

Section 15 Groundwater

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15.0 GROUNDWATER

15.1 Location and Maps

The Canton Mountain Wind Project (Project) is located within the East Dixfield and Canton United States Geological Survey (USGS) quadrangles. The project area is shown on the Maine Geological Survey (MGS) Significant Sand and Gravel Aquifer map in Figure 15-1, the MGS Surficial Geology map in Figure 15-2, and the MGS Bedrock Geology map in Figure 15-3. There are no significant sand and gravel aquifers or aquifer recharge areas underlying the Project. There are no known public drinking water supply wells in the area within 100 feet of the proposed turbine locations or collector lines. There are no U.S. Environmental Protection (EPA)-designated sole source aquifers in the project area (EPA 2011).

15.2 Quantity

A single drilled bedrock well will be installed to serve water needs at the project operations and maintenance (O&M) building. This location is not within any mapped significant sand and gravel aquifers. Approximately 90 gallons of water will be needed per day to support the O&M facility and a sufficient source of water exists at the site (see Section 16 for more information on water supply source).

15.3 Sources of Contamination

The potential sources of groundwater contamination during construction will be fuel and hydraulic and lubricating oils used in the operation of vehicles and construction equipment. Any spills of these materials from the vehicles or equipment are typically small and of very short duration. Spills that are properly cleaned up would not pose a risk to groundwater quality. The construction contractor will be responsible for storage and handling of these materials, including implementing a Project-specific Spill Prevention Control and Countermeasure (SPCC) Plan during construction to address any spills and associated reporting requirements for reportable quantities of spilled materials. The Maine Department of Environmental Protection (Maine DEP) main office in Augusta, Maine will be notified of any spills that are potentially harmful to surface or groundwater resources.

During project operation, petroleum, synthetic gear oil, or hydraulic oil will be present and used for operation and maintenance of the wind turbines. The oil in the turbines will be replaced or recycled every three to five years. The main gearbox of each turbine holds approximately 114 to 193 gallons (432 to 730 liters), depending on the gearbox model and manufacturer. The yaw and pitch gearboxes hold a combined 6.8 to 11.0 gallons (25.6 to 41.5 liters), with an additional 6 gallons (23 liters) stored in the hydraulic system. Large amounts of petroleum products will not be stored on-site and only smaller amounts needed to maintain the fluid levels in the turbines will be stored for any significant amount of time.

Procedures for handling these materials and preventing spills that may affect groundwater resources are detailed in Section 15.4.

A subsurface wastewater disposal system (see Section 17) will be installed at the O&M building to treat up to 90 gallons of normal residential wastewater per day. A licensed site evaluator has concluded that site conditions will allow for a safe wastewater disposal system that will not adversely affect existing groundwater resources, particularly given the low level of water use that will occur at the facility.

15.4 Measures to Prevent Groundwater Degradation

The procedures proposed to prevent groundwater degradation during construction of the proposed Project are incorporated into the erosion and sedimentation control requirements described in Section 14. Stormwater management procedures are described in Section 12 of this application. In addition, Canton Mountain Wind, LLC (CMW) will implement an SPCC Plan during construction that includes the following procedures to ensure protection of groundwater. A copy of this plan will be provided to Maine DEP prior to project operation.

15.4.1 Training of On-Site Personnel

Prior to the start of construction, the contractor will instruct on-site personnel on the operation and maintenance of equipment to prevent the accidental discharge or spill of fuel, oil, and lubricants. Personnel will also be made aware of the pollution control laws, rules, and regulations applicable to their work at the project site. Pre-construction spill prevention training will also include:

- precautionary measures to prevent spills;
- sources of spills, such as equipment failure or malfunction;
- standard operating procedures in case of a spill; and
- equipment, materials, and supplies available for clean-up of a spill and the location of these materials.

The contractor will be responsible for implementing and maintaining spill control measures during construction.

A spill is an un-permitted release of product, raw materials, or chemicals outside any secondary containment and into the environment. Spills can occur as a result of leaks, accidents, or third-party incidents.

15.4.2 Equipment Inspection and Maintenance

The contractor will inspect and maintain equipment that must be fueled and/or lubricated according to a regular schedule. All containers, valves, pipes, and hoses will be examined regularly to assess their general condition. The examination will identify any signs of deterioration that could cause a spill and signs of leaks, such as accumulated fluids. All leaks will be promptly corrected and/or repaired.

