

Exhibit I

Soil Conditions

**West End Solar Project
September 2022**

**Prepared for
EE West End Solar LLC**

Prepared by



Tetra Tech, Inc.

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Acronyms and Abbreviations

Applicant	EE West End Solar LLC
BMP	best management practices
ESCP	Erosion and Sediment Control Plan
NPDES	National Pollutant Discharge Elimination System
OAR	Oregon Administrative Rules
Project	West End Solar Project
SPCC	Spill Prevention, Control, and Countermeasures Plan

1.0 Introduction

EE West End Solar LLC (Applicant) a subsidiary of Eurus Energy America Corporation, proposes to construct the West End Solar Project (Project), a solar generation facility and related or supporting facilities in Umatilla County, OR. Exhibit I was prepared to meet the submittal requirements in Oregon Administrative Rules (OAR) 345-021-0010(1)(i).

2.0 Analysis Area

The Analysis Area for soil resources is the area within the Site Boundary. The Site Boundary is defined in detail in Exhibits B and C and is shown on Figure I-1.

3.0 Identification and Description of Soil Types – OAR 345-021-0010(1)(i)(A)

OAR 345-021-0010(1)(i) Information from reasonably available sources regarding soil conditions and uses in the analysis area, providing evidence to support findings by the Council as required by OAR 345-022-0022, including:

OAR 345-021-0010(1)(i)(A) Identification and description of the major soil types in the analysis area.

Based on the Natural Resources Conservation Service Soil Data (NRCS 2019), there are two major soil types in the Analysis Area (Table I-1, Figure I-1). The Adkins fine sandy loam makes up 73 percent of the analysis area and are eolian deposits, consisting of deep, well-drained soils deposited or transported by wind activity. The remainder of the analysis area is composed of Quincy fine sand (27 percent). The Quincy fine sand is both colluvial and alluvial deposits, consisting of very deep excessively drained soils formed in sands on dunes and terraces. The Adkins series typically consists of four stratigraphic levels (A, Bw, Bk1, Bk2) of fine sandy loam with increasing moisture content and alkalinity at increasing depth at each of the series' level. The Quincy series typically consists of two stratigraphic levels (A and C) of fine sand with decreasing root content and an increase in alkalinity at increasing depth. Soils within the analysis area have a K factor (erosion factor that indicates the susceptibility of a soil to sheet and rill erosion by water) that ranges from approximately 0.1 to 0.32, which could be considered slight to moderate erodibility (NRCS 2019). However, precipitation is limited in the analysis area, as the historical average of precipitation and snow received in Umatilla, Oregon averages 8.93 inches annually, most of which occurs between October and April (Climate Data 2020). Wind erosion is moderate for the Adkins fine sandy loam and is severe for the Quincy fine sand.

- Adkins fine sandy loam (0 to 5 percent slopes): Deep, well drained soils formed in eolian deposits. Used for production of dryland wheat, irrigated cropland, and range for grazing. The soil has an approximate thickness is greater than 7 feet with a slope of 0 to 5 percent. The hazard for erosion is moderate. This soil has a high permeability and moderately low runoff. Shrink-swell potential is low. The depth to a restrictive feature is more than 80 inches. Wind erodibility is rated as moderate.
- Quincy fine sand (0 to 5 percent slopes): Very deep, excessively drained soils formed in sands on dunes and terraces. The depth to a restrictive feature is more than 80 inches. Wind erodibility is rated as severe. 4B Quincy fine sand, 0 to 5 percent slopes have an approximate thickness is greater than 7 feet with a slope of 0 to 5 percent. The hazard for erosion is slight. This soil has a very high permeability and low runoff. Shrink-swell potential is low.

