Section 13
Soils Mapping, Erosion Control and Stormwater Management
13.0 SOILS MAPPING, EROSION CONTROL AND STORMWATER MANAGEMENT

Highland is required to demonstrate that it has made adequate provision for fitting the proposal harmoniously into the existing natural environment in order to ensure there will be no undue adverse effect on natural resources in the area likely to be affected by the proposal. Three components of that demonstration are included in this Section of the Application. In addition, an Environmental Assessment is provided at Section 14 of this Application.

The Applicant, through its consultants, have performed soils mapping which demonstrates that the soils at the Project site are suitable for the proposed use, the results of which are located at Appendix 13-1. In addition, the Application provides the information necessary to demonstrate compliance with the erosion control requirements of Land Use Regulation Commission (LURC) Rule Chapter 10.25, see Section 13.2 below and the civil plans shown in Exhibit 1. The stormwater calculations were performed using methodology developed in consultation with Maine Department of Environmental Protection (MDEP), and demonstrate the Project’s compliance with MDEP Stormwater Rules. These calculations are provided in Appendix 13-2.

13.1 Soils Mapping

Albert Frick Associates, Inc. completed appropriate intensity soil surveys for the Highland Wind Project (Project) generating facility, Operations & Maintenance (O&M) building, and generator lead. See Appendix 13-1. The resulting report concludes that with proper planning and construction techniques, the soils are appropriate for the proposed construction activities. During surveying and planning of the Project, the applicant’s consultants worked closely with the State Soil Scientist to determine appropriate survey extents. As a result of these discussions, the soils report includes additional information concerning poorly drained and somewhat-poorly drained soils.

13.2 Erosion Control

This erosion and sedimentation control plan has been developed to (1) satisfy the requirements of the LURC Chapter 10 Rules and Standards and (2) identify road construction and stormwater management techniques that will minimize unreasonable soil erosion and prevent potential reductions in the water storage capacity of existing soils. The plan identifies Best Management Practices (BMPs) that can be implemented during construction of the Project to minimize and control soil erosion. The plans, details, and specifications included in the plan identify appropriate BMPs for various soil and environmental conditions, explain the basis for their use, and provide details for their installation. Erosion control details are provided in Exhibit 1 (Refer to Sheets 600-609). Note that no component of this Project is located above 2,700 feet in elevation; therefore the erosion control plans do not address work under these conditions.

13.2.1 Overview of Erosion and Sedimentation Concerns

Activities that may potentially cause erosion during Project construction primarily consist of clearing and grading of the access roads and crane paths and grading and site preparation for the wind turbine clearings (i.e., foundations, crane pads, and rotor assembly areas). See Section 12.11 for more detailed clearing information. The critical areas for this site during construction are the steep slopes and any disturbance near wetlands and streams.

13.2.2 Erosion and Sedimentation Control Measures

The proposed erosion and sedimentation control plan includes installation of silt fencing, wood waste berms, erosion control mix, riprap slope protection, and rock sandwich road construction. These BMPs will be designed in accordance with the following Maine standard references for erosion and sedimentation control:

- Maine Erosion and Sedimentation Control Best Management Practices (MDEP, 2003);

Erosion and sedimentation control design plans, details, and specifications will be reviewed by a State of Maine licensed Professional Engineer and Certified Professional in Erosion and Sedimentation Control who specializes in design and implementation of erosion control methods.

If winter or early spring construction occurs, the recommended winter construction BMPs will be followed. These include application of hay mulch at twice the standard rate and installation of a double row of sediment barriers for areas within 75 feet of a wetland. Winter construction specifications are also provided in Exhibit 1 (Refer to Sheet C-4).

**Wood Waste Berms/Silt Fence**
Wood waste berms, silt fence, or a combination of the two, will be installed down gradient of construction and clearing activities. In critical areas, particularly near wetlands, a double layer of silt fencing or wood waste berms may be installed. Multiple rows of wood waste berms/silt fencing also may be necessary in areas with long cuts. The final layout will be prepared in accordance with typical design methods in the above referenced BMPs documents. Silt fence should not be used in areas of concentrated stormwater runoff.

**Erosion Control Mix**
Erosion control mix (ECM) will be used to provide cover and stabilize slopes in denuded areas until vegetation is established. On steep slopes, erosion control mesh or fabric netting anchored with staples may be used with the ECM. Wood mulch generated by tree/stump grinding and other cleared woody vegetation will be used to provide cover material over bare slopes as an erosion control material. ECM should not be used in areas of concentrated stormwater runoff.

**Riprap**
Steeply sloped ditches along Project roadways will be stabilized using approximately sized riprap or processed blast rock armoring. Cross-culverts also may be necessary as part of this Project. Plunge pools, check dams, and level spreaders will be used to dissipate concentrated flows that might cause erosion and thereby protect culvert outlets.

**Rock Sandwich Road Construction**
Where appropriate, the erosive potential of water that otherwise would be concentrated in ditches will be minimized by the use of “rock sandwich” road construction. This method will be used in areas with high ground water or poor soils or other areas with sensitive hydrology. The “rock sandwich” will allow water to pass through the roadway subbase rather than being intercepted by the roadway. This will eliminate concentrated flows in ditches located on the uphill side of the road and allow water from uphill areas to continue flowing under the road through a layer of coarse rock.

**Ditch Turnouts and Level Lip Spreaders**
Ditches will be necessary primarily in cut sections of the roadway. Where ditches are needed, appropriately sized and placed cross-culverts and ditch turnouts will be used to dissipate collected stormwater runoff back to sheet flow. As recommended by MDEP and LURC Chapter 10 criteria, ditches will be designed so that ditch turnouts will end with a level lip spreader.

**13.2.3 Site Plan**
James W. Sewall Company prepared the road and turbine site design plans for this application that identify vegetation types and locations, slopes, and other nature features near the disturbed areas. The plans and accompanying details show and describe temporary and permanent erosion control measures.
13.2.4 Sequence of Construction

In general, erosion control measures will be installed down-gradient of each work area before earthwork begins. Construction activities will be sequenced to minimize the Project area that is disturbed and un-stabilized at any point in time. Disturbed and stockpiled soil will be temporarily stabilized at the end of each workday. Temporary erosion control measures will be the first items installed and the last items to be removed. Removal of temporary erosion control measures will occur only after healthy vegetation is established.

After preliminary layout and staking/flagging of the new road segments and areas to be cleared, erosion control measures will be installed. As the roads are constructed and areas are cleared, additional measures will be implemented. Once roads reach final grade, permanent measures, such as ditch turnouts and level spreaders, will be constructed.

Cleared areas will receive temporary mulching as required. Topsoil stockpiles will be protected by double measures such as temporary seeding and silt fences. After turbines are installed, a significant portion of each turbine clearing will be re-graded and ECM and stockpiled topsoil will be applied.

Because stabilization of areas following completion of final grading is very important to prevent erosion, areas will be stabilized within seven days of work completion. Final stabilization will primarily consist of coarse gravel or blast rock (Project roadways), ECM (turbine clearings and portions of crane paths), erosion control mix/matting (less steep earth cut and fill slopes), and riprap or blast rock (steep cut/fill slopes, ditches and culvert outlets).

13.2.5 Maintenance and Inspection of Erosion Control Measures

Maintenance of erosion control measures is essential to their successful operation. The Applicant will be responsible for ensuring that maintenance of erosion control measures will be completed in a timely manner. During construction, the prime contractor, who has yet to be determined, will have this responsibility. Erosion control measures will be inspected at least weekly and after any rainstorm greater than 0.5 inch. These regular inspections will be conducted by the Project General Contractor, who will be certified in erosion control practices by the MDEP. Periodic inspections also will be conducted by a third-party inspector who will be under direct supervision of a licensed Professional Engineer. Inspections will be documented in writing and be made available to LURC upon request. On-site workers will be instructed to report problems when they occur so remedial action can be taken as soon as possible.

13.2.6 Maintenance Plan

The following outlines the maintenance that will be applied to the various permanent erosion control measures and other features that could experience erosion.

Ditches
Rip-rap lined ditches
- Inspect semi-annually.
- Remove sediment buildup, leaves, litter or other debris from the bottom and side slopes.
- Reposition stones to restore channel to original dimensions.

Vegetated Ditches
- Inspect the ditch lining monthly for slumping of the lining, downcutting of the ditches base, or undercutting of the banks.
- Repair any damage immediately.
- Mow or brush-cut annually only as necessary to prevent the establishment of woody vegetation.
Culverts
- Inspect for sediment buildup.
- Flush pipes and remove sediment at which time the depth of sediment at any location in the pipe exceeds three inches.

Rip-Rap Aprons, Level Spreaders, and Ditch Turnouts
- Inspect semi-annually or after severe storms for dislodged stones or slumping of the stone lining.
- Inspect and verify that top of stone is level (+/-1”).
- Repair level lip to distribute flows uniformly across the buffer
- Reposition stones to restore the pool’s original dimensions and a uniform surface.
- Clean any accumulated sediments and debris from the plunge pool.
- Cut and remove any woody vegetation growing within the pool.

Vegetation
- Inspect vegetated areas each spring.
- Rework and re-stabilize sparsely re-vegetated areas that show evidence of soil erosion.

Stones Check Dams
Prior to establishment of permanent vegetation
- Inspect check dams after each storm event until permanent vegetation is established.
- Remove sediment buildup behind check dams.

After establishment of permanent vegetation
- Inspect for sediment build-up in void space between stones and dislodged stones.
- Remove sediment build-up.
- Stabilize disturbed areas.
- Replace check dam if sediment is filling void space.
- Replace dislodged stones.

Road Grading
- Grade the road as necessary to maintain the proposed roadway crown or super elevation and to prevent the creation of berms or ruts that may channelize flow.

Side slopes of gravel surfaces
- Inspect slopes for rill erosion due to concentrated flows.
- Stabilize eroded slopes with ECM or other approved BMP method.

13.3 Stormwater Management

The construction of gravel roads, tower foundations, turbine pads, and an operations and maintenance area may create stormwater runoff in excess of what the Project area presently generates. It is important to mitigate this increase in stormwater runoff to prevent erosion or damage to downgradient ecosystems. In general, the stormwater control plan is designed to minimize the concentration of stormwater flows off the Project site. The primary components of the plan include minimizing the permanently impacted areas of the Project site and incorporating appropriate BMPs in the Project design. Plans showing stormwater buffers, phosphorous restriction areas, ditch turnouts, and sedimentation and erosion control measures are provided in Exhibit 1.

The primary effort in stormwater management will be to minimize the permanent impacts associated with the Project through the systematic re-vegetation of disturbed areas. The reestablishment of vegetation will occur principally within the areas of temporary impacts. Temporary impacts will be associated with the 34-foot wide crane path roads, and the approximately 332-foot diameter clearings required for assembly of the turbine rotors. Areas of temporary clearing and the reestablishment of vegetation in these areas are further discussed in Section 12.11.
The impacts to site hydrology from the proposed Project also will be minimized by the use of appropriate stormwater management BMPs such as culverts with outlet protection and level spreaders. These are discussed above in Section 13.2.

