.1 Site Setup for Grazing

If an appropriate partner is identified to provide grazing, portions of the Site will be managed with rotational grazing, wherein animals are moved periodically among the four paddocks within each grazing unit, with the aim of maintaining a vegetation height of 10 to 12 inches across the portions of the Site that are grazed. The area of the Site to be grazed will be divided into grazing units of approximately 16 acres each in preparation for grazing, although grazing unit size may change with input from the grazing partner. The number of grazing units used in any given year will be determined at the beginning of each growing season based on the number of acres to be grazed and the number of sheep available for grazing. For best outcomes for pollinator species, it is recommended that no more than 50 percent of the available forage be removed by grazers. The preferred method for dividing the Site is poly-wire or net electric fencing with plastic step-in poles; the grazing operator shall consult with the Lake Charlotte before other options are installed. Sensitive areas will also be fenced off to avoid inadvertent disturbance. The electric fencing shall be grounded independently of the Project infrastructure, with the grounding stakes at least 66 feet from the Project's grounding systems. The grazing operator shall consult Gopher State One Call before siting the grounding stakes and take underground utilities and travel corridors into consideration when placing the grounding stakes. The energizing unit for the electric fence must be independent of the solar facility infrastructure. The energizer can run on 110 volt electrical current or be charged from a battery. The grazing operator shall be responsible for any damage to the solar facility infrastructure due to improper setup or maintenance of the electric fence. Fencing for sheep will not be greater than 5 feet in height, which should not significantly impact wildlife movement.

The grazing rotation in each 16-acre grazing unit will be managed by dividing the unit into four, four-acre paddocks (e.g., Unit 1, Paddocks A-D), which will be grazed over the course of one month. For the first week of the month, the sheep in each unit will graze Paddock A. For the second week, the sheep will graze Paddock B, and so on. This pattern will result in each paddock being grazed for one week and rested for three weeks each month. Grazing will continue for the entire growing season (approximately May 15 to September 15).

When grazing each unit, they will need to be provided with drinking water. The method of watering the flock will be left to the grazing operator, with approval from Lake Charlotte. A mobile watering trough, especially one that does not kill vegetation while it remains in place, is preferred. Moving the watering trough from paddock to paddock as the flock moves will reduce damage to the vegetation under the trough and prevent areas of dead vegetation from forming. Watering shall occur as near to the center of the paddock as possible; water is an attractant, and a trough set too far to a paddock side or corner can lead to uneven grazing of the paddock.

5.6.2 Stocking Rate and Management

The number of sheep in a grazing unit at any time is the stocking rate. The standard way to describe the stocking rate, or grazing pressure, is by animal unit month (AUM). One animal unit is 1,000 pounds of livestock, and one AUM is 1,000 pounds of livestock grazing for one month. AUM is usually calculated on a per acre basis, so the final unit for stocking rate is AUM/acre. If the livestock being used to graze are sheep, depending on the variety of sheep used, one animal unit is approximately six ewes. If grazing units are 16 acres each (as described previously), this would mean an initial stocking rate of about 50 sheep per unit. Each 16-acre grazing unit would start with 50 sheep grazing Paddock A for one week, then all 50 sheep will be moved to Paddock B for the second week, then Paddock C in the third week, then Paddock D in the fourth week, and

then back to Paddock A to start the rotation over again. Since the Site is anticipated to cover approximately 1,000 acres, grazing the entire Site would require approximately 62 grazing units and 3,125 sheep. The actual number of sheep used will depend on the amount of forage present and will be adjusted by the grazing partner throughout the growing season.

The grazing partner shall be responsible for monitoring the response of the vegetation to grazing. The management goal is to have an average vegetation height of 10 to 12 inches when the livestock are first moved into a paddock and to remove the livestock when the vegetation is an average of 6 to 8 inches. If grazing does not achieve the desired vegetation height and is shading the arrays, the Contractor shall immediately contact Lake Charlotte and be responsible for mowing the paddock to a uniform height of 4 to 6 inches. The Contractor shall determine with Lake Charlotte a change in stocking rate to improve the effect of grazing in the future. The grazing partner shall have access to additional livestock in case the stocking rate needs to be increased to achieve the vegetation management goal. Should the entire Site be found to have met the vegetation height and forage removal, the livestock will be relocated offsite until grazing management is once again necessary.

If maintenance by grazing is no longer feasible or desired, vegetation height can be managed by mowing as outlined in Section 5.2.1 of this VMP.

6.0 MONITORING

Monitoring methods include quantitative and qualitative measures to assess how well the Project goals and performance standards are being achieved.

- Quantitative techniques allow for comparisons of subsequent reporting to understand the progression of vegetation establishment over time. Vegetation is sampled using standardized techniques with fixed sample locations and photograph points and includes percent vegetation cover and estimated species richness.

- Qualitative monitoring consists of documentation of onsite vegetation through visual inspections.

Monitoring will evaluate seed mixes and associated planting areas for establishment including the number of species present and percent cover, presence of invasive species, and subsequent management activities needed, to include both species on site and early detection of new invasions. Three monitoring visits will generally occur in the spring, summer, and fall.

6.1 Monitoring Protocol

Vegetation monitoring shall occur three times per year during the Establishment Phase (Years 1 to 5) and annually thereafter over the lifetime of the Project. During the Establishment Phase, inspections shall occur three times in the growing season to accurately document the presence of installed native species: late May/early June, mid-July, and late August/early September. After the Establishment Phase has concluded, inspections shall occur once per year, in mid-July to record the continued presence of native species across the growing season.

The monitoring protocol shall include both microplots and a meander survey. Microplots provide accurate data for the Site but cover a small area. Vegetation can be patchy due to microtopography and other factors, so scattered microplots have the potential to miss species

assemblages or new invasive species populations. For this reason, a meander survey shall also be conducted to provide a broad assessment of vegetation across the Site.

Microplot surveys shall be conducted during each inspection in the Establishment Phase. During the Management Phase, surveys should be undertaken at a time when spring- and fall-blooming species can be identified, usually July; the Monitor should assess the best timing for microplot surveys based on the advancement of the growing season. 50 microplots of 1 meter by 1 meter each shall be distributed at locations that represent conditions across the Project Site. For instance, lowland and upland areas should be sampled in proportion to their acreage. Microplots will be first selected using available maps and air photographs, with the final location selected in the field on the day of sampling to represent the general area of the microplot. Before entering the field, the Monitor will provide the project with a map of the general locations of the 50 microplots. In each microplot all plant species present shall be recorded and assessed using a 1 to 10 scale (1 = ≤10%, 2 = >10% but ≤20%, etc.), based on the percent cover of the species in the microplot. The total percentage of vegetative cover and bare ground will also be recorded.

While traversing the Site from microplot to microplot, the Monitor will follow a meandering path, recording all plants species seen. Upon completing the meander survey, each plant species recorded will be assessed on a 1 to 4 scale (1 = ≤10%, 2 = >10% but ≤30%, 3 = >30% but ≤50%, 4 = >50%) based on the percent cover of the species across the entire Site along the meander path.

After each survey event, the percent cover of native and noxious plant species in microplots and along the meander survey, the total native and invasive vegetation cover and the total native species richness will be entered in an Excel spreadsheet or similar. Each survey event's data will be compared to past survey event data to detect positive, negative, or neutral trends. A positive trend would be decreasing cover by invasive plants and increasing cover by native plants from one survey event to the next.

Each monitoring visit shall also conduct a hazard assessment. While on Site and during the meander survey, the Monitor shall record the location of noxious weeds/invasive species, adventive trees/shrubs, large areas of bare soil, areas of significant erosion, and damage to the vegetative screening area. Any observed significant erosion or damage to the vegetative screening area should be reported to Lake Charlotte immediately. The remaining hazards will be compiled in an annual report (see Section 6.3). Hazard assessments should also be conducted by the Contractor any time they are on Site performing vegetation management. The Contractor hazard assessments should be submitted to the Monitor for review and inclusion in the annual report.

Monitoring activities will be conducted by individuals qualified biologist that are able identify a broad range of native and non-native plant species which occur in Minnesota.

6.2 Targets and Projected Outcomes

6.2.1 Native Vegetation Targets

A typical best practice for achieving soil stabilization and water quality on solar conversion sites is to include a minimum of 15 native species (graminoids and forbs) when using native vegetation (BWSR, 2019). Vegetation management should result in a diverse plant community dominated by native species and lack of noxious and prohibited species, as outlined in this VMP.

Construction stormwater permits, local requirements, and regulations may impose additional requirements on the final quality and performance of native plantings.

The following are typical goals for native revegetation and will be revised when targets for the Project are identified. Short-term goals are goals applicable to the post-construction Establishment Phase of the Project in Years 1 to 5. Long-term goals are defined as goals beyond Year 5, following implementation of the short-term goals.

Short-Term Goals:

- Comply with permit conditions for site revegetation, per the MPCA General Permit.
- After the first growing season, vegetate at least 70 percent of the Site, and ideally 80 percent of the Site.
- Establish sustainable, diverse, perennial grassland community, appropriate to conditions on 70 percent of the Site and comprised of 90 percent native vegetation by Year 5.
- Implement cover crops to effectively assist in establishment of native vegetation, if practicable.
- Manage invasive species and noxious weeds per Minn. Stat., Sections 18.75 to 18.78, and 18.86.
- By the end of the Establishment Phase (approximately 36 to 60 months after vegetation installation), at least 95 percent of the Site shall be vegetated, and at least 90 percent of the cover shall be comprised of native species. Six or more species of planted native graminoids and 12 or more species of planted native forbs shall be well-established across the Project.
- Install and establish vegetative screening as requested. The landscaping screening area should be established, with limited ongoing plant mortality, within one year of installation. At the end of the Establishment Phase, 80 percent of the installed shrubs and trees shall be present in the landscaping/screening area.

Long-Term Goals:

- Maintain 95 percent of the Site in a vegetated state, and at least 90 percent of the cover comprised of native species.
- Establish six or more species of planted native graminoids and 12 or more species of planted native forbs across the Site.
- Maintain a mature landscaped screen that minimizes views of the solar array from an adjacent target parcel over the life of the Project.
- Establish a Site that is suitable for haying and/or grazing during facility operations, if determined to be a viable management strategy following construction.

Accommodate vegetative management of the Site using traditional vegetative management methods for areas not managed by haying or grazing.

- Prioritize the implementation of all required vegetation management activities for safe and efficient operations support including woody species control, height control of herbaceous species, wet area management, and landscape/screening management.

6.2.2 Noxious Weeds and Problem Plants

All prohibited noxious weeds and other plants previously identified in Tables 5.1.1-1, 5.1.1-2, and 5.1.1-3 will be treated repeatedly with herbicide and/or mowed, where appropriate, at a frequency sufficient to prevent seed set and to remove target weeds over time. The following are typical targets for controlling weeds and problem plants:

- Each treatment will show evidence of at least 90 percent of the target vegetation having been affected by herbicide or removed.
- Two weeks after treatment, at least 95 percent of all plants treated with herbicide will be removed, dead, or dying within any 100 square foot area.
- All herbicides must be approved by the appropriate land management agency and applied by permitted applicators.
- Applications of herbicides must also consider wind drift, which may transfer herbicides to nontarget areas and buffers or setbacks from sensitive locations such as water resources or sensitive habitats.
- By the end of the Establishment Phase (approximately 36 months after vegetation installation), all prohibited noxious and other problem plants will not exceed 5 percent aerial cover within any 100 square foot area across the Site.

6.3 Reporting

An independent third-party inspector, qualified to conduct native plant inspections and assessments and retained by Lake Charlotte, shall prepare a report documenting the status of the established vegetation and hazards encountered during such year (i.e., a report every year for years 1 to 5 and a report for every year thereafter). The report shall include the results of inspection and monitoring activities during the prior year and shall report how the vegetation on the Project Site has achieved or is achieving the goals and objectives set forth in this VMP. The report shall be submitted to Lake Charlotte by February 1 of the following year in order to provide sufficient time to review the recommended actions for the upcoming growing season.

In addition to the above report content requirements, the reports shall also include descriptions of adaptive management actions to be completed in the upcoming year to meet management objectives and management challenges encountered during the reporting period. These recommended actions may include, but are not limited to, mowing, spot-mowing, targeted herbicide application, or overseeding bare soil.

6.4 Adaptive Management

Every year during years 1 to 5 and every year thereafter, a third-party independent monitor will be retained by the Project and produce a report summarizing the status of the vegetation established on site and identifying hazards encountered during the reporting period. This report will address any areas of noncompliance and plan targeted remediation efforts for the upcoming reporting period, including altering the timing or extent of mowing or herbicide application, adjusting the rate or formulation of herbicide applied, or conducting targeted overseeding of appropriate seed mixes. The report will also record the presence and location of any noxious or invasive weeds to be treated, which will both guide the Contractor and document changes in the vegetation establishment and management approach over time. This protocol will ensure that timely management activities reflect reporting from the previous monitoring observations.

7.0 REFERENCES

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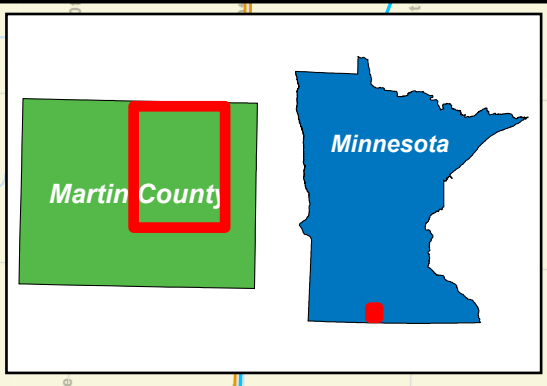
FIGURES



Rutland Substation

Figure1
Project Location

Lake Charlotte Solar and
BESS Projects
Martin County, MN

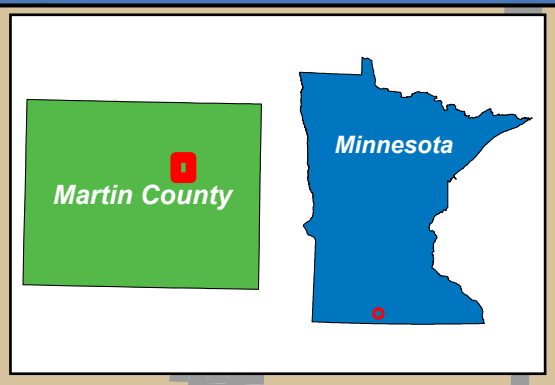
0 1 2 Miles

1:72,000

Imagery: USGS
Sources: National Grid Renewables, MN Geospatial Commons, MDNR, ESRI

Existing Substation
Land Control Area
City/Town
Township
County Boundary
NHD Named Stream
Railroad

Date: 3/18/2025



LAKE CHARLOTTE SOLAR

0 1,000 2,000 Feet

1:12,000

Sources: National Grid Renewables, MN Geospatial Commons, MDNR, ESRI, USGS NLCD Database

Figure 2
Land Cover/Land Use
Lake Charlotte Solar and BESS Projects
Martin County, MN

- Existing Substation
- Land Control Area
- Preliminary Development Area
- Agricultural Land
- Developed Land
- Emergent Herbaceous Wetlands
- Forested Land
- Grassland/ Herbaceous
- Open Water

