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To: [Melissa Schmit](#)
Cc: [Warzecha, Cynthia \(DNR\)](#); [Joyal, Lisa \(DNR\)](#); [Benage, Megan \(DNR\)](#)
Subject: Elk Creek Solar
Date: Friday, March 15, 2019 11:10:56 AM
Attachments: [image003.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)
[FinalPrairie-SolarTechGuidanceMarch2016.pdf](#)
[CompleteDNRCommercial_SolarSiting_GuidanceFebruary242016.pdf](#)

Melissa:

Thanks for providing the letter and information concerning the proposed Elk Creek Solar project. Following are the MNDNR preliminary review comments.

- 1) The DNR Commercial Solar Siting Guidance document (attached) should be reviewed for our standard recommendations.
- 2) The project site has a significant amount of surface drainage and farmed wetlands. Numerous other solar projects have run into major construction issues due to surface runoff, water retention in farmed wetlands, and wet soils. The conditions resulted in construction delays (trenches filled with water, stuck vehicles, rutting, road mud, erosion), wetland impacts, and increased costs. Construction should be planned for July/August/September in order to reduce the likelihood of construction problems. Establishing a cover crop several months ahead of construction can stabilize soils ahead of construction and minimize problems.
- 3) Our agency recommends that a diverse mix of native species be established to stabilize the soil and provide long-term pollinator habitat. See the attached guidance document.

Thanks

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Prairie Establishment & Maintenance Technical Guidance for Solar Projects

Minnesota Department of Natural Resources

March 18, 2016

Introduction

This is a technical guidance document for Prairie Establishment and Management of pollinator-friendly native seed plantings at solar sites. The document provides technical guidance that supports the Minnesota Department of Natural Resources (MNDNR) Commercial Solar Guidance. The goal of this document is to provide a brief, plain language overview of the benefits, establishment, and maintenance guidelines for creating a pollinator-friendly prairie planting at solar sites. It can also be used to develop the Agriculture Impact and Vegetation Management Plans that are required as part of the Public Utilities Commission Site Permit. Additional references that contain more specific planting and maintenance details are included at the end of the document.

The MNDNR is available to provide assistance to solar developers throughout the project planning, construction, and post-planting maintenance. A general course of action for using this guidance would be for a solar company to read this guidance document, work with a native seed company to develop the native seed mix(es), and provide the mix, planting layout, and maintenance specifications to the MNDNR for review and comment.

Why Establish Pollinator-Friendly Plantings?

Prairie communities occur in open landscapes with plants that are dominated by a diversity of grass and forb (wildflower) species. Prairie communities vary from site to site due to differences in slope (hills vs lowlands) and soil types. Prairie seed mixes include a diversity of flowering plants that are both pleasing to the eye, and provide excellent wildlife food and habitat for a variety of species.

Creating a pollinator-friendly prairie planting at solar sites can:

- Provide food and habitat for butterflies, bees, and insects that pollinate flowering forbs and some commercial agricultural crops.
- Provide food, cover, and nesting habitat for some species of mammals, birds, reptiles, and amphibians.
- Significantly reduce wind and surface water erosion.
- Significantly reduce fertilizer, herbicide, and pesticide applications that will result in improved water quality.
- Increase organic matter and water holding capacity of soils. The result is higher quality soils for farming when the site is decommissioned.
- Improve the aesthetic look of the solar facility.

Seed Mix Cost

Native seed mixes in general cost more than non-native seed mixes. However, the higher seed cost can be offset by:

- No fertilizer applications are needed prior to planting.
- Limited use of mulch or using erosion control blankets only on the steepest banks and highly erodible areas. Temporary cover of 20 lbs/acre of oats is recommended to stabilize the soil.
- Only a limited amount of fertilizer is used post-planting for sites with very poor soils or limited amounts of soil.
- Watering recently established native seed plantings is not necessary except in years of extreme drought.
- Participating in trading prairie acres as carbon credits.

Seed Mix Development

Prairie seed mixes can be adapted to include only low-growing species that will not shade the solar panels or cause undue harm to their primary purpose—creating clean, renewable energy. Prairie plantings have both an establishment and a long-term maintenance phase. The establishment phase takes approximately 1-3 years. Long-term maintenance will begin in years 4-5 and continue for the life of the planting. The first year of growth is primarily for root development. In the second and third year of establishment the above ground growth and flowers are more prevalent as the stand matures.

There are many options when developing a native seed mix. MNDNR has laid out a framework that solar companies should consider when working with a native seed company to design a native seed mix.

Seed Source

To the extent possible, plant vegetation or sow seeds that are sourced from Minnesota using a high diversity of species. Seeds should first be sourced from areas with similar site conditions that are native to the county or adjacent county where the project is being constructed. Using local seed protects existing native prairies from genetic contamination and the spread of invasive/noxious species. Plants brought from different areas with significantly different climatic conditions may also not produce viable seed. If local seed isn't available, follow the seed sourcing sequence in the MNDNR Seed Collection and Deployment Zones document, which can be found in Appendix A. This guidance document should be provided to the native seed company that is developing the project seed mix.

Seed Specification/Diversity

Diversity, meaning a variety of plant species in one place, is key to a planting's success. The more diverse a planting is the better chance it has at long-term health and self-sustainability which translates to lower management costs. Over the years, there will be variations in invasive species pressure, soil conditions, and climate such as extreme drought or extreme moisture. Having a diversity of plants ensures that more species are able to adapt to these extremes and can therefore respond to changing environmental conditions.

Pollinator seed mixes should include:

- Seed mixes that have a seeding rate of 30-50 seeds/sq. ft. with forb species making up approximately 40% of the total seeding rate.
- 7 or more native grass/sedge species with at least 2 species of bunchgrass.
- 20 or more native forbs with at least 5 species in each bloom period: Early (April-May), Mid (June-August), and Late (August-October).
- Plant species going under panel arrays should have a maximum height of 3 feet.

