

# **Appendix D**

## **Vegetation Management Plan**

**Louise Solar Project**  
Mower County, Minnesota

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# Vegetation Management

## Louise Solar Site

Barr Engineering

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### I. Project Objectives for Vegetation Establishment

Louise Solar will establish a perennial site cover that prevents erosion, improves water infiltration, reduces runoff, promotes soil health and provides habitat and forage for pollinators. In coordination with MDA and local farmers and ranchers, Louise Solar will explore opportunities for co-location of agricultural activities including grazing and haying. Louise Solar anticipates vegetation will be fully established within three to four years, at which point the areas of the site planted with pollinator friendly seed mixes will achieve a score of 70% or better on the MN Habitat Friendly Solar Site Assessment Form for Project Planning.

The overall means for which vegetation will be established and maintained include:

- Following an adaptive management approach that includes periodically monitoring vegetation establishment success as well as the results of maintenance activities.
- Developing and implementing annual written site management plan that will be updated until the sites reach final restoration.
- Managing noxious weeds as per Minnesota Statutes, sections 18.75 to 18.91.
- Managing invasive species through mowing and herbicide application.
- Herbicide use for weed control will be limited to protect pollinators, water and soil quality.
- Providing opportunities for grazing.

### II. Vegetation Installation Plan

Custom seed mixes developed for the project (in development) will be planted after all solar equipment has been installed. Details for planting will be described in the Planting Plan for the site (in development). These seed mixes are designed to be used with the vegetation management practices of mowing, grazing, and selective herbicide application. If any seed is unavailable, seed substitutions by the Contractor will be discussed with the Owner, and the Contractor shall receive written authorization for any changes prior to the start of work.

At the time of seeding all seed mixes will adhere to the specifications described in the Planting Plan. Genetic source origin of all native seed shall be from within a 150-mile radius of the site, as available. Species shall be true to their scientific name. Seed tags of the order will be provided to the Owner prior to installation. If planted in the spring, seeds shall have been properly stratified and/or scarified to break seed dormancy. All legumes shall be inoculated with proper rhizobia at the appropriate time prior to planting.

The protocol for installing seed mixes shall be dependent on the time of the completion of construction with variation in associated cover crops as follows:

- If construction is completed in **spring**, shall occur when the soil is free of frost and in a workable condition but no later than June 30. Seed mixes shall include 20 pounds per acre pure live seed (PLS) of oats as a cover crop.
- If construction is completed in **summer**, seeding shall occur between July 1 and August 15. After construction is completed the site shall be seeded immediately with 15 pounds per acre PLS of oats and 15 pounds per acre PLS of annual wheat to stabilize the soil and prevent erosion.
- If construction is completed in **late summer or early fall**, seeding shall occur between August 16 and October 31, the site shall be seeded immediately after construction with 20 pounds per acre PLS of winter wheat to stabilize the soil and prevent erosion.

- If construction is completed in **late fall**, seeding shall occur after November 1 but before the soil starts to freeze, seed mixes shall include 30 pounds per acre PLS winter wheat to provide a cover crop for the following year. Fall dormant seeding occur after soil temperatures fall below 50 degrees Fahrenheit for a consistent period of time. If agreed to by both the Owner and the Contractor, a spring seeding the following year can be substituted for a fall dormant seeding after a late fall completion of construction. If a cover crop has already been installed during the calendar year, seed mixes must be installed the same year with a fall dormant seeding.

Seeding may be conducted with a seed drill (preferred) and/or by broadcast seeding. The Contractor shall evaluate the site and determine which technique will produce the best results.

### **III. Adaptive Management**

Louise Solar Project will utilize an adaptive management approach for vegetation management. Adaptive management is an iterative process of decision making in the face of uncertainty, with an aim of reducing uncertainty over time via system monitoring. It is a systematic approach for improving resource management by learning from management outcomes including but not limited to:

- Vegetation impact on solar equipment
- Weed establishment
- Site cover establishment success

#### **Vegetation Monitoring**

The key to adaptive management is monitoring vegetation during the growing season (May-October). To meet vegetation management goals frequent site evaluations are critical during the first three years of vegetation establishment. Monitoring will be useful in identifying issues, tracking progress, and reevaluating management needs.

A Site Evaluation and Vegetation Maintenance Plan for the site will be developed annually for the first three years to include:

- Issues observed with vegetation establishment
- Proposed management activities
- Schedule of management activities
- Issues with stormwater management
- Issues with soil management

The annual Site Evaluation and Vegetation Maintenance Plan will be prepared by an experienced plant community restoration company. This planning process will allow for management decision making based on learning from previous management outcomes. The process is flexible and allows for alternative management actions based on site conditions at the time. Vegetation monitoring will be differentiated between an establishment phase (1-3 years) and a maintenance phase (3+ years):

#### *Establishment Phase (1-3 years) for Pollinator Seed Mixes*

Vegetation management and monitoring will be more intensive during the first few years of vegetation establishment. Monitoring will occur approximately every 4-6 weeks during the growing season by a qualified plant community restoration ecologist until final vegetation establishment goals have been achieved. An email with the updated annual Site Evaluation and Vegetation Maintenance Plans will be submitted to EDF Renewables approximately every 4-6 weeks during the growing season and will contain the items listed above.

#### *Establishment Phase (first year) for Pasture Seed Mixes*

Vegetation management and monitoring will be more intensive during the first year of vegetation establishment. Monitoring will occur approximately every 4-6 weeks during the growing season by a qualified grazing specialist until final pasture establishment goals have been achieved. An email with the updated annual Site Evaluation and Vegetation Maintenance Plans will be submitted to EDF Renewables approximately every 4-6 weeks during the growing season and will contain the items listed above.

