

WEED MANAGEMENT AND LANDSCAPE MANAGEMENT PLAN

**4200 North Solar 1, LLC
Vermilion County, IL**

Prepared For:

Soltage

RENEWABLE ENERGY PROVIDER

Soltage, LLC

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1.0 - INTRODUCTION

Soltage, LLC (the Developer) is developing 4200 North Solar 1, LLC (the Project), located in Vermilion County, Illinois. The preliminary development area for the Project is approximately 21.4 acres of a parcel east of Rankin, Illinois, for the development of a solar energy facility. The Developer has established this Weed Management and Landscape Management Plan (WM&LMP) to guide groundcover, soils, and erosion control management practices for the Project from pre-construction through the life of the Project.

This WM&LMP will provide a preliminary review of site conditions and soils, recommendation of seed species, site preparation, timing of seed installation, seed application methods, maintenance and monitoring guidelines, and performance standards related to the proposed groundcover design.

1.1 - Project Goals

To develop a successful project, this WM&LMP should be used as a general and adaptable guide, allowing for the flexibility to change and evolve over the life of the Project and as a benchmark to the on-going development and monitoring of the Project. On-going monitoring may include on-site evaluation and reporting, with coordination regarding potential plan discrepancies, changes to the plans, or changes to the site program. Recommendations or modifications to the Project that vary from the WM&LMP should be evaluated, coordinated, and authorized through the Project owner, the Developer, or an environmental consultant. In the event of unforeseen circumstances or changing conditions, adaptive maintenance and monitoring strategies, discussed in more detail in Section 9.0 of this plan, may be a necessary approach to ensure success of the Project.

The primary goals of this WM&LMP are to manage weedy vegetation and to establish and maintain height-appropriate, hardy, and regionally appropriate groundcover vegetation and to minimize and control noxious and invasive plant species within the array and open areas of the Project limits throughout the Project lifetime. The proposed vegetation will include a variety of grasses and forbs with multiple benefits to soils, water, and wildlife. The primary composition of the groundcover will be low-growing grasses with a blend of cool-season and warm-season species to maintain a majority soils coverage, supplemented with perennial forbs with various blooming seasons. Woody plants, such as shrubs and evergreen trees, are to be used solely for providing any needed or requested buffering and screening of the Project.

1.2 - Existing Land Use

The Project is located south along E 4200 North Road. Existing land use to the East, South, West, and North across the right-of-way are all agricultural zoned and actively farmed parcels. This site is bisected east-west by an overhead electrical transmission line, and north-south at a slight diagonal by an underground natural gas transmission line. There are multiple non-jurisdictional farmed wetlands throughout the site. Proposed access to the Project is south off E 4200 North Road, at the northeast corner of the parcel.

The proposed site plan limits primarily consist of existing agricultural land to be developed for the use of solar energy production. The existing agricultural usage includes primarily row-crop production with rotated crop species. The remaining site outside of the Project limits of work are intended to remain in agricultural production or to be otherwise utilized by the landowner. For reference to the existing site location, land use, layout, existing vegetative conditions, and existing structures, please see the Proposed Site Plan. [*separate document not included as part of this report*]

2.0 - SITE SOILS

A summary of the existing site soils was prepared from data and mapping provided by the United States Department of Agriculture, Natural Resources Conservation Service. The existing site soils are summarized in Table 1 below. This Plan looks at an aggregated composition of the site soils in order to recommend location-specific and appropriate seeding and vegetation maintenance. The full Web Soil Survey report and map are available as **Appendix A** as part of this report.

The area of study is limited to the preliminary area of the parcels within the identified Project limits anticipated to be used for solar energy development, access and equipment areas, and areas external to the Project that are intended to be converted to natural groundcover vegetation. Soil conditions, classifications, and erosional potentials are all based on desktop analysis and may differ on-site and during time of construction from what is identified and summarized as part of this report.

The soils present are represented by four distinct types and five separate classifications, with all soil types each making up over 3% minimum of the overall project acreage. Of these soil types, the largest percentage is present on approximately 43.7% of the site, and is present throughout the study area.

SOILS SUMMARY OF NRCS WEB SOIL SURVEY									
SOILS NAME	TEXTURE CLASS	SLOPE	AREA	%	DRAINAGE CLASS	FLOODING / PONDING	HYDRIC CLASS	RUNOFF CLASS	DEPTH TO WATER TABLE (INCH)
Bryce	Silty Clay	0-2%	31.4	43.7%	Poorly Drained	None	Yes	Negligible	0-12
Swygert	Silty Clay Loam, Silty Clay	0-2%	27.2	37.8%	Somewhat Poorly Drained	None	No	Medium	12-24
Rantoul	Silty Clay	0-2%	6.4	9.0%	Very Poorly Drained	None	Yes	Negligible	0-12
Swygert, Eroded	Silty Clay Loam, Silty Clay	2-4%	4	5.6%	Somewhat Poorly Drained	None	No	High	12-24
Mona	Silt Loam, Clay Loam, Silty Clay	2-5%	2.8	3.9%	Moderately Well Drained	None	No	Medium	24-42

Table 1. Site Soils Summary

The average profiles of soils are typical of existing agricultural conditions and are primarily comprised of silty clay and silty clay loams. The majority of soils are poor-to-somewhat poorly drained, with only 3.9% of the site by area having moderate levels of drainage.

The typical range of depth to water table within the Project limits range from 0 to 24 inches, with very few areas of soils having water tables exceeding 24 inches in depth. These types of conditions are common occurrences across multiple soil types and are indicative of aged agricultural land with tilled and mixed topsoils, with clay horizons compacted within the top few feet of soil, leading to a restrictive horizon of poor infiltration and saturated conditions.

DRAINAGE CLASS
Water
Very Poor
Poorly Drained
Somewhat Poor
Moderately Well
Well Drained
Somewhat Excessive
Excessive
Not Rated

With poor soil drainage, shallow water tables, and subsurface clay horizons, vegetation should be deep rooted and hardy to seasonal saturated conditions, to provide additional water infiltration and storage capacity to protect soils from rain events and to preserve topsoils on site. Deep roots can also breach the clay textural horizons to increase water infiltration at further depths while decompacting and increasing topsoil depth. This will improve soils conditions over time and help mitigate possible impacts from project development.