Buffers around the Project construction areas are vital to minimize construction-related impacts to existing wetlands, streams, and soils in the Project area. When developing the turbine site and road plans, the Project provided several types of buffers including general stormwater buffers. The length and width of the proposed buffers will be based on site-specific conditions, including land slope and soil type, as defined in Appendix F of the BMP Manual Chapter 500. Three types of stormwater buffers are proposed for use on this Project. The first type of buffer would be used in areas adjacent to the downhill side of the road, in which the runoff from the road will sheet directly into a buffer. The second type is a ditch turn-out buffer in which ditch runoff is diverted to a 20-foot-wide level spreader and then distributed into a buffer. The third type of buffer allows runoff to be diverted to a stone bermed level lip spreader and distributed into a buffer. The level lip spreaders have been sized according to the most recent version of the Maine BMP Manual.

13.3.1 Best Management Practice General and Phosphorous Standard

Due to its size and location, the Project is subject to the BMP General and Phosphorus Standard. The purpose of the BMP standards is to include treatment measures that will mitigate for the increase of channel erosive flows and treat the pollutants effectively, and to mitigate for the potential temperature impacts due to the runoff from the proposed site. The Project also must meet the Flooding Standard for the 2, 10 and 25-year-storm event to prevent flooding down gradient of the site.

The applicant proposes to meet the required **BMP General Standard** by doing the following.

The applicant proposes to use a combination of underdrain soil filters and buffers to treat the runoff from the Project site. Per Maine MDEP regulations, at least 75 percent of the linear portion of the Project (the access roads, crane paths, and turbine pads) and at least 50 percent of the developed area of the linear portion of the Project (access road and crane paths, associated grading, and landscaped area) must be treated. The nonlinear impervious area of the Project (O&M building and parking lot) must have 95 percent treatment and nonlinear developed area (O&M building and parking lot, grading and landscaping) must meet at least 80 percent treatment. The support documents that summarize the method of treatment, with their sizes, the contributing area of impervious surface and developed area, and the percentage of the Project’s treatment met with each treatment system are provided in Appendix 13-2.

The applicant proposes to meet the **BMP Phosphorus Standard** as follows.

The applicant proposes to use a combination of buffers to treat the phosphorus from the Project site. Following MDEP regulations, the phosphorus export for the post-development conditions must be less than the phosphorus budget determined by the State for the Project site. The support documents that summarize the method of treatment, with their sizes, the contributing area of impervious surface, and the phosphorus export for both pre- and post-development conditions are provided in Appendix 13-2.

The applicant proposes to meet the **Flooding Standard** as follows.

As part of the flooding standard, runoff from the site must meet or be less than the pre-development flows or have an insignificant increase in flow off the site. Near the O&M building, the flooding standard will be addressed by storing runoff volume using soil filters. These structures are designed to collect, store, and control the stormwater runoff. To meet the quality standards, the soil filters were modeled to detain only the volume of water for which they were sized. The structures have been designed to accommodate the 2-, 10-, and 25-year storm events. The rest of the Project will use buffers with level lip spreaders to slow and return the runoff to sheet flow. The overall storm water management system has an insignificant increase in runoff and is designed to prohibit any adverse impact on areas downstream from the site.
Pre- and Post-Development Watershed plans illustrating watershed areas, hydraulic lengths lines, and physical features are provided in Exhibit 1 (Refer to Sheets C-701 through C-704). Support documents that summarize the method of treatment, with their sizes, the contributing area of impervious surface, and the calculations for both pre- and post-development conditions are provided in Appendix 13-2.

13.4 Phosphorus Analysis

The Project lies within the Gilman Pond, Carrabassett River, and Kennebec River Watersheds. Runoff from the Project has the potential to increase phosphorus within the Gilman Pond watershed. Buffers will be used throughout the Project to reduce the phosphorus loading to meet the MDEP standards in these areas. See the support documents in Appendix 13-2 for more detailed information.

The phosphorus analysis is based on several assumptions listed in this narrative and specific analytical methods described in “Phosphorus Control in Lake Watersheds: A Technical Guide to Evaluating New Development” published in January 2008 by the MDEP.

Gilman Pond’s current calculated pound per acre phosphorus allocation is 0.038 pounds/acre. The Project area includes 21,470 acres that are within the direct watershed of Gilman Pond. The Small Watershed Threshold is 779 acres.

Linear portions of the Project are gravel or blast rock roadways. From the MDEP guidance documents, these portions have been assigned a phosphorus runoff coefficient of 1.75 pounds/acre/year. The permanent parking areas to remain at each turbine and the area around the base of the turbines have been assigned a coefficient of 1.25 pounds/acre/year. Using these methods, runoff will be treated to meet these standards.

Calculations demonstrating this analysis and indicating what buffers will treat each section of road are included Appendix 13-2.

Phosphorus treatment will be accomplished by extensive forested and roadside buffering. The Project roadways are being built on mountainous slopes, which in many cases exceed 15 percent in grade. MDEP has suggested additional BMP’s that allow for a significant amount of additional roadway to be treated. Many roads will be super elevated to drain surface water from the road to the downhill ditch or fill slope. An 18-foot wide re-vegetated mulched area located on the downhill side of the roadway will function as a pre-filter for the road runoff, and will contribute to pretreatment of the water. This allows the road surface runoff to be treated either by sheet-flow roadside buffers, ditch turnouts, or buffers with stone bermed level lip spreaders. In buffer areas adjacent to roads where existing ground slopes are steeper than 15 percent, wood-waste berms will be utilized and located at the toe of the slope. The berm will reduce the likelihood that the flow from the road will concentrate. Rather, it will seep through the berm and be reintroduced to the mountainside as sheet flow. Where existing grades are steeper than 30 percent, no roadside, ditch turnout or stone bermed level lip spreader buffering is proposed because it is thought to be ineffective.

Phosphorus export from the Project has been calculated in the Gilman Pond watershed and will be reduced by providing buffers and treatment where practical. Phosphorus Encumbrance Zones (Zones) have been created based on the expected export associated with each watershed. These Zones are referred to as the total development areas in the phosphorus calculations. Due to the size of the Zones, the phosphorus export will be slightly less than that allowed in the phosphorus budget. Within these Zones, which are generally defined as a setback from the centerline of Project roads, no additional development resulting in permanent impervious areas will be allowed.

13.5 Re-vegetation Plan

Following construction, the lay down area and approximately 2.4 acres of the total 2.6 acre clearing for each circular turbine pad will be allowed to re-vegetate. To reduce the potential for erosion, topsoil material, previously stripped from the development areas and stockpiled, will be spread on these
relatively flat areas. Erosion control mix, primarily comprised of stump grindings and shredded organic material generated during clearing, will be mixed and spread with the topsoil material and allowed to naturally re-vegetate.

Following completion of road construction and turbine erection activities, these areas will be allowed to re-vegetate and will be inspected periodically to check for erosion. If erosion is noted, these areas will be further stabilized. Areas will continue to be inspected until a vegetative cover is established.

Topsoil stockpiles throughout the site will be protected from erosion and sedimentation through implementation of Best Management Practices. This will include encircling down-gradient sides of the stockpiles with silt fencing or erosion control mix berms. Slopes will be left in a roughened condition to help minimize runoff erosion.
Appendix 13-1
HIGHLAND WIND PROJECT
Highland Plantation and Pleasant Ridge Plantation, Maine

SOIL NARRATIVE REPORT

December 14, 2010

PREPARED FOR:

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1.0 Introduction

Albert Frick Associates hereby provides the Soil Survey for Highland Wind, LLC’s proposed Project in Highland Plantation and Pleasant Ridge Plantation, Maine. This Soil Survey includes:

- a Class L level of soil survey as required by Maine Department of Environmental Protection and the Maine Land Use Regulations for linear projects (e.g. wind projects) in the area of the proposed turbine sites and proposed road alignment,
- a High Intensity Class B Soil Survey at the proposed operations and maintenance building location, and
- a modified Hybrid Class L Soil Survey along the proposed transmission corridor.

1.1 Overview of Project and Location

The Highland Wind Project energy generating facility located in Highland Plantation, Somerset County, Maine. In addition to the wind turbines, the Project includes a 34.5-kilovolt (kV) electrical collector system, an electrical collector substation, a 115-kV generator lead, an Operations and Maintenance (O&M) building, up to five permanent 80-meter meteorological towers, and a series of roads to construct and then access the turbines and related infrastructure. All projects components are proposed to be located in Highland Plantation; however the generator lead, which delivers power from the electrical collector substation to the New England grid, also passes through Pleasant Ridge Plantation on its way to the CMP-controlled substation in Moscow, Maine.

The Project will consist of the following components:

- A total of 39 turbines, along with associated electrical interconnection infrastructure and five permanent meteorological towers, installed in two distinct strings along ridges of the Witham Mountain, Bald Mountain, Burnt Hill and Briggs Hill in Highland Plantation, will be located at elevations between 1,553 and 2,237 feet above mean sea level, along ridges with elevations at approximately 700 feet.
The western string of the Project includes the 18 turbines located on the ridgeline that connects Witham Mountain, and Bald Mountain. The eastern string includes 21 turbines extending from the northeastern end of Burnt Hill south to Briggs Hill.

2.0 Purpose

This investigation is a Class L (linear) soils survey for the proposed project, as required by Maine law. A Class L Soil Survey for linear wind power projects is concentrated in the areas of proposed access roads, turbine pads, and laydown areas. The purpose of this Class L soils investigation is to provide soil information for the proposed Highland Wind project along the proposed corridor of the access road alignment and within the proposed turbine pad sites, and laydown areas. More specifically, the purpose of this Class L soil survey is to identify and quantify soils limitations at the site for the proposed wind power development, particularly with respect to any design accommodations necessary to address soil drainage, physical properties and/or depths to bedrock class.

The purpose of the High Intensity Class B Soil Survey in the Operations and Maintenance Building site is to identify any soils limitations to that more intensive use.

The purpose of the modified Class D Soil Survey for the proposed transmission corridor is to identify hydrologically sensitive soils which may require erosion and sedimentation control measures, or other special considerations that may require caution during construction.

The Maine Department of Environmental Protection, the Maine Land Use Regulation Commission, and David Rocque, State Soil Scientist, are interested in project designs which retain hydraulic connections and maintain the natural perched ground water and surface run-off pattern as much as is feasible. This is a particularly relevant to this project, where there are traversing road alignments along the side sloping mountainous terrain, which is subject to long drainage sheds with high volumes of perched ground
Highland Wind Project Soil Narrative Report

water flows and surface water runoff. Currently, the state of the art of access road designs is to

maintain a continued hydraulic interconnection between the upslope and downslope sides of new road beds, by allowing water to pass through in more of a sheet flow capacity and to minimize large channelized flow. A rock sandwich (aka French mattress per Penn State technical bulletin) is one such technique, which will be employed at the Highland wind project.