Table I-1. General Description of Mapped Soil Units in Project Area

Soil Unit	Setting Within Project Area	Approximate Thickness	Formation Setting	Permeability	Runoff	Hazard for Water Erosion
1B-- Adkins fine sandy loam	0 to 5 percent slopes	>7 feet	eolian sands	High	Moderately Low	Moderate (K factor of 0.32)
74B-- Quincy fine sand	0 to 5 percent slopes	>7 feet	calcareous sandy alluvium	Very High	Low	Slight (K factor of 0.1)

4.0 Current Land Use within the Analysis Area – OAR 345-021-0010(1)(i)(B)

OAR 345-021-0010(1)(i)(B) Identification and description of current land uses in the analysis area, such as growing crops, that require or depend on productive soils.

The Project Site Boundary encompasses approximately 324 acres. Project facilities are located on private land. Land uses within the Site Boundary consists primarily of fallow agriculture land with two existing transmission lines that pass through the Site Boundary. Land within the Site Boundary is zoned Exclusive Farm Use by the Umatilla County. The Adkins soils are considered prime farmland if irrigated while the Quincy soils are not prime farmland (NRCS 2019).

5.0 Project Soil Impacts – OAR 345-021-0010(1)(i)(C)

OAR 345-021-0010(1)(i)(C) Identification and assessment of significant potential adverse impact to soils from construction, operation and retirement of the facility, including, but not limited to, erosion and chemical factors such as salt deposition from cooling towers, land application of liquid effluent, and chemical spills.

5.1 Soil Impacts During Construction

Construction of the solar arrays will require a variety of activities that have the potential for adversely impacting soils. Activities that may result in potential adverse soil impacts include:

- Clearing and grubbing of vegetation in temporary construction areas, solar array, and new access roads;
- Constructing new access roads;
- Hauling heavy equipment and other truck traffic for the delivery of aggregates, concrete, water, solar components, and construction supplies; and
- Fueling or maintenance of construction equipment or vehicles.

The portions of the analysis area that will be graded are expected to result in a balanced cut-and-fill quantity of earthwork to maintain the existing conditions to the extent practicable for the protection of the equipment and facilities. To the extent practicable, existing vegetation will be preserved and open areas will be revegetated or placed with stable ground cover. When practicable, open areas will be revegetated or stabilized before and after grading or construction. Erosion and sediment control and perimeter sediment control measures will be in place before vegetation is disturbed and will remain in place and be maintained, repaired, and promptly implemented for the duration of construction.

For the purpose of analyzing potential impacts to resources, the entire area within the Site Boundary (324 acres) should be considered subject to temporary and/or permanent disturbance. Impacts to soil, such as erosion, resulting from construction activities would be limited through:

- Avoiding sensitive soil areas to the extent practicable;
- Maintaining a Spill Prevention, Control, and Countermeasures Plan (SPCC Plan);
- Implementing the erosion and sediment control best management practices (BMPs) included in the final Erosion and Sediment Control Plan (see Attachment I-1 for example erosion and sediment control measures and best management practices) ; and
- Implementing appropriate site restoration practices following construction as described in the Project's final Erosion and Sediment Control Plan (ESCP) that will be completed prior to construction (see Attachment I-1 for example erosion and sediment control measures and best management practices).

Soil compaction will be minimized by restricting most construction traffic to established access roadways thus minimizing compaction from heavy equipment to the access road areas. The Project Site Boundary is composed of well drained soils and therefore will dry quickly after rain events in the winter months. Heavy equipment work outside the roads and pads will be avoided during and immediately after significant rain events to avoid compaction and rutting. In the event of decommissioning, soil compaction under the roads and pads will be mitigated through removal of gravel surfacing, regrading to appropriate contours, and scarification to loosen compacted soils prior to replacement of topsoil and revegetation.

5.2 Soil Impacts During Operation

Operational activities will not result in impacts to soils as activities will be restricted to access roads and no ground disturbance will occur. Project revegetation efforts will provide for long-term soil stability during operation in areas that were temporarily disturbed.

