

ATTACHMENT 8. EROSION CONTROL PLAN

8.1 INTRODUCTION

The following plan has been developed to provide a strategy for erosion and sediment control associated with the Project both during and after site construction. The Project is a proposed utility scale solar energy facility located in Benton, Clinton, and Unity Twp, Maine, and the scope of work includes:

- Installation of approximately PV panels with an estimated rated capacity of 110 MWac and associated support structures;
- Upgrades to and/or construction of 24- to 16-ft-wide Project access roads;
- Construction of 12-ft-wide access roads to allow access to several outparcels located interior to the Project;
- Installation of up to 39 paired central inverters/transformers on skids;
- Installation of the Collector and Genlead; and
- Installation of an O&M building and collection substation adjacent to Bessey Lane.

This plan is based upon sound conservation practices, including as applicable, those outlined in the “Maine Erosion and Sediment Control Best Management Practices (BMPs) Manual for Designers and Engineers” (BMP Manual) published by the Bureau of Land and Water Quality, MDEP (October 2016).

Details of erosion and sediment control during the construction of the Project are located in the civil site plans for the solar array area, including supporting infrastructure (Attachment 5-1), and the Genlead (Attachment 5-2).

8.1.1 Stormwater Management Measures

Additional measures may be required to protect new stormwater conveyance or management systems due to changes in actual site conditions. For more information on stormwater management, see Section 12.0 of the Project’s Site Law permit application. For additional information on stormwater management and buffers, the contractor shall reference the Maine Stormwater Best Management Practices Manual, Volume III: BMP Technical Design Manual (revised May 2016).

8.1.2 Definitions

The following definitions are for terms commonly used throughout this plan.

Acceptance – As used herein shall mean verification that the specific erosion control measure or device to be accepted is adequately constructed, performs satisfactorily as intended, and is complete. Acceptance of a measure or device shall be based upon visual observations and inspection and is not a warranty of compliance, compaction, structural integrity, workmanship, or other construction-related or qualitative factors that may require testing or other means of certification of compliance.

BMP Manual – Refers to the “Maine Erosion and Sediment Control Best Management Practices (BMPs) Manual for Designers and Engineers”.

Three Corners Solar Project

MDEP Natural Resources Protection Act Permit Application

ATTACHMENT 8. EROSION CONTROL PLAN

Buffer strips – Natural, undisturbed strips of natural vegetation or reseeded strips of close-growing vegetation adjacent to and downslope of developed areas.

Clearing – Includes cutting and removing of vegetative cover. It does not include grubbing. Limited cutting, thinning, use of heavy equipment, and other clearing restrictions will apply to sensitive areas (e.g., wetlands).

Earthwork – Consists of the movement of soil by mechanical means including excavation, filling, grading, trenching, and shaping.

Erosion and Sediment Controls – Defined as the installation of silt fence, bales, erosion control berms, rip-rap, mulching, erosion control matting or netting, check dams, inlet protection, reinforced turf, erosion control mix, construction entrances, diversions, level spreaders, and any other temporary or permanent measures required herein.

Grubbing – The removal of grass, stumps, roots, and scrub required to begin earthwork. Grubbing is the initial clearing action that exposes soil to erosive forces (wind, rain).

Interim Period – A period of time that an un-vegetated area sits un-worked, awaiting the next phase of work.

Permanent or Final – As used herein, shall refer to the use or placement of erosion or sedimentation controls, seeding, or other measures, which will remain through final Project completion.

Seasons – The following dates define the seasons as referred to herein:

<u>Seasons</u>	<u>Dates</u> (<i>Seasonal dates may vary from year-to-year</i>)
Winter	November 1 to April 15
Mud-Season	March 16 to April 30
Spring	May 1 to June 14
Summer	June 15 to September 15
Fall	September 16 to October 31

Temporary – As used herein shall refer to the use or placement of erosion or sedimentation controls, seeding, or other measures intended to be either removed, replaced, reworked, reseeded, or followed with permanent measures.