### *Maintenance Phase (3+ years)*

The project will likely transition to the maintenance phase after year 3. This determination will be made as management needs are reduced, including ongoing noxious weed pressure, tree growth, plant health, and other factors influencing long-term vegetation success. Monitoring will transition into the maintenance phase once the vegetation establishment goals have been achieved. The frequency of monitoring visits and reporting will be re-evaluated during this phase.

### **Vegetation Management Priorities**

Management efforts will focus on the successful establishment of pollinator friendly species where pollinator plantings occur and on vigorous pasture establishment where grazing is to occur. The solar sites exist within an anthropogenic landscape of non-native weeds and agriculture. Neighboring non-native plants will continually be a source of weed seed for the solar sites as seed is blown or washed onto the site. Some weeds may provide long-term competition, but many others will be outcompeted as seed mixes establish. In general, control efforts will focus on perennial, rhizomatous (spreading by root system) weeds that can quickly dominate a site, such as Canada thistle, spotted knapweed, and common tansy which will be managed by both mowing and spot treatments of herbicide. Healthy plantings will (generally) out compete annual weeds quickly. Annual weeds will be managed through mowing and/or grazing where appropriate. If large noxious weed infestations occur requiring boom spraying, the area(s) will be subsequently reseeded.

Non-native, cool season grasses such as Kentucky bluegrass, smooth brome or reed canary grass may establish. These grasses will not be controlled because they meet the project vegetation establishment goal of creating a perennial vegetative cover under the arrays while minimizing herbicide use. These plant species are low growing, respond well to mowing, and create a complete groundcover. Some naturalized weed species, such as dandelion, mustards, and clovers, are also non-native but provide pollinator habitat and other ecosystem services such as soil decompaction and nitrogen fixation. These species will not be controlled.

### **Vegetation Management Techniques**

A variety of management techniques may be implemented on the Louise Solar Project site. They will be selected based on the adaptive management decision making process. The techniques described below will be identified by qualified plant ecologists during monitoring site visits and implemented as necessary. All weeds on the MN Noxious Weed List and the relevant county Noxious Weed Lists will be managed per the weed designation category of the list, i.e., eradicate or control.

#### **Mowing**

Mowing may be used when vegetation reaches a height of approximately 20 inches. The vegetation will then be mown to a height of 6-8 inches from the ground. The most effective mowing height and timing, however, is species dependent. Some species are best mown at 36 inches and others at 12 inches depending on their reproductive morphology. For best results, weeds are mown when they are flowering or about to flower. Adaptive management will allow managers to be flexible in mowing height, timing, and location.

Wet areas pose challenges for mowing because water limits access and also increases the risk of mowing equipment damaging the soil and potentially destroy plants through rutting. Therefore, mowing in low areas will occur only when conditions are dry, or mowing may be avoided altogether. Periodic onsite evaluations will determine wet area mowing regimes. Weed whipping may be used to protect solar equipment from exuberant vegetation growth to maintain safe and efficient array operation. This will be directed by the Owner.

#### **Grazing**

Grazing can provide a natural approach to weed management (compared to herbicides and mowing) and may allow for better control of weeds where vehicle access is limited either due to saturated soils (spring

and after large rain events) or because of permanent structures (under arrays, around poles, and near buildings). This management technique will require contracting with a local farmer to provide the sheep and manage the grazing.

Sheep may be used experimentally where grazing may prove to be a more viable long-term management strategy. Site-specific grazing plans will be developed where grazing will be used that will include information on the stocking rate, pasture rotation, and water placement if a sheep farmer is available for contracting.

#### Herbicide Treatment

Herbicides are an effective weed management tool. Their use will be employed where it is determined that mowing alone will not accomplish perennial weed control. Specific herbicides will be carefully selected to target noxious weed species needing control considering their extent of growth. Directions on the herbicide label will be carefully followed and will not be broadcast sprayed. Herbicides will be limited to cool season application; spring and fall. Only Minnesota-licensed Pesticide Applicators will apply herbicides on the Louise Solar Project site.

#### Supplemental Seeding

Supplemental seeding may be necessary where vegetation establishment has not been successful. Seed failure can occur for a variety of reasons from soil conditions to flooding to competition. It may be necessary to adjust the seed mix species to best fit the growing conditions of an area. The restoration contractor will work with the Owner to choose the appropriate seed mix for seeding temporarily disturbed areas (such as excavating or trenching required for repair or maintenance work) after all construction activity has been completed. If areas need to be continually impacted by maintenance activities (such as travel paths), they may be seeded with species that can tolerate a higher level of disturbance.

### **Soil Management**

#### Erosion Control

Standard erosion control techniques will be used as necessary to address erosion and to stabilize disturbance areas. Establishment of a cover crop is the preferred erosion control method; oats or winter wheat will be sown as appropriate. Erosion control best management practices will be used as necessary when seeding disturbed areas. The methods or practices selected will be appropriate for the level of disturbance and expected runoff volumes. Additional erosion control methods may include:

- Hydromulch, such as bonded fiber matrix, for areas where quick stabilization is necessary
- Erosion control blankets with a minimum 6-month service life
- Disc anchored straw
- Sediment control logs
- Silt fence

#### Compacted Soils

If soils are determined to be compacted and result in poor vegetation growth, tilling to a depth of four inches or ripping, if safely away from buried utilities, may be performed. Over time, freeze/thaw cycles and plant roots introduce porosity to the soil.

#### New Spoil Piles

Future work may create topsoil and subsoil spoil piles. When necessary, excess subsoils will be segregated and capped with topsoil and seeded. Subsoil may also be moved offsite and disposed of according to state and local law. Topsoil piles will either be seeded or spread out onsite and seeded. Topsoil piles will not be removed from the sites.