The inverters, transformers, and the battery storage system will be stored in completely contained, leak-proof modules on concrete pads to capture any leaks that may occur (see Exhibit B). Operation and maintenance staff will conduct inspections of the inverters, transformers, and battery system according to the manufacturer's recommendations, which are assumed to be monthly inspections. In addition, an SPCC Plan will be developed to manage, prevent, contain, and control potential releases, and provide provisions for quick and safe cleanup of hazardous materials (see Exhibit G). The potential for soil contamination will be limited by not maintaining substantial supplies of hazardous materials on site, and by observing appropriate safety measures during maintenance procedures.

5.3 Soil Impacts During Decommissioning

In the event of decommissioning, potential erosion hazards will be similar to those occurring during construction. Measures similar to those employed during construction and operation will be used during decommissioning to prevent and control erosion, to prevent spills, and to revegetate disturbed areas.

6.0 Mitigation Measures – OAR 345-021-0010(1)(i)(D)

OAR 345-021-0010(1)(i)(D) A description of any measures the applicant proposes to avoid or mitigate adverse impact to soils.

6.1 Minimization and Best Management Practices

The Applicant will rely on the following measures to avoid or minimize adverse impacts on soils.

- **Preserve Existing Vegetation** – To the extent practicable, existing vegetation will be preserved. Where vegetation clearing is necessary, root systems would be conserved if possible.

- **Erosion Control Measures** – During construction, the Applicant will implement BMPs for erosion, including perimeter controls (e.g., silt fence), soil stabilization (e.g., mulching or tackifiers), and dust control as outlined in the Project-specific ESCP that will be prepared prior to construction.
- **Revegetation** – The Applicant will provide long-term soil stability by reseeding disturbed areas to reestablish vegetation. At the completion of land-disturbing activities, the site will be revegetated with an appropriate seed mix. The seed will be applied with mulch to protect the seeds as the grass establishes. Scarifying and reseeding of affected areas will occur after construction has been completed.
- **Pollutant Management** – During construction, source control measures will be implemented to reduce the potential of chemical pollution to surface water or groundwater during construction. SPCC plans for construction and operation will be prepared for each phase of the project that outline the site-specific handling and reporting measures (see Exhibit G).
- **Haul Truck Traffic** – Before land-disturbing activities begin, BMPs will be in place to prevent the tracking of sediment onto public or private roads such as using graveled (or paved) exits and parking areas, placing gravel on unpaved roads onsite, or using an exit tire wash. Haul truck traffic will be limited to improved access roads and gravel-covered haul roads, limiting deep soil compaction and disturbance. The loads of the haul trucks and heavy equipment, and the resulting induced stress, will be distributed through the gravelly surfacing material, minimizing compaction of the native soils. Mitigation efforts to reduce impacts from soil compaction will include scarifying and reseeding affected areas after construction is completed.
- **Fugitive Dust Abatement** – BMPs will be used to control fugitive dust in accordance with DEQ regulations. Water, soil-binding agents, or other dust control techniques will be implemented as needed to avoid wind-blown soil. Fugitive dust from grading will be minimized by implementing a phased grading approach. During grading or soil excavation a combination of the following measures may be implemented: water spray/mist, adjust grading activities, and/or suspend work under unfavorable conditions (sustained wind speed greater than 20 miles per hour). For areas where soils are stockpiled, a combination of the following measures may be implemented: water spray/mist, soil-binding agents, and/or other dust suppression systems such as covering stockpiles particularly if sustained wind greater than 20 miles per hour are expected. For soil loading, hauling, and backfilling, airborne dust wet suppression systems and water spray mist will be implemented as required.

7.0 Monitoring Program – OAR 345-021-0010(1)(i)(E)

OAR 345-021-0010(1)(i)(E) The applicant's proposed monitoring program, if any, for adverse impact to soils during construction and operation.

Erosion and sediment control measures will be inspected and maintained regularly during construction. The Applicant will monitor the restoration success of temporarily disturbed areas according to the ESCP. No adverse impacts to soils are expected from operation; therefore, no monitoring program for operation is proposed.