Albert Frick Associates’ soil scientists examined the proposed access road corridors, turbine sites and transmission lines, identifying and survey-locating areas of soils which are:

1. poorly to somewhat poorly drained;
2. exhibit oxyaquic-like conditions (soils which are subjected to oxygen rich, seasonally perched ground water after rainfall events, e.g. early spring, late fall and during periods of heavy precipitation. These soils may exhibit more than one color or streaking, caused by differential organic matter accumulation in soil profile horizons);
3. intermittent drainages not included in wetland delineation streams;
4. subterranean mountain streams; OR
5. natural drainage swales that have potential to concentrate surface water runoff during periods of spring snowmelt, late fall rainfall, and/or during periods of extended heavy precipitation.

Where associates field identified soil areas that should be subject to drainage considerations in the development plans, they so noted on the soils plan.

In order to simplify the soils review, we overlaid a composite road alignment plan depicting cut and fill, grading, erosion and sediment control, cross-drainage techniques, and culverting, etc. onto the soils map.
3.0 Methodology

We performed soils identification, mapping and soil surveys in accordance with the standards adopted by the *Maine Association of Professional Soil Scientists (revised February 2004)* for *Class L* soil surveys for the proposed access road and proposed turbine sites and *Class B* for the proposed Operations & Maintenance building site. We performed a modified *Class D* soil survey for the proposed transmission line corridor to identify somewhat poorly to poorly drained soils, which might be sensitive to erosion and sediment control if the proposed construction were done at times when the soils were wet.

We examined the proposed road alignment, turbine sites, O & M building site, and Transmission Line Corridor in the field on June 22, 23, 24, 30, July 1, September 14, 15, 21, 23 and October 6, 7, 12 and 13, 2009 and December 11, 2010. *Albert Frick*, Certified Soil Scientist, accompanied by a Field Technician with a Global Positioning Systems (GPS) unit [Trimble GeoXT submeter accuracy] performed the field work. The latitude and longitude coordinates were recorded in UTMNAD 83.

Soils are described using standard soil terminology developed by the *USDA Natural Resources Conservation Service*, which is also where soil interpretation records originate for each soil series described in Maine. Where important distinctions between hydric and non-hydric soils are made in the mapping, the *Maine Association of Professional Soil Scientists Key to Soil Drainage Classes* was also utilized, as well as a separate list of regional indicators for identification of hydric soils (*Field Indicators for Identifying Hydric Soils in New England, version 3 2004*).

This proposed wind project is sited in a remote mountainous area. Consequently, it is not feasible to utilize mechanized equipment (i.e. backhoe excavation, drilling rig, etc.) due to inaccessibility and environmental concerns in this remote location. In such situations,
the soil mapping standards allow for use of a tile spade shovel, hand soil auger, and tile probe to excavate test pits to a depth of 40 inches or until refusal due to encountering bedrock, large boulder, or basal lodgment till.

Field work consisted of documenting soil morphology and characteristics with hand dug test pits, borings and probes to bedrock and/or refusal. We identified test pits on-site with numbered flagging tape. AFA personnel located each test pit by submeter GPS. Soil types were identified and depicted on the proposed project Site Plan 1” = 100’.

We took additional confirmatory soil borings/observations by soil auger to assist in the placement of soil map unit boundaries onto the soil survey base map. AFA personnel located observed bedrock outcroppings by GPS survey to further identify shallow to bedrock soil map units, and project the relative depth to bedrock in the soil mapping units.

Soil map units were designed and structured to report the pertinent soil characteristics along with potential soil limitations for the proposed use and management of a Wind Power project site, so that the design team could take such limitations into account. Here, poor soil drainage is the primary concern in identifying soil limiting factors. Therefore, we used *ad hoc* symbols in places on the map to provide more detailed information about bedrock outcropping locations, groundwater seeps, surface water runoff, soil areas comprised of *oxyaquic*-like soils, intermittent and perennial streams or watercourses, and other natural features encountered on the property. We provided this additional detailed information where we anticipated that civil engineers should further evaluate the need for special cross drainage and/or erosion and sediment control measures.

A preliminary soils map was developed by obtaining the electronic layer of the *U.S. Natural Resource Conservation Service* medium intensity map, and importing the soil boundary information into the project CAD file. This was utilized for a preliminary soil map and the entire project area was reviewed along the proposed access road corridor,
turbine sites, and transmission lines. Soil test pit excavations and descriptions were performed to upgrade, refine, and modify the map within the project borders.

The Design and Permitting teams used the developing soils work, along with the topographic survey and wetland delineation to locate and revise the road alignment and turbine placement, as well as to refine the design with regards to natural hydraulic cross-drainage concerns. These specific areas were identified and additional measures were proposed by project engineers to address hydraulic concerns.

The soils data provide information useful for engineering by anticipating existing and proposed conditions with regards to depth to bedrock, that will affect blasting, benching techniques, and source of road building materials and/or cost; soil drainage characteristics that will affect road hydraulic cross-drainage, culverting frequency and sizing, storm water design, erosion and sediment control, and soil textures/slopes that will affect erosion potential.

4.0 Site Location/Setting

The proposed Highland Wind Project is located off Long Falls Dam Road and Sandy Stream Valley Road in Highland Plantation, Maine. The transmission corridor to Wyman Dam passes through Pleasant Ridge Plantation. The project area consists of moderately sloping to steeply sloping topography, and is currently comprised mainly of forested land, except for portions of the existing transmission line.

5.0 General Site and Subsurface Conditions

The site primarily includes forested sideslopes and mountain top ridges. Soil landforms generally consist of loam and sandy loam soils derived from glacial till. The tops of the mountain and ridge lines are generally bedrock controlled, and consequently exhibit shallow to bedrock soil conditions. The sideslopes tend to be comprised of deeper soils (ie. +40” in depth), which are loam to sandy loam textured soils generally derived from
6.0 Soil Map Unit Descriptions

The kinds of map units used in a survey depend primarily on the purposes of the survey and the pattern of the soils and miscellaneous areas in the landscape. The pattern in nature is fixed, and it is not exactly the same in each delineation of a given map unit. In soil surveys, these patterns must be recognized, and map units designed to meet the major objectives of the Survey. It must be remembered that soil interpretations are made for areas of land and the most useful map units are those that group similarities.

The soil map unit descriptions included in Appendix C provide details regarding the soil series encountered, and the composition of soils within the given map unit (both for the range of soil characteristics and the potential similar and dissimilar soil within the soil map unit). Soil map units with multiple names are generally listed in order of their prevalence within the map unit. Slope gradient ranges are also provided, and refer to slope phases indicated in the soil survey map and in the soil legend. The soil narrative report is provided to describe the soil composition and physical characteristics, the general soil limitations, and related recommendations for the proposed use and management. The soils map depicts the spatial location of the soil or soils within the project site.

7.0 Conclusions and Recommendations

Based on our observations of the project site, and our knowledge of the proposed use of the property, the soils within the development area are suitable for the proposed use, with the following notable exceptions:

Recommend providing road cross drainage of the natural perched and surface water flow in the specified areas of the soil map located within the cross-hatched blue area as shown on the plans. (Civil engineers should consider rock sandwich
[aka French mattress], frequent cross culverting and road turn-outs to maintain and maximize sheet flow).

The nearly level, moderately sloping glacial till soils that are moderately well drained or well drained are generally suitable for the proposed use, although some modifications to drainage or slope may be needed to improve conditions (as outlined by the Civil Engineers).

The somewhat poorly drained soils, where seasonal high groundwater tables are within 12” of the mineral soil surface for a significant portion of the year, may require additional measures such as the addition of coarse granular fill, rock sandwich, or the installation of upslope curtain drain to intercept sheet flow drainage, to overcome limitations.

The poorly or very poorly drained hydric soils have further limitations due to prolonged wetland and frost susceptibility, and may have additional permitting implications, if identified as wetland areas. Jurisdictional wetland areas were intentionally avoided, or wetland filling impacts minimized, as part of the selection of the road alignment.

There currently are two existing graveled roads that reach the summits of Briggs Hill and Stewart Mountain (peaks within Project area), and a third existing graveled road that is within 700’ of the Witham Mountain (peak within project area) summit. These existing roads are drivable by 2-wheel drive vehicles, and are clear examples that road access to the summits can be successfully accomplished. However, all the new proposed roads as well as upgraded road within the project have been subjected to substantially more review of soils, wetlands, topographic mapping, as well as extensive civil engineering proven practices of soil and erosion control standards for mountain access road construction.

A segment of the access roads to both Burnt Hill and Witham Mountain, as shown with the symbol for area recommended for cross-drainage, should be subject to standards and
Highland Wind Project Soil Narrative Report

acceptable practices of cross-drainage techniques that are designed by the Civil Engineers to respect the mountain hydrology.
APPENDIX A

Limitations

This soil narrative report and accompanying soil survey map have been prepared for the exclusive use of Stantec Consulting, for its specific application to the proposed Highland Wind Power Project in Highland Plantation and Pleasant Ridge Plantation, Maine. Albert Frick Associates, Inc. conducted the work in accordance with generally accepted soil science practices outlined in the Maine Association of Professional Soil Scientists Guidelines, and the Maine Board of Certification of Geologists and Soil Scientists Guidelines. Further, presentation of mapping information meets the requirements of Guidelines for Maine Certified Soil Scientists for Soil Identification and Mapping (2004), and in accordance with standards adopted by the Maine Department of Environmental Protection (MDEP) for project review. No other warranty, expressed or implied, is made.

It should be recognized that map unit design is influenced by the intended use of the soil survey information, and may not be adequate or sufficient to evaluate for uses other than that for which the specific soil survey was developed. Soils which are non-limiting for one use may be considered a limitation for different use than that identified.

The analysis contained herein is based on data obtained during subsurface exploration of the site, and the interpretation of published information by the USDA Natural Resources Conservation Services. Due to the glaciation of Maine, and the complexity of the landscape, variations in subsurface conditions may exist between exploration sites which may not become evident until significant project excavation begins. Should significant variations in subsurface conditions become evident after the submission of this report, it may be necessary to re-evaluate the nature of the variation, in light of the recommendations enclosed herein.

Due to the combination of remoteness, current inaccessibility of heavy excavation equipment (e.g. backhoe, excavator, drill auger), Albert Frick Associates’ Soil Scientist utilized hand shovels, tile probes and soil augers. Refusal or depth limitation to hand operated equipment may be due to bedrock and/or large stone or boulders.
APPENDIX B

Maine Association of Professional Soil Scientists Standards

Class L (Linear) Soil Survey Map

Purpose - This soil survey standard is designed to provide the minimum soil information necessary to allow for the design and construction of long but narrow projects such as access roads, utility lines or trails with little or no adjacent development. In remote, difficult to access sites such as mountains or roadless areas, soil observations may be made entirely by use of a hand shovel, screw or Dutch auger. For areas which are more accessible, deeper soil observations should be made in order to properly classify the soils.