2.1 - Soil Erosion

Soils on this site have been identified to have varying levels of runoff classification and levels of eroded topsoil. Soil erosion can cause a variety of problems for sites including reduced depth of topsoils, decrease in soil fertility and organic content, build up of silt in swales and waterways, increased susceptibility to ponding and flooding, and damage to vegetation and structures on site.

In order to address and prevent further topsoil erosion, the site should be investigated prior to start of construction, to identify locations of existing and potential erosion. These locations should be immediately addressed with temporary or permanent erosion control measures such as seeding, erosion control blanket, silt fence checks, temporary sediment basins, fiber rolls, or other appropriate applications for the location and size of erosion area.

3.0 - EROSION AND SEDIMENT CONTROL / MITIGATION

Best Management Practices (BMP) shall conform to federal state, and local requirements of practice, as applicable to Erosion and Sediment Control/Mitigation, and defined in this WM&LMP. With the intention of reducing foot and vehicle traffic, the Project should define temporary parking and storage area to serve equipment maintenance and cleaning, employee parking, and locating site facilities, portable facilities, office trailers, and toilet facilities. Proper storage and disposal of project byproducts (wash water, oil, grease, rubbish, litter, etc.) is to be observed in order to mitigate the degradation of land and on-site resources.

Stabilization is defined as the improvement of soil stability through the addition of material to the soil. Stabilization practices should be initiated as soon as practical, completed at the end of each working day, but in no case more than 14 days where construction has temporarily ceased. Disturbed portions of the Project where construction activity has permanently stopped shall be stabilized with a temporary seed species or mix.

If the action of vehicles traveling over the rocked construction entrances is not sufficient to remove the significant dirt or mud from falling onto paved roads, then the tires should be washed before the vehicles enter a public road. If washing is used, provisions must be made to intercept the wash water and trap the sediment before it is carried off site, as identified above. Slopes shall be left in a roughened condition during the grading phase to reduce runoff velocities and overall erosion.

All measures stated in this WM&LMP should be maintained in fully functional condition until no longer required for a completed phase of work or final stabilization of the site. All erosion and sedimentation control measures should be checked at least weekly during construction and within 24 hours of a 0.5" rainfall event or exceeds the governing requirements and cleaned/repared.

3.1 - Soil Compaction Prevention

Compacted soils drastically reduce water infiltration, increase runoff, and promote additional sediment and topsoil erosion. Compacted soils also prevent or inhibit groundcover establishment over a long period of time, leading to additional erosional issues over the life of a project. To prevent soil compaction, construction equipment should be limited to designated access routes or areas identified for necessary construction only.

No equipment should be left outside of designated laydown yards between construction phases or during periods longer than 3 days. All equipment used outside of access routes and equipment laydown yards should be low ground pressure or equipped with wide-spread weight distribution tread/wheels. Personnel transport outside of designated access routes should be limited to small ATV vehicles or similar. No transport or

construction equipment should enter or otherwise impact areas on site identified as wetland or surface water features.

Immediately following final construction of photovoltaic and associated equipment, all disturbed and compacted areas should be tilled to a minimum depth of 3 inches prior to seed application. Deep tilling of soils is to be avoided in order to prevent bringing up dormant weedy or invasive seeds to the surface. If decompact area is anticipated to remain bare longer than 2 weeks, straw mulch or similar cover should be applied to reduce risk of erosion or recompaction due to precipitation. Silt fence check dams may be utilized in areas of concentrated flow or slopes exceeding 5%.

No vegetation identified as noxious or invasive species shall be mulched or remain on site. Mulch may be brought in from off-site to use in temporary construction access locations or areas of erosion in order to prevent soil compaction and reduce surface erosion. Mulch brought from external sources should be untreated, uncolored, and free of contaminants of weedy species to prevent spread of noxious weed species on site. Mulch used for temporary purposes should remain on-site after construction, to aid in erosion control while groundcover vegetation establishes. Over time, wood mulch will decompose, providing additional nutrients and organic content to the soils.

3.2 - Topsoil Management

Topsoil preservation is a key component to site erosion and stormwater mitigation, and establishment of permanent groundcover vegetation. Topsoils should be maintained in existing condition wherever feasible, and should be protected from construction disturbance through best management practices, identification of primary routes, erosion and sediment control barriers, and temporary stabilization. Topsoils in areas of high impact of site construction should be stockpiled in an area with minimally erodible topographic conditions, protected with stabilization measures such as temporary groundcover or other measures. Topsoils should not be used for access road construction, backfill, or berming. No subsoils excavated during project construction should be placed on top of topsoils.

4.0 - PRELIMINARY SITE SEED RECOMMENDATION

4.1 - Temporary Seeding

In areas where construction is not on-going and has disturbed surface conditions, topsoils stockpiles, and areas identified as high concern of erosion, temporary seeding should be utilized for stabilization and protection of site soils. Temporary seeding should be performed on an as-needed basis, and at the earliest feasible timing to encourage quick stabilization. Temporary seeding should be applied either by broadcast with erosion control blanket or straw mulch, or by hydroseeding with straw mulch mix. Temporary seed species should be dependent on-site conditions and season timing, as shown in Table 2 below.

TEMPORARY SEEDING TIMELINE															
SCIENTIFIC NAME	COMMON NAME	LBS/AC	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	
<i>Avena sativa</i>	Common Oat	60	█			●						●	█		
<i>Echinochloa esculenta</i>	Japanese Millet	30				●	█								
<i>Lolium multiflorum</i>	Annual Ryegrass	20				●	█					●			
<i>Pisum sativum</i>	Common Pea	40				●	█					●	█		
<i>Secale cereale</i>	Cereal Rye	60				●	█					●	█		
<i>Glycine max</i>	Soybean	50				●	█					●			
<i>Triticum aestivum</i>	Winter Wheat	80	█			●						●	█		

Table 2. Temporary Seeding Timeline

Temporary seeding should be planned for termination to reduce residual residue that can impede permanent seed establishment. The method for temporary seed species termination depends on the application, use, and location of the applied seed. Temporary seeding utilized for stabilization and steep slopes should not be fully removed to prevent erosion during transitional period. These areas should instead be treated with a glyphosate herbicide and mowed short, prior to immediate application of permanent seed mixture.