Grass only seed mixes:

- Seed mixes should have a seeding rate of 30-50 seeds/sq ft.
- 7 or more native grass/sedge species with at least 2 species of bunchgrass.
- Plant species going under panel arrays should have a maximum height of 3 feet.

Wetland/ Farmed wetland seed mixes to be used outside of panel areas:

- Work with a native seed company to select the appropriate State Seed Mix or develop a custom seed mix using the State Seed Mix Guidance as a template.

We generally recommend not including tall warm season grasses (big bluestem-*Andropogon gerardii*, Indian grass-*Sorghastrum nutans*, switchgrass-*Panicum virgatum*) in seed mixes at solar sites. The tall warm season grass height and density may interfere with operations or dominate the stand and outcompete the shorter stature species. If tall warm season grasses are used then they should comprise less than 5% of the total seed mix.

*Please note that state-listed species (endangered, threatened, or special concern) seed should not be included in any of the mixes.

Visual Screening

If visual screening is being considered for the project site, native flowering shrubs can be planted around the perimeter to both fulfill this consideration and supplement early-blooming species requirements. Suitable shrubs may include: red-osier dogwood (*Cornus sericea*), gray

dogwood (*Cornus racemosa*), pagoda dogwood (*Cornus alternifolia*), American wild plum (*Prunus americana*), chokecherry (*Prunus virginiana*), and New Jersey tea (*Ceanothus americanus*). Shrub selection should be based on site conditions and species native to the county or adjacent county where the project is being constructed.

Visual screening using tree species should follow the shrub selection criteria above. Use of tree species in the open landscapes of Minnesota should be used only when required by a permit or to address adjoining landowner concerns. Companies should not plant invasive tree species. Eastern red cedar (*Juniperus virginiana*), while a native species, should not be selected for solar sites as it competes with prairie vegetation and spreads aggressively.

Planting Layout Recommendations

Appendix B includes a schematic of planting options and an example seed mix. The example seed mixes are short in stature and have some shade tolerance for species planted under the panels. The seed mixes may need to be modified to include species that naturally occur in the geographic area of the project and are suitable for the soil and site conditions.

There are 3 basic layout options that should work for the majority of solar sites and they are as follows:

- Option 1. Whole site planted with pollinator seed mix (grasses and forbs).
- Option 2. Grass only mix planted underneath solar panels. In between rows and perimeter planted with pollinator mix.
- Option 3. Grass only mix planted underneath and between solar panels. Perimeter planted to a pollinator mix.

Plant species chosen for areas under the panels should have a maximum height of 3' so that they do not interfere with solar operations. Taller species can be used in perimeter pollinator plantings or in between panel rows. Shading of the panels should not be an issue when using some taller species because most of the mass of prairie plants is in the lower portion of the plant, with the majority of the height being in the flower stalk.

Planting Specifications

Planting Method: Drilling, Broadcasting

MNDNR recommends that planting occur post-construction of the panels. Attempting to plant after grading and before post and panel installation will result in poor soil to seed contact due to equipment maneuvering. A temporary cover of 20 lbs/acre of oats can be used as erosion control and site stabilization until construction is complete and the prairie seed mixes are planted.

Grasses/sedges should be broadcast seeded in the grass only areas and the pollinator mix (forbs and grasses) drilled into the remaining areas. The key to stand success is to maximize seed to soil contact during planting. If drilling is the planting method, seed drills designed specifically to

plant prairie grasses and flowers should be used. If broadcasting is the planting method, native-seed broadcasters, e.g., Vicon seeder, should be used as they are adapted to spread mixes with different sized seeds. For more information about planting methods, please refer to [A Prairie Restoration Handbook for Minnesota Landowners](#) under the 'Planting your Prairie section'.

Timing

Growing season plantings should occur from May 1-July 1 when the soil temperature is at least 60 degrees F or higher. Frost seeding should occur after October 15 in the northern half of the state and after November 1st in the southern half of the state or after soil temperatures fall below 50 degrees F for a consistent period of time, but before soils freeze. Seeding rates may need to be increased by 25% for frost seeding due to lower germination rates and loss of seed that is consumed by wildlife over the winter months.

Planting dates will vary depending on the weather in a particular year and where the planting site is located, e.g., Northern Minnesota vs. Southern Minnesota. Consult with native seed suppliers to determine the best planting dates for that year.

Temporary Cover

A temporary cover should be used with the planting to help suppress weeds and stabilize the soil until the prairie planting becomes established. A temporary cover of 20 lbs/acre of oats is used in the example seed mixes found in Appendix B.

Establishment and Maintenance Specifications

Prairie establishment in the first 2-3 years involves spot-spraying or mowing of invasive weeds. Removal of the invasive weeds will allow for the prairie plantings to become established and help prevent future weed growth.

Spot-Mowing

Spot-mowing involves mowing only in the areas with invasive or noxious plants. Spot-mowing slows the aggressive and fast growing invasive plants and allows the native species to become established. Spot-mowing should be done at a raised height (>5") in order to target the invasive plants and to not damage the native species, especially during the establishment period. Spot-mowing for control of invasive or noxious weeds can be done every year to ensure planting health—even during establishment years. Care should be taken to avoid repeated mowing, which can cause the planting to fail. A list of noxious/invasive weed species that should be eradicated can be found at the Minnesota Department of Agriculture's website: <http://www.mda.state.mn.us/plants/pestmanagement/weedcontrol/noxiouslist.aspx>.

Spot-Spraying

Spot-spraying should target only noxious/invasive weed species. A licensed applicator should be hired to apply the appropriate selective herbicide. Plantings that include both grasses and forbs should not be broadcast-sprayed. [The Midwest Invasive Plant Control Database](#) provides a compilation of control methods for many common invasive plants.

In order to prevent inadvertent spraying of the prairie, it may be advantageous to be placed on the local do not spray list. This will help prevent damage to your prairie planting.