1. Class L soil survey map units shall be made on the basis of parent material, slope, soil texture, soil depth to dense till or bedrock (which ever is shallowest) and soil wetness (drainage class and/or oxyaquic-like conditions) at the Class A High Intensity Map Unit size. The preferred method of naming the soil map units is by assigning a soil series name or names for complexes. If soils are classified to the series level in remote areas not readily accessible to equipment and/or without road cuts, it shall be noted in the narrative that soils were classified by shallow observations only.

2. Scale is 1 inch equals 100 feet or larger (e.g. 1”=50’).

3. Ground Control - base line and test pits for which detailed data are recorded are located to sub-meter accuracy under the direction of a qualified professional.

4. Base map with two foot contour lines.

SEE END OF SOILS SECTION REPORT FOR LOCATION OF INDIVIDUAL SOIL MAP SHEETS (1 – 40)
APPENDIX C

Soil Map Unit Descriptions
ABRAM
(Frigid Lithic Haplorthod)

SETTING

Parent Material: Thin very shallow mantle of glacial till over bedrock
Landform: On mountains and high elevations
Position in Landscape: Uppermost portions of landscape
Slope Gradient Ranges: (C) 8-20%  (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Well drained to excessively well drained.

Typical Profile Description:
Surface layer: Pinkish gray sandy loam, 0-2”
Subsurface layer: Very dusky red to brown sandy loam, 2-10”
Bedrock: Less than 10” (typical)

Hydrologic Group: D
Permeability: Moderately rapid in organic layers, moderate or moderately rapid on the mineral horizon
Depth to Bedrock: Very shallow, 0-10”
Hazard to Flooding: None
Erosion Factors: k: .17 - .32

INCLUSIONS
(Within Mapping Unit)

Similar: Ricker (cryic) Knob Lock (frigid), Hogback, Rawsonville, Rock Outcrop, Lyman, Tunbridge

Dissimilar: Naskeag, Mahoosuc, Dixfield

USE AND MANAGEMENT

Development of Wind Power Projects: Soils within this map unit are generally suited to the proposed use, in that they generally have no limitations due to wetness, and shallow depths to bedrock can provide stable and solid anchoring points for wind tower bases, or can be a source of road construction material if bedrock is processed.
ABRAM-HOGBACK COMPLEX

SETTING

Parent Material: Coarse loamy soils derived from mica schist and phyllite with some granite and gneiss.

Landform: Ridgetop portions of glaciated uplands.

Position in Landscape: Uppermost sideslopes and ridgetops.

Slope Gradient Ranges: (C) 8-20% (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Excessively drained (Abram) to well drained (Hogback) with a seasonal high groundwater table observed only for short durations after significant storm events or snowmelt, usually on top of bedrock.

Typical Profile Description:
(for Abram) Surface layer: Pinkish gray sandy loam, 0-2"
Subsurface layer: Very dusky red to brown sandy loam, 2-5"
Bedrock @ 5"

(for Hogback) Surface layer: Dark reddish brown fine sandy loam, 0-7"
Subsurface layer: Dark reddish brown fine sandy loam, 7-15"
Bedrock @ 15"

These two soils occur in a non-regular, non-repeating pattern that could not be separated out in mapping. It is estimated that Abram forms the majority of this map unit, while Hogback occupies the balance of the area.

Hydrologic Group:
Hogback: Group B
Abram: Group D

Surface Run Off: Rapid
Permeability: Moderately rapid

Depth to Bedrock:
Abram: 0-10" to bedrock
Hogback: 10-20" to bedrock

Hazard to Flooding: None
Erosion Factor: K: .17 - .64

INCLUSIONS
(Within Mapping Unit)

Similar: Knob Lock (frigid), Ricker (cryic), Rawsonville, Dixfield, Skerry, Marlow
Dissimilar: Mahoosuc, Rock Outcrop

USE AND MANAGEMENT

Development of Wind Power Projects: Abram and Hogback soils are generally suited for development of wind power projects, in that wetness is generally not a factor in these map units, and both provide for solid and stable anchoring points for wind tower bases.
ABRAM-RICKER-ROCK OUTCROP COMPLEX
(Dysic Lithic Borofolists)

SETTING

Parent Material:  Thin organic deposits underlain by a thin mineral horizon over bedrock

Landform:  On mountains and hills

Position in Landscape:  Uppermost portions of landscape

Slope Gradient Ranges:  (C) 8-20%  (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class:  Well drained to excessively well drained

Typical Profile

<table>
<thead>
<tr>
<th>Description</th>
<th>Surface layer</th>
<th>Subsurface layer</th>
</tr>
</thead>
<tbody>
<tr>
<td>(for Abram)</td>
<td>Pinkish gray sandy loam, 0-2&quot;</td>
<td>Very dusky red to brown sandy loam, 2-5&quot;</td>
</tr>
<tr>
<td>(for Ricker)</td>
<td>Dark reddish brown to black peat, 7-0&quot;</td>
<td>Dark bluish gray, very channery silt loam, 0-6&quot;</td>
</tr>
</tbody>
</table>

Substratum:  Bedrock

Note:  These two soils occur in a non-regular, non-repeating pattern with areas of exposed bedrock (Rock Outcrop) and could not be separated out in mapping.  It is estimated that Abram occupies the most area of this map unit, with Ricker occupying less area and Rock Outcrop less area.

Hydrologic Group:  D:  Abram/Rock Outcrop
A:  Ricker

Note:  NRCS lists Ricker as “A”, however, a conference with David Rocque, State Soil Scientist, suggests expected run-off similar to Abram (D).

Surface Water Runoff:  Rapid

Permeability:  Moderately rapid in organic layers, moderate or moderately rapid on the mineral horizon

Depth to Bedrock:  Very shallow to moderately deep, 0-10"

Hazard to Flooding:  None

Erosion Factors:  K:  .17 - .49

INCLUSIONS
(Within Mapping Unit)

Similar:  Hogback, Rawsonville, Lyman, Tunbridge
Dissimilar:  Naseag, Mahoosuc, Marlow

USE AND MANAGEMENT

Development of Wind Power Projects:  Soils within this map unit are generally suited to the proposed use, in that they generally have no limitations due to wetness, and shallow depths to bedrock can provide stable and solid anchoring points for wind tower bases, or can be a source of road construction material if bedrock is processed.
BRAYTON
(Aeric Haplaquepts)

SETTING

Parent Material: Compact loamy glacial till.

Landform: Depressions and toeslopes of glaciated uplands.

Position in Landscape: Lowest positions on landform.

Slope Gradient Ranges: 
(A) 0-3%  
(B) 3-8%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Poorly drained, with a perched water table 0 to 1.0 feet beneath the soil surface from November through May or during periods of excessive precipitation.

Typical Profile Description:
- Surface layer: Very dark grayish brown sandy loam, 0-5"
- Subsurface layer: Grayish brown sandy loam, 5-15"
- Subsoil layer: Olive gray fine sandy loam, 15-24"
- Substratum: Olive sandy loam, 24-65"

Hydrologic Group: Group C

Surface Run Off: Moderate to moderately rapid.

Permeability: Moderate in solum, moderately slow or slow in dense substratum.

Depth to Bedrock: Deep, greater than 40 inches.

Hazard to Flooding: None

Erosion Factors: 
K: .24 - .32

INCLUSIONS
(Within Mapping Unit)

Similar: Pillsbury, Colonel, Monarda, Westbury, Telos

Dissimilar: Naskeag, Peacham, Waskish

USE AND MANAGEMENT

Development for wind power projects: The limiting factor for development of wind power projects is wetness, since seasonal high groundwater tables within these map units are generally within 7" of the ground surface for long durations of the year. Groundwater perches on the firm substratum in Brayton, and this can carry significant amounts of runoff from long, upsloping watersheds. Importation of granular fill may be necessary to overcome limitations due to drainage for turbine pad construction, and maintaining cross drainage on new road sections will avoid concentration of stormwater. Brayton flows may have further implications as jurisdictional wetlands, when all three parameters of hydrophytic (wetland) vegetation, wet hydrology, and hydric (wetland) soils are present.
CHARLES (Limerick)
(Aeric Fluvaquents)

**SETTING**

**Parent Material:** Recently deposited alluvium sediment on flood plain.

**Landform:** Floodplains adjacent to rivers and streams.

**Position in Landscape:** Commonly found in broad depressions on floodplains.

**Slope Gradient Ranges:** (A) 0-3%  (B) 3-8%

**COMPOSITION AND SOIL CHARACTERISTICS**

**Drainage Class:** Poorly drained, with an apparent water table from 0 to 1.5 feet beneath the soil surface from November through June.

**Typical Profile Description:**
- **Surface layer:** Dark grayish brown silt loam, 0-13”
- **Subsurface layer:** Olive gray silt loam, 13-35”
- **Subsoil layer:** Gray silt loam, 35-40”
- **Substratum:** Dark gray silt loam, 40-65”

**Hydrologic Group:** Group C

**Surface runoff:** Overflow generally occurs during spring runoff

**Permeability:** Moderate to very rapid.

**Depth to Bedrock:** Very deep, greater than 60”.

**Hazard to Flooding:** Common for brief periods from March through October.

**Erosion Factor:** K: .32 - .49

**INCLUSIONS**
(Within Mapping Unit)

**Similar:** Cornish, Pillsbury, Brayton

**Dissimilar:** Limerick (Variant) - very poorly drained, Medomak (Saco), Waskish

**USE AND MANAGEMENT**

**Development of Wind Power Projects:** The limiting factor of this soil for development of wind power projects is wetness, since this floodplain soil is frequently flooded and seasonal high groundwater tables are within 18” of the soil surface for considerable periods of the year. Charles soil may be consistent with floodplains as identified on the Federal Emergency Management Agency’s FIRM maps, and otherwise may be jurisdictional wetland area in areas where all three parameters of wet hydrology, hydric soils, and hydrophytic vegetation are present.
COLONEL
(Aquic Haplorthods)

SETTING

Parent Material: Compact loamy glacial till.
Landform: Glaciated uplands.
Position in Landscape: Intermediate positions on landform.
Slope Gradient Ranges: (A) 0-3%  (B) 3-8%  (C) 8-20%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Somewhat poorly drained, with a perched water table 1.0 to 1.5 feet beneath the soil surface from November through May or during periods of excessive precipitation.
Typical Profile
Surface layer: Grayish brown fine sandy loam, 0-2"
Subsurface layer: Dark reddish brown fine sandy loam, 2-12"
Subsoil layer: Light olive brown gravelly fine sandy loam, 12-18"
Substratum: Olive gravelly fine sandy loam, 18-65"

Hydrologic Group: Group C
Surface Run Off: Moderate
Permeability: Moderate in solum and moderately slow or slow in the compact substratum.
Depth to Bedrock: Deep, greater than 40 inches.
Hazard to Flooding: None
Erosion Factor: K: .17 - .24

INCLUSIONS
(Within Mapping Unit)

Similar: Dixfield, Skerry, Westbury, Telos
Dissimilar: Brayton, Pillsbury, Hogback, Rawsonville, Naskeag

USE AND MANAGEMENT

Development of Wind Power Projects: The limiting factor of this soil for development of wind power projects is wetness, since Colonel soils exhibit a perched water table within 15” of the ground surface during periods of heavy precipitation and spring run-off. Proposed activities near the bottom of long sideslopes may be subject to considerable runoff. Maintaining cross drainage beneath proposed roads will help to assure stable road bases, and to avoid concentration of stormwater flows.
COLONEL (Very Stony)  
(Aquic Haplorthods)

SETTING

Parent Material: Compact loamy glacial till.