Date: 3/18/2025

Rutland Substation

LAKE CHARLOTTE SOLAR

0 1,000 2,000 Feet

1:12,000

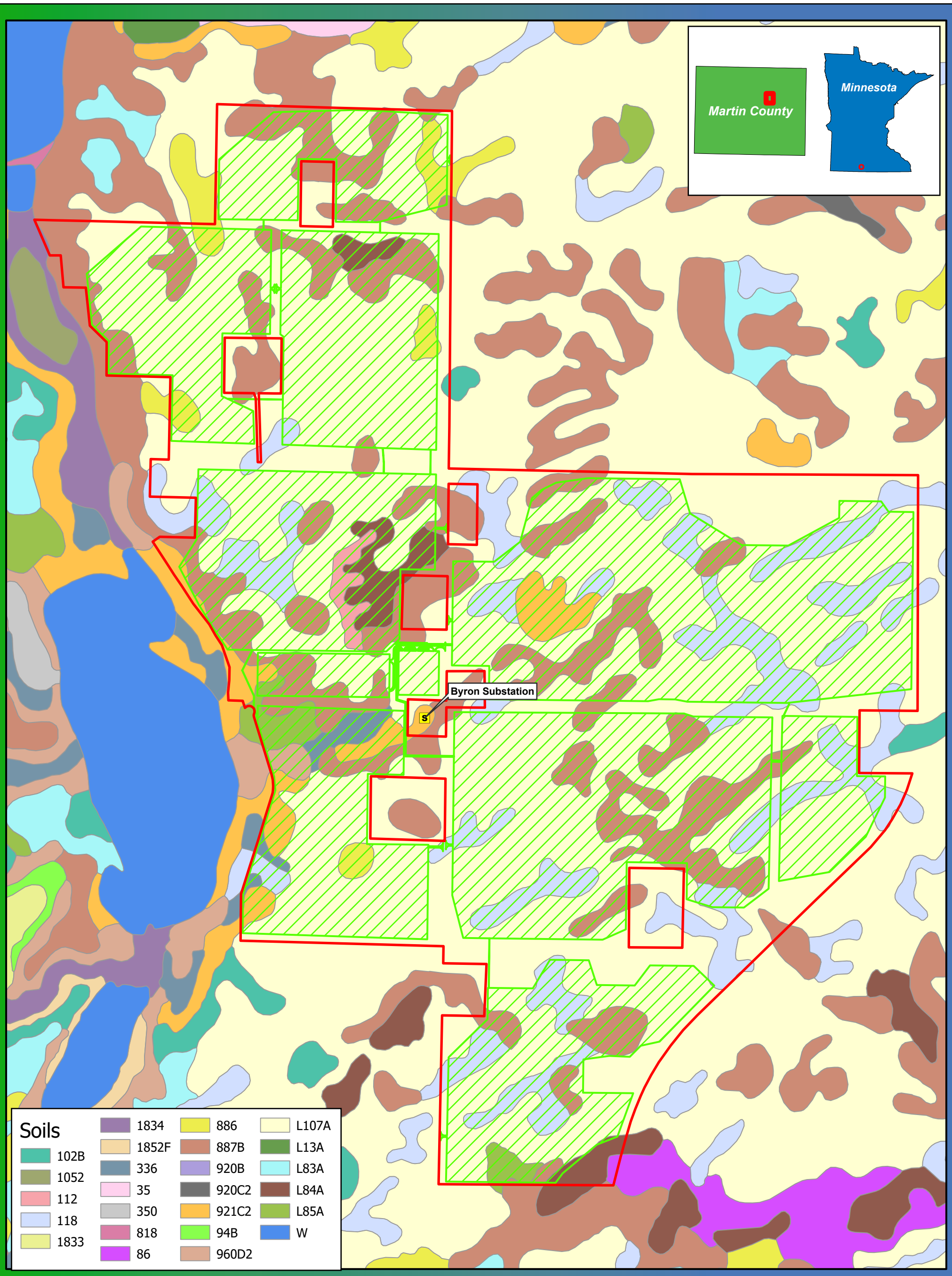
Sources: National Grid Renewables, MN Geospatial Commons, MDNR, ESRI, USGS

Figure 3
Topographic Map
Lake Charlotte Solar and BESS Projects
Martin County, MN

- Existing Substation
- Land Control Area
- Preliminary Development Area

Elevation (Ft)
- 1,093- 1,120
- 1,120 - 1,150
- 1,150 - 1,180
- 1,180 - 1,205

Date: 3/18/2025



LAKE CHARLOTTE SOLAR

0 1,000 2,000 Feet

1:12,000

Imagery Source: 2021 FSA
Sources: National Grid Renewables, MN Geospatial Commons, MDNR, ESRI, NRCS Web Soil Survey

Figure 4
NRCS Soils Map
Lake Charlotte Solar and BESS Projects
Martin County, MN

S Existing Substation

Land Control Area

Preliminary Development Area

Date: 3/18/2025

State Hwy 15

County Hwy 38

County Road 145

MAI-0702112286

County Ditch 72
M-055-076-012-010

MAI-0702223925

Rutland Substation

Unnamed Stream
M-055-076-012-010-000.5

County Hwy 34

Unnamed Stream
M-055-076-013-007

LAKE CHARLOTTE SOLAR

N

0 1,500 3,000 Feet

1:18,000

Imagery Source: 2021 FSA
Sources: National Grid Renewables, MN Geospatial Commons, MDNR, ESRI

Figure 5
Surface Waters
Lake Charlotte Solar and BESS Projects
Martin County, MN

- S Existing Substation
- Land Control Area
- Preliminary Development Area
- Watercourse (MDNR)
- PWI Watercourse
- PWI Waterbody
- Lake/Pond (MDNR)
- Delineated Wetland

NWI Wetland Type
- Freshwater Emergent Wetland
- Freshwater Forested Wetland
- Freshwater Pond
- Freshwater Shrub Wetland
- Freshwater Forested/ Shrub Wetland
- Lake
- Riverine

Date: 3/18/2025

175Th St
County Hwy 38
Martin Luther D
Bridgeman St
N Judson St
N James St
Harriet St
Von Holst St
Freund St
S Bridgeman St
Inness St
S James St
Park St
S Judson St
E Town Rd
170Th St
County Road 145
State Hwy 15
Rutland Substation
S
Charlotte Oak Dr
160Th St
210Th Ave
220Th Ave

LAKE CHARLOTTE SOLAR

0 1,000 2,000 Feet

1:12,000

Imagery Source: 2021 FSA
Sources: National Grid Renewables, MN Geospatial Commons, MDNR, ESRI

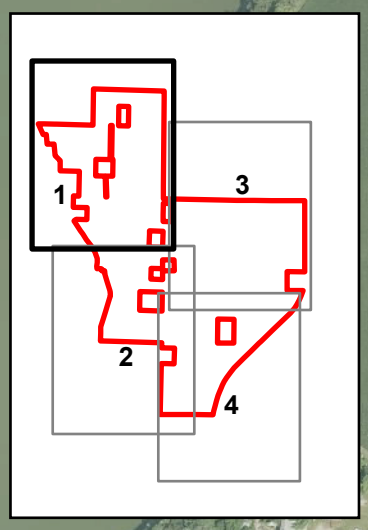
Figure 6
Seeding Map Overview
Lake Charlotte Solar and BESS Projects
Martin County, MN

- S Existing Substation
- Land Control Area
- Security Fence
- Fire Break
- Access Road

Seed Mix Type

- Array Native Seed Mix (720.9 acres)
- Perimeter Native Pollinator Mix (242.9 acres)
- Wet Mix (2.37 acres)

Date: 5/19/2025



210Th Ave

175Th St

170Th St

LAKE CHARLOTTE SOLAR

0 250 500 Feet

1:6,000

Imagery Source: 2021 FSA
Sources: National Grid Renewables, MN Geospatial Commons, MDNR, ESRI

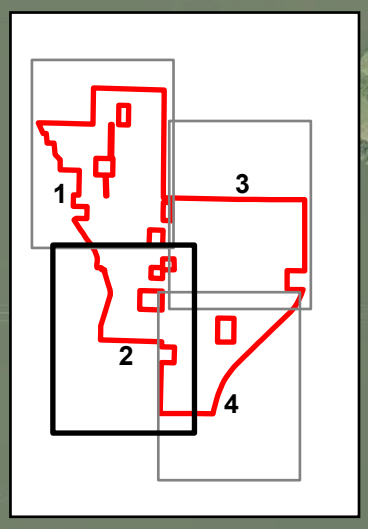
Figure 6
Seeding Map
Lake Charlotte Solar and BESS Projects
Martin County, MN

- Land Control Area
- Security Fence
- Access Road

Seed Mix Type

- Array Native Seed Mix (720.9 acres)
- Perimeter Native Pollinator Mix (242.9 acres)
- Wet Mix (2.37 acres)

Date: 5/19/2025



Rutland Substation

Charlotte Oak Dr

160Th St

210Th Ave

LAKE CHARLOTTE SOLAR

0 250 500 Feet

1:6,000

Imagery Source: 2021 FSA
Sources: National Grid Renewables, MN Geospatial Commons, MDNR, ESRI

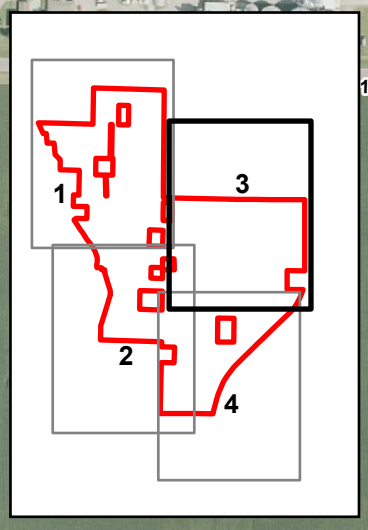
Figure 6
Seeding Map
Lake Charlotte Solar and BESS Projects
Martin County, MN

- Existing Substation
- Land Control Area
- Security Fence
- Fire Break
- Access Road

Seed Mix Type

- Array Native Seed Mix (720.9 acres)
- Perimeter Native Pollinator Mix (242.9 acres)
- Wet Mix (2.37 acres)

Date: 5/19/2025



175Th St
County Hwy 38
Martin Luther
Bridgeman St
N Judson St
N James St
Harper St
Von Holst St
Freund St
Inness St
S Bridgeman St
Judson St
S James St
Park St
E Town Rd
170Th St
County Road 145
State Hwy 15
220Th Ave

LAKE CHARLOTTE SOLAR

0 250 500 Feet

1:6,000

Imagery Source: 2021 FSA
Sources: National Grid Renewables, MN Geospatial Commons, MDNR, ESRI

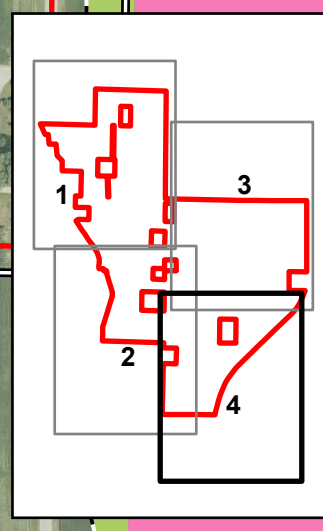
Figure 6
Seeding Map
Lake Charlotte Solar and BESS Projects
Martin County, MN

Land Control Area
Security Fence
Access Road

Seed Mix Type

Array Native Seed Mix (720.9 acres)
Perimeter Native Pollinator Mix (242.9 acres)
Wet Mix (2.37 acres)

Date: 5/19/2025



160Th St

State Hwy 15

210Th Ave

LAKE CHARLOTTE SOLAR

0 250 500 Feet

1:6,000

Imagery Source: 2021 FSA
Sources: National Grid Renewables, MN Geospatial Commons, MDNR, ESRI

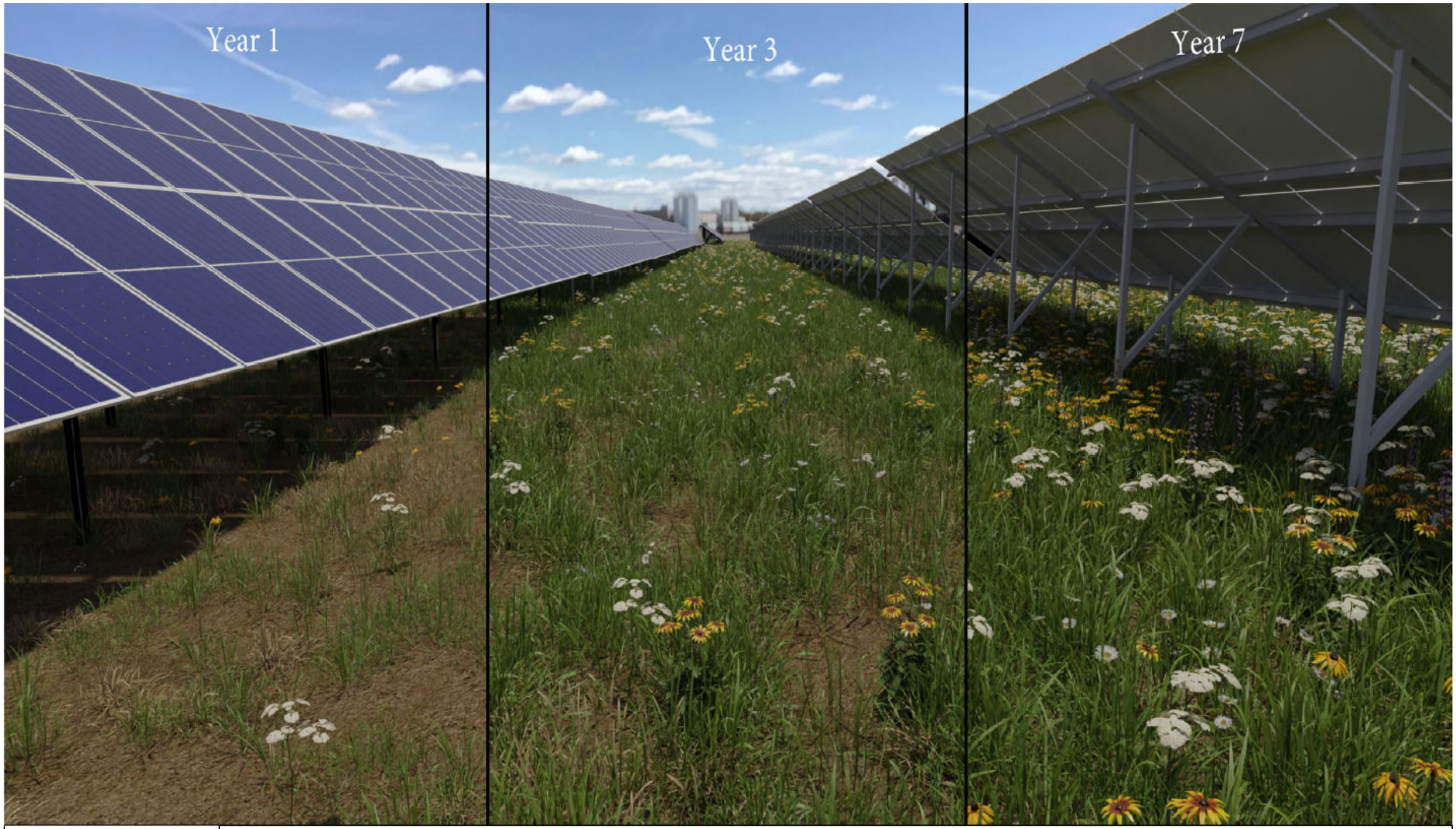
Figure 6
Seeding Map
Lake Charlotte Solar and BESS Projects
Martin County, MN

- Land Control Area
- Security Fence
- Access Road

Seed Mix Type

- Array Native Seed Mix (720.9 acres)
- Perimeter Native Pollinator Mix (242.9 acres)
- Wet Mix (2.37 acres)

Date: 5/19/2025



SUMMIT LAKE SOLAR

Figure 7
Transitional Vegetation Growth
Summit Lake Solar Project
Nobles County, MN

ATTACHMENT A

HABITAT FRIENDLY SOLAR SITE ASSESSMENT FORMS

Habitat Friendly Solar Site Assessment Form for Project Planning

For Solar Companies, Local Governments and Other Partners to Meet Habitat Friendly Solar Standards

Updated 12-22-23

Note: The use of state developed solar seed mixes over 70% of the plantable area of a site will result in automatically meeting the standard.

1) PLANNED PERCENT OF PLANTABLE AREAS WITHIN PROJCT FOOTPRINT DOMINATED BY NATIVE SPECIES COVER (forbs, grasses, sedges, rushes, ferns). PROJECTS MUST HAVE A GOAL OF AT LEAST 70% COVER OF NATIVE VEGETATION TO MEET HABITAT FRIENDLY SOLAR STANDARDS

☐	70-84%	+15 points	
☒	85% and above	+20 points	Total Points: 20

2) PERCENT OF PROPOSED SITE VEGETATION COVER TO BE DOMINATED BY FORBS (not grasses, sedges and rushes)

☐	10-19%	+5 points	
☒	20-29%	+10 points	
☐	30-39%	+15 points	
☐	40 and above	+15 points	Total Points: 10

Note: Projects may have "array" mixes and diverse border mixes; forb dominance should be averaged across the entire site. The dominance should be calculated from total numbers of forb seeds vs. grass seeds based on seeds per square foot (from all seed mixes to be planted).