Long-Term Maintenance

Long-term prairie maintenance usually begins in years 4-5 by introducing disturbance into the planting. Prairie habitats thrive on disturbance. Disturbance allows them to renew themselves while also slowing natural succession (keeping the prairie from becoming a forest). Plan on haying/mowing, burning, or spraying to remove any unwanted trees/shrubs that may be present. It is not necessary to use all of these options, just one or two, depending upon the planting's progression and operational concerns. Since burning is most likely not an option at solar sites, introducing a rotation of haying/mowing would be an excellent option. After completing the selected maintenance activity in year 4-5, you will need to repeat this type of maintenance approximately every 2-3 years, depending on tree/shrub encroachment, ratios of grasses to forbs, presence of noxious weeds, and overall planting health.

Haying/mowing should be done at a raised height of 5" or higher in the month of October or when prairie plants have gone dormant. Haying or mowing below 5" in height can damage the long-term health of the planting. Hayed/mowed vegetation should be bagged and removed off site to prevent smothering new growth. Haying/mowing equipment should be cleaned prior to use on site to prevent the spread of non-native and invasive species into the planting.

With any management activity it is very important to establish refugia (undisturbed areas). These areas play an important role in pollinator conservation and allow for the completion of pollinator life cycles. No more than 1/3 of the site should be hayed/mowed each year. The same 1/3 should not be hayed/mowed in consecutive years. If possible, 10% of the site should be set aside as semi-permanent refugia that receives limited haying/mowing on a longer return interval of 15 years. For more information about refugia, consult the [MNDNR's Pollinator Best Management Practices and Habitat Restoration Guidelines](#).

Prairie Seed Suppliers and Restoration Companies:

MNDNR recommends you work with a company(s) that specialize in native seed and installing/maintaining prairie restoration projects. Companies should be selected who are experienced and have a history of successful prairie restoration projects. There are several commercial companies that can be easily found through an internet search. A list of native seed suppliers can be found by visiting the [MNDNR's Landscaping with Native Plants webpage](#).

Commercial Solar Siting Guidance

Minnesota Department of Natural Resources

February 2016

Introduction

Minnesota Governor Mark Dayton signed into law an omnibus economic development bill in 2013 that included the Solar Energy Jobs Act (Act). A provision of the Act was the establishment of Minnesota Statute 216B.1691 that requires large utility companies to generate 1.5 percent of their electricity from solar sources by 2020. The Statute has generated an influx of commercial solar projects being proposed throughout Minnesota. This document is intended to help commercial solar developer's site projects in locations that minimize impacts to natural resources. For this document, "commercial solar" is defined as ground mounted photovoltaic solar systems that create electricity that is sold to other users. Additional guidance will be needed if other types of large scale commercial solar systems (e.g., concentrated solar) are proposed in Minnesota.

Large electric power generating plants that are 50 megawatts (MW) or greater need a site permit from the Public Utilities Commission (PUC) according to Minnesota Statute Chapter 216E. Projects less than 50 MW typically need a conditional use permit (CUP) from the local government unit (LGU). Locally reviewed projects include Community Solar Gardens, which may be up to 1 MW with a maximum of 5 projects being co-located (5MW total). Community Solar Gardens are permitted at the county/township/city level through local land use ordinances, which typically require a CUP. The Minnesota Department of Natural Resources (MNDNR) provides comments and guidance to the PUC and LGU's. A MNDNR permit for the taking of a threatened or endangered species, MNDNR License to Cross Public Lands and Waters, or a Public Waters Work Permit may be required for some projects.

Early Coordination

The MNDNR encourages all commercial solar developers to start the initial planning process by sending project information (cover page, map of project area, and GIS shapefiles of the project boundary) directly to the MNDNR Regional Environmental Assessment Ecologist (REAE), Division of Ecological & Water Resources. Transmission and collector lines, access roads, and temporary construction areas outside the project boundary should also be included with the information submitted. These same materials should be submitted to the Endangered Species Review Coordinator along with the Natural Heritage Information Data Request Form. Early coordination with the MNDNR benefits the solar industry by identifying potential issues for resolution early in the process. The MNDNR provides insight on where high value habitat is within a project area so the site proponent can consider this as they develop the project. Early coordination with the MNDNR REAE is especially important for Community Solar projects because project notification to the MNDNR is inconsistent due to the numerous LGU's involved with permitting. In order to avoid last minute issues, it is advisable to provide project information directly to the REAE during the preliminary planning phase of project development. Please contact the MNDNR REAE if you have questions or need additional information about siting commercial solar projects. The MNDNR REAE's address, email, and phone numbers can be accessed on the MNDNR website at:

http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html. Further coordination should also occur with the United States Fish & Wildlife Service (USFWS) concerning federal-listed species, bald eagles, conservation easements, and other issues that should be considered.

Identification of High Value Resources

Identification of high value resources early in the process allows the developer and MNDNR to work together to avoid and minimize potential impacts. Potential impacts include effects to native prairie, wetlands, state-listed species, or other valuable resources. The MNDNR can provide a preliminary review concerning high value resources prior to the developer acquiring or leasing the site. The preliminary review will help developers pursue sites that will be easier to develop and permit due to proper siting that avoids natural resource impacts.

The MNDNR has identified the following high value resources that should be identified and considered during project development.

Rare Species and Native Plant Communities

Minnesota endangered species law (Minnesota Statutes, section 84.0895) and associated rules (Minnesota Rules, parts 6212.1800 to 6212.2300 and 6134) prohibit the taking of endangered or threatened species without a takings permit. "Taking" for animals includes pursuing, capturing, or killing; and for plants includes picking, digging, or destroying. Surveys for rare species may be required in order to determine if the proposed project would result in a taking. Project planning timelines should take into account that some species can only be surveyed at specific times of the year.