Areas identified with high amounts of temporary vegetation and residue can be mowed and shallow disced to incorporate residue into the topsoil before application of permanent seed mixture. In the case of a nurse crop, which is a temporary cover crop species used in conjunction with the permanent seed mix, no additional action is required as annual temporary species will be removed over time with general site maintenance, mowing, and dethatching.

4.2 - Permanent Seeding Recommendation

Permanent seeding is used to provide long-term vegetative groundcover during the lifetime of the Project. These types of seed mixes aid in the stabilization of soils, stormwater infiltration, slow runoff, and control noxious and invasive weedy species. All plant species to be used on the site should be native or naturalized with additional benefits and designed to meet the Project's specific needs. Individual seed species may require substitution based on availability at time of construction, seasonal conditions, or other unforeseen site conditions as evaluated during the development process. Seed mixes designed as part of this Project can be found on the Landscape Plan. *[separate document not included as part of this report]*

The Project seeding should utilize a dual-mix approach, with the "Array Area Seed Mix" specifically designed for shade tolerance and limited plant heights to use in and around photovoltaic panels and around other site electrical equipment. This will reduce potential impacts to solar energy production and safety risks near site equipment and access points.

The second mix included in this recommended approach is the "Open Area Seed Mix". This mix is intended to be utilized around the perimeter and in larger open spaces outside of the array layout, with a focus on having full-sun exposure. This mix includes more variety of plant species and pollinator and habitat species of forbs and nesting bunch grasses.

5.0 - SITE PREPARATION

It is essential to prepare the site in order to give vegetation the highest chances of germinating and establishing. **To do so it is important to clear the target area of existing weedy vegetation. This can be achieved through mowing and the targeted use of an animal-friendly Glyphosate herbicide. If a significant amount of weedy vegetation is present, it is not recommended to till the site as this can stir up dormant, buried weed seeds which can germinate quickly.** If broad-application herbicide is required, seeding can take place one week after last herbicide application.

Soils should be uniform, without excessive furrows, ruts, or ridges, and low areas where water may collect. Areas identified to have rills or small gullies should be filled and blended with adjacent grade to mitigate and stop the continuation of soil erosion in these areas. Areas identified to have erosion should be noted and monitored during the first three years of seed establishment. Soils should be cleared of trash, debris, and invasive species prior to final seeding application. Soil preparation should occur when weather permits, and timing allows for at least a following 48 hours where seeding and stabilization methods may take place.

Since native pollinator species may be slow to establish, annual plant species, such as millet, rye, wheat, or oats may be used to temporarily stabilize the soil, depending on the soil and season, and at rates equal to 10-

20 lbs per acre. These should not be allowed to seed and should be cut between 9 and 12 inches in height during the first season.

If excessive crop residue remains present on-site prior to seeding, residue should be disced or lightly tilled to a depth no more than 3 inches. Crop residue on the surface of soils can provide some soil stabilization and seed protection, however dense residue can hinder seed germination and establishment. If crop residue is identified to be dry and loose, care should be taken to minimize fire risk on site by applying water to the surface, removing residue, tilling residue into the topsoil, or a combination of these measures. No seeding should be performed during periods of excessive drought or where dry crop residue is identified.

5.1 - Site Preparation Guidelines

As the existing agricultural use can vary and change prior to vegetation application, site-specific preparation and seeding treatments may differ with potential for varying levels of success. Standard types of seeding application include no-till drilling, broadcast, or hydroseeding. These applications all have potential for successful establishment of groundcover and should be utilized in different ways or times depending on multiple factors such as timing and existing site conditions. The table on the next page, Table 3, is to be used as a guide to ensure the highest success rate possible for each parcel within the Project limits.

5.2 - Seed Preparation and Storage

Proper transport and storage of seed is important to maintain viability and successful establishment of vegetation species. If feasible, seed should be shipped in bulk and as close to application timeframe as possible. Long-term storage of seed will lead to a decrease in seed viability and resilience. Significant drops in germination rates may adversely impact the ability of planned vegetation species to establish and propagate and may struggle to outcompete invasive or unplanned species. This may lead to the need to reapply seed, apply seed at higher rates, or in event of failed establishment, result in the need to broadcast herbicide and start the seed preparation and application process over.

Other major factors that can negatively impact seed viability include high humidity, storage temperature, insect or rodent predation, and age of seed. If bulk storage is required, seed should not be left outside in an exposed or uncontrolled environment.

5.3 - Woody Vegetation Preparation

All woody vegetation (trees, shrubs, etc.) to be used on-site for screening buffers should be selected based on specimen grade, well-branched, healthy, and pre-inoculated standards, and should be free from disease, pests, wounds, and scars. All plants should meet the American Standard for Nursery Stock (ANSI Z60.1-2014 or most current version) requirements for size and type specified.

Woody vegetation should be transported with tightly wrapped burlap, tied with twine for bare root ball, or secured upright in pots. Woody vegetation should be stored on site no longer than 2 weeks before installation. All stored plant materials should receive watering daily and be placed on non-compacted surface to allow for drainage.