15.4.3 Refueling Procedures

The contractor will ensure that equipment is refueled and lubricated within the approved construction work limits and at least 50 feet away from all waterbodies and wetlands.

Under no circumstances will refueling take place within 100 feet of any known potable water wells.

The contractor will ensure that all refueling is done pursuant to the following conditions:

- Impact minimization measures and equipment will be sufficient to prevent discharged fluids from leaving the project work limits or reaching wetlands or waterbodies, and be readily available for use. These will include some combination of the following:
 - a. absorbent and barrier materials in quantities determined by the contractor to be sufficient to capture the largest reasonably foreseeable spill; and

- b. drums or containers suitable for holding and transporting contaminated materials for proper disposal.
- All spills will be cleaned up immediately. Containment equipment will not be used for storing contaminated material.
- The contractor will prepare for approval by CMW a list of the type, quantity, and the storage location of potential containments and associated clean-up equipment to be used during construction, if required.

15.4.4 Spill Impact Minimization Measures

Containment is the immediate priority in the case of a spill. A spill will be contained on the project site and within the approved construction workspace, if possible. Clean-up procedures will begin immediately after a spill is contained. In no case will containment equipment be used to store contaminated material.

Immediately report any spill or release of the following materials regardless of location (on-property or off-property) to the appropriate CMW representative as indicated below:

- Oil or petroleum products
- Hazardous substances or hazardous wastes
- Chemicals

The following contacts are currently assigned to the Project and are subject to change (call in the order listed until someone is reached):

Canton Mountain Wind, LLC Office (549 South Street, Quincy, MA)

Project Manager: Andy Novey, (857) 403-0119

General Office Number: (617) 890-0600

If a spill enters a body of water, the contractor will immediately take samples upstream and downstream from point of entry and refrigerate these samples. If advised, additional analysis will be completed and/or additional samples will be gathered.

If the contractor determines that a spill is small enough such that the construction crew can safely handle it, the crew will use construction equipment to containerize all spilled material, contaminated soil, and sorbent material in a manner consistent with the spilled material's characterization.

If the contractor determines that a spill cannot be adequately excavated and disposed of by the construction crew alone, the contractor will contact waste containment specialists. The contractor will ensure that all excavated wastes are transported to a CMW-approved disposal facility licensed to accept such wastes.

The contractor will prepare a Construction Site Spill Report within three days of a spill to be given to CMW that includes:

- a. the date, time and location of the occurrence or discovery of the occurrence;
- b. a description or identity of the material spilled;
- c. an estimate of the quantity spilled;
- d. the circumstances that caused the spill (e.g., equipment failure);

- e. a list of waterbodies affected or potentially affected by the spill;
- f. a statement verifying whether a sheen is present;
- g. the size of the affected area;
- h. an estimate of the depth that the material has reached in water or on soil;
- i. a determination of whether the spill will migrate off of the company's property or the right-of-way or workspace;
- j. a determination of whether the spill is under control;
- k. a statement verifying that clean-up has begun and a description of the methods being used to clean up the spill; and
- l. the names of the people observing the spill (with their affiliations) and the extent of injuries, if any.

CMW will ensure that the contractor's spill report is complete. The contractor shall follow the "Contractor's Environmental Guidelines - Waste Disposal and Spill Notification" procedures regarding all required regulatory notifications, subject to CMW's prior approval, and for obtaining any necessary state and local licenses, permits, or other authorizations associated with the clean-up project, except as otherwise provided in the contract for the work. The contractor is responsible for knowing what state and local environmental authorizations are necessary for the specific job at hand. Any above-mentioned permits, clearances or authorizations obtained by the contractor shall be furnished to CMW.

15.4.5 Spill Reporting Requirements

Spill reporting is the responsibility of the contractor and all subcontractors. As required by Title 38 M.R.S.A., Section 543 and Maine DEP regulations (06-096 Chapters 600 4.B and 800 4.1), spills of oil or hazardous materials in any amount and under any circumstances must be reported to the Maine DEP at **1-800-482-0777** within two hours from the time the spill was discovered. The contractor must also report all spills immediately to CMW, the Project and or/Construction Manager, and local emergency response officials.

The following releases require immediate (within 1 hour of discovery) notification to the National Response Center (NRC) at **1-800-424-8802**:

- (1) Any petroleum product released into streams, rivers, lakes, or dry washes;
- (2) A release that exceeds the reportable quantity (RQ) of any CERCLA hazardous substances in any 24-hour period that is not fully contained;
- (3) A release of a hazardous substance or hazardous waste that occurs during transportation; and
- (4) A release of hazardous waste that contains a RQ of a hazardous substance.