Issues concerning rare features should be identified and resolved early in the siting process. To receive information regarding rare features and species in the vicinity of the proposed project, the developer should submit a completed Natural Heritage Information System (NHIS) Data Request Form (http://files.dnr.state.mn.us/eco/nhnrp/nhis_data_request.pdf). The Natural Heritage Review will identify known occurrences of rare plants, animals, and native plant communities in the vicinity of the project boundary. Please note that some NHIS data is available as GIS shapefiles and can be downloaded at no cost from the Minnesota Geospatial Commons at <http://gisdata.mn.gov>. These include the following shapefiles: MNDNR Native Plant Communities, Calcareous Fens, and MBS Sites of Biodiversity Significance. The MNDNR recommends avoidance of these significant natural areas and encourages the use of this data to identify areas within a project boundary that would not be appropriate for development. Please contact the Endangered Species Review Coordinator at 651-259-5109 for more information on the Natural Heritage Review process.

Native Prairie

Given the rarity of native prairies and the potential for state-listed species and other Species in Greatest Conservation Need (SGCN) to occur within native prairie habitat, the MNDNR recommends avoidance of all native prairie remnants. If avoidance is not feasible, rare species surveys may be required and will need to be coordinated with the MNDNR Endangered Species Review Coordinator (651-259-5109). The USFWS should also be contacted for their recommendations regarding native prairie.

Native prairie is grassland that has never been plowed and contains plant species representative of prairie habitats. In the mid-1800s, eighteen million acres of prairie covered Minnesota. Since then, more than 99% of native prairie has been destroyed, and the 1% that remains consists mostly of widely scattered fragments that are surrounded by agriculture and development. Due to the loss of this once widespread habitat, many species found only in prairie have become rare; more than one-third of Minnesota's endangered, threatened, and special concern species are dependent on the remaining small fragments of prairie.

Project proposers are encouraged to use the data collected by the Minnesota Biological Survey (MBS) as an initial screen to identify known locations of native prairie. MNDNR Native Prairies are available as GIS shapefiles that can be downloaded at no cost from the Minnesota Geospatial Commons webpage at: <https://gisdata.mn.gov/>. However, because this information is not based on a comprehensive inventory, there is the potential for native prairie to exist in the project area that is not included in these data sets. To better understand the potential impacts to native prairie and state-listed species, all grasslands or pasturelands within the project boundary that have not been previously plowed and that could be slated for development, including access roads and utilities, should be assessed by a qualified botanist or plant ecologist for the existence of remnant prairie. The MNDNR maintains a list of surveyors (available from the Endangered Species Review Coordinator) who are considered qualified to perform rare species surveys in Minnesota. Having a plant surveyor from this list perform the native prairie assessment will ensure that the surveyor will be able to obtain a collection permit if rare plant surveys are also needed. The MNDNR should be contacted to discuss potential surveyors, survey protocol, and other requirements before any work is initiated.

Wildlife Action Network, MN Wildlife Action Plan

The Wildlife Action Network is composed of mapped terrestrial and aquatic habitats, buffers, and connectors that represent a diversity of quality habitats that support SGCN. SGCN are defined as native animals whose populations are rare, declining, or vulnerable to decline and are below levels desirable to ensure their long-term health and stability. Also included are species for which Minnesota has a stewardship responsibility.

The Wildlife Action Network is made up of mapped habitat representing viable or persistent populations and "richness hotspots" of SGCN. Added to this information are other data on the relative condition of habitat including spatially prioritized and connected Sites of Biodiversity Significance, Lakes of Biological Significance, and Streams with "exceptional" Indices of Biological Integrity. The network is largely based on ground-truthed mapped habitats that represent a diversity of quality habitats that contain populations of SGCN. Consideration should be given to projects or activities that could result in the loss, degradation or fragmentation of habitat within the Wildlife Action Network. Habitat loss has been identified as a significant factor to SGCN population declines. The list of SGCN are available at: <http://www.dnr.state.mn.us/cwcs/index.html>. Detailed information concerning the richness hotspots and high value habitats that should be reviewed and considered during project development can be located on the MNDNR website.

Lakes, Wetlands, Streams and Rivers

Statewide and local government shoreland standards provide for the orderly development and protection of Minnesota's shoreland areas (lakes, wetlands, streams, and rivers). Local

government floodplain standards promote public health, safety and general welfare, in accordance with state and federal regulations. The LGU should be contacted by the developer regarding local shoreland and floodplain ordinances and their application to a proposed solar development. Local floodplain ordinances would not allow solar structures and related infrastructure within the “floodway” portion of the floodplain.

If your project site is located within the Lower St. Croix Scenic Riverway or Mississippi River Corridor Critical Area then you should contact the LGU for requirements associated with these areas. Additional information on these areas can be viewed at the following websites: http://www.dnr.state.mn.us/waters/watermgmt_section/wild_scenic/ws_rivers/stcroix_lower.htm and http://www.dnr.state.mn.us/waters/watermgmt_section/critical_area/index.html.

Project developers crossing (over, under, or across) any MNDNR administered state land or public water with any utility (power or transmission lines) need to apply for a MNDNR License to Cross Public Lands and Waters (Minnesota Statutes, section 84.415). Information and details on how to apply for a License to Cross can be found at: http://www.dnr.state.mn.us/permits/utility_crossing/index.html. For detailed information on where public waters are located in a project area, visit the following web site and click on the Public Waters Inventory (PWI) Maps Download button: http://www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps.html. Minnesota Geospatial Commons (<https://gisdata.mn.gov/>) contains numerous GIS layers that can be downloaded and used to identify recreational areas including: State Lands Administered by MNDNR or by Counties; Scientific and Natural Area Units; Boundaries, Publicly Accessible State Wildlife Management Areas; State Forest Statutory Boundaries and Management Units; State Parks, Recreation Areas, and Waysides; State Trails of Minnesota; Public Water Access Sites in Minnesota; and State Aquatic Management Area Acquisitions.