Landform: Glaciated uplands.

Position in Landscape: Intermediate positions on landform.

Slope Gradient Ranges: (B) 3-8% (C) 8-20%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Somewhat poorly drained, with a perched water table 1.0 to 1.5 feet beneath the soil surface from November through May or during periods of excessive precipitation.

Typical Profile Description:
- **Surface layer:** Grayish brown fine sandy loam, 0-2"  
- **Subsurface layer:** Dark reddish brown & brown fine sandy loam, 2-12"  
- **Subsoil layer:** Light olive brown gravelly fine sandy loam, 12-18"  
- **Substratum:** Olive gravelly fine sandy loam, 18-65"

Hydrologic Group: Group C

Surface Run Off: Moderate

Permeability: Moderate in solum and moderately slow or slow in the compact substratum.

Depth to Bedrock: Deep, greater than 40".

Hazard to Flooding: None

INCLUSIONS  
(Within Mapping Unit)

Similar: Dixfield, Skerry, Westbury

Dissimilar: Brayton, Pillsbury

USE AND MANAGEMENT

Development of Wind Power Projects: The limiting factor of this soil for development of wind power projects is wetness, since Colonel soils exhibit a perched water table within 15" of the ground surface during periods of heavy precipitation and spring run-off. Proposed activities near the bottom of long sideslopes may be subject to considerable runoff. Maintaining cross drainage beneath proposed roads will help to assure stable road bases, and to avoid concentration of stormwater flows.
CORNISH
(Fluvaquentic Dystrochrepts)

SETTING

Parent Material: Alluvial sediments.
Landform: Floodplains.
Position in Landscape: Nearly level areas, commonly in broad depressions.
Slope Gradient Ranges: (A) 0-3%  (B) 3-8%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Somewhat poorly drained, with an apparent water table 1.0 to 2.0 feet beneath the soil surface from November through May and during periods of excessive precipitation or spring run-off.

Typical Profile
Surface layer: Very dark grayish-brown, very fine sandy loam, 0-12"
Description:
Subsurface layer: Light olive-brown, very fine sandy loam, 12-24"
Subsoil layer: Olive, very fine sandy loam, 24-35"
Substratum: Olive-gray, very fine sandy loam, 35-60"

Hydrologic Group: Group C
Surface Run Off: Slow
Permeability: Moderate in coarse silty layers, and moderate to very rapid in the silt loam to fine gravel strata, where present.
Depth to Bedrock: Very deep, greater than 60".
Hazard to Flooding: Twice annually to once every ten years.
Erosion Factor: K: .32 - .49

INCLUSIONS
(Within Mapping Unit)

Similar: Lovewell (moderately well drained floodplain soils)
Dissimilar: Charles, Medomak

USE AND MANAGEMENT

Development of Wind Power Projects: This soil map unit is subjected to periodic flooding and the flood hazard should be evaluated. The limiting factor of this soil for development of wind power projects is depths to seasonal high groundwater table, which are 1-2’ beneath the ground surface, and frequency of flooding, which may occur 1-2 times every 10 years. Water table limitations may be overcome by the addition of coarse granular fill and associated stabilization. Other methods to maintain unimpeded cross drainage beneath proposed road beds may also be indicated.
DIXFIELD
(Typic Haplorthods)

SETTING

Parent Material: Compact loamy glacial till.
Landform: Glaciated uplands and drumlins.
Position in Landscape: Upper portions of landform.
Slope Gradient Ranges: (B) 3-8% (C) 8-20%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Moderately well drained, with a perched water table 1.5 to 2.5 feet beneath the existing soil surface from November through April and during periods of excessive precipitation.

Typical Profile

Surface layer: Grayish brown and dark brown fine sandy loam, 0-6"
Subsurface layer: Strong brown and dark yellowish brown fine sandy loam, 6-19"
Subsoil layer: Light olive brown gravelly fine sandy loam, 19-24"
Substratum: Light olive brown gravelly sandy loam, 24-65"

Hydrologic Group: Group C
Permeability: Moderate in the solum, moderately slow or slow in the compact substratum.
Depth to Bedrock: Very deep, greater than 60".
Hazard to Flooding: None
Erosion Factors: K: .17 - .24

INCLUSIONS
(Within Mapping Unit)

Similar: Hermon, Skerry, Becket, Croghan, Sunappe, Marlow, Berkshire, Monadnock
Dissimilar: Colonel, Hogback (10-20" to bedrock), Rawsonville (20-40" to bedrock), Sunappe

USE AND MANAGEMENT

Development with Wind Power Projects: Dixfield soils are generally suited for development of wind power projects, in that these soils are moderately well drained with dense basal till substratum. Depths to seasonal high groundwater table can be overcome by redirection of surface water runoff, and/or importation of coarse granular fill, or by providing adequate cross-drainage techniques.
HERMON  
(Typic Haplorthods)

SETTING

Parent Material: Hermon - sandy ablation glacial till without a restrictive subsurface.

Landform: Glaciated upland plains, hills and ridges.

Position in Landscape: Both soils occupy uppermost portions of landforms.

Slope Gradient Ranges: (C) 8-20%  (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Hermon soils are somewhat excessively drained, while Skerry soils are moderately well drained

Drainage Class: Somewhat excessively drained, with a water table greater than 6.0 feet beneath the existing soil surface.

Typical Profile

Surface layer: Pinkish gray sandy loam, 0-3”

Subsurface layer: Dark reddish brown, 3-9”

Subsoil layer: Strong brown & dark yellowish brown, 9-32”

Substratum: Light olive brown gravelly coarse sand, 32-65”

Hydrologic Group: Hermon: Group A

Surface Run Off: Slow to medium

Permeability: Rapid in the solum, rapid or very rapid in the coarser substratum.

Depth to Bedrock: Very deep, greater than 60”.

Hazard to Flooding: None

Erosion Factors: K: .10 - .24

INCLUSIONS
(Within Mapping Unit)

Similar: Skerry, Dixfield, Marlow, Waumbek, Becket, Hermon (D slopes in C unit), Colton, Monadnock, Adams

Dissimilar: Stetson, Waumbek (moderately well drained), Skerry, Colonel, Hogback (10-20” to bedrock), Rawsonville (20-40” to bedrock)

USE AND MANAGEMENT

Development of Wind Power Projects: Hermon soils are generally suited for the development of wind power projects. The Hermon map unit may also be a source of gravelly materials for use as road subgrades, etc.
HOGBACK
(Lithic Haplohumods)

SETTING

Parent Material:  Loamy soils of glacial till over bedrock.

Landform:  Ridgetop portions of glaciated uplands.

Position in Landscape:  Uppermost sideslopes and ridgetops.

Slope Gradient Ranges:  (C)  8 – 20%  (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class:  Well drained (Hogback) with a seasonal high groundwater table observed only for short durations after significant storm events or snowmelt, on bedrock surface.

Typical Profile Description:
Surface layer:  Dark reddish brown fine sandy loam, 0-7"
Subsurface layer:  Dark reddish brown fine sandy loam, 7-15"
Bedrock @ 10” to 20”

Hydrologic Group:  Group B

Surface Run Off:  Rapid

Permeability:  Moderately rapid

Depth to Bedrock:  10-20” to bedrock

Hazard to Flooding:  None

Erosion Factor:  K: .17 - .64

INCLUSIONS
(Within Mapping Unit)

Similar:  Abram, Rawsonville, Ricker [Knob Lock], Rock Outcrop

Dissimilar:  Dixfield, Skerry, Mahoosuc, Naskeag, Berkshire

USE AND MANAGEMENT

Development of Wind Power Projects:  Hogback soils are generally suited for development of wind power projects, in that wetness is generally not a factor in this mapping unit, and provides for solid and stable anchoring points for wind tower bases.
HOGBACK–ABRAM COMPLEX

SETTING

Parent Material: Coarse loamy soils derived from mica schist and phyllite with some granite and gneiss.

Landform: Ridgetop portions of glaciated uplands.

Position in Landscape: Uppermost sideslopes and ridgetops.

Slope Gradient Ranges: (C) 8-20%   (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Well drained (Hogback) to excessively drained (Abram) with a seasonal high groundwater table observed only for short durations after significant storm events or snowmelt.

Typical Profile

Surface layer: Dark reddish brown fine sandy loam, 0-7"

Subsurface layer: Dark reddish brown fine sandy loam, 7-15"

Schist bedrock @ 15"

(for Hogback)

Surface layer: Pinkish gray sandy loam, 0-2"

Subsurface layer: Very dusky red to brown sandy loam, 2-5"

Bedrock @ 5"

Note: These two soils occur in a non-regular, non-repeating pattern that could not be separated out in mapping. It is estimated that Hogback forms the majority of this map unit, while Abram occupies the balance of the area.

Hydrologic Group: Hogback: Group B

Abram: Group D

Surface Run Off: Rapid

Permeability: Moderately rapid

Depth to Bedrock: Hogback: 10-20” to bedrock

Abram: 0-10” to bedrock

Hazard to Flooding: None

Erosion Factor: K: .17 - .64

INCLUSIONS

(Within Mapping Unit)

Similar: Saddleback, Ricker [Knob Lock], Dixfield, Skerry, Rawsonville

Dissimilar: Rock Outcrop

USE AND MANAGEMENT

Development of Wind Power Projects: Hogback and Abram soils are generally suited for development of wind power projects, in that wetness is generally not a factor in these map units, and both provide for solid and stable anchoring points for wind tower bases.
HOGBACK-ABRAM-RAWSONVILLE COMPLEX

SETTING

Parent Material: Loamy glacial till formed from mica schist and phyllite with some granite and gneiss.

Landform: Glaciated upland ridges.

Position in Landscape: Uppermost till ridges and upper sideslopes.

Slope Gradient Ranges: (C) 8-20%   (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Well drained, generally with no observed water table, or a short duration water table observed after significant storm events or snowmelt.