Pursuant to the Clean Water Act (40 CFR Part 110.4), a discharge of oil "which causes a sheen upon the surface of the water or adjoining shore line or oily sludge deposits beneath the surface of the water" must be reported to the NRC within 24 hours.

15.4.6 Suggested Equipment List

The Contractor's choice of impact minimization measures and equipment will be tailored to meet the characteristics of the potentially affected terrain, as well as the types and amounts of material that could

potentially be spilled. The types of equipment that CMW expects to use to control spills at terrestrial sites and wetlands are described below.

15.4.6.1 Terrestrial Construction

General equipment that the contractor will use for spill containment and clean-up on terrestrial areas includes:

- sorbents (pillows, socks, and wipe sheets) for containment and pick up of spilled liquids;
- commercially available spill kits (or the functional equivalent thereof) that are prepackaged, self-contained spill kits containing a variety of sorbents for small to large spills;
- structures such as gutters, culverts, and dikes for immediate spill containment;
- shovels, backhoes, etc., for excavating contaminated materials;
- sumps and collection systems; and
- drums, barrels, and temporary storage bags to clean up and transport contaminated materials.

15.4.6.2 Routine Refueling and Maintenance

Absorbent pads and mats will be stored in the immediate vicinity of refueling and equipment maintenance areas. Equipment that will be stored on-site for routine refueling and maintenance will include small sorbent kits (or their functional equivalent). Kits with the capacity to absorb up to five gallons of liquid will be used in the event of equipment failure.

15.4.6.3 Waterbody, Riparian Buffers, and Wetlands

For each wetland and waterbody crossed, the equipment listed below will be available in addition to that needed for terrestrial construction. This equipment will be stored close to the water or wetland to minimize response time, and will include:

- oil containment booms and the related equipment needed for rapid deployment; and
- equipment to remove oils from water, such as oleophilic and hydrophobic absorbent booms and mats, and/or mechanical skimmers.

15.4.7 Groundwater Protection Plan

Groundwater protection measures described in Section 15.4 above and those in the Project's construction SPCC Plan constitute the applicant's proposed groundwater protection plan.