Minnesota Statutes, section 103G.245, subdivision 1, indicates that a MNDNR public waters work permit is needed to change or diminish the course, current, or cross section of public waters by filling, excavating, or placing materials in or on the bed of public waters. Minnesota Rule 6115.0170, subpart 37 defines a structure as any building, footing, foundation, slab, roof, boathouse, deck, wall, dock, bridge, culvert, or any other object extending over or under, anchored to, or attached to the bed or bank of a public water. A public water work permit is required for the placement of posts or other structures in public waters. Additional information concerning the public waters work permit process can be found at: <http://www.dnr.state.mn.us/permits/water/index.html>.

“The Minnesota Wetland Conservation Act (WCA) regulates wetland draining and filling and essentially covers all wetlands that are not listed as public waters. The definition of “fill” under the WCA generally excludes posts and pilings or structures traditionally built on pilings. However, posts and pilings are regulated as fill if they bring the wetland into a nonaquatic use or have the effect of significantly altering the wetland’s function and value. To the extent that solar panels constructed on posts or pilings in a wetland will adversely affect wetland vegetation through shading or maintenance needs or impact wildlife, particularly bird use of wetlands, solar installations may be regulated under the WCA. As a regulated activity, such projects would be required to demonstrate that wetland impacts have been avoided and minimized to the extent practicable and to compensate for any unavoidable impacts by restoring or creating other wetlands or by purchasing banked wetland mitigation credits.”

The MNDNR recommends that lakes, wetlands, streams, and floodplain be avoided in order to minimize project impacts. Avoiding these resources will reduce permitting costs and minimize damage to site infrastructure from flooding and ice damage.

The practice of surrounding natural wetlands with panels is not recommended as it will negatively impact wildlife use of the wetland. Some species will avoid the wetlands due to the structures, glare, vehicular traffic, and human disturbance.

Large Block Habitats

Large blocks of habitat (grassland or forest) can provide an increased diversity of species, higher species populations, and more resilient and complex ecological communities. A large block of habitat is a function of both acres and shape of the patch. Larger round or square blocks provide interior habitat that is more isolated from noise, pollution, parasitic birds, and predators associated with habitat edges. Locating solar projects in large blocks of forested or grassland habitat causes habitat loss and fragmentation that is detrimental to area-sensitive species. For example, habitat fragmentation is associated with decreases in population size and nesting success for area-sensitive species.

Large blocks (>40 acres) of grassland habitat in the project area should be identified. In many instances, blocks of grassland habitat will be in restored prairie, Conservation Reserve Program, Conservation Reserve Enhancement Program, or in conservation easements. The MNDNR recommends avoiding large blocks of grassland habitat during the solar siting process.

Forest interior habitat should be identified during project development. Forest interior habitat supports nesting and migratory stopover areas for area-sensitive species. Research suggests that area sensitive species tend to use forested areas at least 330 feet from the edge of the patch. The edge of the patch is where a break in the forest canopy occurs. Protecting interior habitat is important due to loss of this resource from habitat conversion for farming, transmission lines, pipelines, roads, other forms of development, and potentially solar projects. Fragmenting forest interior can result in a loss of habitat for area-sensitive species. The deforested area and extended fragmentation effects result in less desirable plant communities, increased levels of invasive species, changes to avian and predator species composition and populations, nest parasitism, and behavior changes. The MNDNR recommends avoiding forest interior habitat during the solar siting process.

For both grassland and forest large blocks of habitat, it is also recommended that wildlife corridors, areas that provide a natural corridor for wildlife to travel between habitats, be preserved and avoided. Maintaining wildlife corridors benefits species diversity and reduces fragmentation effects on species.

Public Conservation and Recreation Lands

Public lands provide a multitude of recreational opportunities such as: fishing, hunting, hiking, biking, bird watching, camping, boating, swimming, and educational opportunities. Public lands also provide a wide diversity of habitat that supports hundreds of species including: birds, bats, amphibians, insects, and plants.

During early project planning the developer should identify, federal, state, and local government lands in and within 1/4 mile of the project area boundary using existing geographical information from the MNDNR, USFWS, and local governments. Minnesota Outdoor Recreation System Units (Minnesota Statute 86A, Outdoor Recreation System) include state parks, state recreation areas, state trails, state scientific and natural areas, state wilderness areas, state forests, state wild & scenic rivers, state water access sites, state wildlife management areas, aquatic management areas, state historic sites, and other units should be identified. State water trail campsites, rest areas, and portages should also be identified even though they are not included in Minnesota Statute 86A. Federal Waterfowl Production Areas and refuges, national parks, county trails and parks, other public lands, and private conservation lands should also be identified.

It is the MNDNR's responsibility to seek avoidance, minimization, and mitigation for potential impacts to Minnesota Outdoor Recreation System Units. In addition, the MNDNR recommends further avoidance in order to minimize indirect wildlife and recreational impacts. The MNDNR may provide additional recommendations concerning wildlife or recreational resources near MNDNR administered lands based on a project-by-project review. State, federal, and non-profit conservation groups have expended a considerable amount of time and money to acquire and manage these properties for the conservation of natural resources and recreational use by the public. Minnesota Geospatial Commons (<https://gisdata.mn.gov/>) contains numerous GIS layers that can be downloaded and used to identify recreational areas including: State Lands Administered by MNDNR or by Counties; Scientific and Natural Area Units; Publicly Accessible State Wildlife Management Areas; State Forest Statutory Boundaries and Management Units; State Parks, Recreation Areas, and Waysides; State Trails of Minnesota; Public Water Access Sites in Minnesota; and State Aquatic Management Area Acquisitions.

Minnesota Rule 7850.4400, subpart 1 includes a list of prohibited sites where no large electric power generating plant may be located. Large electric power generating plants are defined as capable of operation at a capacity of 50 MW or greater (Minnesota Rule 4400.0200, subpart 10). The prohibited sites include: national parks; national historic sites and landmarks; national historic districts; national wildlife refuges; national monuments; national wild, scenic, and recreational rivers and their land use districts; state wild, scenic, and recreational rivers and their land use districts; state parks; nature conservancy preserves; state scientific and natural areas; and state and national wilderness areas.