8.2 CONSTRUCTION CALENDAR

The contractor is required to give special attention to the sections pertaining to fall and winter construction, as well as to sensitive areas and requirements for temporary seeding, dormant seeding, and mulching.

8.2.1 Schedule of Activities

The following construction activities, erosion and sediment control measures, or other items are required for the construction of this Project or require specific measures or scheduling of activities to be conducted or restricted during the various construction seasons as defined above.

Clearing – Clearing is anticipated to occur during the late summer through fall 2022 and winter 2023.

Three Corners Solar Project

MDEP Natural Resources Protection Act Permit Application

ATTACHMENT 8. EROSION CONTROL PLAN

Erosion and Sediment Controls Installation – Erosion and sediment control measures shall be installed prior to commencement of disturbance activities and throughout the duration of active construction as applicable to each erosion control measure. See civil site plans for locations and installation procedures (Attachments 5-1 and 5-2).

Access Road Construction – This construction is anticipated to occur in the late summer 2022 through early winter 2023.

8.3 EROSION AND SEDIMENT CONTROL MEASURES

Construction of the Project may require or incorporate the following erosion and sediment control measures or practices as needed or applicable. No more than 10 acres of disturbed soils will be open at one time without erosion and sediment control measures (e.g., mulch) in place on the disturbed soil. Additional measures not shown or discussed here may be needed to protect natural resources and/or off-site properties from erosion and sediment runoff. The following information is being provided at a minimum, with supporting more-detailed information available in the BMP Manual and the civil site plans for the solar array area (Attachment 5-1) and the Genlead (Attachment 5-2)

Bales – Straw (or hay) bales may be required in addition to silt fencing or other measures in sensitive areas. Bales are to be embedded at a minimum of four inches into the existing soil and staked with ends tightly abutting adjacent bales. At least two stakes per bale are to be driven into the ground for anchoring. Where staking and embedding of bales is impractical due to excessive roots, ledge, or other construction hazards, bale barriers may be substituted with erosion control mix berms provided they are not installed in locations with concentrated flow. Refer to Section B-6 of the BMP Manual.

Construction Entrance/Exit – A crushed stone-stabilized construction entrance will be installed as shown on the civil site plans. Stone entrances/exits shall be placed on geotextile fabric and shall include a minimum 10-foot by 10-foot taper (or as needed to support large construction/delivery vehicles) on both sides of the entrance to allow for turning vehicles. Refer to Section A-2 in the BMP Manual.

Dust Control – As necessary, the contractor shall take steps to control blowing and airborne movement of dust from exposed soil surfaces. Maintaining natural or temporary vegetation and/or mulching shall be used where practical. Mechanical sweepers shall be used where necessary to prevent and remove dust buildup on paved surfaces. Regularly traveled soil surfaces shall be maintained to minimize dust by periodically moistening bare areas with adequate water to prevent dust. Calcium Chloride may be used in areas experiencing significant dust problems and to reduce frequency of watering. Repetitive treatment shall be applied as necessary to accomplish adequate dust control. Refer to Section A-1 in the BMP Manual.

Erosion Control Mix Berms – May be installed in locations that do not have a concentrated flow. Erosion control mix berms are an approved alternative to silt fence provided they are not located in sensitive areas described above. Refer to Section B-2 of the BMP Manual. Erosion control mix may be manufactured on or offsite and shall follow the guidelines outlined in Section D-3 in the BMP Manual. The composition specification outlined in Section D-3 should be used as a guideline, but the actual mix design will be performance based.

Level Lip Spreader – Level lip spreader lengths are stone-lined ponded areas discharging over a level berm through a well vegetated buffer area. If needed, these spreaders will function to disperse channelized flow

Three Corners Solar Project

MDEP Natural Resources Protection Act Permit Application

ATTACHMENT 8. EROSION CONTROL PLAN

into shallow sheet flow. Construction and length of level lip spreaders shall be as detailed on the final design plans. Refer to Section G-4 and I-2 of the BMP Manual.