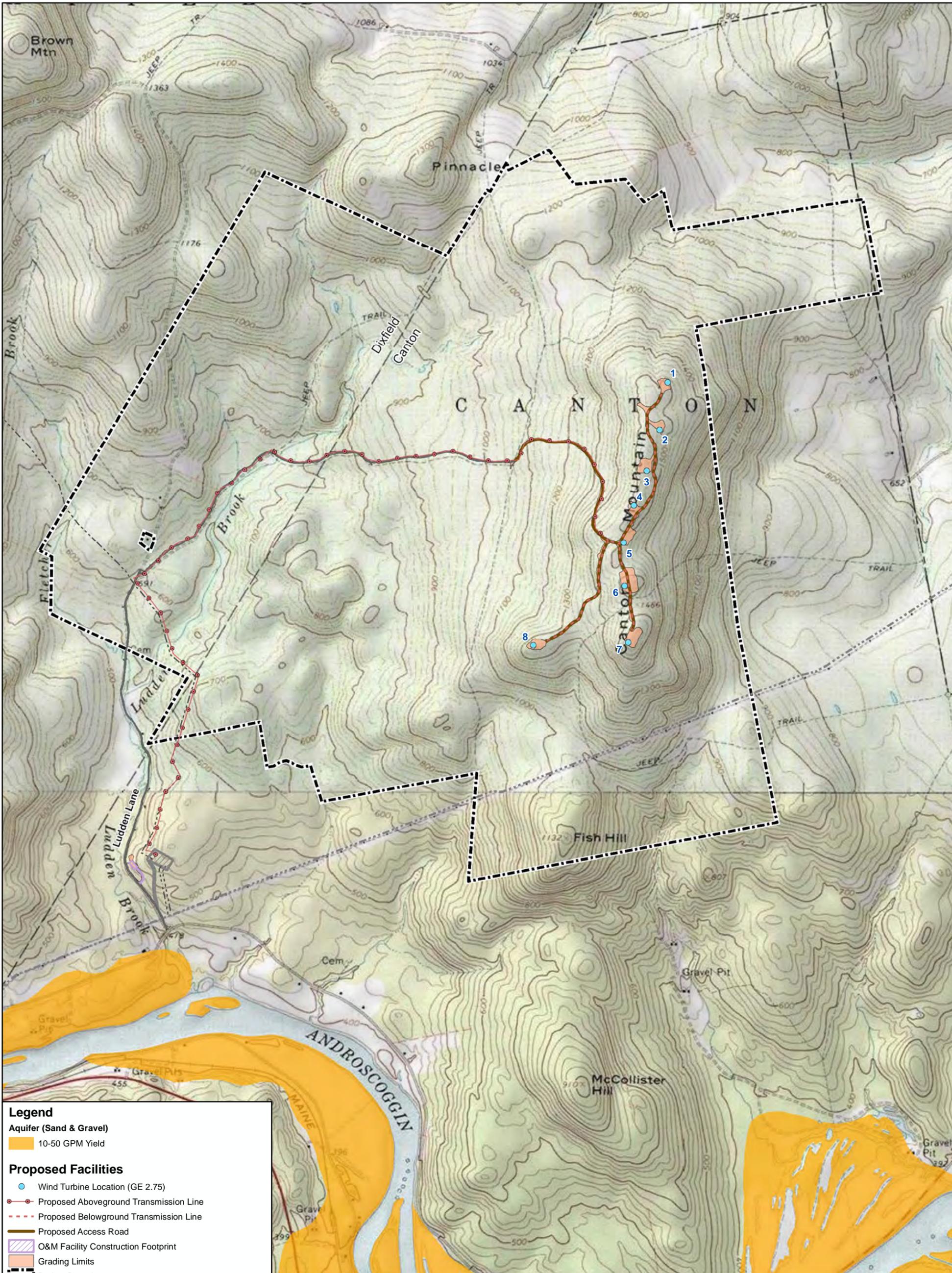
15.5 Monitoring Plan

Since the Project does not involve operational activities that will influence groundwater quantity or quality, it will not require a water quality monitoring plan to be developed.

15.6 References

EPA. 2011. Designated Sole Source Aquifers in EPA Region 1. Accessed online November 29, 2011 at http://www.epa.gov/region1/eco/drinkwater/pc_solesource_aquifer.html.

Maine Geological Survey. 2010. Online Water Resource Publications. Accessed November, 29 2011 at <http://www.maine.gov/doc/nrimc/mgs/pubs/online/water.htm>.



Legend

Aquifer (Sand & Gravel)

10-50 GPM Yield

Proposed Facilities

- Wind Turbine Location (GE 2.75)
- Proposed Aboveground Transmission Line
- - - Proposed Belowground Transmission Line
- Proposed Access Road
- ▨ O&M Facility Construction Footprint
- ▨ Grading Limits
- ▨ Project Boundary

Existing Facilities

- Existing Access Road
- - - Existing Aboveground Transmission Line
- ▨ 115kV Electric Transmission Line (CMP 229 Line)
- ▨ Ludden Lane Substation

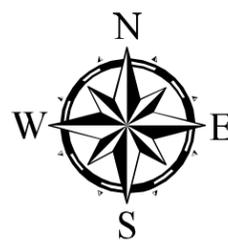
SOURCE: Mount Blue, Dixfield, East Dixfield, & Canton USGS Quadrangles
 0 0.25 0.5 Miles