Minnesota Rule 7850.4400, subpart 3 includes a list of site exclusions when alternative sites exist. No large electric power generating plant may be located in any of the following areas unless there is no feasible and prudent alternative. Economic considerations alone do not justify approval of these areas. The areas include; state registered historic sites; state historic districts; state wildlife management areas; county parks; metropolitan parks; designated state and federal recreational trails; designated trout streams; and the rivers identified in Minnesota Statutes, section 85.32, subdivision 1.

“School trust land” means land granted by the United States for use of schools within each township, swampland granted to the state, and internal improvement land that are reserved for permanent school fund purposes under the Minnesota Constitution, article XI, section 8, and land exchanged, purchased, or granted to the Permanent School Fund. Permanent university fund lands were granted to Minnesota by the United States for use and support of a state

university. The MNDNR manages the trust lands for maximum long-term economic return under sound natural resource and conservation practices. Potential exists to locate solar projects on trust lands in order to generate income. For more information about school trust lands go to: http://www.dnr.state.mn.us/aboutdnr/school_lands/index.html.

In general, developers should avoid MNDNR administered lands. Potential exceptions are trust lands and disturbed lands. Disturbed lands could include poorly reclaimed mine sites or other degraded areas. The DNR will review trust lands and disturbed lands on a project-by-project basis to determine if solar development is appropriate for the site. The DNR review will include identification of potential impacts to state-listed species, sites of biodiversity, wetlands, and other significant resources that may not be compatible with solar development. The value of mineral resources and other uses of the property will also be considered during the review.

Additional restrictions to development could also occur due to deed and funding restrictions that apply to certain parcels of MNDNR administered lands or to areas under easement.

Properties in Government Programs or with Conservation Easements

Solar projects are prohibited in Reinvest in Minnesota, MNDNR Native Prairie Bank, and Forest Legacy easements. The easement language prohibits the development of new structures within the area under easement. USFWS or private conservation easements may also have prohibitions on structures and should be reviewed with the holder of the easement. Statewide GIS (shapefiles) information on the location of Native Prairie Bank easements in relation to your project boundary can be requested from the Scientific and Natural Areas Program at <http://www.dnr.state.mn.us/prairierestoration/prairiebank.html>.

Design Considerations

Fencing

Fencing of a solar site has the potential to disrupt wildlife travel corridors. Project sites should be designed in a manner that does not disrupt significant wildlife travel corridors. Significant wildlife travel corridors are typically associated with streams, rivers, large wetlands, or other habitats. Fences can be modified to allow small openings for small animals to move in and out of the fenced area. Modified fencing for animal passage should only be used for specific sites on an as needed basis.

Fencing that will direct wildlife onto roads, especially high speed roads, should be avoided as it results in wildlife fatalities and creates a safety issue for the motoring public. The MNDNR will provide comments during project review of individual projects for when the use of fence setbacks from roads are warranted. The setback recommendation will be based on traffic volume and speed, as well as wildlife population levels in the area (primarily deer), and the presence of wildlife travel corridors.

The MNDNR recommends using 3-4 strand smooth fencing that is 4-5 feet high and does not use barbed wire. The use of a more open type of fencing allows wildlife to freely move in and out of the area. If chain link or woven wire fencing is used then that fencing should be 8-10 feet high to ensure that deer do not attempt to jump the fence. Barbed wire should not be used

at the top of the fence because deer can get entangled in the barbed wire. The result is injuries to the deer, fence repairs, and poor public relations for the operator of the solar project. An alternative design is to have a top guard that is angled out and upward at 45 degrees with 3-4 strands of smooth wire (no barbs) that would discourage trespassing. Solar developers should also review other applicable codes and standards that may influence the type of fencing that is used at a site.

Wildlife Friendly Erosion Control

Fatalities to snakes, birds, small mammals, and other wildlife occur when they get entangled in erosion control mesh. The MNDNR recommends the use of biodegradable wildlife friendly erosion control materials for highly erodible areas. Biodegradable materials tend to break down faster than photodegradable materials, especially when the area is shaded. The netting should be flexible rectangular shaped mesh (not square). The use of biodegradable mesh is most important when used in areas with state-listed species, and near wooded areas, wetlands, rivers, and lakes. Information on wildlife friendly erosion control can be found at: <http://files.dnr.state.mn.us/eco/nongame/wildlife-friendly-erosion-control.pdf>.

Panels

A limited number of facilities in other states have reported that birds or insects mistake the glare/polarized light reflection as water. Sporadic fatalities may occur to birds attempting to land on or within the panels. A few species of insects have been documented to simultaneously lay eggs on panels resulting in reproductive failure. Impacts can be minimized by using less reflective panels, or non-polarizing white grids between the panels to break up the polarized reflection of light. Another mechanism to reduce the potential for wildlife impacts is to place the panels away from water bodies. Solar developers should report any unusual wildlife events that occur on their site to the permitting authority and MNDNR REAE. The monitoring information could then be used to determine if a pattern of impacts is occurring that should be addressed.

Vegetation Management

An opportunity is available to manage vegetation at project sites as short-grass prairie, meadows, or other appropriate wildlife habitat. The MNDNR encourages solar developers to plant native seed that contains grasses and flowering forbs that are beneficial to wildlife, including pollinators. For additional information on establishing and maintaining prairie to benefit pollinators and other insects go to the following link: http://www.dnr.state.mn.us/pollinator_resources/index.html. The planting of common milkweed (*Asclepias syriaca*) can be especially beneficial to monarch butterflies (*Danaus plexippus*) since their life cycle relies upon milkweed plants for egg laying and larvae development. Please contact the MNDNR Regional Ecologist if you would like to discuss the establishment or management of prairie or other habitat at your solar site. Regional Ecologist contact information can be located on the MNDNR website at: http://dnr.state.mn.us/ecological_assistance/index.html.