3) PLANNED COVER DIVERSITY (# of species in seed mixes; numbers from upland and moist soil mixes can be combined

☐	10-19 species	+5 points	
☐	20-25 species	+10 points	
☒	26-39 species	+15 points	
☐	40 and above	+20	Total Points: 15

4) PLANNED SEASONS WITH AT LEAST THREE BLOOMING SPECIES (check all that apply)

☒	Spring (April-May)	+4 points	
☒	Summer (June-August)	+3 points	
☐	Fall (September-October)	+3 points	Total Points: 7

See BWSR pollinator toolbox about bloom season

5) SITE PLANNING

☒	Detailed establishment and management plan (see notes)	+20 points	
☒	Seed Mixes are composed of at least 40 seeds per square foot	+5 points	
☐	All seed genetic origin is within 200 miles of site (see notes)	+5 points	
☐	At least .5% milkweed cover within each seed mix	+5 points	
☒	Plant species with more than 3 flower colors in mixes (see notes)	+5 points	Total Points: 30

6) INSECTICIDE RISK

☐	Planned on-site insecticide use (excluding buildings/electrical boxes, etc.)	-30 points	
☒	Communication with local chemical applicators/neighbors about need to prevent drift from adjacent areas.	+10 points	Total Points: 10

GRAND TOTAL: 92

Gold Standard 85+ points
Meets Standard 70 points

Project Name: Lake Charlotte Solar [Array Native Seed Mix Option C]
Project County: Martin County
Project Size:
Evaluation Date: 03/03/2025

See notes related to the questions on the back side of this form

Notes:
Estimates of percent "cover" should be based on "absolute cover" (the percent of the ground surface that is covered by a vertical projection of foliage as viewed from above).

All project plans must include detailed vegetation establishment and management specifications to ensure the success of projects (see sample specifications on *BWSR's Habitat Friendly Solar Webpage*).
Seed mixes provided for projects need to show seeds per square foot for each species in the mix.

Question 1 - *Native plant species provide benefits to a wide range of pollinators and other wildlife species. The Minnesota DNR List should be used to determine if a species is native. Native species include wildflowers, graminoids (grasses, sedges rushes), shrubs and trees. The percent areal cover of native vs. non-native species should be estimated based on the seeds per square foot of all species to be used across all seed mixes. As non-native fescues tend to have a high seeding rate, but also small seeds with a lower germination success the number of fescue seeds per square foot in mixes can be decreased by half when calculating native species dominance of mixes. This should result in a more accurate representation of native dominance.*

Question 2 - *There is a focus on native forbs on this assessment form to maximize benefits to the approximately 500 species of native bees in Minnesota, honeybees and other pollinators. Forbs are (flowering plants that are not woody or graminoids such as grasses and sedges) and can include introduced clovers and other non-native species beneficial to pollinators. No noxious weeds or invasive plants can be included in the total.*

Question 3 - *Plant diversity adds to wildlife benefits, as well as the resiliency of projects. For this question, planned native and non-native species from all seed mixes can be combined for the total.*

Question 4 - *Having blooming species throughout the season helps support pollinator species. See BWSR's Pollinator Toolbox for a listing of bloom seasons for species.*

Question 5 - *To meet requirements for a long-term management plan projects must provide information about:*
-Timing of yearly inspections,
-A detailed native vegetation establishment plan with detailed instructions for contractors.
-A detailed maintenance schedule for the first three years of the project (establishment period) listing timing of establishment mowing/ trimming, spot herbicide application, prescribed grazing or other management actions.
-Proposed maintenance schedule for year four and beyond.
-List of weed species that may become problematic at the site and how they will be managed if needed.

All mixes being used for the project must include at least 40 seeds per square foot to receive points for the first category. Using seed with a genetic origin within 200 miles helps ensure that species will be adapted to site conditions and decrease the risk of introducing invasive species in seed mixes. Please refer to pages 7-8 of BWSR's Native Vegetation Establishment and Enhancement Guidlines for more information about appropriate seed sources. To obtain points for including milkweed in projects mixes must contain at least .5% milkweed seed based on seeds per square foot, or a combination of seed and containerized plugs could be used with a plan to cover .5% of the ground surface with milkweed. Flower colors can include blue, pink, purple, yellow, white, orange, red, green and brown. The Minnesota Wildflowers website allows for searching species based on flower color Minnesota Wildflowers Categorized by Color.

Question 6 - *It is important that seeds treated with insecticides are not used at project sites and that insecticides are not being sprayed at the site. To meet requirements for communication/registration with local landowners/applicators about the need to prevent drift from adjacent areas, information provided can be in the form of email communication or copies of letters. Communication must be provided to all landowners adjacent to the property including municipalities.*

Send completed forms, project plans, seed mixes (showing seeds per square foot for each species) and any communications with pesticide applicators to BWSR at Dan.Shaw@state.mn.us as well as any local government staff involved in reviewing the project.

Habitat Friendly Solar Site Assessment Form for Project Planning

For Solar Companies, Local Governments and Other Partners to Meet Habitat Friendly Solar Standards

Updated 12-22-23

Note: The use of state developed solar seed mixes over 70% of the plantable area of a site will result in automatically meeting the standard.

1) PLANNED PERCENT OF PLANTABLE AREAS WITHIN PROJCT FOOTPRINT DOMINATED BY NATIVE SPECIES COVER (forbs, grasses, sedges, rushes, ferns). PROJECTS MUST HAVE A GOAL OF AT LEAST 70% COVER OF NATIVE VEGETATION TO MEET HABITAT FRIENDLY SOLAR STANDARDS

☐	70-84%	+15 points	
☒	85% and above	+20 points	Total Points: 20

2) PERCENT OF PROPOSED SITE VEGETATION COVER TO BE DOMINATED BY FORBS (not grasses, sedges and rushes)

☒	10-19%	+5 points	
☐	20-29%	+10 points	
☐	30-39%	+15 points	
☐	40 and above	+15 points	Total Points: 5

Note: Projects may have "array" mixes and diverse border mixes; forb dominance should be averaged across the entire site. The dominance should be calculated from total numbers of forb seeds vs. grass seeds based on seeds per square foot (from all seed mixes to be planted).

3) PLANNED COVER DIVERSITY (# of species in seed mixes; numbers from upland and moist soil mixes can be combined

☐	10-19 species	+5 points	
☐	20-25 species	+10 points	
☐	26-39 species	+15 points	
☒	40 and above	+20	Total Points: 20

4) PLANNED SEASONS WITH AT LEAST THREE BLOOMING SPECIES (check all that apply)

☒	Spring (April-May)	+4 points	
☒	Summer (June-August)	+3 points	
☒	Fall (September-October)	+3 points	Total Points: 10

See BWSR pollinator toolbox about bloom season

5) SITE PLANNING

☒	Detailed establishment and management plan (see notes)	+20 points	
☒	Seed Mixes are composed of at least 40 seeds per square foot	+5 points	
☐	All seed genetic origin is within 200 miles of site (see notes)	+5 points	
☐	At least .5% milkweed cover within each seed mix	+5 points	
☒	Plant species with more than 3 flower colors in mixes (see notes)	+5 points	Total Points: 30

6) INSECTICIDE RISK

☐	Planned on-site insecticide use (excluding buildings/electrical boxes, etc.)	-30 points	
☒	Communication with local chemical applicators/neighbors about need to prevent drift from adjacent areas.	+10 points	Total Points: 10

GRAND TOTAL: 95

Gold Standard 85+ points
Meets Standard 70 points

Project Name: Lake Charlotte Solar [Perimeter Native Seed Mix Option C]
Project County: Martin County
Project Size:
Evaluation Date: 03/03/2025

See notes related to the questions on the back side of this form

Notes:
Estimates of percent "cover" should be based on "absolute cover" (the percent of the ground surface that is covered by a vertical projection of foliage as viewed from above).

All project plans must include detailed vegetation establishment and management specifications to ensure the success of projects (see sample specifications on *BWSR's Habitat Friendly Solar Webpage*).
Seed mixes provided for projects need to show seeds per square foot for each species in the mix.

Question 1 - *Native plant species provide benefits to a wide range of pollinators and other wildlife species. The Minnesota DNR List should be used to determine if a species is native. Native species include wildflowers, graminoids (grasses, sedges rushes), shrubs and trees. The percent areal cover of native vs. non-native species should be estimated based on the seeds per square foot of all species to be used across all seed mixes. As non-native fescues tend to have a high seeding rate, but also small seeds with a lower germination success the number of fescue seeds per square foot in mixes can be decreased by half when calculating native species dominance of mixes. This should result in a more accurate representation of native dominance.*

Question 2 - *There is a focus on native forbs on this assessment form to maximize benefits to the approximately 500 species of native bees in Minnesota, honeybees and other pollinators. Forbs are (flowering plants that are not woody or graminoids such as grasses and sedges) and can include introduced clovers and other non-native species beneficial to pollinators. No noxious weeds or invasive plants can be included in the total.*

Question 3 - *Plant diversity adds to wildlife benefits, as well as the resiliency of projects. For this question, planned native and non-native species from all seed mixes can be combined for the total.*

Question 4 - *Having blooming species throughout the season helps support pollinator species. See BWSR's Pollinator Toolbox for a listing of bloom seasons for species.*

Question 5 - *To meet requirements for a long-term management plan projects must provide information about:*
-Timing of yearly inspections,
-A detailed native vegetation establishment plan with detailed instructions for contractors.
-A detailed maintenance schedule for the first three years of the project (establishment period) listing timing of establishment mowing/ trimming, spot herbicide application, prescribed grazing or other management actions.
-Proposed maintenance schedule for year four and beyond.
-List of weed species that may become problematic at the site and how they will be managed if needed.

All mixes being used for the project must include at least 40 seeds per square foot to receive points for the first category. Using seed with a genetic origin within 200 miles helps ensure that species will be adapted to site conditions and decrease the risk of introducing invasive species in seed mixes. Please refer to pages 7-8 of BWSR's Native Vegetation Establishment and Enhancement Guidlines for more information about appropriate seed sources. To obtain points for including milkweed in projects mixes must contain at least .5% milkweed seed based on seeds per square foot, or a combination of seed and containerized plugs could be used with a plan to cover .5% of the ground surface with milkweed. Flower colors can include blue, pink, purple, yellow, white, orange, red, green and brown. The Minnesota Wildflowers website allows for searching species based on flower color Minnesota Wildflowers Categorized by Color.

Question 6 - *It is important that seeds treated with insecticides are not used at project sites and that insecticides are not being sprayed at the site. To meet requirements for communication/registration with local landowners/applicators about the need to prevent drift from adjacent areas, information provided can be in the form of email communication or copies of letters. Communication must be provided to all landowners adjacent to the property including municipalities.*

Send completed forms, project plans, seed mixes (showing seeds per square foot for each species) and any communications with pesticide applicators to BWSR at Dan.Shaw@state.mn.us as well as any local government staff involved in reviewing the project.

Habitat Friendly Solar Site Assessment Form for Project Planning

For Solar Companies, Local Governments and Other Partners to Meet Habitat Friendly Solar Standards

Updated 12-22-23

Note: The use of state developed solar seed mixes over 70% of the plantable area of a site will result in automatically meeting the standard.

1) PLANNED PERCENT OF PLANTABLE AREAS WITHIN PROJCT FOOTPRINT DOMINATED BY NATIVE SPECIES COVER (forbs, grasses, sedges, rushes, ferns). PROJECTS MUST HAVE A GOAL OF AT LEAST 70% COVER OF NATIVE VEGETATION TO MEET HABITAT FRIENDLY SOLAR STANDARDS

☐	70-84%	+15 points	
☒	85% and above	+20 points	Total Points: 20

2) PERCENT OF PROPOSED SITE VEGETATION COVER TO BE DOMINATED BY FORBS (not grasses, sedges and rushes)

☐	10-19%	+5 points	
☒	20-29%	+10 points	
☐	30-39%	+15 points	
☐	40 and above	+15 points	Total Points: 10

Note: Projects may have "array" mixes and diverse border mixes; forb dominance should be averaged across the entire site. The dominance should be calculated from total numbers of forb seeds vs. grass seeds based on seeds per square foot (from all seed mixes to be planted).

3) PLANNED COVER DIVERSITY (# of species in seed mixes; numbers from upland and moist soil mixes can be combined

☐	10-19 species	+5 points	
☐	20-25 species	+10 points	
☐	26-39 species	+15 points	
☒	40 and above	+20	Total Points: 20

4) PLANNED SEASONS WITH AT LEAST THREE BLOOMING SPECIES (check all that apply)

☒	Spring (April-May)	+4 points	
☒	Summer (June-August)	+3 points	
☒	Fall (September-October)	+3 points	Total Points: 10

See BWSR pollinator toolbox about bloom season

5) SITE PLANNING

☒	Detailed establishment and management plan (see notes)	+20 points	
☒	Seed Mixes are composed of at least 40 seeds per square foot	+5 points	
☐	All seed genetic origin is within 200 miles of site (see notes)	+5 points	
☐	At least .5% milkweed cover within each seed mix	+5 points	
☒	Plant species with more than 3 flower colors in mixes (see notes)	+5 points	Total Points: 30

6) INSECTICIDE RISK

☐	Planned on-site insecticide use (excluding buildings/electrical boxes, etc.)	-30 points	
☒	Communication with local chemical applicators/neighbors about need to prevent drift from adjacent areas.	+10 points	Total Points: 10

GRAND TOTAL: 100

Gold Standard 85+ points
Meets Standard 70 points

Project Name: Lake Charlotte Solar [Wetland Native Seed Mix Option C]
Project County: Martin County
Project Size:
Evaluation Date: 03/03/2025

See notes related to the questions on the back side of this form

Notes:
Estimates of percent "cover" should be based on "absolute cover" (the percent of the ground surface that is covered by a vertical projection of foliage as viewed from above).

All project plans must include detailed vegetation establishment and management specifications to ensure the success of projects (see sample specifications on *BWSR's Habitat Friendly Solar Webpage*).
Seed mixes provided for projects need to show seeds per square foot for each species in the mix.

Question 1 - *Native plant species provide benefits to a wide range of pollinators and other wildlife species. The Minnesota DNR List should be used to determine if a species is native. Native species include wildflowers, graminoids (grasses, sedges rushes), shrubs and trees. The percent areal cover of native vs. non-native species should be estimated based on the seeds per square foot of all species to be used across all seed mixes. As non-native fescues tend to have a high seeding rate, but also small seeds with a lower germination success the number of fescue seeds per square foot in mixes can be decreased by half when calculating native species dominance of mixes. This should result in a more accurate representation of native dominance.*

Question 2 - *There is a focus on native forbs on this assessment form to maximize benefits to the approximately 500 species of native bees in Minnesota, honeybees and other pollinators. Forbs are (flowering plants that are not woody or graminoids such as grasses and sedges) and can include introduced clovers and other non-native species beneficial to pollinators. No noxious weeds or invasive plants can be included in the total.*

Question 3 - *Plant diversity adds to wildlife benefits, as well as the resiliency of projects. For this question, planned native and non-native species from all seed mixes can be combined for the total.*

Question 4 - *Having blooming species throughout the season helps support pollinator species. See BWSR's Pollinator Toolbox for a listing of bloom seasons for species.*

Question 5 - *To meet requirements for a long-term management plan projects must provide information about:*
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-A detailed native vegetation establishment plan with detailed instructions for contractors.
-A detailed maintenance schedule for the first three years of the project (establishment period) listing timing of establishment mowing/ trimming, spot herbicide application, prescribed grazing or other management actions.
-Proposed maintenance schedule for year four and beyond.
-List of weed species that may become problematic at the site and how they will be managed if needed.

All mixes being used for the project must include at least 40 seeds per square foot to receive points for the first category. Using seed with a genetic origin within 200 miles helps ensure that species will be adapted to site conditions and decrease the risk of introducing invasive species in seed mixes. Please refer to pages 7-8 of BWSR's Native Vegetation Establishment and Enhancement Guidlines for more information about appropriate seed sources. To obtain points for including milkweed in projects mixes must contain at least .5% milkweed seed based on seeds per square foot, or a combination of seed and containerized plugs could be used with a plan to cover .5% of the ground surface with milkweed. Flower colors can include blue, pink, purple, yellow, white, orange, red, green and brown. The Minnesota Wildflowers website allows for searching species based on flower color Minnesota Wildflowers Categorized by Color.