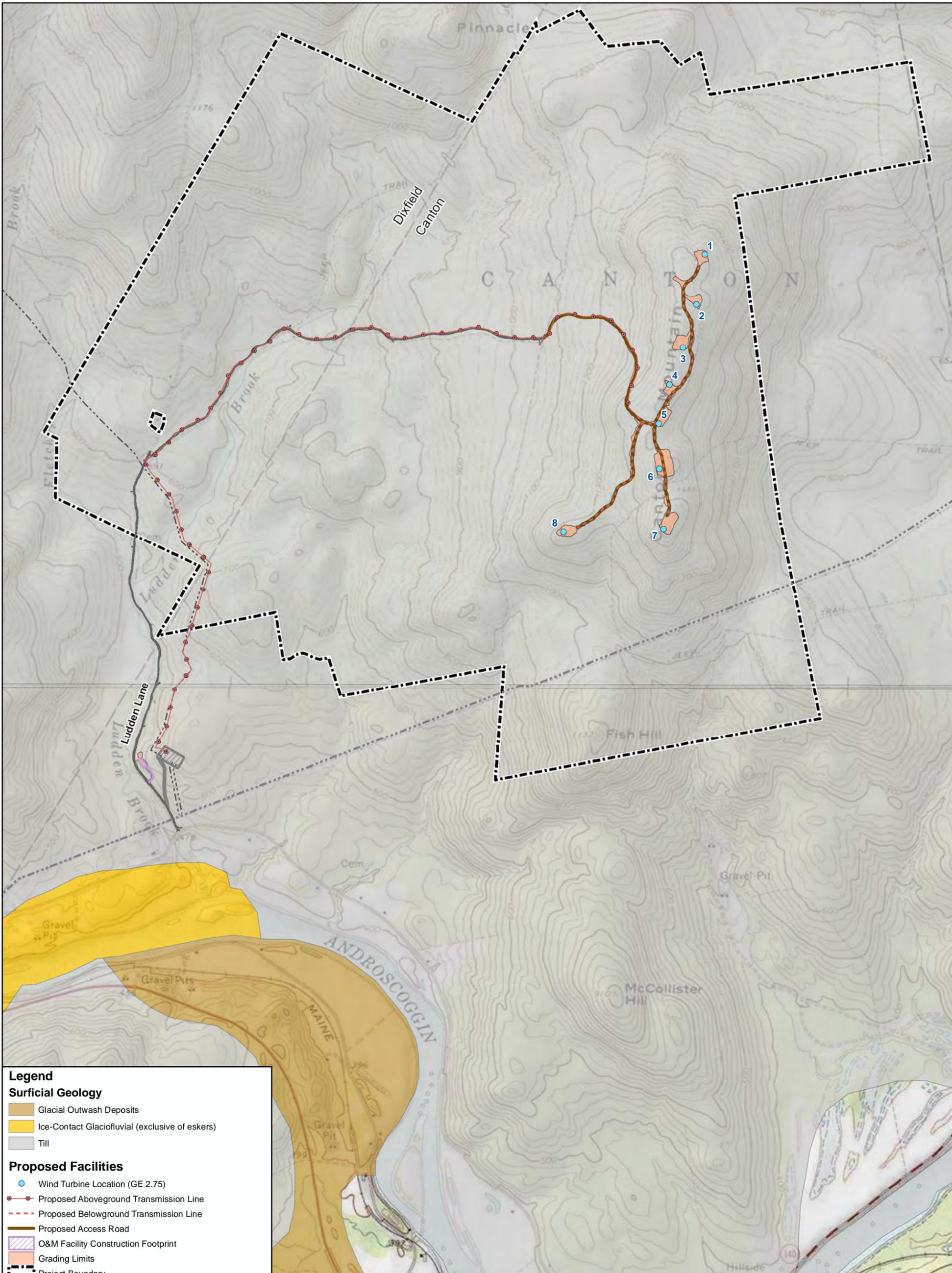


**Figure 15-1
 Proximity to Sand & Gravel Aquifers**

**Canton Mountain Wind Project
 Canton and Dixfield, Maine**

December 2011





Legend

Surficial Geology

- Glacial Outwash Deposits
- Ice-Contact Glaciofluvial (exclusive of eskers)
- Till

Proposed Facilities

- Wind Turbine Location (GE 2.75)
- Proposed Aboveground Transmission Line
- Proposed Belowground Transmission Line
- Proposed Access Road
- O&M Facility Construction Footprint
- Grading Limits
- Project Boundary

Existing Facilities

- Existing Access Road
- Existing Aboveground Transmission Line
- 115kV Electric Transmission Line (CMP 229 Line)
- Ludden Lane Substation