Establishing restored prairie on previously farmed land can provide the following conservation benefits: improved water quality by reducing soil erosion, increased soil water retention,

improved soil composition and structure with the extensive root systems of prairie plants, reduced applications of fertilizer and herbicides, and habitat for pollinators and other wildlife.

The Minnesota Prairie Conservation Plan (Plan) provides a great resource that promotes the conservation of grasslands, native prairie, and wetlands. The Plan identifies prairie core areas and corridors for connectivity. Avoiding impacts to these resources and establishing prairie at solar sites is a step toward supporting the intent of the Plan. After decommissioning of a solar site, the landowner should consider placing the established prairie into a permanent conservation easement or sell the land to a conservation organization. The Plan can be viewed at: <http://www.dnr.state.mn.us/prairieplan/index.html>.

Invasive Species Control

Vehicles and heavy equipment can gather and transport plants and soil that can spread invasive plant seeds from one work site to another. The MNDNR recommends that all equipment be cleaned prior to transporting it to a new work site. This will help prevent the spread of unwanted invasive plants that can become established, outcompete native vegetation, decrease habitat quality, and increase invasive/noxious weed control costs. Controlling invasive plants is especially important if the developer intends to seed the site to native grasses and forbs. Information on equipment cleaning to minimize the introduction and spread of invasive species at your project site is available on the MNDNR website at: http://files.dnr.state.mn.us/natural_resources/invasives/terrestrialplants/equipment_cleaning_to_minimize.pdf.

Equal Opportunity Statement

Equal opportunity to participate in and benefit from programs of the MNDNR is available to all individuals regardless of race, color, creed, religion, national origin, sex, marital status, public assistance status, age, sexual orientation, disability or activity on behalf of a local human rights commission. Discrimination inquiries should be sent to Minnesota DNR, 500 Lafayette Road, St. Paul, MN 55155-4049; or the Equal Opportunity Office, Department of the Interior, Washington, D.C. 20240.

Alternative format available upon request.

Document Citation

Minnesota Department of Natural Resources Guidance for Commercial Solar Projects. 2016. Minnesota Department of Natural Resources. New Ulm, Minnesota, USA. 8pp.

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From: [Horton, Becky \(DNR\)](#)
To: [Melissa Schmit](#)
Cc: [Warzecha, Cynthia \(DNR\)](#)
Subject: Elk Creek Solar boundary update
Date: Friday, May 17, 2019 9:32:08 AM
Attachments: [image003.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)
[2019-05-13-Geronimo-ElkCreekSolar-ReviewRequest.pdf](#)

Hi Melissa,

Thank you for providing the DNR with the updated project boundary for the Elk Creek Solar project in Rock County.

In addition to the preliminary review comments provided by Kevin Mixon on March 15 of this year, I'd like to remind you to submit to DNR a Natural Heritage Information System (NHIS) request once a final project boundary has been determined. Information on how to submit an NHIS review request can be found on the [MN DNR NHIS website](#) (at the bottom of the webpage).

Kevin retired earlier this spring and I've been helping review energy projects in his work area. Please send me future documents related to this project.

Thanks,

Becky

Rebecca Horton

Region Environmental Assessment Ecologist | Ecological and Water Resources

Minnesota Department of Natural Resources

1200 Warner Road

St. Paul, MN 55404

Phone: 651-259-5755

Fax: 651-772-7977

Email: becky.horton@state.mn.us

mndnr.gov



Brie Anderson

From: Horton, Becky (DNR) <becky.horton@state.mn.us>
Sent: Friday, June 14, 2019 11:22 AM
To: Melissa Schmit
Cc: Warzecha, Cynthia (DNR)
Subject: RE: Elk Creek Solar Seed Mixes
Attachments: Elk Creek Seed Mixes 2019-06-05.docx

Hi Melissa,

Generally, the mixes looks good, we would recommend incorporating more early blooming plant species and more species overall for added diversity. However, we understand that you've been working with native prairie specialists to develop seed mixes that will have success at this particular site. The plan to incorporate a heavy grass mix to combat reed canary grass makes sense.

We recommend taking a look at [BWSR's Habitat Friendly solar Program website](#) which has a checklist for solar site pollinator habitat assessment. If you meet the requirements listed, the project could be added to the list of projects meeting requirements posted on the Board of Water and Soil Resources website and will be able to promote the array as a MN Board of Water and Soil Resources "Habitat Friendly Solar" project. The site assessment gives points for added species diversity and added seasons with blooming plants present, in addition to other components.

Thanks,

Becky

Rebecca Horton

Region Environmental Assessment Ecologist | Ecological and Water Resources

Minnesota Department of Natural Resources

1200 Warner Road

St. Paul, MN 55404

Phone: 651-259-5755

Fax: 651-772-7977

Email: becky.horton@state.mn.us

mndnr.gov



From: Melissa Schmit [mailto:melissa@geronimoenergy.com]
Sent: Wednesday, June 05, 2019 1:14 PM
To: Horton, Becky (DNR) <becky.horton@state.mn.us>
Subject: RE: Elk Creek Solar Seed Mixes

Hi Becky,

No problem, please see the attached mixes. I also wanted to call out that the array mix has about an even split on number of seeds for grasses vs. forbs, while the wet mix is much heavier in favor of grasses. During the field visit, it was observed that the wet areas are heavily infested with reed canary grass and new influxes of reed canary grass seed will likely be an ongoing issue in the wet areas. Therefore, we have a very grass-heavy wet mix to establish native vegetation that will resist the reed canary grass pressure as best as possible. Please let me know if you have any other questions.