Matting (or Erosion Control Blankets) – Shall consist of straw, coconut or excelsior sandwiched between photodegradable netting. Matting may be substituted with sod where desired. Matting shall be used on all steep constructed slopes as indicated on the design plans or where mulching has proven to be ineffective in the field. Refer to Section D-2 of the BMP Manual.

Outlet Protection – Riprap outlets (aprons or plunge pools) shall be placed in locations where indicated on the final design plans, and in locations where flared end sections have proven to be inadequate to prevent scouring at the pipe outlet in the field. Refer to Section H-2 of the BMP Manual.

Permanent Mulching (Erosion Control Mix) and Revegetation – Permanent mulch is long-term cover that provides a good buffer on and around disturbed areas. Permanent mulching with erosion control mix can be used as a permanent ground cover, as an overwinter stabilization mulch, or left to naturalize and revegetate to near natural conditions. It is not used to support grassy vegetation, but legumes or woody vegetation may be established if allowed to revert to natural conditions. Permanent mulch must not be used in areas of concentrated water flows, and any evidence of groundwater seepage on slopes may require the erosion control mix to be replaced with riprap. Erosion control mix can be manufactured on or off the Project site. It shall consist primarily of organic material, separated at the point of generation and may include shredded bark, stump grindings, composted bark, or flume grit and fragmented wood generated from water-flume log handling systems. Wood chips, ground construction debris, reprocessed wood products, or bark chips will not be acceptable as the organic component of the mix. Erosion control mix composition shall be in accordance with Section D-3 of the BMP Manual. Erosion control mix must be free of refuse, physical contaminants, and material toxic to plant growth.

Riprap – Shall be used in swales, steep slopes, and outlets as necessary to protect soils from excessive flow velocities. Riprap may be required at locations where revegetation matting, high velocity ditch lining or soft armor is proven to be ineffective in the field. Refer to Sections F-3 (slopes) and G-2 (channels) of the BMP Manual.

Sediment Controls – Sediment controls are installed down gradient of disturbed earth with the purpose of reducing runoff velocity and allowing for soil settlement (see Section B of the BMP Manual). A sediment controls include silt fence, erosion control mix berm, filter socks, stone check dams, storm drain inlet protection, and hay bales that are intended to be used where:

- Sedimentation can pollute or degrade a wetland or other water resource;
- Sedimentation will reduce the capacity of storm drainage systems or adversely flood adjacent areas; and
- Sediment barriers cannot be used in areas of concentrated flows. *Under no circumstances* should erosion control mix sediment barriers be constructed in streams or in swales.

Silt Fence – Silt fence may be required as warranted or determined by field conditions. Silt fence may also be required in addition to bales or other measures in sensitive areas as shown on the design plans. Where staking and embedding fabric is impractical due to excessive roots, ledge, or other construction hazards, silt fence may be substituted with erosion control mix berms or placement of 6 inches of suitable non-organic material along fabric flap on upslope side of fence, in lieu of burying fabric in trench. Refer to Section B-1 of the BMP Manual.

Three Corners Solar Project

MDEP Natural Resources Protection Act Permit Application

ATTACHMENT 8. EROSION CONTROL PLAN

Stone Check Dams – Shall be installed in existing and proposed swales or at culvert inlets as necessary. These check dams serve to reduce flow velocities in swales thus helping to reduce rilling. Check dams shall be constructed to prevent breaching and scour at the outer edges along the sides of the ditch. Refer to Section B-4 of the BMP Manual.

Temporary Mulching – Shall consist of spreading of straw (or hay) mulch or erosion control mix over bare or disturbed areas. It shall be applied at the rates described in the *Temporary Seeding and Mulching Schedule* described below. Mulching shall be substituted with matting in locations where it has proven to be ineffective in the field. Refer to Section D-1 of the BMP Manual.