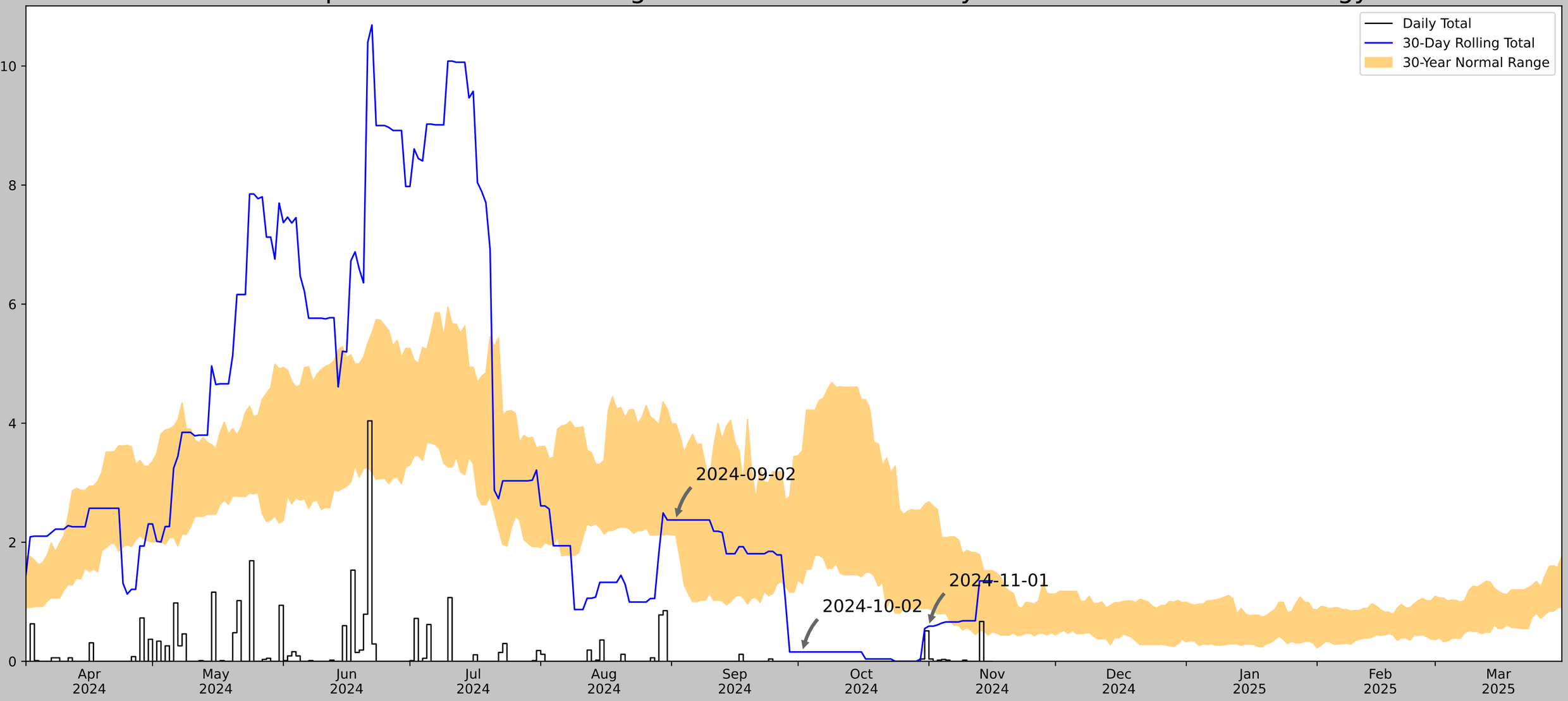
Question 6 - *It is important that seeds treated with insecticides are not used at project sites and that insecticides are not being sprayed at the site. To meet requirements for communication/registration with local landowners/applicators about the need to prevent drift from adjacent areas, information provided can be in the form of email communication or copies of letters. Communication must be provided to all landowners adjacent to the property including municipalities.*

Send completed forms, project plans, seed mixes (showing seeds per square foot for each species) and any communications with pesticide applicators to BWSR at Dan.Shaw@state.mn.us as well as any local government staff involved in reviewing the project.

ATTACHMENT B

PROJECT HISTORICAL CLIMATE DATA

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-11-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness (2024-10)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-11-01	0.885039	2.680709	0.590551	Dry	1	3	3
2024-10-02	1.300787	3.536614	0.15748	Dry	1	2	2
2024-09-02	2.12126	3.988583	2.374016	Normal	2	1	2
Result							Drier than Normal - 7

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11193	86
WORTHINGTON 1.9 SW	43.6081, -95.625	1598.097	3.406	30.184	1.636	0	4
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network

Coordinates	43.725195, -95.713136
Observation Date	2024-10-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-10-01	1.367717	3.453937	0.15748	Dry	1	3	3
2024-09-01	2.124803	3.988583	2.374016	Normal	2	2	4
2024-08-02	1.991339	3.609843	2.610236	Normal	2	1	2
Result							Drier than Normal - 9

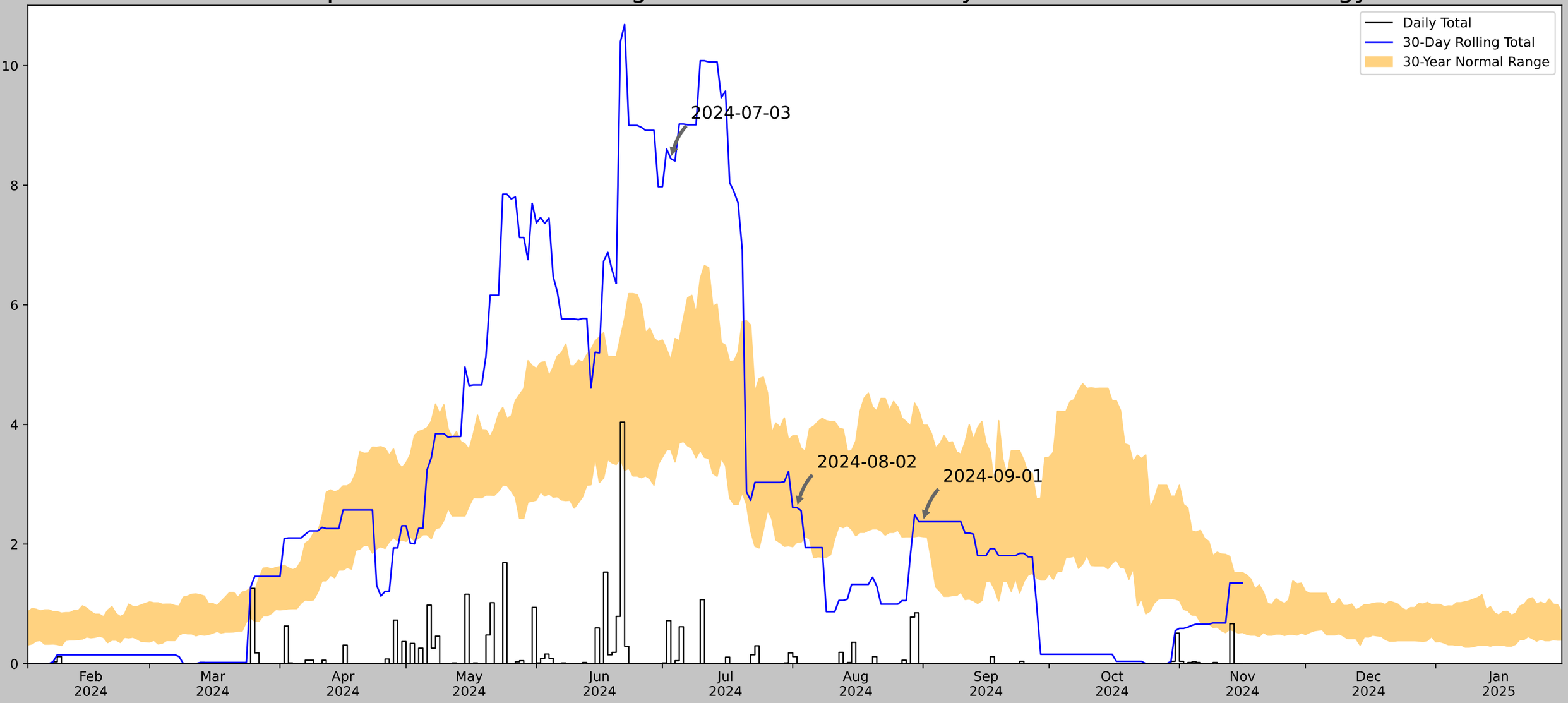
US Army Corps of Engineers

ERDC ENGINEER RESEARCH & DEVELOPMENT CENTER

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11193	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0



Coordinates	43.725195, -95.713136
Observation Date	2024-09-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-09-01	2.124803	3.988583	2.374016	Normal	2	3	6
2024-08-02	2.033465	3.81063	2.610236	Normal	2	2	4
2024-07-03	3.579134	5.080709	8.444882	Wet	3	1	3
Result							Normal Conditions - 13

US Army Corps of Engineers

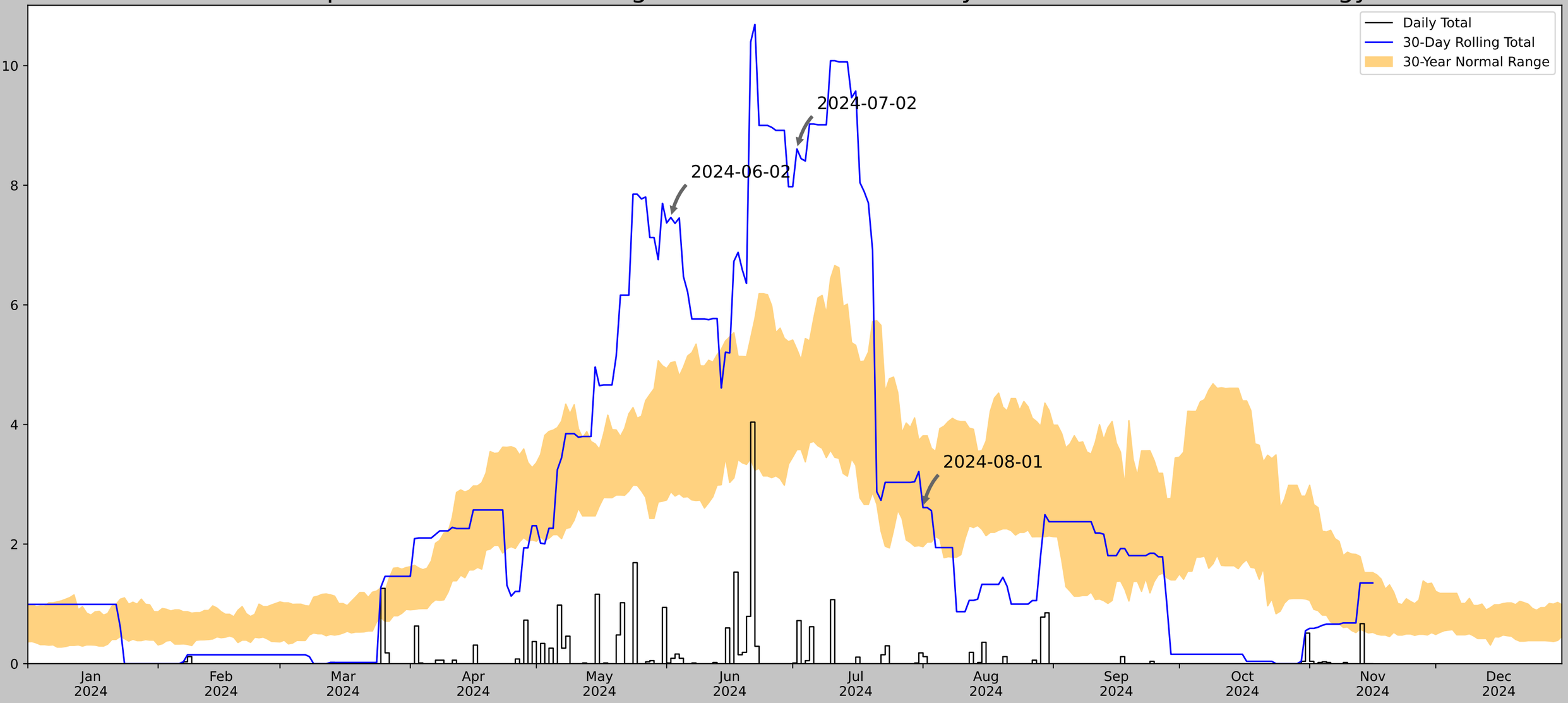
ERDC ENGINEER RESEARCH & DEVELOPMENT CENTER

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-08-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Severe wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-08-01	1.957087	3.81063	2.610236	Normal	2	3	6
2024-07-02	3.579134	5.255512	8.606299	Wet	3	2	6
2024-06-02	2.877559	5.033858	7.46063	Wet	3	1	3
Result							Wetter than Normal - 15

US Army Corps of Engineers

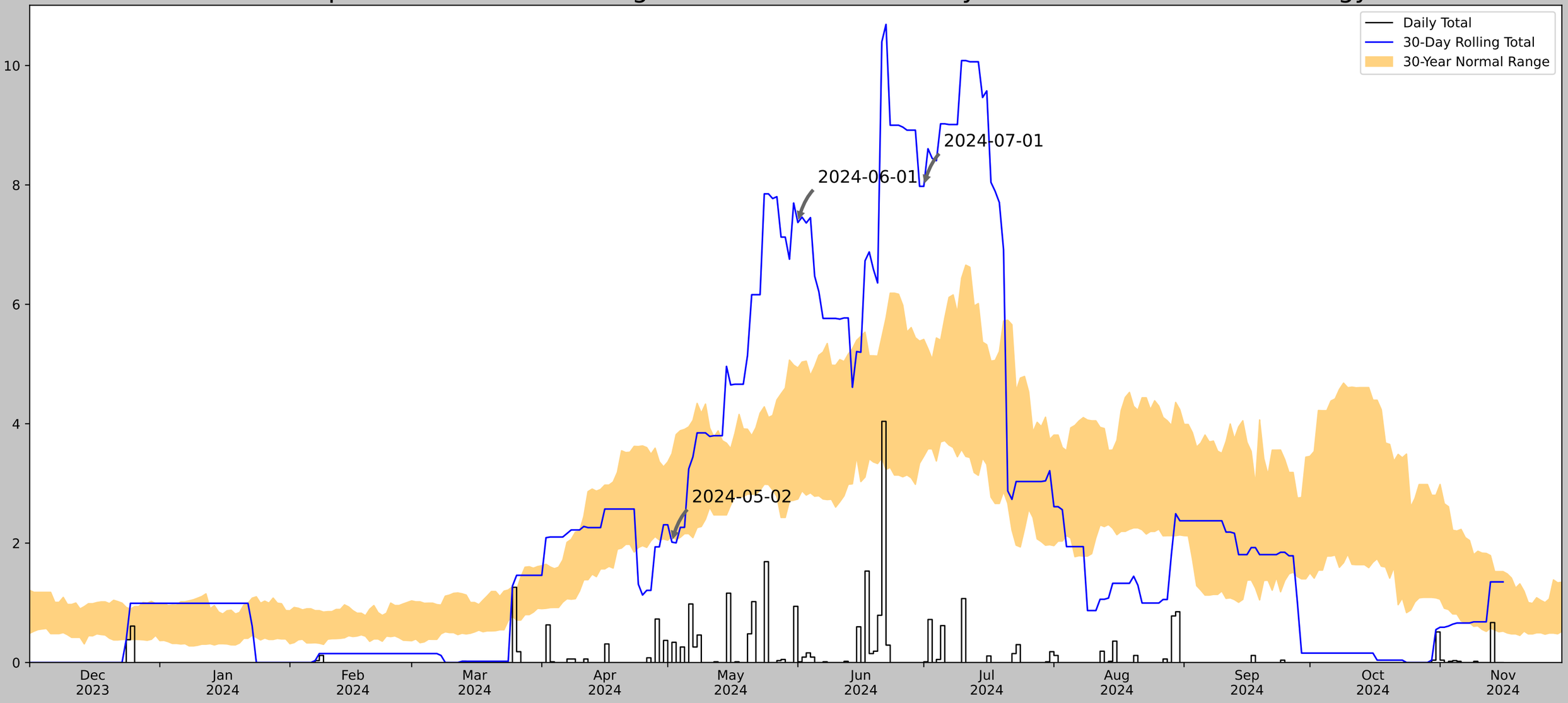
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-07-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-07-01	3.454331	5.412992	7.976378	Wet	3	3	9
2024-06-01	2.737402	4.93504	7.370079	Wet	3	2	6
2024-05-02	2.122835	3.497638	2.015748	Dry	1	1	1
Result							Wetter than Normal - 16