Typical Surface layer: Dark reddish brown fine sandy loam, 0-7"
Typical Subsurface layer: Dark reddish brown fine sandy loam, 7-15"
Typical Schist bedrock @ 15"

(for Abram) Surface layer: Pinkish gray sandy loam, 0-2"
(for Abram) Subsurface layer: Very dusky red to brown sandy loam, 2-5"
(for Abram) Bedrock @ 5"

(for Rawsonville) Surface layer: Dark reddish brown fine sandy loam, 0-10"
(for Rawsonville) Subsurface layer: Dark reddish brown fine sandy loam, 10-19"
(for Rawsonville) Subsoil layer: Dark brown fine sandy loam, 19-28"
(for Rawsonville) Schist bedrock @ 28"

Note: These three soils occur within this complex in a non-regular, non-repeating pattern that could not be separated out in mapping.

Hydrologic Group: Group C

Surface Run Off: Rapid

Permeability: Moderate of moderately rapid

Depth to Bedrock: Moderately deep, 20-40” to bedrock
Hazard to Flooding: None

Erosion Factor: K: .17 - .64

INCLUSIONS
(Within Mapping Unit)

Similar: Saddleback, Ricker, Marlow
Dissimilar: Rock Outcorp, Naskeag, Brayton, Pillsbury, Rock Outcrop, Mahoosuc, Dixfield

USE AND MANAGEMENT

For Development of Wind Power Projects: Hogback-Abram-Rawsonville soils are generally suited for construction of wind power projects, since drainage is not a significant limitation within these map units, and can provide solid and stable anchoring points for wind towers.
HOGBACK-ABRAM-ROCK OUTCROP COMPLEX

SETTING

Parent Material: Coarse loamy soils derived from mica schist and phyllite with some granite and gneiss.

Landform: Ridgetop portions of glaciated uplands.

Position in Landscape: Uppermost sideslopes and ridgetops.

Slope Gradient Ranges: (C) 8-20%   (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Well drained (Hogback) to excessively drained (Abram) with a seasonal high groundwater table observed only for short durations after significant storm events or snowmelt.

Typical Profile Description: 
- **Surface layer:** Dark reddish brown fine sandy loam, 0-7”
- **Subsurface layer:** Dark reddish brown fine sandy loam, 7-15”
- **Schist bedrock @ 15”**

(for Abram)
- **Surface layer:** Pinkish gray sandy loam, 0-2”
- **Subsurface layer:** Very dusky red to brown sandy loam, 2-5”
- **Bedrock @ 5”**

Note: These two soils occur in a non-regular, non-repeating pattern, along with areas of exposed bedrock. Hogback is the dominant soil type in the complex, followed by Abram and Rock Outcrop, respectively.

Hydrologic Group: 
- Hogback: Group B
- Abram: Group D

Surface Run Off: Rapid
Permeability: Moderately rapid
Depth to Bedrock: 
- Hogback: 10-20” to bedrock
- Abram: 0-10” to bedrock

Hazard to Flooding: None
Erosion Factor: K: .17 - .64

INCLUSIONS
(Within Mapping Unit)

Similar: Rawsonville, Saddleback, Ricker
Dissimilar: Naskeag, Brayton, Pillsbury, Dixfield

USE AND MANAGEMENT

Development of Wind Power Projects: Hogback and Abram soils are generally suited for Development of wind power projects, in that wetness is generally not a factor in these map units, and both provide for solid and stable anchoring points for wind tower bases.
HOGBACK-RAWSONVILLE COMPLEX

SETTING

Parent Material: Loamy glacial till formed from mica schist and phyllite with some granite and gneiss.

Landform: Glaciated upland ridges.

Position in Landscape: Uppermost till ridges and upper sideslopes.

Slope Gradient Ranges: (C) 8-20% (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Well drained, generally with no observed water table, or a short duration water table observed after significant storm events or snowmelt.

Typical Profile Description:

(for Hogback)
- Surface layer: Dark reddish brown fine sandy loam, 0-7”
- Subsurface layer: Dark reddish brown fine sandy loam, 7-15”
- Schist bedrock @ 15”

(for Rawsonville)
- Surface layer: Dark reddish brown fine sandy loam, 0-10”
- Subsurface layer: Dark reddish brown fine sandy loam, 10-19”
- Subsoil layer: Dark brown fine sandy loam, 19-28”
- Schist bedrock @ 28”

Note: These soils occur in a non-regular, non-repeating pattern that could not be separated out in mapping.

Hydrologic Group: Group C

Surface Run Off: Rapid

Permeability: Moderate of moderately rapid

Depth to Bedrock: Moderately deep, 20-40” to bedrock

Hazard to Flooding: None

Erosion Factor: K: .28 -.64

INCLUSIONS

(Within Mapping Unit)

Similar: Ricker, Abram, Saddleback

Dissimilar: Rock Outcrop, Naskeag, Brayton, Pillsbury, Dixfield

USE AND MANAGEMENT

Development of Wind Power Projects: Hogback-Rawsonville soils are generally suited for construction of wind power projects, since drainage is not a significant limitation within these map units, and can provide solid and stable anchoring points for wind towers.
HOGBACK-RAWSONVILLE-ABRAM COMPLEX

SETTING

Parent Material: Loamy glacial till formed from mica schist and phyllite with some granite and gneiss.

Landform: Glaciated upland ridges.

Position in Landscape: Uppermost till ridges and upper sideslopes.

Slope Gradient Ranges: \( (C) \) 8-20% \( (D) \) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Well drained, generally with no observed water table, or a short duration water table observed after significant storm events or snowmelt.

Typical Profile

(For Hogback)

Surface layer: Dark reddish brown fine sandy loam, 0-7"
Subsurface layer: Dark reddish brown fine sandy loam, 7-15"
Schist bedrock @ 15"

(For Rawsonville)

Surface layer: Dark reddish brown fine sandy loam, 0-10"
Subsurface layer: Dark reddish brown fine sandy loam, 10-19"
Subsoil layer: Dark brown fine sandy loam, 19-28"
Schist bedrock @ 28"

(For Abram)

Surface layer: Pinkish gray sandy loam, 0-2"
Subsurface layer: Very dusky red to brown sandy loam, 2-5"
Bedrock @ 5"

Note: These three soils occur within this complex in a non-regular, non-repeating pattern that could not be separated out in mapping.

Hydrologic Group: Group C

Surface Run Off: Rapid

Permeability: Moderate of moderately rapid

Depth to Bedrock: Moderately deep, 20-40” to bedrock

Hazard to Flooding: None

Erosion Factor: \( K: .28 - .64 \)

INCLUSIONS

(Within Mapping Unit)

Similar: Abram, Saddleback, Ricker
Dissimilar: Naskeag, Brayton, Pillsbury, Rock Outcrop

USE AND MANAGEMENT

Development of Wind Power Projects: The soils within this soil mapping unit are generally suited for construction of wind power projects, since drainage is not a significant limitation within these map units, and can provide solid and stable anchoring points for wind towers.
MADE LAND

SETTING

Parent Material: Variable
Landform: Variable
Position in Landscape: Variable
Slope Gradient Ranges: (A) 0-3% (B) 3-8%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: None assigned
Typical Profile Description:
Surface layer: Typically this map unit consists of areas
Subsurface layer: consists of areas
Subsoil layer: excavated and reworked
Substratum: by man, then smoothed.
Hydrologic Group: None assigned
Surface Run Off: Variable
Permeability: Variable
Depth to Bedrock: Variable
Hazard to Flooding: None

INCLUSIONS
(Within Mapping Unit)

Similar: Filled Land
Dissimilar: Small 'made' depressions that contain standing water or have other drainage implications. These may be caused by compaction by vehicular traffic, which is not synonymous with seasonal water tables.

USE AND MANAGEMENT

Development of Wind Power Project: This map unit consists of areas reworked by man, so that the soils are no longer taxonomically classifiable. Limiting factor for development is soil drainage, though somewhat difficult to determine in these map units. Proper foundation drainage or other site alterations recommended for construction. This map unit usually consists of existing graveled roadways.
MAHOOSUC  
(Typic Borofolists) 

SETTING 

Parent Material: Deep and very deep soils formed in thin organic materials overlying fragmental colluviums. 

Landform: Ridge and mountain tops. 

Position in Landscape: Steep slopes on uppermost portions of glaciate uplands, generally found at the base of a steep bedrock slope. 

Slope Gradient Ranges: (C) 8 – 20%  (D) 20%+ 

COMPOSITION AND SOIL CHARACTERISTICS 

Drainage Class: Somewhat excessively drained, generally with no observable seasonal high groundwater table. 

Typical Profile  
Surface layer: Dusty red to black fabric and hemi materials, 0-8”  
Substratum: Fragmental cobbles, stones, gravel and boulders, 8-20’. 
Subsoil: Fragmental soils consisting of cobbles, stones, and boulders, 20-60”. 

Hydrologic Group: Group A 

Permeability: Very rapid 

Depth to Bedrock: Very deep, greater than 60 inches 

Hazard to Flooding: None 

INCLUSIONS  
(Within Mapping Unit) 

Similar: Rawsonville, Dixfield, Skerry, Monadnock, Berkshire 
Dissimilar: Abram, Hogback, Saddleback, Pillsbury, Dixfield, Skerry 

USE AND MANAGEMENT 

Development of Wind Power Projects: The limiting factor for development of wind power projects is the fragmental nature of this soil, where the abundance of boulders and other large colluviums can be an impediment to excavation and/or vehicular traffic. Large boulders in this soil mapping unit have the potential to be processed into rip rap stone for a source of road construction base material. Wetter substrata may be evident underlying the boulders and stones in places, and flowing underground streams can occur in localized areas subject to surface and perched groundwater accumulation.
### NASKEAG
(Aeric Haplaquods)

#### SETTING

<table>
<thead>
<tr>
<th>Parent Material:</th>
<th>Loamy and sandy glacial till over bedrock.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landform:</td>
<td>Depressions of glaciated bedrock ridges.</td>
</tr>
<tr>
<td>Position in Landscape:</td>
<td>Lowest positions in depressions or concavities in landform.</td>
</tr>
<tr>
<td>Slope Gradient Ranges:</td>
<td><em>(A)</em> 0-3%  <em>(B)</em> 3-8%  <em>(C)</em> 8-20%</td>
</tr>
</tbody>
</table>

#### COMPOSITION AND SOIL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Drainage Class:</th>
<th>Somewhat poorly to poorly drained, with a perched water table 0-1.5 feet beneath the soil surface.</th>
</tr>
</thead>
</table>
| Typical Profile Description: | **Surface layer:** Very dusky red muck, 0-5"  
**Subsurface layer:** Light brownish gray and brown sandy loam or loamy sand, 5-16"  
**Subsoil layer:** Dusky red loamy sand, 10-26"  
**Substratum:** Light yellowish brown gravelly loamy sand, 26-38" |
| Hydrologic Group: | Group C |
| Surface Run Off: | Moderate or moderately rapid (across bedrock surface) |
| Permeability: | Rapid |
| Depth to Bedrock: | Moderately deep, 20-40" to bedrock surface. |
| Hazard to Flooding: | None, but may be ponded for short duration in spring and during periods of excessive rainfall. |
| Erosion Factors: | K: .10 |

#### INCLUSIONS
(Within Mapping Unit)

| Similar: | Colonel, Brayton, Pillsbury, Hogback, Rawsonville |
| Dissimilar: | Rock Outcrop, Naskeag (Variant-V.P.D.), Waskish |

#### USE AND MANAGEMENT

**Development of Wind Power Projects:** The limiting factors for development of wind power projects is wetness, due to a seasonal high groundwater table near the soil surface for a significant portion of the year, and bedrock which varies generally from 20-40". Naskeag (poorly drained) may also have further limitation as a wetland area, if combined parameter of wet hydrology, hydric soils, and hydrophytic vegetation are all present. The underlying bedrock, generally within 40 inches of the surface, does generally provide for a firm structural foundation for construction if the wetness, due to perched ground water table, is properly addressed with drainage and/or suitable fill material.
NASKEAG (SWP)  
(Aeric Haplauquods)

SETTING

Parent Material: Loamy and sandy glacial till over bedrock.