8.4 EROSION AND SEDIMENT CONTROL EXECUTION

8.4.1 General Construction Phase

The following general practices will be used to minimize the potential for erosion and control sediment runoff during construction of the Project. Applications and installation methods will be further detailed in the final design plans. If the contractor is unclear regarding the use, location, installation, intended performance, or maintenance of any prescribed erosion control measures, the contractor shall refer to the BMP Manual for detailed procedures.

NOTE: Locations of erosion and sediment control measures are shown on design plans as typical for general purposes only to indicate the intent. Final locations of erosion and sediment control measures should be selected based on actual field conditions and as site conditions warrant.

Construction Traffic – Construction traffic will be directed over the stabilized construction entrance/exit and proposed roads. The crushed stone construction entrance/exit shall be maintained with the addition of more crushed stone as needed or as the voids become filled. The public roadway shall be swept as soon as possible should mud be tracked onto it.

Erosion Control Installation – Prior to the start of grubbing, silt fence, bales, erosion control mix berms, stabilized construction entrances, or other appropriate measures shall be installed adjacent to construction areas, at the toe of slopes, or as otherwise required to protect against construction related erosion. Double rows of sediment barrier will be installed prior to winter construction. Immediately following construction of culverts and swales, any necessary stone check dams, and ditch linings shall be installed. Prior to start of construction there will be a mandatory pre-construction meeting to discuss the construction schedule and the erosion and sedimentation control plan.

Following Clearing – Only those areas under active construction shall be left in an untreated or unvegetated condition.

Grading – Grading will be held to a maximum 2:1 slope where practical. Finish-graded areas shall be stabilized with permanent seeding and mulching or other accepted means immediately after final grading is complete. If final grading will not be completed immediately, refer to the *Temporary Seeding and Mulching Schedule* detailed below. It is understood that immediately means within five days of the completion of work. For time periods longer than five days, refer to *Permanent Seeding and Mulching Plan* below. **No more than 10 acres of disturbed area will be left unstabilized at any time.**

Three Corners Solar Project

MDEP Natural Resources Protection Act Permit Application

ATTACHMENT 8. EROSION CONTROL PLAN

Housekeeping – Rubbish, trash, garbage, litter, or other such materials shall be deposited into sealed containers. Materials shall be prevented from leaving the premises through the action of wind or stormwater drainage into drainage ditches or waters of the State.

Monitoring Schedule – The contractor shall be responsible for installing, monitoring, maintaining, repairing, replacing and/or removing the temporary erosion and sedimentation controls as specified herein, or shall appoint a qualified subcontractor to do so, as follows:

- The contractor or approved designated Inspector shall perform weekly inspections of the site until the site is stabilized. Inspections may be performed on a bi-weekly schedule when work has abated for more than one week.
- Maintenance measures will be performed as needed during the entire construction cycle. After each rainfall, and *prior to* predicted significant rainfall events (> 1 inch), a visual inspection of erosion and sediment controls will be made by the contractor or approved designated Inspector to confirm their continuing function as designed.
- Stone check dams, bale barriers, drop inlet barriers, erosion control mix berms, silt fence, and mulch shall be inspected and repaired once a week or immediately following any significant rainfall. Sediment trapped behind these barriers shall be removed when it reaches a depth of 6 inches (or 1/2 the height of the dam for check dams) and redistributed to areas undergoing final grading.
- Near completion of the construction and after the site is reseeded and stabilized, the contractor shall inspect, clean, maintain, repair, restabilize, or revegetate all drainage structures, storm drains, culverts, level spreaders and ditches prior to acceptance by the Applicant.

Permanent Seeding and Mulching Plan – The following general practices will be used to re-establish final vegetation.