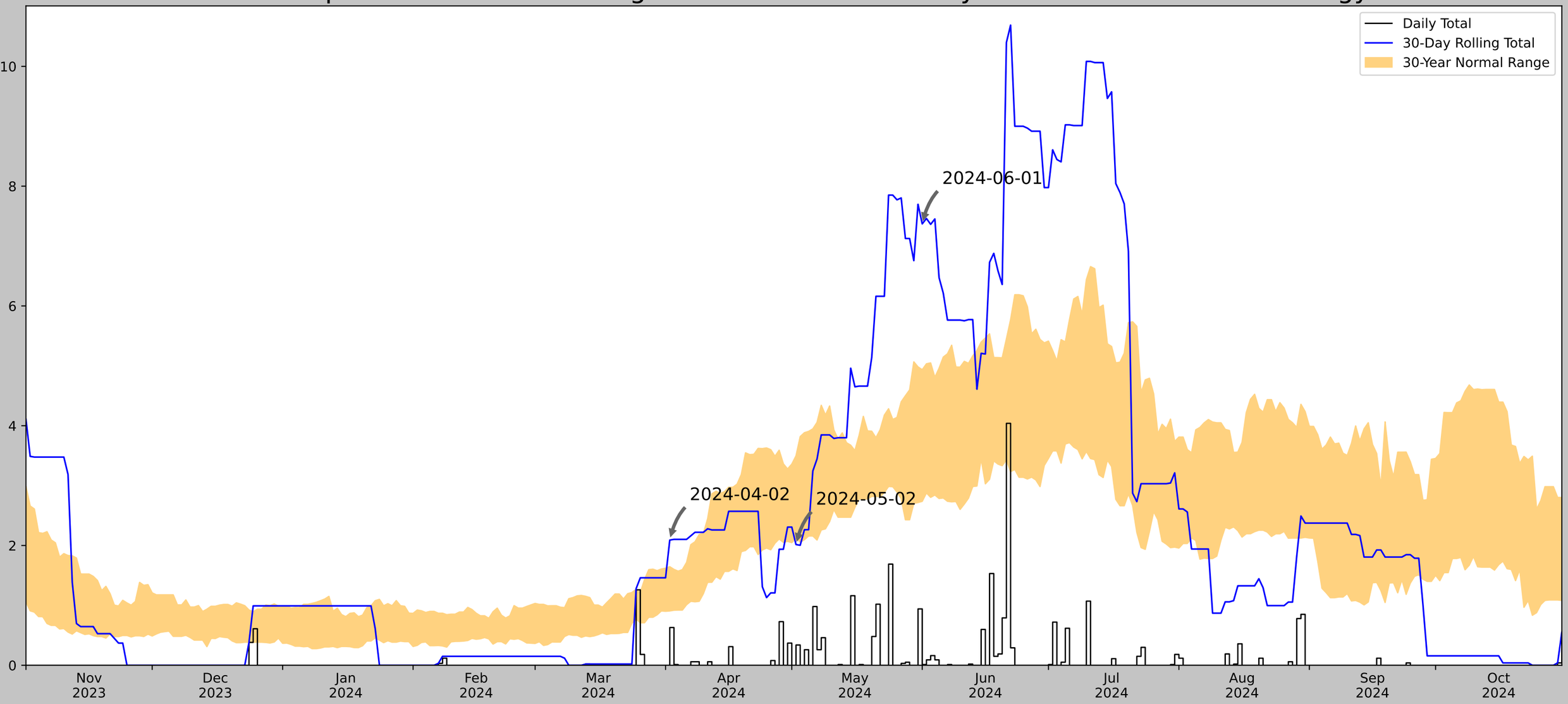
US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0



Coordinates	43.725195, -95.713136
Observation Date	2024-06-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Extreme wetness
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-06-01	2.737402	4.93504	7.370079	Wet	3	3	9
2024-05-02	2.122835	3.497638	2.015748	Dry	1	2	2
2024-04-02	0.907087	1.646063	2.090551	Wet	3	1	3
Result							Normal Conditions - 14

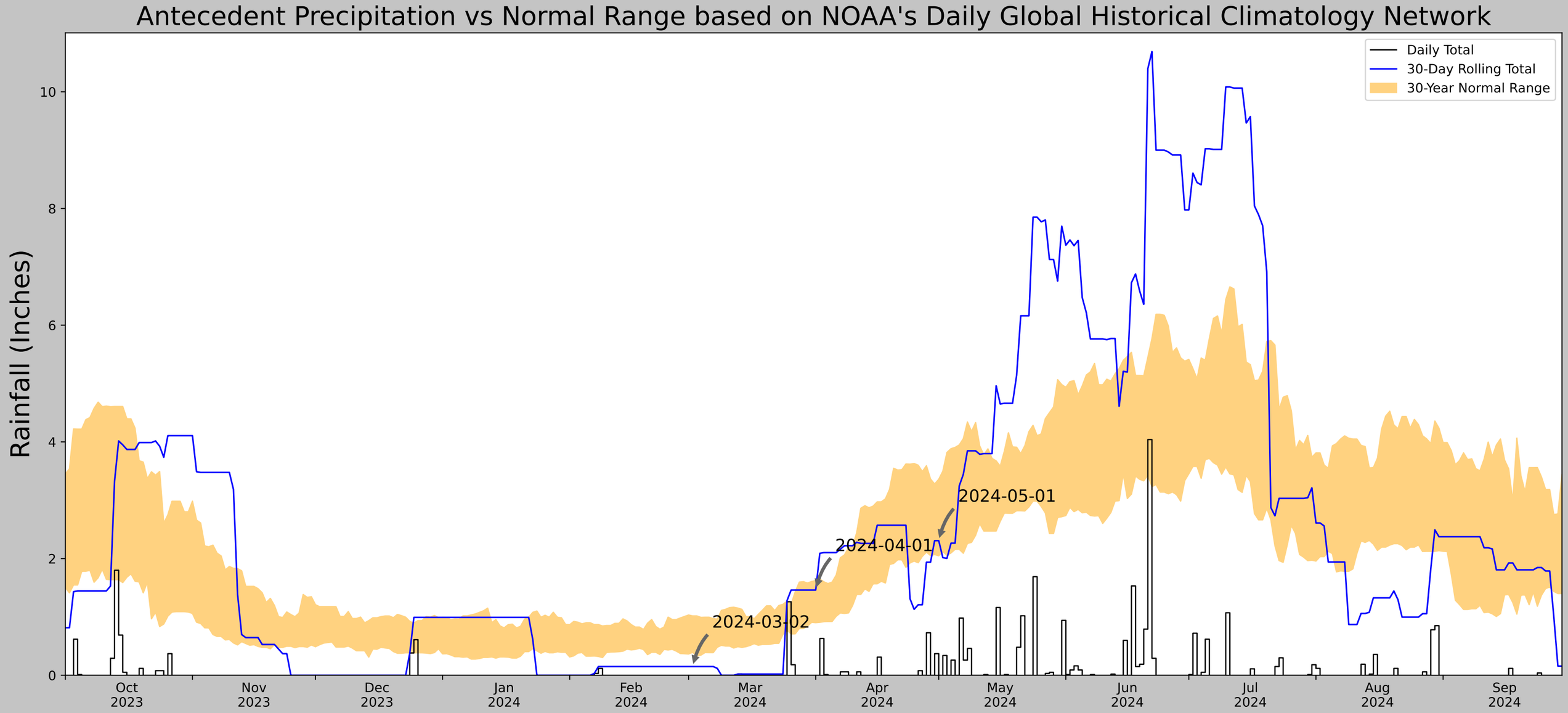
US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0



Coordinates	43.725195, -95.713136
Observation Date	2024-05-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-05-01	2.047638	3.358662	2.307087	Normal	2	3	6
2024-04-01	0.901575	1.62126	1.46063	Normal	2	2	4
2024-03-02	0.393307	1.016929	0.149606	Dry	1	1	1
Result							Normal Conditions - 11

US Army Corps of Engineers

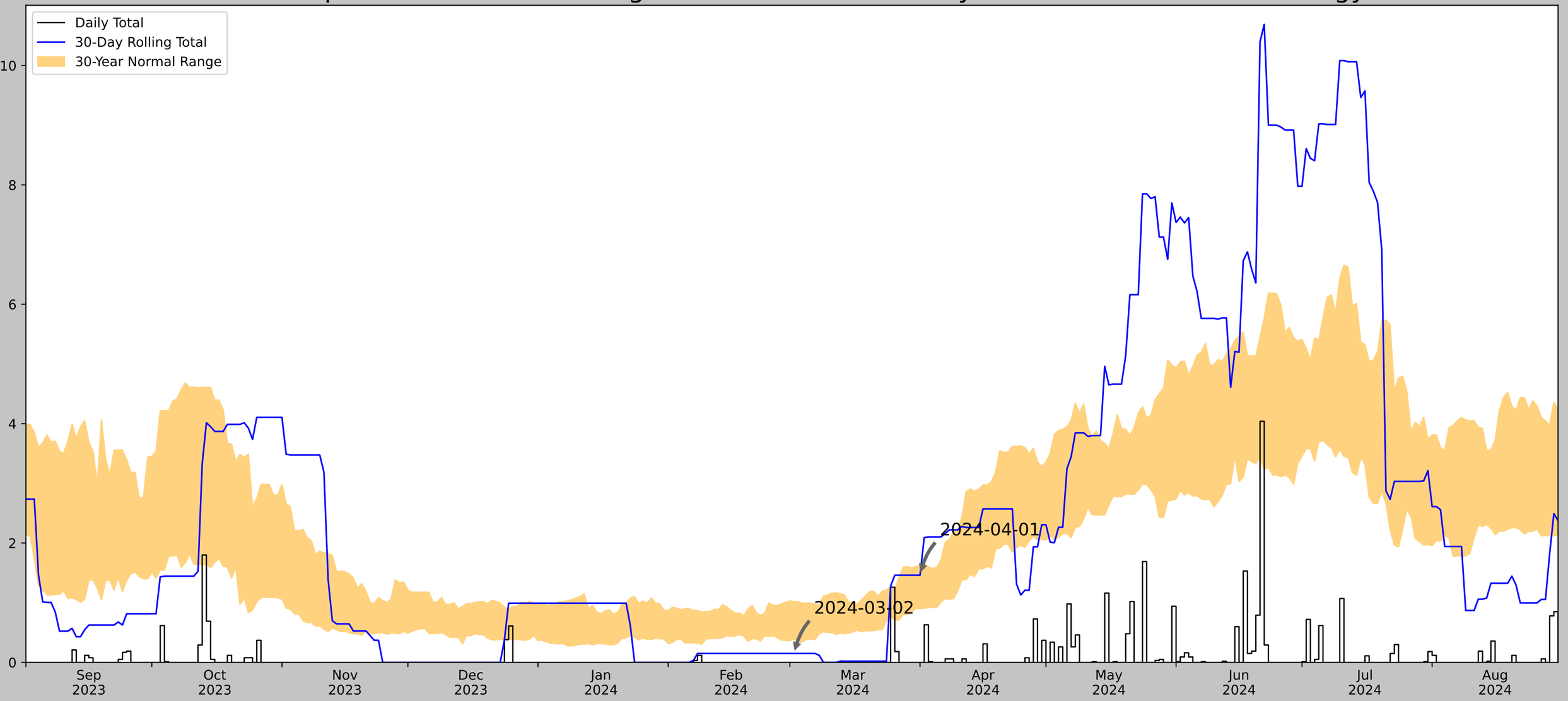
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-04-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Moderate wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-04-01	0.901575	1.62126	1.46063	Normal	2	3	6
2024-03-02	0.393307	1.016929	0.149606	Dry	1	2	2
2024-02-01	0.31378	0.866929	0.0	Dry	1	1	1
Result							Drier than Normal - 9

US Army Corps of Engineers

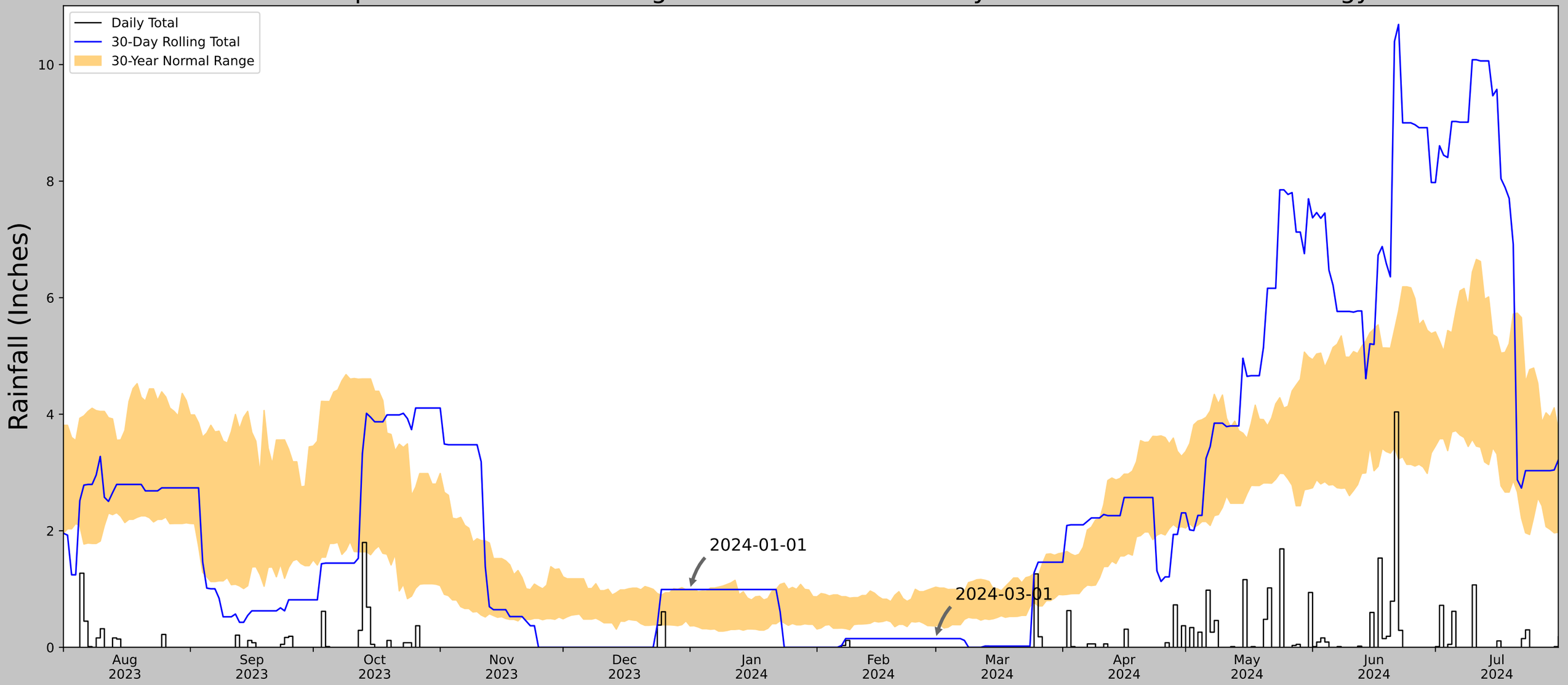
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-03-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-03-01	0.364567	1.032677	0.149606	Dry	1	3	3
2024-01-31	0.394488	0.870472	0.0	Dry	1	2	2
2024-01-01	0.366535	0.99252	0.992126	Normal	2	1	2
Result							Drier than Normal - 7

US Army Corps of Engineers

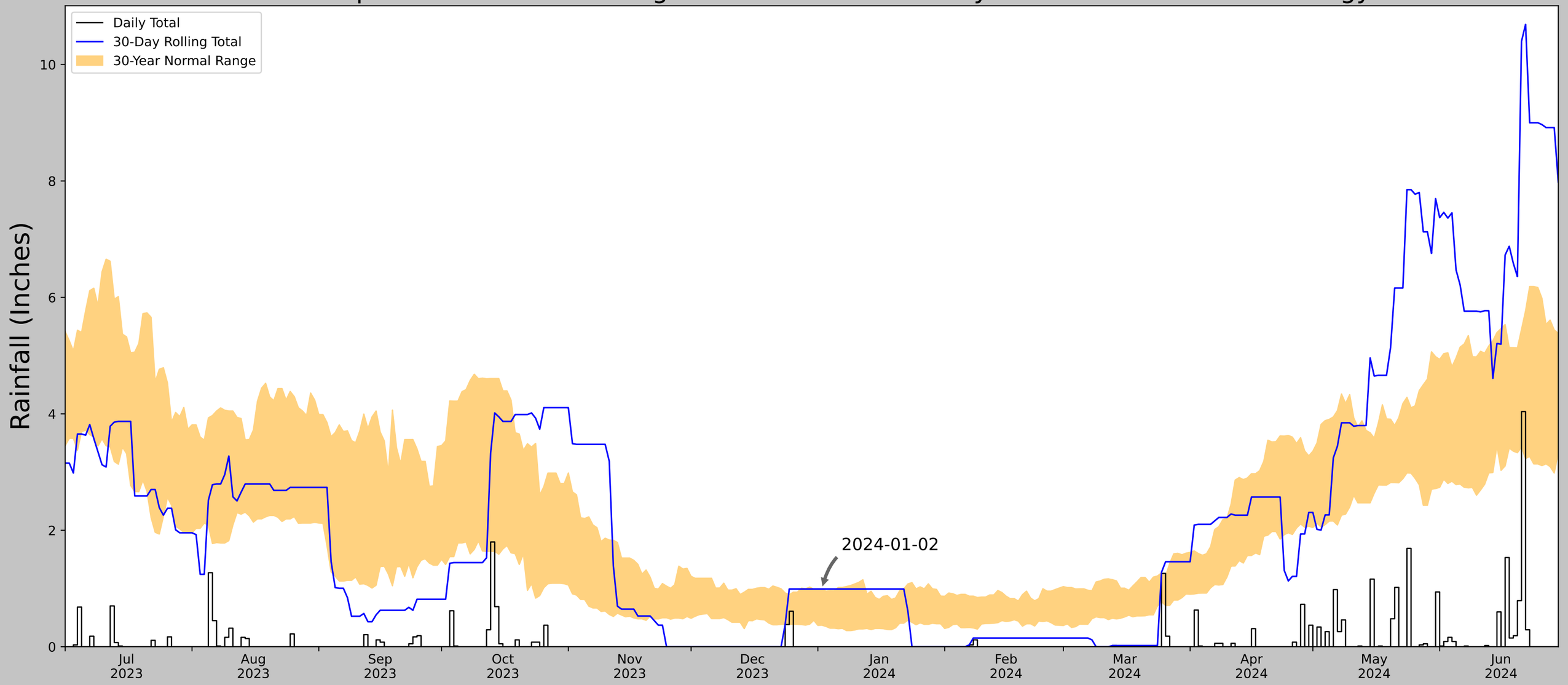
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-02-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-02-01	0.31378	0.866929	0.0	Dry	1	3	3
2024-01-02	0.369685	0.991339	0.992126	Wet	3	2	6
2023-12-03	0.551181	1.175984	0.0	Dry	1	1	1
Result							Normal Conditions - 10

