



**DETERMINING PRIME FARMLAND SOILS
AND
SOILS OF STATEWIDE IMPORTANCE
FOR SITING SOLAR PROJECTS IN MAINE**

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BACKGROUND:

In 2019, the Maine Legislature enacted “An Act To Promote Solar Energy Projects and Distributed Generation Resources in Maine.” This act requires the Maine Public Utilities Commission (PUC) to solicit long-term contract proposals for targeted amounts of energy capacity and renewable energy credits from developers of renewable distributed energy facilities of less than 5 MW. The act provides financial incentives for outside parties to develop appropriately sized solar projects creating significant interest from the public sector.

The Maine PUC issued a [Procurement Announcement](#) for prospective developers which includes requirements to qualify for each of 5 rounds of bidding. The Procurement Announcement also includes an [Appendix A](#), which lists both Pricing Attributes and Project Attributes.

Appendix A Number 9 of the Project Attributes states as follows: Project is sited such that no more than 10% of the project is located on land containing soils defined by the USDA Natural resources Conservation Services as “Prime Farmland” or “Farmland of Statewide Importance,” as determined by a field-based survey conducted by a licensed soil scientist. How to demonstrate that this requirement is met is indicated as follows: “An affidavit from a Soil Scientist licensed by the Maine Department of Professional and Financial Regulation.” The purpose of this document is to provide guidance and consistency to Maine licensed soil scientists in meeting this requirement.

TECHNICAL GUIDANCE:

Although Prime Farmland and Soils of Statewide Importance are listed by the USDA’s Natural Resource Conservation Service (NRCS) which can be cross-referenced to widely available soil maps, these maps are not sufficient for calculation because their classification is based on soil map *units*, not soil series. All map units contain other soils besides the soil series for which a soil map unit is named. In addition, it will not be known where in the range of characteristics allowed for every soil series that the soil series on the property is until an on-site investigation is performed. Further, NRCS soil mapping concepts have changed over time and new soil series have been established since many of the soil maps were created. Also important is that significant alteration of the underlying soils may have occurred after the soil maps were made. As a result, the determination of whether a proposed solar project site has less than 10% of its soils meeting the definition of Prime Farmland or Farmland of Statewide Importance requires an on-site investigation using established technical criteria.

Prime Farmland

The National Soil Survey Handbook (NSSH) and 7 CFR 657 Prime and Unique Farmlands, defines Prime Farmlands as follows: “Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops, and is also available for these uses (the land could be in cropland, pastureland, rangeland, forest land,

or other land, but not urban built-up land or water). It has the soil quality, growing season and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods.”

The NSSH lists “other considerations for prime farmland” which includes (iv) Water Table – “The soils either have no water table or have a water table that is maintained at a sufficient depth during the cropping season to allow cultivated crops common to the area to be grown.” Most map units are drained but a few undrained areas are included. Note that only the drained areas meet the prime farmland criteria. The NSSH also requires that prime farmlands soils have a permeability of at least 0.06 inches per hour in the upper 20 inches.

Also, per the NSSH, (iii) Irrigation – “Some map units have areas with a developed irrigation water supply that is dependable and of adequate quality while other areas do not have such a supply. In those map units, only the irrigated areas meet the prime farm land criteria.” 7 CFR 657 also states that prime farmlands have no or few surface rocks (would not interfere with farming) and that “less than 10% of the surface layer (upper 6”) in these soils consists of rock fragments coarser than 3.”

Slope alone is not a specific criteria but is tied to the erodibility of the soil and is determined by multiplying the K factor (erodibility) x percent slope. To qualify as a prime farmland, the product must be 2.0 or less. The pH of the soil must be between 4.5 and 8.4 in all horizons within 40” or within the root zone. Prime farmlands cannot flood frequently during the growing season (no more than once in 2 years).