- Loam or reclaimed topsoil will be spread over disturbed areas and graded to a uniform depth and a natural appearance.
- Final seeding shall be completed immediately (within 7 days) following final any necessary grading. All final fertilizing and seeding shall adhere to these specifications.
- Areas shall be mulched immediately after seeding. Immediately upon first signs of any evidence of significant erosion occurring, the contractor shall repair and mulch all such areas until the area is stabilized. Mulching shall consist of hay mulch, hydro-mulch, or any suitable substitute. Mulching shall be monitored according to the *Monitoring Schedule* above. Should mulching prove to be ineffective, netting or matting shall be used in its place.
- Straw mulch or hay shall be applied at the rate of 2 tons per acre (90 pounds or 2 bales/1,000 square feet) unless otherwise specified.
- Hydro-mulch shall consist of a mixture of tackifier, wood fiber or paper fiber and water sprayed over a seeded area. Hydro-mulch shall not be used during the fall, winter, or mud season.

Three Corners Solar Project

MDEP Natural Resources Protection Act Permit Application

ATTACHMENT 8. EROSION CONTROL PLAN

- Dormant seeding, between first frost and snowfall, will be applied at twice the standard rate and heavily mulched.
- Erosion control mix utilized for permanent stabilization and to promote natural revegetation may be used in lieu of loaming and seeding.

Temporary Seeding and Mulching Schedule – During construction, all disturbed areas shall adhere to the schedules specified in Tables 8-1 and 8-2. Refer to *Permanent Seeding and Mulching Plan* above for permanent seeding and mulching requirements.

- The contractor shall be responsible for monitoring daily weather reports when working in identified sensitive areas and for monitoring weekly reports in all other areas. The contractor shall adjust the work schedule in anticipation of rains and shall stabilize the site as indicated or required.
- All completed areas that have been loamed and/or finish graded shall be permanently reseeded in accordance with the *Permanent Seeding and Mulching Plan* above.
- Temporary mulching and/or seeding shall commence immediately following initial fine grading of any area expected to remain bare for an interim period of more than 7 days. Stabilization or seeding requirements shall be determined in accordance with Tables 14-1 and 14-2 and shall be implemented at the beginning of the expected interim period.
- Exposed or bare soil in these areas shall be mulched at the completion of work, each day, if significant rainfall is predicted or imminent.
- Mulch application rate shall be doubled during winter construction. Where practicable, mulch should be applied at the end of each day's work for areas that have been fine graded or if snow is predicted or eminent. In no case shall any areas be left bare for more than 15 days during winter construction.
- Temporary seeding and mulch shall be inspected and maintained or repaired weekly. At a minimum, 75% of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (e.g., mulch, filter barriers, check dams, bales). Mulch shall be reapplied as necessary to completely cover soil.
- Areas within 75 feet of a wetland or waterbody will be stabilized with a double row of sediment barriers within 48 hours of the initial disturbance or prior to any storm event, whichever comes first (Maine Construction General Permit, Appendix A (3)).

Three Corners Solar Project

MDEP Natural Resources Protection Act Permit Application

ATTACHMENT 8. EROSION CONTROL PLAN

Table 8-1. Stabilization Schedule

Maximum Expected Interim Period (Days)	Temporary Mulching (Hay)	Temporary Seeding
0-7	None	None
7-30	2-bales/1,000 square feet	None
30-60	2-bales/1,000 square feet	(per Table 14-2: Temporary Seeding Schedule)
More than 7 days during winter season	4-bales/1,000 square feet	Dormant seeding only

Table 8-2. Temporary Seeding Schedule

Typical Seed	Seeding Rate (lbs/acre – lbs/1,000 sf)	Recommended Seeding Dates
Winter Rye Grass	112 – 2.6	8/15 to 10/1
Oats	80 – 1.8	4/1 to 7/1 8/15 to 9/15
Annual Rye Grass	40 – 0.9	4/1 to 7/1
Sudangrass	40 – 0.9	5/15 to 8/15
Perennial Rye Grass	40 – 0.9	8/15 to 9/15

Topsoil – Any necessary topsoil will be stockpiled on-site in areas that have minimum potential for erosion, such as flat slopes or on-site borrow pits, and will be kept as far as possible from existing drainage areas. Stockpiles expected to remain longer than 15 days shall be encircled with bales, erosion control mix berms, or silt fence at the down gradient sides of the stockpile and mulched with a second application of hay mulch and anchored with biodegradable netting, as necessary (Maine Construction General Permit, Appendix A (6) a-d).