US Army Corps of Engineers

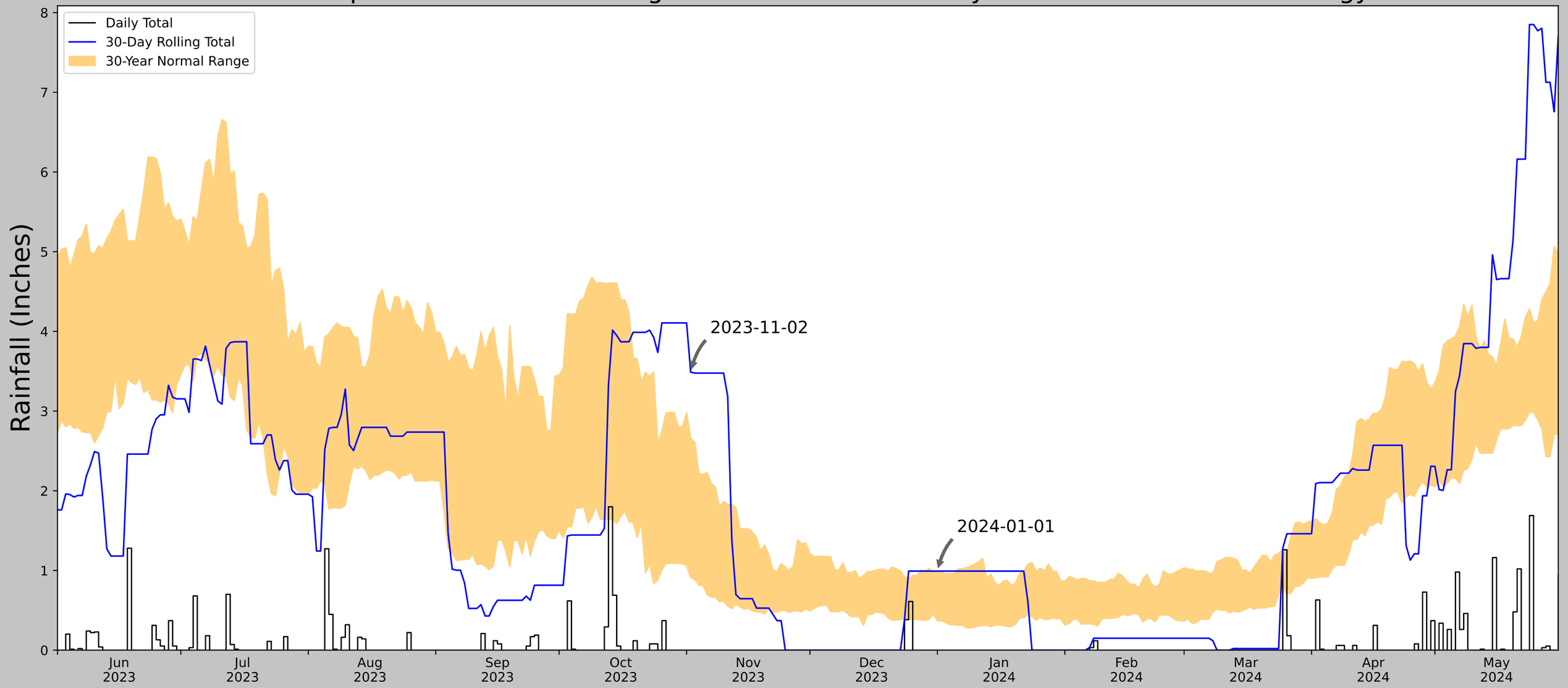
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2024-01-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-01-01	0.366535	0.99252	0.992126	Normal	2	3	6
2023-12-02	0.523228	1.175984	0.0	Dry	1	2	2
2023-11-02	0.908661	2.659449	3.488189	Wet	3	1	3
Result							Normal Conditions - 11

US Army Corps of Engineers

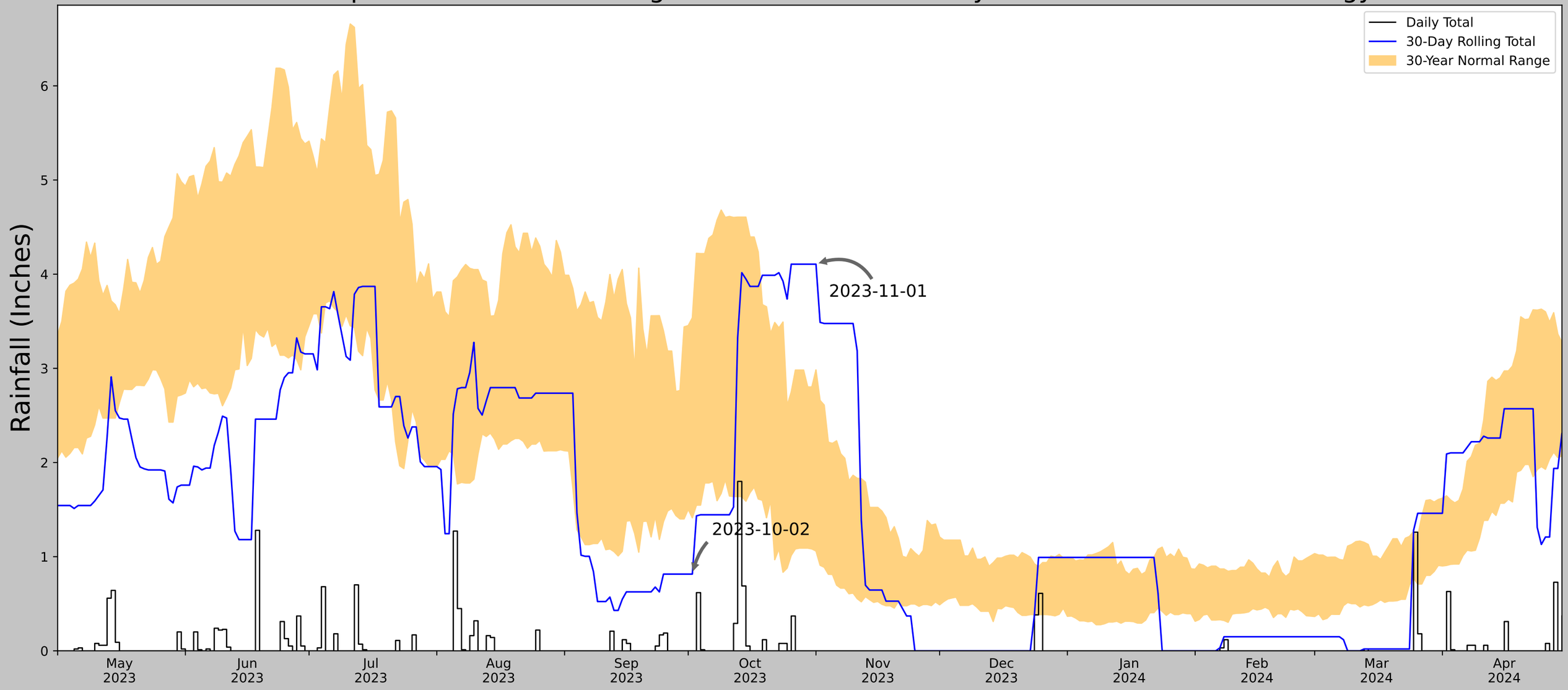
ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	43.725195, -95.713136
Observation Date	2023-12-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-12-01	0.488583	1.209055	0.0	Dry	1	3	3
2023-11-01	1.060236	2.983858	4.106299	Wet	3	2	6
2023-10-02	1.412205	3.536614	0.814961	Dry	1	1	1
Result							Normal Conditions - 10

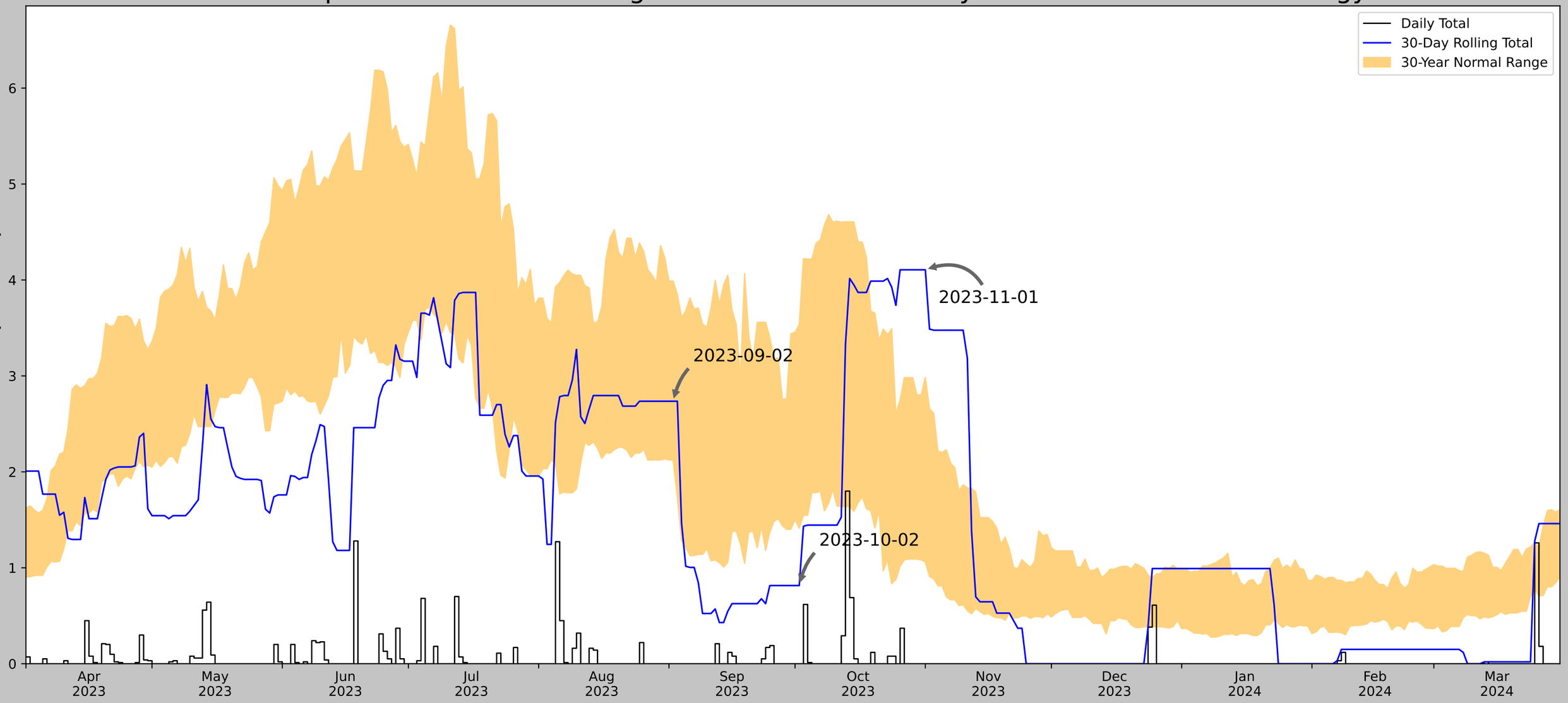
US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0



Coordinates	43.725195, -95.713136
Observation Date	2023-11-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Incipient wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-11-01	1.060236	2.983858	4.106299	Wet	3	3	9
2023-10-02	1.412205	3.536614	0.814961	Dry	1	2	2
2023-09-02	2.12126	3.988583	2.736221	Normal	2	1	2
Result							Normal Conditions - 13

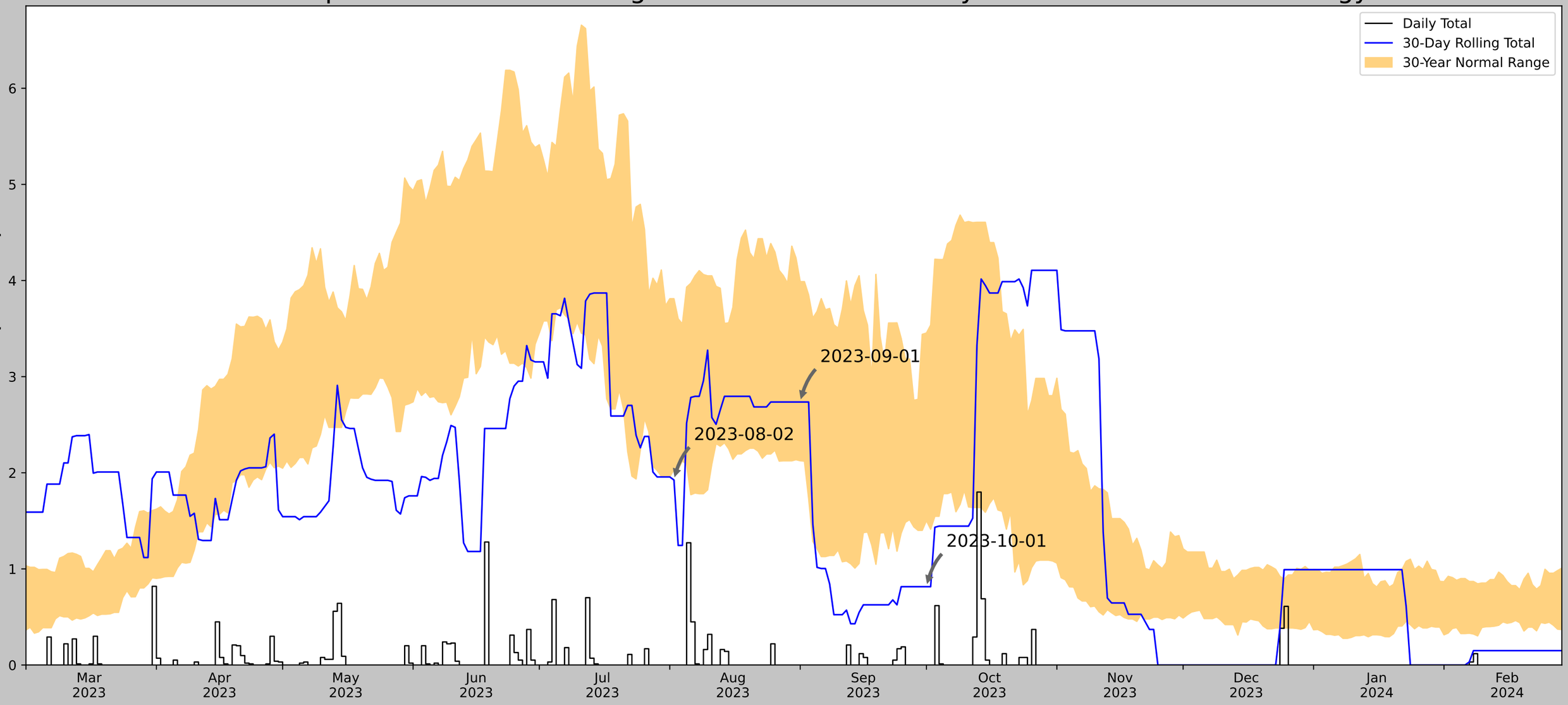
US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0