VEGETATION APPLICATION GUIDELINES			
EXISTING CONDITIONS	PREPARATION	APPLICATION	POST-SEEDING
Crops - Corn (Current or Recent Harvest)	<ul style="list-style-type: none"> Cut and remove biomass Disc or shallow till before seeding 	<ul style="list-style-type: none"> Drill Seed Broadcast Seed Hydroseed 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment
Crops - Corn (Aged Residue)	<ul style="list-style-type: none"> Disc or shallow till before seeding 	<ul style="list-style-type: none"> Drill Seed Broadcast Seed Hydroseed with Straw Mulch 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment
Crops - Soybean (Current or Recent Harvest)	<ul style="list-style-type: none"> Cut and remove biomass Disc only if heavy residue is present 	<ul style="list-style-type: none"> Drill Seed Broadcast Seed Hydroseed 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment
Crops - Soybean (Aged Residue)	<ul style="list-style-type: none"> Disc only if heavy residue is present 	<ul style="list-style-type: none"> Drill Seed Broadcast Seed Hydroseed with Straw Mulch 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment
Crops - Grain (Current or Recent Harvest)	<ul style="list-style-type: none"> Cut and remove biomass Disc or shallow till before seeding 	<ul style="list-style-type: none"> Drill Seed Broadcast Seed Hydroseed 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment
Crops - Grain (Aged Residue)	<ul style="list-style-type: none"> Disc or shallow till before seeding 	<ul style="list-style-type: none"> Drill Seed Broadcast Seed Hydroseed with Straw Mulch 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment
Feed Hay or Fallow Field	<ul style="list-style-type: none"> Cut and remove biomass Herbicide treat vegetation if existing species are undesirable Disc or shallow till before seeding 	<ul style="list-style-type: none"> Drill Seed Broadcast Seed Hydroseed 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment
Bare Soils (Minimal Residue)	<ul style="list-style-type: none"> If soils are identified to be compacted Decompact and till soil Drag smooth and level soils before immediate seeding 	<ul style="list-style-type: none"> Drill Seed Broadcast Seed Hydroseed with Straw Mulch 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment Apply erosion control blanket as needed
Bare Soils (Post-Construction, Under Array)	<ul style="list-style-type: none"> Decompact and till soil Drag smooth and level soils before immediate seeding 	<ul style="list-style-type: none"> Broadcast Seed 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment Apply erosion control blanket as needed
Bare Soils (Post-Construction, Open Area)	<ul style="list-style-type: none"> Decompact and till soil Drag smooth and level soils before immediate seeding 	<ul style="list-style-type: none"> Drill Seed Broadcast Seed Hydroseed with Straw Mulch 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment Apply erosion control blanket as needed
Bare Soils (Washout / Erosional Area)	<ul style="list-style-type: none"> Backfill with soil Drag smooth and level soils before immediate seeding 	<ul style="list-style-type: none"> Broadcast Seed Hydroseed with Straw Mulch 	<ul style="list-style-type: none"> Apply erosion control blanket and straw bale check dams as needed
Turf Grass	<ul style="list-style-type: none"> Herbicide treat vegetation Disc or shallow till, 2 weeks following herbicide application Repeat if necessary 	<ul style="list-style-type: none"> Drill Seed Broadcast Seed Hydroseed with Straw Mulch 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment
Weed-Dominated (Post-Construction, Under Array)	<ul style="list-style-type: none"> Herbicide treat vegetation Disc or shallow till, 2 weeks following herbicide application Repeat if necessary 	<ul style="list-style-type: none"> Broadcast Seed 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment
Weed-Dominated (Post-Construction, Open Area)	<ul style="list-style-type: none"> Herbicide treat vegetation Disc or shallow till, 2 weeks following herbicide application Repeat if necessary 	<ul style="list-style-type: none"> Drill Seed Broadcast Seed Hydroseed with Straw Mulch 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment
Weed-Dominated (Pre-Construction)	<ul style="list-style-type: none"> Herbicide treat vegetation Disc or shallow till, 2 weeks following herbicide application Repeat if necessary 	<ul style="list-style-type: none"> Drill Seed Broadcast Seed Hydroseed with Straw Mulch 	<ul style="list-style-type: none"> Roll or pack soils with low-pressure equipment

Table 3. Site Conditions and Application Table.

6.0 - VEGETATION APPLICATION

6.1 - Seed Application Timing

To promote early and strong establishment of a specified seed mix, dormant season seed application should be utilized if possible and as construction timeline permits. Dormant season seeding should occur between November 15th and February 28th utilizing winter-tolerant seed from the specified seed mix, along with a winter nurse crop such as annual rye, winter wheat, or annual oat. To apply dormant seed, the site should be cleared of invasive weeds, lightly tilled or disced, then drill seed applied across the entire area of agricultural soil.

Active season seed application should be performed between April 1st and May 30th, after risk of major freezing conditions is minimized, for ideal establishment and minimizing invasive species competition. Seeding that takes place after June 1st should only include drought-tolerant species from the seed mix and may require multiple rounds of watering in order to successfully establish. See Table 4 for seed application timelines.

GROUND COVER APPLICATION TIMELINE												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Temporary Seeding			●	●	●	●	●	●	●		●	
Permanent Seeding				●	●	●	●	●	●	●	●	
Dormant Seeding	●	●									●	●
Sodding			●		●	●	●	●	●	●		
Mulching	●	●	●	●	●	●	●	●	●	●	●	●

●	Acceptable timeline for application
●	2-3 Weeks of Irrigation required following application
●	Straw mulch recommended during application at a rate of 2 tons per acre
●	Seeding is recommended for only drought tolerant species

Table 4. Seeding Timeline Table.

6.2 - Seed Application Phasing

Seeding is recommended to be performed in two phases. The first phase of seeding should occur at least 4 weeks prior to installation of array piles in order to reduce disturbance. During this time, laydown yards, temporary stormwater measures, or access road preparation may be performed only within designated areas. The first application should be mechanically drill seeded with the full nurse crop and at minimum 50% of the final and permanent seed mix. No straw mulch is required unless needed for soil stabilization in areas of concentrated surface flow or recommended to insulate seed during cold weather seeding. Straw mulch should be applied in these areas at a rate of 2 tons per acre during the first application of seed.

The second round of seeding should occur post-panel installation, after piles and array racking is built, and should include the full remainder seed mix by broadcast application and any additional that may be required in areas identified as heavily disturbed during the construction phase. Spot herbicide application should occur during this phase of seeding, focusing on areas where noxious weeds are aggressively outcompeting native vegetation.

6.3 - Woody Vegetation Application

Woody vegetation should be installed during spring from mid-April through late-June, or from mid-September to late-October, prior to major freeze conditions. It is not recommended to plant trees or shrubs during the hotter parts of the summer season, as drought conditions and sun scalding hazard could damage or kill vegetation, and would often require more intensive and frequent watering.

To allow for higher rate of survival while providing visual screening as soon as feasible, evergreen trees should be installed at a height between 4 and 6 feet, or as identified according to a landscape plan. This height range allows for vegetation to establish and fill in buffer areas in a natural and healthy environment, while providing some initial aesthetic and visual screening of the Project. Woody vegetation that are installed at larger sizes have increased risk of failed establishment due to insufficient root systems (due to transplanting from nurseries), slower root recovery rates, higher risk of wind load damages, and vegetation death from 'transplant sock'.