Winter Construction – For any work proposed during the winter season, the contractor shall adhere to the following practices.

- Limit the exposed area to those areas in which work is to occur during the following 15 days and that can be mulched in one day prior to any snow event.
- Where required, installation of silt fence may be modified from detail on design plans to substitute 6 inches of suitable non-organic material over the bottom of the silt fence in lieu of trenching and backfilling fabric or erosion control mix berm/barrier.
- Double rows of sediment barriers will be installed prior to winter construction where required within 100 feet of wetlands and waterbodies.

Three Corners Solar Project

MDEP Natural Resources Protection Act Permit Application

ATTACHMENT 8. EROSION CONTROL PLAN

- Mulching and seeding rates shall adhere to the *Temporary Seeding and Mulching Schedule* above. Note that all mulching rates shall be doubled as shown in the above table.

8.4.2 Erosion Control Measure Removal

Removal of temporary erosion and sediment control measures shall be the responsibility of the contractor. Erosion and sediment controls shall remain in place and will be maintained by the contractor until all related construction is complete and the area has been stabilized.

An area is considered stable if an 85% cover of vegetation has been established or riprap or other permanent measures are in place and functioning properly.

Bales and silt fence shall be removed within 30 days of final stabilization. The bales and silt fence shall be disposed of appropriately in an off-site location. Sediment trapped behind these controls shall be distributed to an upland area undergoing final grading and graded in an aesthetic manner to conform to the topography, and fertilized, seeded and mulched, or otherwise stabilized, in accordance with the BMP Manual.

The sediment trapped behind/around/in stone check dams will be removed and transported off-site, or to an upslope area undergoing final grading. The sediment trapped by stone check dam devices will not be regraded locally since they exist in drainage ways.

8.5 FIELD ADJUSTMENTS

The Applicant expects that minor adjustments will be made during final design work and during construction based on conditions encountered in the field, such as vegetation clearing outside of resources. As described below, the Applicant has identified changes that do not require a permit modification and that may be made (a) without advance notice to MDEP or, (b) that require prior approval by MDEP staff.

As reflected in notes to the Project plans, the Applicant understands that the following field and/or final design adjustments are authorized under the permit provided they do not result in new impacts to protected natural resources as defined under the NRPA (38 MRSA Section 480-B(8)); do not increase overall Project clearing; do not impact a new landowner without authorization; and meet the requirements of MDEP Chapter 500 Stormwater Management Standards. These adjustments will be reflected in the final as-built drawings.

- (a) Examples of adjustments that may be made during construction and/or final design without advance notice to MDEP:
- Reduction in clearing, impervious surface, or size of structure; elimination of a structure; or relocation of a structure;
 - Location, dimension, or addition of drainage culverts, level spreaders, rock sandwiches, or other stormwater infrastructure, provided that the culvert does not convey a regulated stream

Three Corners Solar Project

MDEP Natural Resources Protection Act Permit Application

ATTACHMENT 8. EROSION CONTROL PLAN

and that the hydraulic capacity of the modified stormwater infrastructure meets design standards; and

- Changes to ground screw locations for the panel racking system.

(b) May be made upon prior approval by MDEP staff:

- Changes other than those identified in (a) and that do not otherwise require a permit amendment, as determined by MDEP.

8.6 CONCLUSION

If constructed in conformance with these basic standards, the Project is not expected to result in significant erosion or sedimentation either on or off the site