Coordinates	43.725195, -95.713136
Observation Date	2023-10-01
Elevation (ft)	1727.821
Drought Index (PDSI)	Mild wetness
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2023-10-01	1.501969	3.453937	0.814961	Dry	1	3	3
2023-09-01	2.124803	3.988583	2.736221	Normal	2	2	4
2023-08-02	2.033465	3.81063	1.925197	Dry	1	1	1
Result							Drier than Normal - 8

US Army Corps of Engineers

ERDC ENGINEER RESEARCH & DEVELOPMENT CENTER

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
WORTHINGTON 2 NNE	43.6453, -95.5803	1567.913	8.633	159.908	5.265	11192	90
HARRIS 0.1 NNE	43.4473, -95.4328	1558.071	15.547	9.842	7.149	24	0
SIBLEY	43.4022, -95.7497	1532.152	18.819	35.761	9.142	43	0
LAKEFIELD 2NE	43.7022, -95.1519	1529.856	21.767	38.057	10.624	62	0
OCHEYEDAN	43.4144, -95.5314	1250.0	16.141	317.913	12.395	31	0

ATTACHMENT C

SEED MIXES

Lake Charlotte Solar Array Native Seed Mix — Moderately Well Drained to Poorly Drained Soils

Martin County, Minnesota

Scientific Name	Common Name	Height	Bloom Season	Drill Rate (PLS)		Broadcast Rate (PLS)	
		in	Apr – Oct	lb/ac	seeds/sq ft	lb/ac	seeds/sq ft
Grasses, Sedges & Rushes							
Bouteloua curtipendula	Sideoats Grama	12–24	A S	1.981	12.75	2.575	16.57
Carex blanda	Eastern Woodland Sedge	6–18	M J	0.007	0.04	0.009	0.05
Carex brevior	Shortbeak Sedge	12–24	J J	1.167	13.01	1.517	16.91
Carex granularis	Limestone Meadow Sedge	6–24	M J	1.545	29.97	2.009	38.96
Carex grisea	Inflated Narrow-leaf Sedge	6–24	M J	0.144	0.62	0.188	0.81
Carex radiata	Eastern Star Sedge	8–24	J	0.005	0.08	0.007	0.11
Dichanthelium oligosanthes	Heller's Rosette Grass	8–24	M J J A S O	0.007	0.04	0.009	0.05
Eleocharis acicularis	Needle Spikerush	1–12	J J A S	0.013	0.52	0.017	0.68
Eleocharis obtusa	Blunt Spikerush	2–10	J J A S O	0.039	2.62	0.051	3.40
Juncus dudleyi	Dudley's Rush	8–24	J J A S	0.207	229.11	0.270	297.84
Juncus interior	Inland Rush	0	M J J	0.227	168.66	0.295	219.26
Juncus tenuis	Poverty Rush	6–18	J J A S	0.214	206.98	0.278	269.07
Sporobolus heterolepis	Prairie Dropseed	12–24	A S O	0.666	4.12	0.866	5.36
Substitions (may exceed 24" height)							
Carex sprengelii	Sprengel's Sedge	12–30	M J J	0.000	0.00	0.000	0.00
Muhlenbergia mexicana	Mexican Muhly	12–30	A S	0.000	0.00	0.000	0.00
			Grass, Sedge & Rush Total	**6.223**	**669**	**8.090**	**869**
Forbs							
Castilleja coccinea	Scarlet Indian Paintbrush	6–24	M J	0.024	5.10	0.031	6.63
Chamaecrista fasciculata	Partridge Pea	6–24	J A S	0.501	0.62	0.652	0.81
Dalea candida	White Prairie Clover	12–24	J J A S	0.331	2.61	0.430	3.39
Gentiana andrewsii	Closed Bottle Gentian	12–24	A S O	0.004	0.72	0.005	0.94
Heuchera richardsonii	Richardson's Alumroot	18–24	M J J	0.004	0.77	0.005	0.99
Hypericum majus	Large St. Johnswort	4–24	J A S	0.001	1.07	0.001	1.39
Lobelia spicata	Palespike Lobelia	12–24	M J J A	0.001	0.23	0.001	0.29
Lycopus americanus	American Water Horehound	6–24	J A S	0.005	0.35	0.007	0.46
Mentha arvensis	Wild Mint	6–24	J A S	0.002	0.18	0.002	0.23
Mimulus ringens	Allegheny Monkeyflower	12–24	J J A S	0.165	172.11	0.215	223.74
Oligoneuron album	Prairie Goldenrod	12–18	J J A S	0.014	0.24	0.018	0.31
Osmorhiza claytonii	Clayton's Sweetroot	12–24	M J	0.102	0.12	0.133	0.15
Penthorum sedoides	Ditch Stonecrop	6–24	J J A S	0.029	23.35	0.038	30.36
Rosa arkansana	Prairie Rose	6–24	J J A	0.014	0.01	0.018	0.01
Zizia aurea	Golden Zizia	12–24	A M J	0.924	4.44	1.201	5.77
Substitions (may exceed 24" height)							
Achillea millefolium	Common Yarrow	12–30	M J J A S O	0.000	0.00	0.000	0.00
Ammannia coccinea	Valley Redstem	8–30	J J A	0.000	0.00	0.000	0.00
Coreopsis tinctoria	Golden Tickseed	24–28	J J A	0.000	0.00	0.000	0.00
Cryptotaenia canadensis	Canadian Honewort	12–30	J J A S	0.000	0.00	0.000	0.00
Geum canadense	White Avens	12–30	M J J	0.000	0.00	0.000	0.00
Hydrophyllum virginianum	Eastern Waterleaf	12–30	M J	0.000	0.00	0.000	0.00
Maianthemum racemosum	Feathery False Lily Of The Valley	12–30	A M J	0.000	0.00	0.000	0.00
Osmorhiza longistylis	Longstyle Sweetroot	18–30	M J	0.000	0.00	0.000	0.00
Phryma leptostachya	American Lopseed	12–30	J J A	0.000	0.00	0.000	0.00
Potentilla arguta ssp. arguta	Tall Cinquefoil	12–30	J J A S	0.000	0.00	0.000	0.00
Rudbeckia hirta	Blackeyed Susan	12–30	J J A S O	0.000	0.00	0.000	0.00
Taenidia integerrima	Yellow Pimpernel	12–30	M J J	0.000	0.00	0.000	0.00
			Forb Total	**2.121**	**212**	**2.758**	**275**

SEED MIX TOTAL	**8.344**	**880**	**10.848**	**1145**

Lake Charlotte Solar Perimeter Native Seed Mix — Moderately Well to Somewhat Poorly Drained Soils

Martin County, Minnesota

Scientific Name	Common Name	Height	Bloom Season	Drill Rate (PLS)		Broadcast Rate (PLS)	
		in	Apr – Oct	lb/ac	seeds/sq ft	lb/ac	seeds/sq ft
Grasses, Sedges & Rushes							
Andropogon gerardii	Big Bluestem	24–78	J J A S	0.588	2.72	0.765	3.54
Bouteloua curtipendula	Sideoats Grama	12–24	A S	0.546	3.52	0.710	4.57
Bouteloua dactyloides	Buffalograss		M J J A	0.690	1.58	0.897	2.05
Bromus kalmii	Arctic Brome	20–36	J A S	0.124	0.46	0.161	0.59
Carex bicknellii	Bicknell's Sedge	18–36	J J	0.027	0.24	0.035	0.31
Carex blanda	Eastern Woodland Sedge	6–18	M J	0.015	0.08	0.020	0.10
Carex brevior	Shortbeak Sedge	12–24	J J	0.097	1.08	0.126	1.40
Carex cristatella	Crested Sedge	12–36	J J A	0.046	2.26	0.060	2.93
Carex granularis	Limestone Meadow Sedge	6–24	M J	0.057	1.10	0.074	1.43
Carex gravida	Heavy Sedge	12–36	M J	0.030	0.16	0.039	0.21
Carex grisea	Inflated Narrow-leaf Sedge	6–24	M J	0.032	0.14	0.041	0.18
Carex molesta	Troublesome Sedge	12–36	J J	0.101	0.93	0.131	1.22
Carex scoparia	Broom Sedge	12–30	J J	0.053	1.42	0.069	1.85
Carex vulpinoidea	Fox Sedge	12–36	J J	0.387	11.52	0.503	14.98
Echinochloa crus-galli	Barnyardgrass			0.648	1.95	0.843	2.54
Elymus canadensis	Canada Wildrye	12–54	J A S O	0.684	1.62	0.889	2.11
Elymus trachycaulus	Slender Wheatgrass	12–36	J A	0.655	1.88	0.852	2.44
Elymus virginicus	Virginia Wildrye	12–48	J A	0.707	1.45	0.919	1.88
Hordeum jubatum	Foxtail Barley		J J A S	0.074	0.44	0.097	0.57
Juncus dudleyi	Dudley's Rush	8–24	J J A S	0.034	37.92	0.045	49.30
Juncus tenuis	Poverty Rush	6–18	J J A S	0.035	34.26	0.046	44.54
Juncus torreyi	Torrey's Rush	12–30	J A S O	0.024	20.97	0.031	27.26
Muhlenbergia mexicana	Mexican Muhly	12–30	A S	0.009	0.55	0.011	0.72
Muhlenbergia racemosa	Marsh Muhly	10–42	A S	0.051	1.65	0.066	2.15
Panicum virgatum	Switchgrass	36–66	J A S	0.518	4.23	0.673	5.50
Poa palustris	Fowl Bluegrass	12–42	J J A S	0.335	19.04	0.435	24.75
Schizachyrium scoparium	Little Bluestem	12–36	J A S O	0.538	3.71	0.699	4.83
Sorghastrum nutans	Indiangrass	36–78	A S	0.573	2.98	0.745	3.88
Spartina pectinata	Prairie Cordgrass	36–84	J A S	0.116	0.58	0.151	0.75
Sphenopholis obtusata	Prairie Wedgescale		J J A	0.078	2.21	0.102	2.88
Sporobolus compositus	Composite Dropseed	24–36	A S O	0.471	5.86	0.613	7.61
Sporobolus heterolepis	Prairie Dropseed	12–24	A S O	0.074	0.45	0.096	0.59
Substitions							
Carex annectens	Yellowfruit Sedge	18–30	J A	0.000	0.00	0.000	0.00
Carex cephalophora	Oval-leaf Sedge	12–24	M J	0.000	0.00	0.000	0.00
			Grass, Sedge & Rush Total	**8.418**	**169**	**10.943**	**220**
Forbs							
Agastache foeniculum	Blue Giant Hyssop	24–42	J J A S	0.058	2.08	0.075	2.71
Agastache nepetoides	Yellow Giant Hyssop		J A S O	0.005	0.15	0.006	0.19
Allium cernuum	Nodding Onion	6–18	J A	0.006	0.02	0.007	0.02
Anemone canadensis	Canadian Anemone	12–18	M J	0.003	0.01	0.003	0.01
Anemone cylindrica	Candle Anemone	12–24	J J	0.002	0.02	0.003	0.03
Apocynum cannabinum	Indianhemp		M J J A	0.001	0.01	0.001	0.01
Aquilegia canadensis	Red Columbine	6–30	A M J	0.004	0.05	0.005	0.07
Asclepias speciosa	Showy Milkweed		J J A	0.011	0.02	0.014	0.02
Asclepias syriaca	Common Milkweed	24–48	J J A	0.011	0.02	0.014	0.03
Asclepias tuberosa	Butterfly Milkweed	12–24	J J A	0.003	0.01	0.004	0.01
Asclepias verticillata	Whorled Milkweed	8–24	J A S	0.002	0.01	0.003	0.02
Astragalus canadensis	Canadian Milkvetch	12–40	J J A	0.086	0.53	0.112	0.68
Baptisia alba	White Wild Indigo	24–36	J J	0.008	0.00	0.010	0.01
Bidens frondosa	Devil's Beggartick		A S O	0.010	0.03	0.013	0.04

Scientific Name	Common Name	Height	Bloom Season	Drill Rate (PLS)		Broadcast Rate (PLS)	
		in	Apr – Oct	lb/ac	seeds/sq ft	lb/ac	seeds/sq ft
Chamaecrista fasciculata	Partridge Pea	6–24	J A S	0.124	0.15	0.161	0.20
Cirsium discolor	Field Thistle		A S O	0.003	0.01	0.004	0.01
Coreopsis palmata	Stiff Tickseed	12–30	J J A	0.002	0.01	0.003	0.02
Coreopsis tinctoria	Golden Tickseed	24–28	J J A	0.056	2.30	0.073	2.99
Dalea candida	White Prairie Clover	12–24	J J A S	0.082	0.64	0.106	0.84
Dalea purpurea	Purple Prairie Clover	12–24	J A S	0.086	0.54	0.111	0.70
Desmanthus illinoensis	Illinois Bundleflower		J A	0.115	0.20	0.149	0.26
Desmodium canadense	Showy Ticktrefoil	24–66	J A	0.111	0.22	0.144	0.29
Doellingeria umbellata	Parasol Whitetop	24–72	J A S	0.004	0.07	0.005	0.09
Eryngium yuccifolium	Button Eryngo	24–54	J A S	0.010	0.03	0.013	0.04
Eupatorium altissimum	Tall Thoroughwort	24–60	A S O	0.006	0.13	0.008	0.17
Euthamia graminifolia	Flat-top Goldentop	12–48	J A S	0.001	0.12	0.002	0.16
Galium boreale	Northern Bedstraw	12–30	J J	0.002	0.03	0.002	0.04
Gentiana andrewsii	Closed Bottle Gentian	12–24	A S O	0.002	0.38	0.003	0.49
Geum aleppicum	Yellow Avens		J J A	0.001	0.01	0.001	0.01
Glycyrrhiza lepidota	American Licorice	12–36	J J	0.003	0.00	0.004	0.01
Helenium autumnale	Common Sneezeweed	24–54	A S O	0.059	1.98	0.077	2.57
Helianthus giganteus	Giant Sunflower		J A S	0.001	0.00	0.002	0.01
Helianthus grosseserratus	Sawtooth Sunflower	36–156	A S O	0.004	0.03	0.006	0.04
Heliopsis helianthoides	Smooth Oxeye	24–66	J J A S	0.107	0.25	0.139	0.33
Heracleum maximum	Common Cowparsnip		J J	0.117	0.19	0.152	0.24
Heuchera richardsonii	Richardson's Alumroot	18–24	M J J	0.002	0.40	0.003	0.52
Hypericum ascyron	Great St. Johnswort		J A	0.048	4.13	0.062	5.36
Lespedeza capitata	Roundhead Lespedeza	24–54	A S	0.009	0.03	0.012	0.05
Liatris ligulistylis	Rocky Mountain Blazing Star	12–48	A S	0.005	0.02	0.006	0.03
Liatris pycnostachya	Prairie Blazing Star	24–54	J A S	0.009	0.04	0.011	0.05
Lobelia inflata	Indian-tobacco	6–24	J A S O	0.002	0.94	0.002	1.22
Lobelia spicata	Palespike Lobelia	12–24	M J J A	0.001	0.30	0.001	0.39
Maianthemum racemosum	Feathery False Lily Of The Valley	12–30	A M J	0.005	0.00	0.006	0.00
Mentha arvensis	Wild Mint	6–24	J A S	0.002	0.23	0.003	0.30
Monarda fistulosa	Wild Bergamot	24–48	J A S	0.061	1.75	0.079	2.28
Oenothera biennis	Common Evening Primrose		J J A S O	0.062	1.62	0.081	2.11
Oligoneuron rigidum	Stiff Goldenrod	12–54	A S O	0.007	0.11	0.009	0.15
Pedicularis canadensis	Canadian Lousewort		A M	0.001	0.01	0.001	0.01
Phlox maculata	Wild Sweetwilliam	12–36	J J A	0.002	0.04	0.002	0.05
Physostegia virginiana	Obedient Plant	12–48	A S	0.005	0.03	0.006	0.03
Polygonatum biflorum	Smooth Solomon's Seal		M J	0.004	0.00	0.005	0.00
Potentilla arguta ssp. arguta	Tall Cinquefoil	12–30	J J A S	0.048	4.04	0.062	5.25
Pycnanthemum virginianum	Virginia Mountainmint	12–36	J J A S	0.005	0.35	0.006	0.45
Ratibida columnifera	Upright Prairie Coneflower		J J A	0.075	0.87	0.097	1.14
Ratibida pinnata	Pinnate Prairie Coneflower	36–78	J A S	0.074	0.90	0.096	1.17
Rudbeckia hirta	Blackeyed Susan	12–30	J J A S O	0.058	2.04	0.076	2.65
Rudbeckia laciniata	Cutleaf Coneflower		J A S O	0.009	0.04	0.012	0.05
Rudbeckia triloba	Browneyed Susan	12–60	A S O	0.072	0.98	0.094	1.27
Rumex altissimus	Pale Dock		J J A	0.009	0.05	0.011	0.06
Scrophularia lanceolata	Lanceleaf Figwort		M J J	0.004	0.29	0.005	0.38
Scrophularia marilandica	Carpenter's Square		J A S O	0.005	0.32	0.006	0.41
Silene stellata	Widowsfrill		J A S O	0.001	0.01	0.001	0.02
Silphium laciniatum	Compassplant	36–96	J J A S	0.010	0.00	0.012	0.00
Silphium perfoliatum	Cup Plant	36–84	J A S	0.012	0.01	0.016	0.02
Smilax lasioneura	Blue Ridge Carrionflower		M J J	0.009	0.00	0.012	0.00
Solidago gigantea	Giant Goldenrod		A S	0.002	0.05	0.002	0.07
Symphyotrichum ericoides	White Heath Aster	12–30	A S O	0.001	0.13	0.002	0.16
Symphyotrichum laeve	Smooth Blue Aster	12–36	A S O	0.006	0.13	0.008	0.18
Symphyotrichum lanceolatum	White Panicle Aster	12–60	S O	0.003	0.16	0.004	0.20
Symphyotrichum novae-angliae	New England Aster	36–72	A S O	0.006	0.20	0.007	0.26
Taenidia integerrima	Yellow Pimpernel	12–30	M J J	0.003	0.01	0.004	0.01
Teucrium canadense	Canada Germander	24–42	J A S	0.005	0.03	0.006	0.04