Trees and shrubs installed on-site should be laid out according to a landscape plan, following species, spacing, sizes, and other specified information at time of installation [separate document not included as part of this report]. Trees are recommended to be planted a minimum of eight feet from the solar facility fence, to the anticipated mature canopy spread of evergreen and shrub species to allow for maintenance access between buffer rows and fencing. At installation, all trees and shrubs should have containers or basket removed and any burlap or wrappings around root balls pulled back from the top third of the root ball. No twine, string, or cord should remain tied around the trunk of trees or shrubs after plants are in final locations.

Woody vegetation should be set on tamped soils in excavated locations and backfilled with soils that are free of any invasive or weedy plant species. If site soils have been identified to have high levels of herbicides or improper pH levels for native vegetation, backfill should be amended prior to replacement in excavated locations. A ring of untreated, uncolored, shredded hardwood mulch should be applied in an even 3" depth layer at a width of twice the root ball. Immediately following application of mulch, all trees should receive ten to fifteen gallons of water to saturate root ball and backfill soils. Shrubs should receive between five and ten gallons of water depending on installation size.

7.0 - MAINTENANCE AND MONITORING

Maintenance and monitoring will be needed to successfully achieve the criteria needed to meet and continue the Illinois Pollinator Friendly designation for the duration of the project. Maintenance programs, identified in Table 5 on the next page, should be site specific and coordinated with the landscape contractor and county for adequate maintenance procedures. **A three-year stewardship program is necessary to ensure proper establishment and health of ground cover, to control invasive species, and to prevent overgrowth and shading of equipment.** After the third growing season, the program is to be reduced to a minimum of one visit per year, dependent upon site conditions and required strategies to maintain good health of the site such as dethatching, additional mowing, or herbicide treatments.

All assessments made during monitoring visits should identify any presence of invasive species as defined by the Illinois Exotic Weed Act (525 ILCS 10/ET SEQ.) and the Illinois Noxious Weed Law (505 ILCS 100/ET SEQ.), including additional species of invasive or weedy vegetation as defined by the Illinois Department of Natural Resources, University of Illinois, the U.S. Department of Agriculture, and Vermillion County. Assessments should include planned action to manage and remove identified weedy species.

Typical Vegetation Management Schedule												
Management Action	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Vegetation Evaluation			● ● ○	●	● ○	● ●	● ● ○	● ● ○	● ● ○	● ● ○	● ● ○	
*Physical Weed Removal			● ● ○	●	● ○	● ●	● ● ○	● ● ○	● ● ○	● ● ○	● ● ○	
*Mowing (Weed Control)			● ● ○	●	● ○	● ●	● ● ○	● ● ○	● ● ○	● ● ○	● ● ○	
Mowing (Height Management)			● ● ○								● ● ○	
Re-Seed / Overseed									● ○	● ○		
*Herbicide Treatment			● ● ○	● ○	● ○	● ○	● ○	● ○	● ○	● ○	● ○	● ○
*Cut and Remove Woody Vegetation			● ● ○		● ○					● ● ○		
Dethatching			● ○									
Performance Standard Evaluation										● ● ○		
<p>● Year 1</p> <p>● Year 2</p> <p>○ Year 3</p> <p>○ Subsequent Years</p>												
<p>* Denotes management actions that should be evaluated on-site in order to determine if they are required at the time of evaluation, or if no action is needed until the next evaluation period.</p>												

Table 5. Typical Management Schedule.

7.1 - Timeline of Implementation

First year:

The earliest possible seed application may occur in the Spring of the first year. No maintenance actions are required to be performed during the first season of application. If seed application takes place in summer or fall of the first year, maintenance and monitoring should start the following season.

Site visits are recommended to be performed one to three times throughout the Summer and an additional one to three times throughout the Fall, with monitoring and evaluation of vegetation height and presence of invasive species occurring at each visit. If weedy species are identified during an observation, measures to control invasive woody and herbaceous flora through physical removal or spot herbicide treatments are required. Mowing should be conducted during the first year in areas of the site identified to have vegetation over 16

inches in height. Areas with groundcover height under 16 inches may remain until the next scheduled monitoring visit. Newly seeded areas should be cut back to 9 inches in height, if possible, as the lower mowing height helps to reduce opportunistic weedy species.

Second year:

Site visits are recommended to be performed one to three times throughout the Spring, Summer, and Fall, with monitoring and evaluation of vegetation height and presence of invasive species occurring at each visit. During the first visit of the year, mowing should occur to cut back any vegetation to a height of 10 inches and remove dead stalks and seed heads from the previous growing season. If weedy species are identified during an observation, measures to control invasive woody and herbaceous flora through physical removal or spot herbicide treatments are required.

Mowing should be conducted at each additional visit in areas of the site identified to have vegetation over 18 inches in height. Areas with groundcover height under 18 inches may remain until the next scheduled monitoring visit. Vegetative areas should be cut back to 9 inches in height.

Third year:

Site visits are recommended to be performed one-to-two times during the early Spring, Summer, and Fall with monitoring and evaluation of vegetation height and presence of invasive species occurring at each visit. During the first visit of the year, mowing should occur to cut back any vegetation to a height between 9 and 12 inches to remove dead stalks and seed heads from the previous growing season. If weedy species are identified during an observation, measures to control invasive woody and herbaceous flora through physical removal or spot herbicide treatments are required.

Mowing in open areas, along the fence line, and buffer areas should be conducted in areas of the site identified to have vegetation over 36 inches in height. Areas with groundcover height under 24 inches may remain until the next scheduled monitoring visit. Vegetative areas should be cut back to 9 inches in height.

Following the third year:

Site visits are recommended to be performed at least once a year, during the early Spring, with monitoring and evaluation of vegetation height and presence of invasive species occurring during the visit. During the Spring, mowing should occur to cut back any vegetation to a height between 9 and 12 inches to remove dead stalks and seed heads from the previous growing season. If weedy species are identified during an observation, measures to control invasive woody and herbaceous flora through physical removal or spot herbicide treatments are required.

