SECTION 20 BLASTING

A. Introduction

It is anticipated that blasting will be required during construction to provide road grades that will accommodate oversized loads accessing the site and to allow for construction of the turbine foundations and underground electrical collector lines. This blasting and other areas of excavation cuts will provide fill that can be used elsewhere on-site during the construction of roads, turbine pads, and turbine crane pads. When designing the access roads and crane paths for this Project, the Project cut/fill balance attempted to minimize the net import or export of fill to or from the site. Any excess material will likely be used on-site. Additionally, any waste concrete from tower foundations will be used as fill in the turbine clearings.

B. Soils

The Project area is comprised of glacial outwash and glacial till-derived soil. Several areas of the Project site contain stony and very stony phases of soil series. The nearly-level to gently sloping glacial till map units that are moderately well drained or well drained are generally suitable for the proposed Project, although some modifications to drainage or slope may be required to improve site conditions.

Shallow to bedrock soils have been observed in several different areas of the Project site. Therefore, it is assumed that blasting will be required in some locations. Geotechnical investigations at each turbine site will occur prior to construction, and this information will determine turbine foundation types. Preliminary indications suggest that both spread footing and rock anchor foundations will be used for the proposed turbines.

C. Blasting Plan

Blasting operations will follow all local, State, and Federal regulations related to the transportation and use of explosives, including Title 38 M.R.S. §490-Z (14) and M.R.S. Title 25, Chapter 318.

(1) Pre-Blast Surveys and Notifications

Pre-blast surveys will be offered to all property owners with structures, wells, or other infrastructure within a 2,000-foot radius of the blast site. Appropriate notices will be given, and appointments will be arranged for those owners who desire a survey. Results of those surveys will be documented through video or still photographs and appropriate narration or written reports. [Note: There are no known structures or wells within a 2,000-foot radius of likely blast locations.]

Prior to blasting, the owner or operator will develop and implement a plan to provide notification of a planned blast to all persons located within 1,000 feet of the blast site. Notification may be made by telephone, in writing, by public notice in a newspaper of general circulation in the area affected, or by other means identified in the plan. The plan must be in writing and must be available for inspection by the MDEP. [Note: There are no known persons located within 1,000 feet of the Project Site. The owner or operator will identify all persons within 1,000 feet of a blast location prior to any blast.]

(2) Blast Monitoring

All blasts will be monitored by a representative who has been properly trained in the setup and use of seismic monitoring equipment. At least one seismograph will be used for each blast, and monitoring equipment will be placed at the structure in the closest proximity to the blast site.

(3) Sequence of Blasting

All blasting operations will be strictly coordinated with all appropriate parties including the local Fire Department. Operations will emphasize the safe and efficient removal of rock without impacting surrounding structures. Blasts will be developed to create adequate relief that will minimize ground vibrations and offer the greatest possible protection to surrounding structures.

(4) Blast Procedures

- Explosives will be delivered to the job site on a daily basis or will be stored in a secured bulk tank at the Project site per applicable regulations.
- Blasting operations will occur Monday through Friday, commencing after 7:00 am and ceasing by 7:00 pm.
- Blasting will not be conducted at times different from those announced in the blasting schedule, except in emergency situations, such as electrical storms or other circumstances concerning public safety.
- Warning and "all clear" signals of different character will be sounded within an audible range of 0.5 mi from the blasting location. All persons within the permit area will be notified of signal designations through appropriate instructions and posted signs.
- Blasting area access will be regulated to protect the public from the effects of blasting. Access to the blasting area will be controlled to prevent unauthorized entry before each blast and until it is determined that no unusual circumstances exist following the blast, at which point access to the area can then safely resume.
- Areas in which charged holes are awaiting firing will be guarded, barricaded, and posted or flagged to prohibit unauthorized entry.
- All blasts will be made in the direction of the stress relieved face.
- Stemming material will be clean, dry 3/8-inch crushed stone.

(5) Blast Security and Warning Whistles

Each blast will be preceded by a security check of the affected area and a series of warning whistles. Communications will be made with job site supervisors and local officials as required to ensure safe operations. All personnel in the vicinity closest to the blast area will be warned. The warning whistles will consist of the following sequence: 3 whistles = 5 minutes to blast; 2 whistles = 1 minute to blast; and 1 whistle = all clear.

The blast site will be examined by the blaster prior to the "all clear" signal to determine that it is safe to resume work. No blast will be fired until the area has been secured and deemed safe.

(6) Blast Personnel

All blasting operations will be conducted by experienced, trained, and competent persons who understand the hazards involved. Persons working with explosive materials will be aware of safety and security requirements and will comply with such protocols. Those responsible for explosives will possess current knowledge of applicable local, State, and Federal laws and regulations, and also will possess a Certificate of Competency or a license as required by State law. Furthermore, persons working with explosives will be in good physical condition with no addictions to intoxicants, narcotics, or other similar drugs and will exercise mature judgement in all situations.

(7) Licenses, Permits and Records

Blasting operations will be performed by a blaster who is fully licensed and insured for the transportation, use, and handling of explosives. Blasting permits will be obtained as required by local authorities. Records of individual blasts will comply with Title 38 M.R.S. §490-Z (14)(L).

(8) Blast Vibration and Sound

Blast vibration will be monitored, typically at the structure(s) closest to the blast site. Vibration limits will adhere to guidelines described in State regulations, and sound from blasting will comply with Title 38 M.R.S. §490-Z (14)(H). Blast designs will be modified as required to remain within the guidelines and operations will be modified accordingly when approaching buildings and utilities.

D. Acid Rock Mitigation

As part of the preliminary geotechnical investigation for the Project, the underlying bedrock will be analyzed for potential acid rock drainage (ARD). The evaluation will analyze and identify rock samples from the Project that may be acid (based on sulfur content). The assessment also will analyze rock samples that may generate a buffering alkaline drainage. If acid rock is identified during pre-construction engineering, soils will be amended appropriately to mitigate for pH levels in general accord with the mitigation techniques described below.

Mitigation techniques are based on mitigation plans prepared for recent wind projects. Measures have been outlined to deal with acid generation potential associated with sulfuric rock should this material be discovered during Project construction. A variety of handling techniques and treatment methodologies are available for acid-producing rock, including:

- Avoiding or minimizing the disturbance/excavation of acid-producing rock;
- Disposing of the material above the water table;
- Controlling surface and groundwater to divert water away from acid-producing rock and management areas;
- Blending or alkaline addition to maintain the pH at near-neutral levels;
- Identifying potential borrow sites for cover material;
- Identifying potential borrow sites for the isolation or temporary storage of potential acid-producing material;
- Preparing a logistics plan including sources for alkaline material and locations for stockpiling of such material;
- Identifying monitoring methods and locations to evaluate the effectiveness of mitigation; and,
- Preparing contingency plans should initial mitigation require modification.

The construction plan will be reviewed and adapted to allow initial construction activities to commence while further ARD evaluations of concerning locations are in progress. Initial construction activities are expected to include preliminary clearing and grubbing that do not require cut and fill operations into bedrock.

Sources of crushed limestone and agricultural lime to neutralize potential ARD-producing rocks will be investigated. The limestone will be analyzed in accordance with appropriate procedures to evaluate its neutralization potential. Furthermore, borrow (deep till) areas will be identified on-site as a source of low permeability cover.

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