Scientific Name	Common Name	Height	Bloom Season	Drill Rate (PLS)		Broadcast Rate (PLS)	
		in	Apr – Oct	lb/ac	seeds/sq ft	lb/ac	seeds/sq ft
Thalictrum dasycarpum	Purple Meadow-rue	24–72	J J	0.009	0.04	0.012	0.05
Tradescantia bracteata	Longbract Spiderwort	6–18	M J J	0.003	0.01	0.003	0.01
Tradescantia ohiensis	Bluejacket	18–36	M J J	0.005	0.02	0.007	0.02
Verbena hastata	Swamp Verbena	12–66	J A S	0.055	2.49	0.072	3.24
Vernonia fasciculata	Prairie Ironweed	18–60	J A S	0.008	0.06	0.010	0.08
Veronicastrum virginicum	Culver's Root	36–66	J J A	0.004	0.75	0.005	0.97
Zizia aurea	Golden Zizia	12–24	A M J	0.091	0.44	0.119	0.57
Substitions							
Anemone virginiana	Tall Thimbleweed	12–36	J J A	0.000	0.00	0.000	0.00
Oligoneuron album	Prairie Goldenrod	12–18	J J A S	0.000	0.00	0.000	0.00
Symphyotrichum pilosum	Hairy White Oldfield Aster		S O	0.000	0.00	0.000	0.00
Verbena urticifolia	White Vervain		J J A S O	0.000	0.00	0.000	0.00
Zizia aptera	Meadow Zizia	12–30	A M	0.000	0.00	0.000	0.00
			Forb Total	**1.919**	**34**	**2.494**	**45**

			SEED MIX TOTAL	**10.337**	**203**	**13.438**	**264**

Lake Charlotte Solar Wetland Native Seed Mix — Somewhat Poorly to Poorly Drained Soils

Martin County, Minnesota

Scientific Name	Common Name	Height	Bloom Season	Drill Rate (PLS)		Broadcast Rate (PLS)	
		in	Apr – Oct	lb/ac	seeds/sq ft	lb/ac	seeds/sq ft
Grasses, Sedges & Rushes							
Andropogon gerardii	Big Bluestem	24–78	J J A S	0.868	4.02	1.128	5.22
Beckmannia syzigachne	American Sloughgrass	8–42	J J A	0.637	11.69	0.828	15.20
Bolboschoenus fluviatilis	River Bulrush		J J	0.037	0.06	0.047	0.08
Bromus kalmii	Arctic Brome	20–36	J A S	0.061	0.22	0.079	0.29
Calamagrostis canadensis	Bluejoint	24–48	J J A	0.006	0.59	0.007	0.77
Carex aquatilis	Water Sedge		J J	0.008	0.20	0.010	0.26
Carex bebbii	Bebb's Sedge	8–36	J J	0.008	0.16	0.011	0.21
Carex blanda	Eastern Woodland Sedge	6–18	M J	0.006	0.03	0.007	0.04
Carex brevior	Shortbeak Sedge	12–24	J J	0.047	0.53	0.062	0.69
Carex comosa	Longhair Sedge	24–42	J	0.024	0.27	0.031	0.35
Carex cristatella	Crested Sedge	12–36	J J A	0.017	0.83	0.022	1.08
Carex granularis	Limestone Meadow Sedge	6–24	M J	0.021	0.41	0.027	0.53
Carex grayi	Gray's Sedge		M J J A	0.018	0.01	0.023	0.02
Carex grisea	Inflated Narrow-leaf Sedge	6–24	M J	0.012	0.05	0.015	0.07
Carex haydenii	Hayden's Sedge		J J A	0.005	0.06	0.006	0.08
Carex hystericina	Bottlebrush Sedge	10–36	J	0.041	0.89	0.053	1.16
Carex lacustris	Hairy Sedge		M J J	0.005	0.03	0.007	0.05
Carex molesta	Troublesome Sedge	12–36	J J	0.049	0.46	0.064	0.60
Carex pellita	Woolly Sedge	6–36	J	0.006	0.03	0.007	0.04
Carex retrorsa	Knotsheath Sedge	6–36	J J A	0.026	0.19	0.034	0.24
Carex scoparia	Broom Sedge	12–30	J J	0.019	0.52	0.025	0.68
Carex stipata	Awlfruit Sedge	12–36	J	0.023	0.32	0.029	0.41
Carex stricta	Upright Sedge	24–48	J J	0.004	0.08	0.005	0.11
Carex tribuloides	Blunt Broom Sedge	12–36	J	0.034	1.69	0.044	2.19
Carex trichocarpa	Hairyfruit Sedge		J J	0.011	0.07	0.014	0.09
Carex utriculata	Northwest Territory Sedge		J J	0.011	0.06	0.015	0.08
Carex vulpinoidea	Fox Sedge	12–36	J J	0.571	17.00	0.742	22.10
Echinochloa crus-galli	Barnyardgrass			0.956	2.88	1.243	3.74
Eleocharis acicularis	Needle Spikerush	1–12	J J A S	0.018	0.71	0.023	0.92
Eleocharis obtusa	Blunt Spikerush	2–10	J J A S O	0.016	1.06	0.021	1.38
Eleocharis palustris	Common Spikerush		M J J A	0.009	0.15	0.011	0.20
Elymus virginicus	Virginia Wildrye	12–48	J A	1.043	2.13	1.356	2.77
Glyceria grandis	American Mannagrass	36–54	J J A S	0.038	1.12	0.050	1.46
Glyceria striata	Fowl Mannagrass	12–36	J J A S	0.032	2.01	0.042	2.61
Hordeum jubatum	Foxtail Barley		J J A S	0.027	0.16	0.036	0.21
Juncus arcticus ssp. littoralis	Mountain Rush		M J J A	0.013	2.22	0.017	2.89
Juncus dudleyi	Dudley's Rush	8–24	J J A S	0.017	18.64	0.022	24.24
Juncus tenuis	Poverty Rush	6–18	J J A S	0.017	16.84	0.023	21.90
Juncus torreyi	Torrey's Rush	12–30	J A S O	0.009	7.73	0.012	10.05
Leersia oryzoides	Rice Cutgrass	24–54	J J A S O	0.049	0.48	0.064	0.62
Muhlenbergia mexicana	Mexican Muhly	12–30	A S	0.003	0.20	0.004	0.26
Muhlenbergia racemosa	Marsh Muhly	10–42	A S	0.019	0.61	0.024	0.79
Panicum virgatum	Switchgrass	36–66	J A S	0.764	6.24	0.993	8.11
Poa palustris	Fowl Bluegrass	12–42	J J A S	0.494	28.08	0.642	36.51
Schoenoplectus acutus	Hardstem Bulrush		J J A	0.010	0.09	0.013	0.12
Schoenoplectus pungens	Common Threesquare		J J A S O	0.012	0.05	0.015	0.07
Schoenoplectus tabernaemontani	Softstem Bulrush		J J A	0.047	0.54	0.061	0.70
Scirpus atrovirens	Green Bulrush	36–60	J J A	0.386	65.28	0.502	84.87
Scirpus cyperinus	Woolgrass	36–66	A S O	0.310	140.13	0.402	182.17
Scolochloa festucacea	Common Rivergrass		J J	0.010	0.08	0.013	0.11
Spartina pectinata	Prairie Cordgrass	36–84	J A S	0.057	0.28	0.074	0.37
Sphenopholis obtusata	Prairie Wedgescale		J J A	0.039	1.09	0.050	1.42

Scientific Name	Common Name	Height	Bloom Season	Drill Rate (PLS)		Broadcast Rate (PLS)	
		in	Apr – Oct	lb/ac	seeds/sq ft	lb/ac	seeds/sq ft
Substitions							
Carex annectens	Yellowfruit Sedge	18–30	J A	0.000	0.00	0.000	0.00
Carex buxbaumii	Buxbaum's Sedge	9–30	M J	0.000	0.00	0.000	0.00
Carex prairea	Prairie Sedge		J J	0.000	0.00	0.000	0.00
Eleocharis erythropoda	Bald Spikerush		M J J A	0.000	0.00	0.000	0.00
			Grass, Sedge & Rush Total	**6.967**	**339**	**9.057**	**441**
Forbs							
Acorus americanus	Sweetflag		M J J	0.045	0.09	0.058	0.11
Alisma subcordatum	American Water Plantain		J J A S	0.129	2.85	0.168	3.71
Anemone canadensis	Canadian Anemone	12–18	M J	0.002	0.01	0.002	0.01
Apocynum cannabinum	Indianhemp		M J J A	0.001	0.01	0.002	0.02
Asclepias incarnata	Swamp Milkweed	12–48	J J A	0.044	0.10	0.057	0.12
Asclepias speciosa	Showy Milkweed		J J A	0.046	0.08	0.060	0.10
Astragalus canadensis	Canadian Milkvetch	12–40	J J A	0.173	1.05	0.225	1.37
Bidens cernua	Nodding Beggartick	6–42	J J A S	0.003	0.01	0.004	0.02
Bidens frondosa	Devil's Beggartick		A S O	0.003	0.01	0.004	0.01
Boltonia asteroides	White Doll's Daisy	36–54	A S O	0.109	5.16	0.142	6.71
Cicuta maculata	Spotted Water Hemlock	36–72	J J A S	0.003	0.01	0.004	0.02
Doellingeria umbellata	Parasol Whitetop	24–72	J A S	0.001	0.02	0.001	0.03
Epilobium coloratum	Purpleleaf Willowherb	12–36	J A S	0.001	0.08	0.001	0.10
Eryngium yuccifolium	Button Eryngo	24–54	J A S	0.041	0.11	0.054	0.15
Eupatorium perfoliatum	Common Boneset	24–48	J A S	0.002	0.10	0.002	0.13
Euthamia graminifolia	Flat-top Goldentop	12–48	J A S	0.001	0.07	0.001	0.09
Eutrochium maculatum	Spotted Joe Pye Weed	24–96	J A S	0.002	0.06	0.002	0.08
Galium boreale	Northern Bedstraw	12–30	J J	0.001	0.02	0.001	0.02
Gentiana andrewsii	Closed Bottle Gentian	12–24	A S O	0.001	0.11	0.001	0.15
Geum aleppicum	Yellow Avens		J J A	0.001	0.01	0.002	0.01
Helenium autumnale	Common Sneezeweed	24–54	A S O	0.118	3.96	0.153	5.14
Helianthus grosseserratus	Sawtooth Sunflower	36–156	A S O	0.001	0.01	0.002	0.01
Heracleum maximum	Common Cowparsnip		J J	0.234	0.37	0.304	0.48
Hypericum ascyron	Great St. Johnswort		J A	0.095	8.25	0.124	10.73
Iris versicolor	Harlequin Blueflag		M J J	0.003	0.00	0.003	0.00
Iris virginica var. shrevei	Shreve's Iris		M J J	0.003	0.00	0.004	0.00
Liatris pycnostachya	Prairie Blazing Star	24–54	J A S	0.003	0.01	0.004	0.02
Lobelia cardinalis	Cardinalflower	12–54	J A S	0.001	0.15	0.001	0.20
Lobelia siphilitica	Great Blue Lobelia	12–42	J A S O	0.001	0.35	0.001	0.46
Lobelia spicata	Palespike Lobelia	12–24	M J J A	0.001	0.18	0.001	0.23
Lycopus americanus	American Water Horehound	6–24	J A S	0.002	0.11	0.002	0.14
Lycopus asper	Rough Bugleweed	6–36	J J A S	0.026	0.55	0.034	0.71
Lythrum alatum	Winged Lythrum	12–48	J J A S	0.001	0.38	0.001	0.50
Mentha arvensis	Wild Mint	6–24	J A S	0.001	0.07	0.001	0.09
Mimulus ringens	Allegheny Monkeyflower	12–24	J J A S	0.054	56.62	0.071	73.60
Oligoneuron riddellii	Riddell's Goldenrod	12–36	A S O	0.002	0.06	0.002	0.08
Pedicularis lanceolata	Swamp Lousewort		A S	0.001	0.01	0.002	0.02
Penthorum sedoides	Ditch Stonecrop	6–24	J J A S	0.058	46.09	0.075	59.92
Phlox maculata	Wild Sweetwilliam	12–36	J J A	0.001	0.02	0.001	0.03
Physostegia virginiana	Obedient Plant	12–48	A S	0.001	0.01	0.002	0.01
Polygonum punctatum	Dotted Smartweed		A S	0.003	0.01	0.004	0.01
Pycnanthemum virginianum	Virginia Mountainmint	12–36	J J A S	0.002	0.12	0.002	0.15
Ranunculus sceleratus	Cursed Buttercup	6–24	A M J	0.002	0.09	0.002	0.12
Rudbeckia laciniata	Cutleaf Coneflower		J A S O	0.003	0.01	0.004	0.02
Rumex altissimus	Pale Dock		J J A	0.003	0.02	0.004	0.02
Sagittaria latifolia	Broadleaf Arrowhead		J A S	0.001	0.02	0.001	0.03
Scutellaria lateriflora	Blue Skullcap	12–30	J A S	0.001	0.03	0.001	0.04
Silphium perfoliatum	Cup Plant	36–84	J A S	0.051	0.06	0.066	0.07
Sium suave	Hemlock Waterparsnip	24–60	J A S	0.001	0.02	0.002	0.02
Solidago gigantea	Giant Goldenrod		A S	0.001	0.03	0.001	0.04

Scientific Name	Common Name	Height	Bloom Season	Drill Rate (PLS)		Broadcast Rate (PLS)	
		in	Apr – Oct	lb/ac	seeds/sq ft	lb/ac	seeds/sq ft
Sparganium eurycarpum	Broadfruit Bur-reed		J J A	0.081	0.01	0.105	0.01
Symphyotrichum lanceolatum	White Panicle Aster	12–60	S O	0.001	0.05	0.001	0.06
Symphyotrichum novae-angliae	New England Aster	36–72	A S O	0.002	0.07	0.002	0.09
Symphyotrichum puniceum	Purplestem Aster		A S O	0.001	0.04	0.001	0.05
Teucrium canadense	Canada Germander	24–42	J A S	0.001	0.01	0.002	0.01
Thalictrum dasycarpum	Purple Meadow-rue	24–72	J J	0.003	0.01	0.004	0.02
Verbena hastata	Swamp Verbena	12–66	J A S	0.110	4.98	0.143	6.48
Vernonia fasciculata	Prairie Ironweed	18–60	J A S	0.033	0.25	0.043	0.32
Veronicastrum virginicum	Culver's Root	36–66	J J A	0.001	0.25	0.002	0.32
Zizia aurea	Golden Zizia	12–24	A M J	0.182	0.88	0.237	1.14
Substitions							
Alisma triviale	Northern Water Plantain		J J A S	0.000	0.00	0.000	0.00
Helianthus giganteus	Giant Sunflower		J A S	0.000	0.00	0.000	0.00
Verbena urticifolia	White Vervain		J J A S O	0.000	0.00	0.000	0.00
			Forb Total	**1.697**	**134**	**2.206**	**174**

SEED MIX TOTAL	**8.664**	**473**	**11.263**	**615**