For the remainder of the year, vegetation should be mowed in open areas, along the fence line, and buffer areas to maintain a height under 48 inches through the growing season. Areas with groundcover height under 36 inches may remain until the next scheduled monitoring visit. Mowing may only be necessary in areas that are identified to have vegetation over 24 inches in height. Vegetative areas should be cut back to 9 inches in height.

7.2 - Woody Vegetation Maintenance

As screening vegetation serves both an aesthetic and functional purpose, maintaining proper year-round and healthy vegetation are critical in the early stages of establishment. During the first growing season, woody vegetation should be inspected and monitored on a monthly basis. If strong storms occur on site, woody vegetation should be assessed for damages caused by high winds, snow, or heavy rainfall.

Woody vegetation should be watered regularly for the first 2 years in excessive heat, allowing for a deep soak of the root ball every 1-to-1.5 weeks, with small deciduous shrubs requiring more frequent watering during excessive heat and drought up to 2 times per week. Following establishment period of woody vegetation, supplemental irrigation should not be necessary except in the case of unusual or excessive drought and heat periods.

Canopy management should be minimal, avoiding pruning to retain a natural form and habitat of site vegetation. Dead or diseased branches should be removed yearly during monitoring periods, with diseased materials required to be removed from the site and disposed of in accordance with local regulations.

Any woody vegetation identified to be dead, or not meeting the performance standards listed as part of this Plan, should be replaced within 60 days of identification.

8.0 - PERFORMANCE STANDARDS

Satisfactory groundcover development associated with naturalized vegetation should be evaluated at each monitoring period and based on the following criteria.

Upon completion of project construction:

All disturbed areas or areas identified as bare soils measuring one square meter with no vegetation should receive either temporary cover crop or permanent seed application. No areas of bare soils should remain after substantial completion of the Project.

Three months after seeding:

Within three months of seed application, or three months after the start of the growing season following dormant seeding, approximately 60 percent of the seeded area (excluding access roads, pads, or other hardscape areas), as measured by aerial cover, should be vegetated or otherwise stabilized against erosion. Temporary cover crop may be included in stabilization and seeded area percentage. Supplemental use of straw mulch or blanket should not be included in the seeded area percentage, unless new growth germination is identified within the straw or blanketed areas. Any areas of identified bare soils measuring one square meter or more with no vegetation should be re-seeded.

After the first year:

By the end of the first full growing season, all seeded areas should have 80 percent minimum vegetation (excluding access roads, pads, or other hardscape areas), as measured by aerial cover. Temporary cover crop may be included in seeded area percentages. Any areas of identified bare soils measuring one square meter or more with no vegetation should be re-seeded.

All trees, shrubs, or woody vegetation identified to be dead or diseased should be replaced. Woody vegetation identified to have pest presence should be further evaluated to determine if pests can be treated, removed, or if vegetation should be taken off site and replaced. No diseased or pest-infected vegetation is to remain on-site.

After the second year:

By the end of the second growing season, all seeded areas should have a minimum of 90 percent vegetation ground cover, of which 50 percent should be native and naturalized species identified in final seed mix (excluding access roads, pads, or other hardscape areas). Native and naturalized species percentage should not include temporary cover crop, erosion control measures, or undesirable and invasive plant species. Any areas of identified bare soils measuring one square meter or more with no vegetation should be re-seeded.

All trees, shrubs, or woody vegetation with more than 50 percent dead branches or biomass should be replaced. All woody vegetation identified to be diseased should be replaced. Woody vegetation identified to have pest presence should be further evaluated to determine if pests can be treated, removed, or if vegetation should be taken off site and replaced. No diseased or pest-infected vegetation is to remain on-site.

After the third year, and subsequent years:

By the end of the third growing season, all seeded areas should have a minimum of 75 percent ground cover by native and naturalized species identified in final seed mix (excluding access roads, pads, or other hardscape areas). This should not include temporary cover crop, erosion control measures, or undesirable and invasive plant species. No areas identified as bare soils of one square meter or larger should be present within seeded areas. Any areas of identified bare soils measuring one square meter or more with no vegetation should be re-seeded.

All trees, shrubs, or woody vegetation with more than 20 percent dead branches or biomass should be replaced. All woody vegetation identified to be diseased should be replaced. Woody vegetation identified to have pest presence should be further evaluated to determine if pests can be treated, removed, or if vegetation should be taken off site and replaced. No diseased or pest-infected vegetation is to remain on-site.

If performance standards are not met at each observation period, the landscape contractor should notify the owner and Developer and propose corrective action in order to meet the performance standard by the next observation period. Corrective action may include overseeding, especially areas identified with bare soils, additional erosion control measures, or herbicide treatments.

9.0 - ADAPTIVE MANAGEMENT

Adaptive management is the process of maintenance and monitoring of site vegetation that involves evaluation and real-time planning based on changing site conditions. This approach of reacting to and addressing unknown or evolving situations allows for a higher success and quality of site development over the entire life of the Project. Although it is not feasible to plan for every possible scenario, there are common and potential conditions that may arise from the Project, and in response to past management actions or environmental circumstances. Some of these situations may include the following, and should be monitored, evaluated, and corrected or maintained as prescribed during the management period.

Failing vegetation establishment.

This can occur for many different or unexpected reasons, but should be addressed in a timely manner to avoid poor ground cover conditions that could lead to erosion and sediment issues. Overseeding or re-seeding may be required in bare areas or areas with failing stabilization. In addition, supplemental stabilization methods should be considered to maintain site soils.

Invasive or noxious vegetation influx.

Along with the unknowns of existing invasive or noxious vegetation on-site, weed species may be brought onto the Project site from elsewhere. If weedy patches or spread of invasive species are identified during normal monitoring, it is imperative to address conditions as soon as possible. If weedy species are allowed to seed and propagate, it may become substantially more difficult to treat and prevent further spread throughout the Project site. Noxious species may also have a significant negative impact on grazing livestock, leading to failed Agrivoltaics programming.

Pesticide / Herbicide drift.