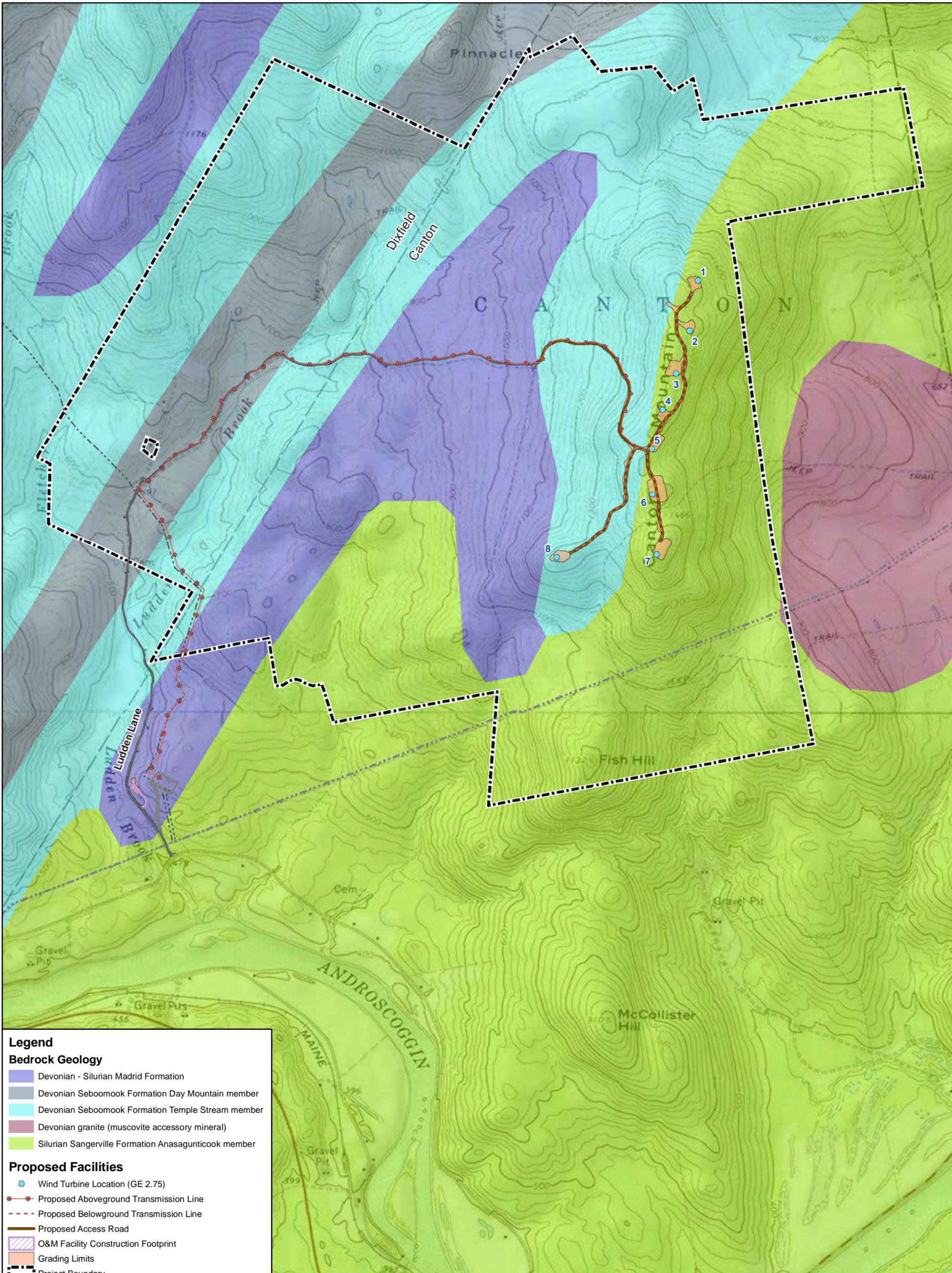
SOURCE: Mount Blue, Dixfield, East Dixfield, & Canton USGS Quadrangles



**Figure 15-2
Surficial Geology**
Canton Mountain Wind Project
Canton and Dixfield, Maine

December 2011





- Legend**
- Bedrock Geology**
- Devonian - Silurian Madrid Formation
 - Devonian Seboomook Formation Day Mountain member
 - Devonian Seboomook Formation Temple Stream member
 - Devonian granite (muscovite accessory mineral)
 - Silurian Sangerville Formation Anasagunticook member

- Proposed Facilities**
- Wind Turbine Location (GE 2.75)
 - Proposed Aboveground Transmission Line
 - Proposed Belowground Transmission Line
 - Proposed Access Road
 - O&M Facility Construction Footprint
 - Grading Limits
 - Project Boundary

- Existing Facilities**
- Existing Access Road
 - Existing Aboveground Transmission Line
 - 115kV Electric Transmission Line (CMP 229 Line)
 - Ludden Lane Substation

SOURCE: Mount Blue, Dixfield, East Dixfield, & Canton USGS Quadrangles

0 0.25 0.5 Miles



**Figure 15-3
Bedrock Geology**

**Canton Mountain Wind Project
Canton and Dixfield, Maine**

December 2011