8.0 Conclusions

The evidence provided in this exhibit demonstrates that the requirements specified in OAR 345-022-0022 have been met because the Project is not likely to result in significant adverse impacts to soils. The potential impacts from erosion during construction are anticipated to be minimal and are addressed through erosion-control measures as described above and in Attachment I-1. Subsequent revegetation efforts will provide for long-term soil stability during operation. Restricting operational activity to permanent roads will minimize erosion. Taking this into account, the Oregon Energy Facility Siting Council may conclude that the design, construction, and operation of the Facility, as proposed, is not likely to result in a significant adverse impact to soils.

9.0 References

NRCS (Natural Resources Conservation Service) 2019 Web Soil Survey Map. Electronic document, <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>. Last modified May 20, 2020






Figures

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West End Solar Project

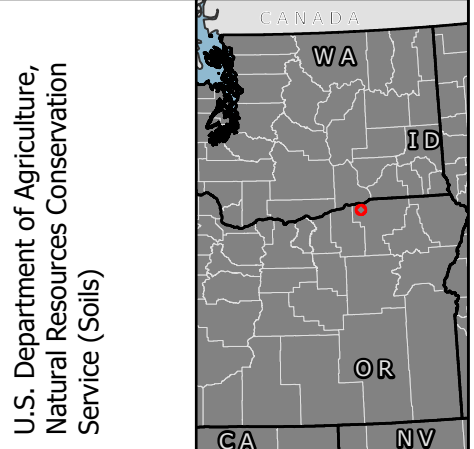
Figure I-1 Soil Type

UMATILLA COUNTY, OR

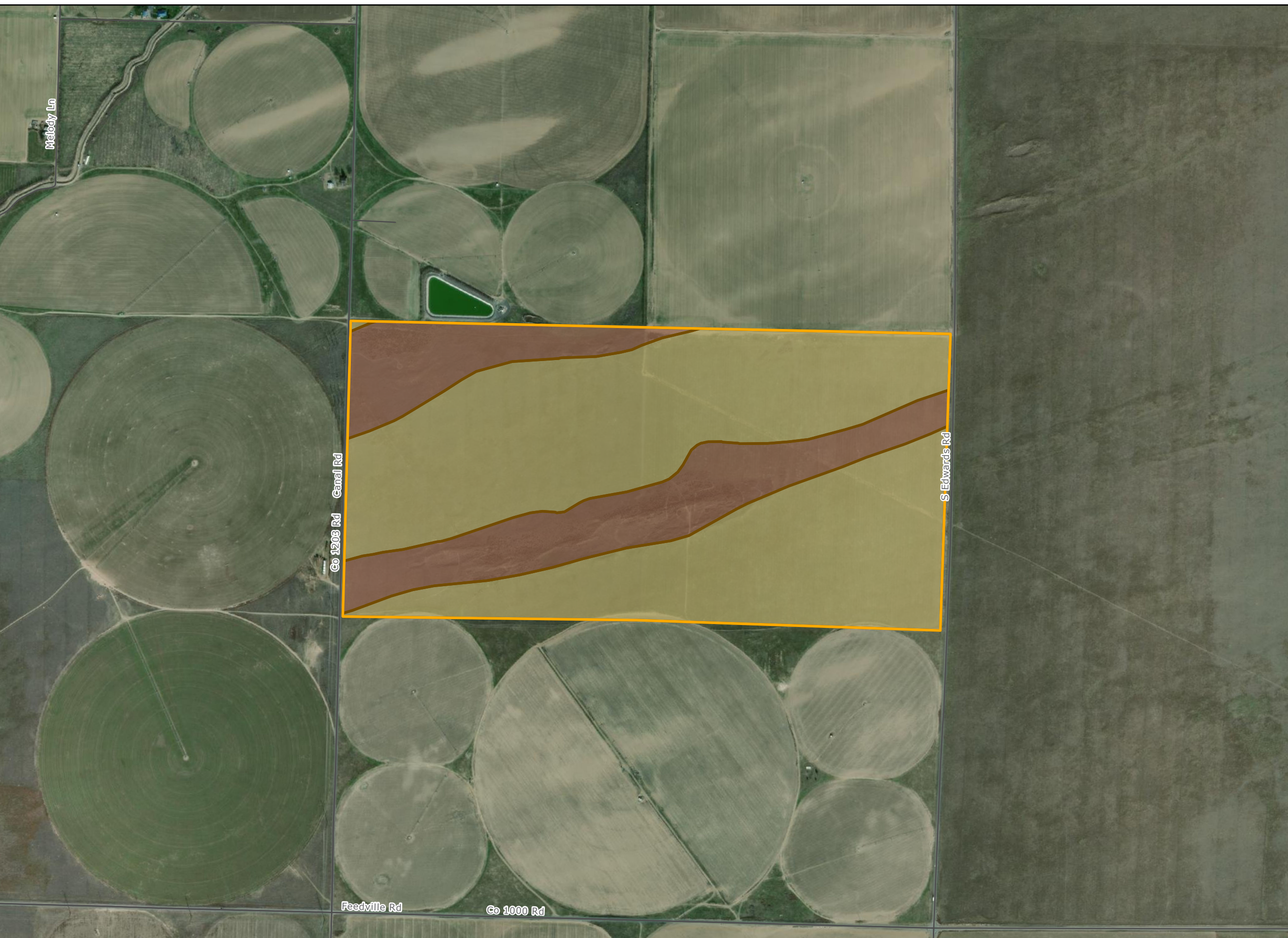
-  Proposed Site Boundary
 -  Local Roads
 -  Soil Unit
- Soil Types
-  1B - Adkins fine sandy loam, 0 to 5 percent slopes
 -  74B - Quincy fine sand, 0 to 5 percent slopes