Although it should be communicated and coordinated with local landowners and farmers in advance of project development and construction, it is possible that pesticide or herbicide drift may impact the Project. These drifts can damage or kill off beneficial species and designed habitat conditions that take time and planning to establish. High rates of these chemicals can also lead to harm for foraging livestock and potential for surface and subsurface water contamination. All herbicide use should be managed and utilized as outlined in this WM&LMP.

10.0 - INVASIVE / NOXIOUS WEED SITE ANALYSIS

As part of this WM&LMP, **a site visit was conducted on October 28, 2025 in order to evaluate and assess the site for presence of invasive and noxious weed species.** Current conditions of the site were defined as recent soybean crop harvest, with biomass ground and mixed throughout the site. No clear evidence of tillage or mixing of biomass into the topsoils was observed.

The following species of invasive vegetation was identified throughout the site, along the site perimeter, or within the right-of-way. Vegetation defined as 'Common Weeds' are considered harmless and easy to treat. 'Invasive Weeds' have been identified to be hard to control or aggressive spreading. 'Noxious Weeds', not observed on site, must be controlled immediately and pose a threat to local environments. A collection of site photographs along with descriptions of weed species is available as **Appendix B** as part of this report.

Taraxacum officinale – Common Lawn Weed. Found throughout the parcel, predominantly in the right-of-way.

Trifolium pratense – Common Lawn Weed. Found throughout the parcel

Setaria Spp. – Invasive Weed. Found along the perimeter of the parcel.

Amaranthus palmeri – Invasive Weed. Found throughout the parcel.

Amaranthus Spp. – Common Farm Weed. Found throughout the parcel.

Physalis Spp. – Common Farm Weed. Found along the perimeter and right-of-way of the parcel.

Viola palustris – Common Lawn Weed. Found throughout the parcel.

Medicago sativa – Common Roadside Weed. Found along the right-of-way.

Hibiscus trionum – Invasive Weed. Found along the right-of-way.

Lamium amplexicaule – Invasive Weed. Found throughout the parcel.



A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Vermilion County, Illinois



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

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scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

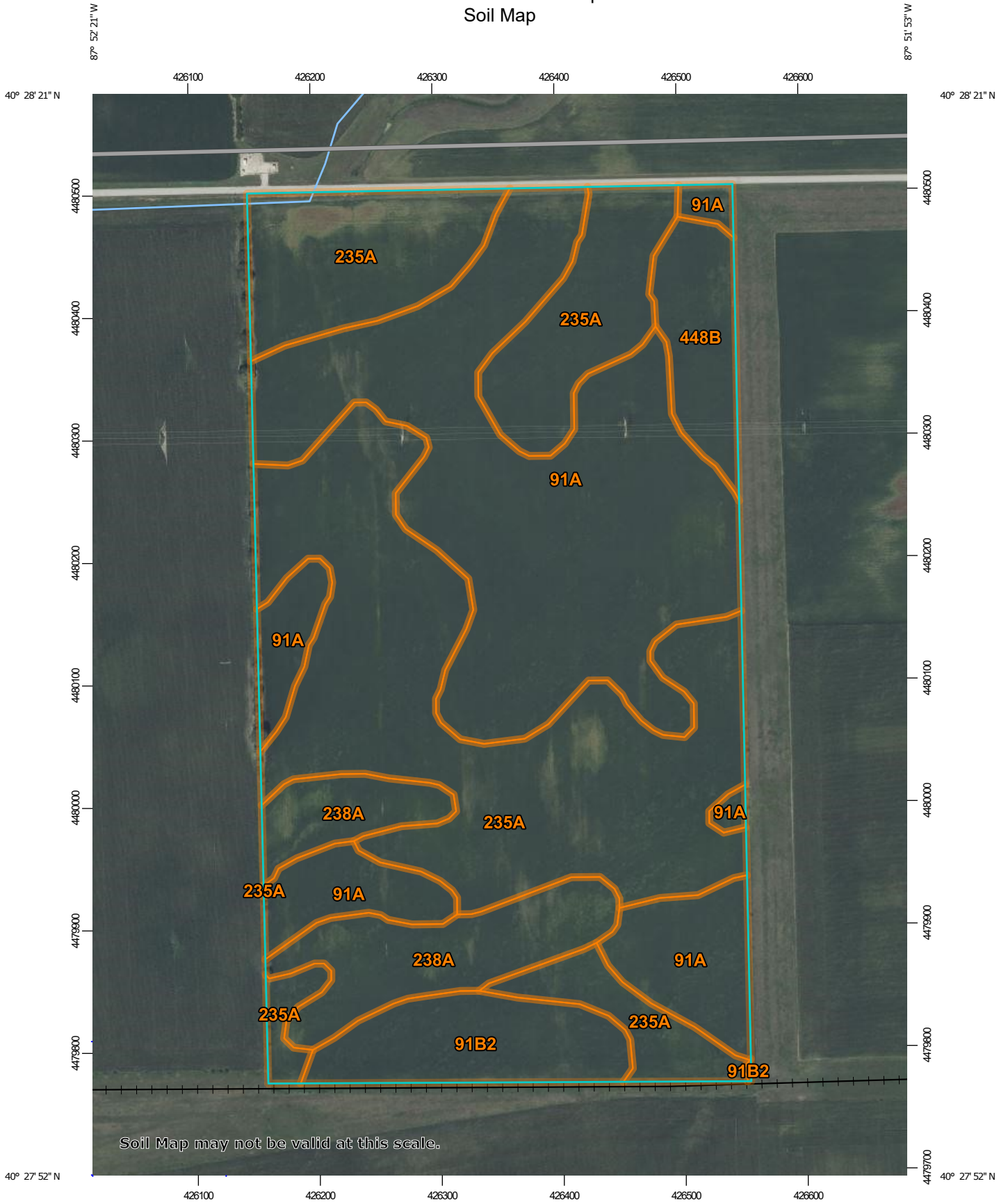
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

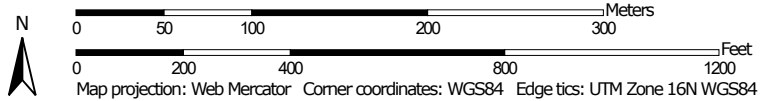
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map




Map Scale: 1:4,300 if printed on A portrait (8.5" x 11") sheet.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)




