How to Determine if a Soil is Prime Farmland:

1. You do not have to determine the soil moisture regime. All of Maine has a soil moisture regime that qualifies (aquic or Udic)
2. You do not have to determine the soil temperature regime (frigid and mesic qualify). Cryic does not qualify, however.
3. **You do have to determine the groundwater table depth.** The depth to groundwater table must be deep enough during the cropping season to allow cultivated crops common to the area to be grown (24” or deeper has been chosen to meet this criteria). The soil can also be drained and qualify if the ground water table is a at depth of less than 24”.
4. You should not have to determine soil pH as the allowable range is 4.5 – 8.4.
5. **You do need to determine surface stoniness.** To qualify as prime farmland, there can’t be enough stones to interfere with farming.
6. **You do need to determine the erodibility of the soil** by looking up the K factor and multiplying it by the slope. In order for the soil to be prime farmland, the product of that multiplication has to be less than 2.0.
7. **You do need to determine whether or not the soil floods less often than once in every 2 years,** required in order to be prime farmland.

8. **You do need to determine the permeability rate of the soil** which must be equal to or more than 0.06 inches per hour in the upper 20". Base this decision on the presence or absence of a "root restrictive layer" including hardpan or bedrock. Layers above a root restrictive layer will have a permeability of 0.06" per hour or more. Layers below a hardpan or bedrock will not have adequate permeability.
9. **You do need to determine the percent of the surface layer (upper 6") that is coarse fragments over 3"**. It must be less than 10% in order to qualify as a prime farmland.
10. **You may need to determine an adequate and dependable water supply** from precipitation or irrigation. Soils that are somewhat excessively or excessively drained would not qualify as prime farmlands unless irrigated.

Soils of Statewide Importance

According to 7 CFR 657, Prime and Unique farmlands is defined as follows: "Criteria for defining and delineating this land are to be determined by the appropriate State agency or agencies. Generally, additional farmlands of statewide importance include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods." (Emphasis added). There are no specific national criteria for classifying soils of statewide importance but the NRCS in Maine has recently developed those criteria.

How to Determine if a Soil is of Statewide Importance:

1. Does not meet Prime Farmland criteria.
2. **Does not have a seasonal groundwater table within 16 inches** of the mineral soil surface during the growing season of most years (moderately well or well drained).
3. Are **less than 15% slope**.
4. Have **less than 3% cover of rocks or stones greater than 10 inches in diameter and less than 40 % cover of rocks less than 10 inches but more than 2" in diameter**.
5. Are **more than 20 inches to a root restrictive layer** (hardpan or bedrock)
6. Have **greater than 2 inches of available water holding capacity in the upper 20 inches** of soil (loamy fine sand or finer).
7. NRCS further requires areas designated as of statewide importance to be composed of at least 50% coverage of soils meeting the criteria. That means small areas of soils meeting the criteria scattered about a site do not have to be added up as they would not be realistically farmable (similar to pit and mound topography in wetland determinations where you use what predominates).

Additional Considerations

As previously mentioned, NRCS has compiled a list of Prime Farmland soils and Soils of Statewide Importance, by map unit. Many of those map units are named for the predominant soil series present in the map unit. Some of those soil series have a wide range of characteristics which go beyond the characteristics allowed for prime farmlands or soils of

statewide importance. An example would be the Peru and Woodbridge soil series. Both Peru and Woodbridge soils were mapped by NRCS when county soil survey maps were developed as both moderately well drained and somewhat poorly drained. In such cases, only the soils meeting the criteria allowed for Prime Farmlands or Soils of Statewide Importance would qualify. In the case of the Peru and Woodbridge soil series, only the moderately well drained component would be considered Prime Farmland or Soils of Statewide Significance.

The PUC Procurement Announcement, Appendix A, does not require a soil scientist to create a soil map. It asks for an Affidavit stating: “that the project is sites such that no more than 10% of the project is located on land containing soils defined by the USDA NRCS as Prime Farmland or Farmland of Statewide Importance, as determined by a field-based survey conducted by a licensed soil scientist.” If you know the specific location of a proposed solar project and there are no Prime Farmland soils or Soils of Statewide Importance in the area, no soil map is needed. If, on the other hand, there are Prime Farmlands or Soils of Statewide Importance in the area, a soil map may be needed to properly site the project so that it is under the allowable threshold. The areas of Prime Farmland or Soils of Statewide Importance should be large enough to be farmable, not small spots here and there on the property (this is akin to the process for mapping wetlands in pit and mound topography).