Data Source Reference Map



U.S. Department of Agriculture,
Natural Resources Conservation
Service (Soils)



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Attachment I-1. Erosion Sediment Control Measures

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West End Solar Project

Erosion Sediment Control Measures

West End Solar Project
September 2022

Prepared for
EE West End Solar LLC

Prepared by



Tetra Tech, Inc.

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Erosion and Sediment Control Measures

Introduction

EE West End Solar LLC (Applicant), a subsidiary of Eurus Energy America Corporation, proposes to construct the West End Solar Project (Project), a solar energy generation facility and related or supporting facilities in Umatilla County, Oregon. The Project Site Boundary includes 324 acres. Land uses within the Site Boundary consists primarily of fallow agriculture land with two existing transmission lines that pass through the Site Boundary. Land within the Site Boundary is zoned Exclusive Farm Use by the Umatilla County.

Based on the Natural Resources Conservation Service Soil Data (NRCS 2019), there are two major soil types in the Project Site Boundary. The Adkins fine sandy loam makes up 73 percent of the Site Boundary and are eolian deposits, consisting of deep, well-drained soils deposited or transported by wind activity. The remainder of the Site Boundary is composed of Quincy fine sand (27 percent). The Quincy fine sand is both colluvial and alluvial deposits, consisting of very deep excessively drained soils formed in sands on dunes and terraces. Soils within the Site Boundary have a K factor (erosion factor that indicates the susceptibility of a soil to sheet and rill erosion by water) that ranges from approximately 0.1 to 0.32, which could be considered slight to moderate erodibility (NRCS 2019). However, precipitation is limited in the Project Site Boundary, as the historical average of precipitation and snow received in Umatilla, Oregon averages 8.93 inches annually, most of which occurs between October and April (Climate Data 2020). Wind erosion is moderate for the Adkins fine sandy loam and is severe for the Quincy fine sand.

The Site Boundary occupies slopes ranging from approximately zero to 15 percent, with an average slope of less than 2 percent. Elevations within the Site Boundary range from approximately 665 feet to 732 feet above mean sea level. No wetland or stream features were mapped by the National Wetlands Inventory (NWI) database and National Hydrography Dataset (NHD) within or immediately adjacent to the Site Boundary and none were documented during the Project field investigations.