Thanks,

Melissa Schmit

Permitting Manager

Main: 952.988.9000

Direct: 612.259.3095

[Geronimo Energy](#)



From: Horton, Becky (DNR) <becky.horton@state.mn.us>
Sent: Tuesday, June 4, 2019 12:59 PM
To: Melissa Schmit <melissa@geronimoenergy.com>
Subject: RE: Elk Creek Solar Seed Mixes

Hi Melissa,

Can you provide information on seeds/square foot and ounce/acre? That's what our guidance document uses, so it makes it easier to review.

Thanks,

Becky

From: Melissa Schmit [mailto:melissa@geronimoenergy.com]
Sent: Thursday, May 23, 2019 4:34 PM
To: Horton, Becky (DNR) <becky.horton@state.mn.us>
Cc: Warzecha, Cynthia (DNR) <cynthia.warzecha@state.mn.us>
Subject: Elk Creek Solar Seed Mixes

Hi Becky,

As we move forward with development on our Elk Creek Solar Project in Rock County, we have worked with native prairie specialists to develop the attached proposed seed mixes for the site which included a site visit to evaluate what

native species are currently growing in the area. This project has several areas of hydric soil that will require a wet seed mix and we are proposing to use a mesic to dry-mesic mix for all other areas of the site. Our mixes are designed to be native and promote pollinator habitat and achieve our goals for operating the solar facility, promote pollinator habitat, establish stable ground cover successfully, reduce erosion, reduce runoff, and improve infiltration. I have attached a copy of the project map for your reference.

When you are able, can you please review the attached lists and let me know if the DNR concurs the mixes are acceptable?

Thank you in advance for your review and I hope you have a nice holiday weekend!

Melissa Schmit

Permitting Manager

7650 Edinborough Way, Suite 725

Edina, MN 55435

Main: 952.988.9000

Direct: 612.259.3095

[Geronimo Energy](#)





Minnesota Department of Natural Resources
Division of Ecological & Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4025

August 19, 2019
Correspondence # ERDB 20200017

Ms. Michael Swenson
HDR Engineering
701 Xenia Ave S. Suite 600
Minneapolis, MN 55416

RE: Natural Heritage Review of the proposed Elk Creek Solar Project,
T103N R44W Sections 27, 34 & 35; Rock County

Dear, Mr. Swenson

As requested, the Minnesota Natural Heritage Information System has been queried to determine if any rare species or other significant natural features are known to occur within an approximate one-mile radius of the proposed project. Based on this query, rare features have been documented within the search area (for details, please visit the [Rare Species Guide Website](#) for more information on the biology, habitat use, and conservation measures of these rare species). Please note that the following rare features may be adversely affected by the proposed project:

- Topeka shiner (*Notropis topeka*), a federally-listed endangered and state-listed special concern species, and plains topminnow (*Fundulus sciadicus*), a state-listed threatened species, have been documented in the vicinity of the proposed project in Elk Creek. These fish species are adversely impacted by actions that alter stream hydrology or decrease water quality. As such, the proposed project should not be allowed to negatively affect the water quality of the Elk Creek and its tributaries. Comprehensive erosion and sediment control practices should be implemented and maintained for the duration of the project. Also, the Elk River is federally designated as critical habitat for the Topeka shiner. Given the federal status of this species, I recommend you coordinate with the U.S. Fish & Wildlife Service's Twin Cities Field Office (612-725-3548) regarding this project. For more information regarding Topeka shiners, please see [Questions and Answers about the Topeka Shiner in Minnesota](#).
- For additional information regarding solar projects, please see [Commercial Solar Siting Guidance](#) and [Prairie Establishment & Maintenance Technical Guidance for Solar Projects](#) documents.
- Please include a copy of this letter in any state or local license or permit application. Please note that measures to avoid or minimize disturbance to the above rare features may be included as restrictions or conditions in any required permits or licenses.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location (noted above) and the project description provided on the NHIS Data Request Form. Please contact me if project details change or for an updated review if construction has not occurred within one year.

The Natural Heritage Review does not constitute review or approval by the Department of Natural Resources as a whole. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. If needed, please contact your [DNR Regional Environmental Assessment Ecologist](#) to determine whether there are other natural resource concerns associated with the proposed project. Please be aware that additional site assessments or review may be required.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources. An invoice will be mailed to you under separate cover.

Sincerely,



Samantha Bump
Natural Heritage Review Specialist
Samantha.Bump@state.mn.us

Links: Rare Species Guide

<http://www.dnr.state.mn.us/rsg/index.html>

DNR Regional Environmental Assessment Ecologist Contact Info

http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html

USFWS Q & A about the Topeka Shiner in MN

https://www.fws.gov/Midwest/endangered/fishes/TopekaShiner/tosh_mn.html

Commercial Solar Siting Guidance

http://files.dnr.state.mn.us/publications/ewr/commercial_solar_siting_guidance.pdf

Prairie Establishment & Maintenance Technical Guidance for Solar Projects

http://files.dnr.state.mn.us/publications/ewr/prairie_solar_tech_guidance.pdf

From: [Roos, Stephan \(MDA\)](#)
To: [Melissa Schmit](#)
Cc: [Patton, Bob \(MDA\)](#)
Subject: Elm Creek Solar Project Discussion
Date: Tuesday, March 5, 2019 12:03:58 PM
Attachments: [image001.jpg](#)

Hi Melissa,

We generally find it very useful to have a meeting with companies proposing power projects in agricultural areas before we provide any formal comments on the project for the PUC's review process. There are usually several issues we need to understand and accompanying plans we need to review prior to comment, such as an Agricultural Impact Mitigation Plan, Environmental Protection Plan, and issues related to the conversion of prime farmland, among others.

We'd be very happy to sit down with you to learn about this project and begin discussions over issues pointed to above. Please contact me with some alternate days and times that would be convenient for you and I'll work something into our schedules and arrange for a meeting space.

We look forward to meeting with you and thanks for reaching out to us,
Steve

Steve Roos, PLA, ASLA

Environmental Planner

Energy and Environment Section
Agricultural Marketing and Development Division
Minnesota Department of Agriculture
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