Landform: Depressions of glaciated bedrock ridges.

Position in Landscape: Lowest positions in depressions or concavities in landform.

Slope Gradient Ranges: (A) 0-3%  (B) 3-8%  (C) 8-20%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Somewhat poorly drained, with a perched water table 7” to 15” beneath the soil surface.

Typical Profile Description:
- Surface layer: Very dusky red muck, 0-5"
- Subsurface layer: Light brownish gray and brown sandy loam or loamy sand, 5-16"
- Subsoil layer: Dusky red loamy sand, 10-26"
- Substratum: Light yellowish brown gravelly loamy sand, 26-38"

Hydrologic Group: Group C

Surface Run Off: Moderate or moderately rapid (across bedrock surface)

Permeability: Rapid

Depth to Bedrock: Moderately deep, 20-40” to bedrock surface.

Hazard to Flooding: None, but may be ponded for short duration in spring and during periods of excessive rainfall.

Erosion Factors: K: .10

INCLUSIONS
(Within Mapping Unit)

Similar: Colonel, Pillsbury

Dissimilar: Rock Outcrop, Naskeag (Variant-V.P.D.), Waskish (Moosabec), Hogback, Rawsonville

USE AND MANAGEMENT

Development of Wind Power Projects: The limiting factors for development of wind power projects is wetness, due to a seasonal high groundwater table 7 to 12” from the soil surface for a significant portion of the year, and bedrock which varies generally from 20-40”. The underlying bedrock, generally within 40 inches of the surface, does generally provide for a firm structural foundation for construction if the wetness, due to perched ground water tale, is properly addressed with drainage and/or suitable fill material.
NASKEAG-WASKISH COMPLEX

SETTING

Parent Material: Loamy and sandy glacial till.
Landform: Depressions of glaciated bedrock ridges.
Position in Landscape: Lowest positions in depressions or concavities in landform.
Slope Gradient Ranges: (A) 0-3%   (B) 3-8%   (C) 8-20%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Naskeag soil is somewhat poorly to poorly drained, with a perched water table 0-1.5 feet beneath the soil surface. Waskish soil is very poorly drained, with seasonal water table within 0.5’ of the soil surface for most of the year.

Typical Description:
(for Naskeag)
Surface layer: Very dusky red muck, 0-5”
Subsurface layer: Light brownish gray and brown sandy loam or loamy sand, 5-16”
Subsoil layer: Dusky red loamy sand, 10-26”
Substratum: Light yellowish brown gravelly loamy sand, 26-38”

(for Waskish)
Surface layer: Very pale brown to brown fibric material, 0-14”
Subsurface layer: Dark brown sapric material, 14-16”
Subsoil layer: Reddish brown fibric material, 16-84”

Note: Waskish generally is found in the deeper to bedrock areas towards the center of the depression with Naskeag near the perimeter.

Hydrologic Group: for Naskeag: Group C
for Waskish: Group D

Surface Run Off: Moderate or moderately rapid (across bedrock surface)
Permeability: Rapid
Depth to Bedrock: Naskeag: Moderately deep, 20-40” to bedrock surface.
Waskish: Deep, greater than 40”

Hazard to Flooding: None, but may be ponded for short duration in spring and during periods of excessive rainfall.

Erosion Factors: K: .10 (for Naskeag)

INCLUSIONS
(Within Mapping Unit)

Similar: Lyman, Tunbridge, Colonel, Brayton, Swanton, Pillsbury
Dissimilar: Rock Outcrop, Peacham, Naskeag (Variant-V.P.D.)

USE AND MANAGEMENT

Development of Wind Power Projects: The limiting factor of soils within this soil map unit for development of wind power projects is wetness, due to the presence of a seasonal high groundwater table very near the soil surface throughout much of the year. Waskish soils are generally considered to be wetland soils, while the poorly drained component of Naskeag may also be classified as wetland area. Appropriate engineering methods such as importation of coarse granular fill, or the use of ‘rock sandwich’ type road base construction can help overcome limitations due to drainage.
**PILLSBURY**  
(Aeric Haplaquepts)

**SETTING**

Parent Material: Compact loamy glacial till.

Landform: Concave slopes with glaciated uplands.

Position in Landscape: Depressional areas and shallow drainageways.

Slope Gradient Ranges:  
(A) 0 – 3%  
(B) 3 - 8%

**COMPOSITION AND SOIL CHARACTERISTICS**

Drainage Class: Poorly to somewhat poorly drained, with a perched water table at or near the surface from 7-9 months a year.

Typical Profile Description:  
Surface layer: Black loam, 0-5''

Subsurface layer: Dark grayish brown fine sandy loam, 5-12''

Subsoil layer: Dark grayish brown fine sandy loam, 12-22''

Substratum: Olive brown fine sandy loam, 22-65''

Hydrologic Group: Group C

Surface Run Off: Slow to medium

Permeability: Moderate in solum, slow in substratum

Depth to Bedrock: Very deep, greater than 60''.

Hazard to Flooding: None

Erosion Factors: K: .24 - .32

**INCLUSIONS**  
(Within Mapping Unit)

Similar: Brayton, Colonel

Dissimilar: Naskeag, Waskish, Mahoosuc

**USE AND MANAGEMENT**

Development of Wind Power Projects: The limiting factor for development of wind power projects is wetness, due to the presence of seasonal high groundwater table at or near the mineral soil surface for a considerable period of the year. Redirecting runoff and subsurface drainage away from project areas, or importation of loose granular fill, can help overcome limitations for construction due to drainage. Pillsbury soils may also have further limitations and permitting implications, since these areas may also include wetlands on the combined basis of hydric soils, hydrology and hydrophytic vegetation. Adequate hydrologic cross drainage under roadways is appropriate for this soil map unit (i.e. rock sandwich, culvert cross drainage, adequate road subbase, etc.)
RAWSONVILLE
(Typic Haplorthods)

SETTING

Parent Material: Loamy glacial till over bedrock.
Landform: Glaciated upland ridges.
Position in Landscape: Uppermost till ridges and upper sideslopes.
Slope Gradient Ranges: (B) 3 – 8%  (C) 8 – 20%  (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Well drained, generally with no observed water table, or a short duration water table observed after significant storm events or snowmelt.
Typical Profile
Surface layer: Dark reddish brown fine sandy loam, 0-10"
Subsurface layer: Dark reddish brown fine sandy loam, 10-19"
Subsoil layer: Dark brown fine sandy loam, 19-28"
Bedrock @ 20”-40” (typical)

Hydrologic Group: Group C
Surface Run Off: Rapid
Permeability: Moderate or moderately rapid
Depth to Bedrock: Moderately deep, 20-40” to bedrock
Hazard to Flooding: None
Erosion Factor: K: .28 - .64

INCLUSIONS
(Within Mapping Unit)

Similar: Hogback, Abram, Dixfield, Skerry, Marlow, includes shallow to bedrock, moderately well drained soils, with perched water table on top of bedrock
Dissimilar: Naskeag, Rock Outcrop, Mahoosuc

USE AND MANAGEMENT

Development of Wind Power Projects: Rawsonville soils are generally suited for construction of wind power projects, since drainage is not generally a significant limitation within these map units, and Rawsonville can provide solid and stable anchoring points for wind tower bases with underlying bedrock presence.
RAWSONVILLE-HOGBACK COMPLEX

SETTING

Parent Material: Loamy glacial till formed on top of bedrock

Landform: Glaciated upland ridges.

Position in Landscape: Uppermost till ridges and upper sideslopes.

Slope Gradient Ranges: (C) 8-20% (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Well drained, generally with no observed water table, or a short duration water table observed after significant storm events or snowmelt.

Typical Profile Description: (for Rawsonville)
- Surface layer: Dark reddish brown fine sandy loam, 0-10"
- Subsurface layer: Dark reddish brown fine sandy loam, 10-19"
- Subsoil layer: Dark brown fine sandy loam, 19-28"
- Bedrock @ 28"

(for Hogback)
- Surface layer: Dark reddish brown fine sandy loam, 0-7"
- Subsurface layer: Dark reddish brown fine sandy loam, 7-15"
- Bedrock @ 15"

Note: These soils occur in a non-regular, non-repeating pattern that could not be separated out in mapping.

Hydrologic Group: Group C

Surface Run Off: Rapid

Permeability: Moderate of moderately rapid

Depth to Bedrock: Moderately deep, 20-40" to bedrock

Hazard to Flooding: None

Erosion Factor: K: .17 - .64

INCLUSIONS
(Within Mapping Unit)

Similar: Dixfield, Skerry, Hermon, Saddleback
Dissimilar: Rock Outcrop, Naskeag

USE AND MANAGEMENT

For Development of Wind Power Projects: Rawsonville-Hogback soils are generally suited for construction of wind power projects, since drainage is not a significant limitation within these map units, and Rawsonville-Hogback can provide solid and stable anchoring points for wind towers.
RICKER (cryic) [Knob Lock (frigid)]  
(Dysic Lithic Cryofolists)

SETTING

Parent Material: Thin organic deposits underlain by a thin mineral horizon over bedrock

Landform: On mountains and hills

Position in Landscape: Uppermost portions of landscape

Slope Gradient Ranges: (C) 8-20%  (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Well drained to excessively well drained

Typical Profile Description: (Ricker)

Surface layer: Dark reddish brown to black peat, 7-0"

Subsurface layer: Dark bluish gray, very channery silt loam, 0 9"

Substratum: Bedrock

Hydrologic Group: D*  
Note: Natural Resource Conservation Service lists as Hydrogeologic Group “A”, however, discussion with David Rocque, State Soil Scientist, suggested soil is expected to perform similarly to Abram, which is rated as “D”. Used D to be conservative until further notice.