Regulatory Background

The U.S. Environmental Protection Agency has delegated authority to the ODEQ to issue National Pollutant Discharge Elimination System (NPDES) stormwater discharge permits for construction and operations activities. A NPDES permit is required for construction activities that will disturb more than one acre of land and has the possibility of stormwater running off the site into surface waters or conveyance systems leading to surface waters of the state.

Project activities will disturb more than one acre of land; however, as there are no surface waters or ditches/conveyance systems within or adjacent to the Site Boundary and the topography of the Project site is such that rainfall or snowmelt would not leave the site or enter a waterway, the Applicant maintains that there is no possibility of stormwater running off the site into surface waters of the state or into a conveyance systems leading to surface waters of the state. Therefore, the Applicant understands that a NPDES 1200-C permit is not required.

An Erosion and Sediment Control Plan (ESCP) is required with NPDES 1200-C permit coverage. Although 1200-C permit coverage is not required, the Applicant has prepared this document to provide a description of erosion and sediment control measures and best management practices that will be implemented prior to and during construction to reduce erosion. A site-specific ESCP may be developed prior to construction in coordination with the county and any required grading permit documents.

Erosion and Sediment Control Measures and Best Management Practices

Erosion control best management practices will be implemented during all ground disturbing activity until permanent site ground covers are in place. A best management practice (BMP) is a physical, chemical, structural or managerial practice that prevents, reduces or treats contamination of water or which prevents or reduces soil erosion. The following BMPs protect exposed soil surfaces from rain generated splash erosion, dust erosion, and help slow flows across a site of ground disturbance.

- Erosion Prevention Practices:
 - Grading will be minimized to the maximum extent practicable and existing vegetation preserved where practical.
 - Grading will be scheduled/phased to minimize soil exposure and prevent exposed inactive areas from becoming a source of erosion. Existing vegetation will not be removed any sooner than is necessary.
- Fugitive Dust Abatement:
 - Water, soil-binding agents, or other dust control techniques will be implemented as needed to avoid wind-blown soil. Watering will be applied without creating ponding or mists that travel beyond the site. If soil-binding agents are used, they will be applied in a way to not travel beyond the site.
 - Fugitive dust from truck traffic will be minimized by applying water to access roads and by keeping paved public rights-of-way (ROW) clean or wet down. All trucks entering and leaving the Site will adhere to the posted speed limit, which shall be no more than 10 miles per hour (mph). All trucks leaving unpaved areas to paved areas of the public ROW, whether full or empty, will be visually inspected for loose material. Stabilized construction exits (e.g., 3- to 6-inch cobblestone or rip rap placed on top of a geotextile) will be used to assist with cleaning of truck tires as the vehicles leave unpaved areas. Any loose material is to be removed and placed into the truck trailer.
 - Fugitive dust from grading will be minimized by implementing a phased grading approach. During grading or soil excavation a combination of the following measures may be implemented: water spray/mist, adjust grading activities, and/or suspend work under unfavorable conditions (sustained wind speed greater than 20 miles per hour).

- For areas where soils are stockpiled, a combination of the following measures may be implemented: water spray/mist, soil-binding agents , and/or other dust suppression systems such as covering stockpiles particularly if sustained wind greater than 20 miles per hour are expected.
- For soil loading, hauling, and backfilling, use airborne dust wet suppression system and water spray mist as required.
- Sediment retention:
 - Sediment will be kept on site by using sediment basins, traps or sediment barriers. Sediment basins and traps will be located at low points below disturbed areas. Earth dikes or swales will be implemented as needed to route drainage from disturbed areas into the basins. Sediment barriers and sediment fences will be placed below small disturbed areas on gentle to moderate slopes.
- Vegetate and mulch disturbed areas.
 - Apply temporary and/or permanent soil stabilization measures immediately on all disturbed areas as grading progresses. Temporary or permanent stabilizations measures are not required for areas that are intended to be left unvegetated, such as dirt access roads or utility pole pads.
 - Exposed soil will be seeded and mulched as soon as practicable after grading is completed.

References

NRCS (Natural Resources Conservation Service) 2019 Web Soil Survey Map. Electronic document, <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>. Last modified May 20, 2020

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