Soils







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Vermilion County, Illinois
 Survey Area Data: Version 21, Aug 31, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 30, 2023—Sep 2, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
91A	Swygert silty clay loam, 0 to 2 percent slopes	27.2	37.8%
91B2	Swygert silty clay loam, 2 to 4 percent slopes, eroded	4.0	5.6%
235A	Bryce silty clay, 0 to 2 percent slopes	31.4	43.7%
238A	Rantoul silty clay, 0 to 2 percent slopes	6.4	9.0%
448B	Mona silt loam, 2 to 5 percent slopes	2.8	3.9%
Totals for Area of Interest		71.9	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Vermilion County, Illinois

91A—Swygert silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t6zn
Elevation: 540 to 840 feet
Mean annual precipitation: 34 to 40 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 155 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Swygert and similar soils: 98 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swygert

Setting

Landform: Till plains, ground moraines, end moraines
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Thin mantle of loess over clayey lacustrine deposits over clayey till

Typical profile

Ap - 0 to 12 inches: silty clay loam
Bt1 - 12 to 26 inches: silty clay
2Bt2 - 26 to 51 inches: silty clay
2Cd - 51 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 35 to 55 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.02 to 0.06 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R110XY007IL - Moist Glacial Drift Upland Prairie
Hydric soil rating: No

Minor Components

Bryce, drained

Percent of map unit: 2 percent
Landform: End moraines, ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R110XY008IL - Wet Glacial Drift Upland Prairie
Hydric soil rating: Yes

91B2—Swygert silty clay loam, 2 to 4 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2st2l
Elevation: 540 to 840 feet
Mean annual precipitation: 34 to 40 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 155 to 190 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Swygert, eroded, and similar soils: 98 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swygert, Eroded

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Clayey lacustrine deposits over clayey till

Typical profile

Ap - 0 to 7 inches: silty clay loam
Bt1 - 7 to 30 inches: silty clay
2Bt2 - 30 to 48 inches: silty clay
2Cd - 48 to 60 inches: silty clay

Properties and qualities

Slope: 2 to 4 percent
Depth to restrictive feature: 35 to 51 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.02 to 0.06 in/hr)

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Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 30 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: R110XY007IL - Moist Glacial Drift Upland Prairie
Hydric soil rating: No

Minor Components

Bryce, drained

Percent of map unit: 2 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R110XY008IL - Wet Glacial Drift Upland Prairie
Hydric soil rating: Yes

235A—Bryce silty clay, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t6zp
Elevation: 540 to 770 feet
Mean annual precipitation: 33 to 40 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 155 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Bryce, drained, and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bryce, Drained

Setting

Landform: Till-floored lake plains, glacial lakes (relict), ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, talf
Down-slope shape: Linear, concave
Across-slope shape: Concave
Parent material: Clayey glaciolacustrine deposits over clayey till

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Typical profile

Ap - 0 to 13 inches: silty clay
Btg - 13 to 45 inches: silty clay
2BCg - 45 to 58 inches: silty clay
2Cg - 58 to 66 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.02 to 0.06 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.2 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 6.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R110XY008IL - Wet Glacial Drift Upland Prairie
Hydric soil rating: Yes

Minor Components

Rantoul, drained

Percent of map unit: 2 percent
Landform: Depressions on till-floored lake plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Concave
Ecological site: R110XY024IL - Poned Depressional Sedge Meadow
Hydric soil rating: Yes

Orthents, clayey

Percent of map unit: 2 percent
Landform: Lake plains, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XB010WI - Loamy and Clayey Upland
Hydric soil rating: No

Urban land

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear

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Across-slope shape: Linear
Hydric soil rating: No

238A—Rantoul silty clay, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 1r4n4
Elevation: 510 to 930 feet
Mean annual precipitation: 28 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Rantoul and similar soils: 94 percent
Minor components: 6 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rantoul

Setting

Landform: Depressions on lake plains, depressions on ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Colluvium

Typical profile

H1 - 0 to 17 inches: silty clay
H2 - 17 to 40 inches: silty clay
H3 - 40 to 60 inches: silty clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.02 to 0.06 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow

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Hydric soil rating: Yes

Minor Components

Houghton

Percent of map unit: 6 percent

Landform: Depressions on ground moraines, depressions on outwash plains

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Dip

Down-slope shape: Concave

Across-slope shape: Concave

Ecological site: R110XY024IL - Poned Depressional Sedge Meadow

Hydric soil rating: Yes

448B—Mona silt loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 1r4nw

Elevation: 540 to 980 feet

Mean annual precipitation: 28 to 40 inches

Mean annual air temperature: 45 to 54 degrees F

Frost-free period: 140 to 180 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Mona and similar soils: 90 percent

Minor components: 3 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mona

Setting

Landform: Lake plains, ground moraines

Landform position (two-dimensional): Summit, backslope

Landform position (three-dimensional): Interfluve

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Thin mantle of loess or other silty material and in the underlying outwash and lacustrine deposits or till

Typical profile

H1 - 0 to 11 inches: silt loam

H2 - 11 to 39 inches: clay loam

H3 - 39 to 44 inches: silty clay

H4 - 44 to 60 inches: silty clay

Properties and qualities

Slope: 2 to 5 percent

Depth to restrictive feature: 36 to 54 inches to densic material

Drainage class: Moderately well drained

Runoff class: Medium

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Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.02 to 0.06 in/hr)

Depth to water table: About 24 to 42 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 30 percent

Available water supply, 0 to 60 inches: Moderate (about 7.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C

Ecological site: R108XA006IL - Loess Upland Prairie, R110XY007IL - Moist
Glacial Drift Upland Prairie

Hydric soil rating: No

Minor Components

Bryce

Percent of map unit: 3 percent

Landform: Ground moraines, glacial lakes (relict)

Landform position (two-dimensional): Toeslope

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Concave

Ecological site: R110XY008IL - Wet Glacial Drift Upland Prairie

Hydric soil rating: Yes

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Taraxacum officinale



Trifolium pratense



Physalis Spp



Amaranthus Spp.



Zea mays



Amaranthus palmeri



Setaria Spp.



Viola palustris



Lamium amplexicaule



Medicago sativa



Hibiscus trionum