Surface Runoff: Rapid

Permeability: Moderately rapid in organic layers, moderate or moderately rapid on the mineral horizon

Depth to Bedrock: Very shallow to moderately deep, 0-10"

Hazard to Flooding: None

Erosion Factors: K: .17 - .49

INCLUSIONS  
(Within Mapping Unit)

Similar: Knob Lock (frigid), Abram, Hogback, Rawsonville

Dissimilar: Rock Outcrop, Naskeag

USE AND MANAGEMENT

Development of Wind Power Projects: The soils within this map unit is generally suited to the development of wind power projects, in that wetness is generally not a factor, while shallow depths to bedrock can provide for stable and solid anchoring points for wind tower bases.
RICKER-ABRAM-ROCK OUTCROP COMPLEX

SETTING

Parent Material: Thin organic deposits underlain by a thin mineral horizon over bedrock
Landform: On mountains and hills
Position in Landscape: Uppermost portions of landscape
Slope Gradient Ranges: (C) 8-20% (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Well drained to excessively well drained

Typical Profile Description: 
(Ricker) 
Surface layer: Dark reddish brown to black peat, 7-0"
Subsurface layer: Dark bluish gray, very channery silt loam, 0 9"
Substratum: Bedrock – micaceous schist

(Abram) 
Surface layer: Pinkish gray sandy loam, 0-2"
Subsurface layer: Very dusky red to brown sandy loam, 2-5"
Bedrock @ 5"

Note: Ricker and Abram soils in this map unit are interspersed with areas of exposed Rock Outcrop in a non-regular, non-repeating pattern that could not be separated out in mapping.

Hydrologic Group: A: Ricker
D: Abram/Rock Outcrop

Surface Water Runoff: Rapid

Permeability: Moderately rapid in organic layers, moderate or moderately rapid on the mineral horizon

Depth to Bedrock: Very shallow to moderately deep, 0-40"

Hazard to Flooding: None

Erosion Factors: K: .17 - .49

INCLUSIONS
(Within Mapping Unit)

Similar: Knob Lock (frigid), Hogback, Rawsonville, Saddleback
Dissimilar: Rock Outcrop, Naskeag

USE AND MANAGEMENT

Development of Wind Power Projects: The soils within this map unit are generally suited for development of wind power projects, in that wetness is generally not a factor, while shallow depths to bedrock can provide for stable and solid anchoring points for wind tower bases.
RICKER–ROCK OUTCROP COMPLEX

SETTING

Parent Material: Thin organic deposits underlain by a thin mineral horizon over bedrock

Landform: On mountains and hills

Position in Landscape: Uppermost portions of landscape

Slope Gradient Ranges: (C) 8-20% (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Well drained to excessively well drained

Typical Profile
- Surface layer: Dark reddish brown to black peat, 7-0”
- Subsurface layer: Dark bluish gray, very channery silt loam, 0-9”
- Substratum: Bedrock – micaceous schist

Note: Ricker soils in this map unit are interspersed with areas of exposed Rock Outcrop in a non-regular, non-repeating pattern that could not be separated out in mapping.

Hydrologic Group: D* Ricker  Note: Natural Resource Conservation Service lists as Hydrogeologic Group “A”, however, discussion with David Rocque, State Soil Scientist, suggested soils is expected to perform similarly to Abram, which is rated as “D”. Used D to be conservative until further notice.

D Rock Outcrop (not listed by NRCS), projected

Permeability: Moderately rapid in organic layers, moderate or moderately rapid on the mineral horizon

Depth to Bedrock: Very shallow to moderately deep, 0-40”

Hazard to Flooding: None

INCLUSIONS
(Within Mapping Unit)

Similar: Hogback, Rawsonville

Dissimilar: Rock Outcrop, Naskeag, Mahoosuc

USE AND MANAGEMENT

Development of Wind Power Projects: The soils within this map unit are generally suited for construction of wind power projects, in that they have no limitations due to drainage, and the shallow depths to bedrock provide for stable and solid anchoring points for wind tower bases.
ROCK OUTCROP

This mapping unit consists of areas of exposed bedrock.

USE AND MANAGEMENT

Development of Wind Power Projects: Rock Outcrop is generally suited for development of wind power projects, in that wetness is generally not a factor in this map unit, and it provides for solid and stable anchoring points for wind tower bases. This map unit is generally found on the top of a drainage shed along ridge tops and consequently is not subjected to large upslope drainage flows.
ROCK OUTCROP-ABRAM-HOGBACK COMPLEX

SETTING

Parent Material: Coarse loamy soils derived from mica schist and phyllite with some granite and gneiss.

Landform: Ridgetop portions of glaciated uplands.

Position in Landscape: Uppermost sideslopes and ridgetops.

Slope Gradient Ranges: (C) 8-20%  (D) 20%+

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Excessively drained (Abram) to well-drained (Hogback) with a seasonal high groundwater table observed only for short durations after significant storm events or snowmelt, usually directly on top of bedrock.

Typical Profile
Description: Dark reddish brown fine sandy loam, 0-7"
(for Hogback)
Subsurface layer: Dark reddish brown fine sandy loam, 7-15"
Bedrock @ 15"

(for Abram)
Surface layer: Pinkish gray sandy loam, 0-2"
Subsurface layer: Very dusky red to brown sandy loam, 2-5"
Bedrock @ 5"

Note: These soils occur in a non-regular, non-repeating pattern that could not be separated out in mapping. It is estimated that Rock Outcrop surface forms the largest portion of this map unit, while Abram occupies the next largest area followed by Hogback.

Hydrologic Group: Rock Outcrop: Group D
Abram: Group D
Hogback: Group B

Surface Run Off: Rapid
Permeability: Moderately rapid
Depth to Bedrock: Rock Outcrop: 0" of soil cover
Abram: 0-10" to bedrock
Hogback: 10-20" to bedrock

Hazard to Flooding: None
Erosion Factor: K: .17 - .64

INCLUSIONS
(Within Mapping Unit)

Similar: Ricker (cryic), Knob Lock (frigid), Rawsonville, Dixfield, Skerry, Marlow
Dissimilar: Mahoosuc, Rock Outcrop

USE AND MANAGEMENT

Development of Wind Power Projects: Rock Outcrop, Hogback and Abram soils are generally suited for development of wind power projects, in that wetness is generally not a factor in these map units, and both provide for solid and stable anchoring points for wind tower bases. This map unit is generally found on the top of a drainage shed along ridge tops and consequently is not subjected to large upslope drainage flows.
SKERRY
(Aquic Haplorthods)

SETTING

Parent Material: Loamy glacial till underlain by sandy textured denser till.
Landform: Drumlins and glaciated uplands.
Position in Landscape: Usually occupies upper components of landform.
Slope Gradient Ranges: (B) 3-8%   (C) 8-20%

COMPOSITION AND SOIL CHARACTERISTICS

Drainage Class: Moderately well-drained, with a perched water table 1.5 to 3.5 feet below the soil surface from November through May.
Typical Profile Description:
Surface layer: Light gray fine sandy loam, 0-4”
Subsurface layer: Dark reddish brown fine sandy loam, 4-20”
Subsoil layer: Yellowish brown fine sandy loam, 20-25”
Substratum: Mixed brown and light olive brown fine sandy loam and sand, 25-65”

Hydrologic Group: Group C
Surface Run Off: Moderate
Permeability: Moderate in solum and slow or moderately slow in the compact substratum.
Depth to Bedrock: Deep, greater than 40”.
Hazard to Flooding: None

INCLUSIONS
(Within Mapping Unit)

Similar: Dixfield, Herman
Dissimilar: Colonel, Westbury

USE AND MANAGEMENT

Development of Wind Power Projects: Skerry soils are generally suited for development of wind power projects, in that these soils are moderately well drained with basal till substratum. Depths to seasonal high groundwater table can be overcome by redirection of surface water runoff, and/or importation of coarse granular fill.
APPENDIX D

Soil Profile Descriptions
### Soil Description and Classification (Location of Observation Holes Shown Above)

**Observation Hole TP 1**
- **Texture:** Dark Brown
- **Consistency:** Friable
- **Color:** Dark Brown
- **Mottling:** Firm
- **Drainage Class:** Moderate Well/Moderate
- **Profile:** Rawsonville/Dixfield (Variant)
- **Slope Limiting Factor:** 30°
- **Hydrologic Group:** C
- **Depth Below Mineral Soil Surface:** Not shown

**Observation Hole TP 2**
- **Texture:** Sandy Loam
- **Consistency:** Friable
- **Color:** Strong Brown
- **Mottling:** Firm
- **Drainage Class:** Moderate Well/Moderate
- **Profile:** Rawsonville/Dixfield (Variant)
- **Slope Limiting Factor:** 30°
- **Hydrologic Group:** C
- **Depth Below Mineral Soil Surface:** Not shown

**Observation Hole TP 3**
- **Texture:** Gray (ALBIC)
- **Consistency:** Friable
- **Color:** Strong Brown
- **Mottling:** Firm
- **Drainage Class:** Moderate Well/Moderate
- **Profile:** Rawsonville (Atypical)
- **Slope Limiting Factor:** 30°
- **Hydrologic Group:** C
- **Depth Below Mineral Soil Surface:** Not shown

**Observation Hole TB 4**
- **Texture:** Sandy Loam
- **Consistency:** Friable
- **Color:** Dark Brown
- **Mottling:** Firm
- **Drainage Class:** Moderate Well/Moderate
- **Profile:** Rawsonville
- **Slope Limiting Factor:** 30°
- **Hydrologic Group:** C
- **Depth Below Mineral Soil Surface:** Not shown

---

**Site Evaluator/Soil Scientist Signature:**

*Albert Frock Associates - 95A County Road, Gorham, ME 04038 - (207) 839-5663*

**Date:** 6/3/06

**Owner's Name:** Highland Wind, LLC

**Street, Road Subdivision:** Highland Wind Project

**Town, City, Plantation:** Highland Plantation
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TP 5</th>
<th>Test Pit</th>
<th>Boring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of Organic Horizon Above Mineral Soil</td>
<td>10 Feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texture</td>
<td>Consistency</td>
<td>Color</td>
<td>Molting</td>
</tr>
<tr>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>YELLOWISH BROWN</td>
<td>FREE WATER (ABOVE MEAN HIGH WATER) OR RAIN</td>
</tr>
<tr>
<td>REFUSAL (BEDROCK)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TP 6</th>
<th>Test Pit</th>
<th>Boring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of Organic Horizon Above Mineral Soil</td>
<td>10 Feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texture</td>
<td>Consistency</td>
<td>Color</td>
<td>Molting</td>
</tr>
<tr>
<td>SANDY LOAM</td>
<td>STRONG BROWN</td>
<td>BEDROCK</td>
<td></td>
</tr>
</tbody>
</table>

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TB 7</th>
<th>Test Pit</th>
<th>Boring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of Organic Horizon Above Mineral Soil</td>
<td>10 Feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texture</td>
<td>Consistency</td>
<td>Color</td>
<td>Molting</td>
</tr>
<tr>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>STRONG BROWN</td>
<td>BEDROCK</td>
</tr>
<tr>
<td>REFUSAL (BEDROCK)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Recommend Area for Cross-DRAINAGE

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TP 8</th>
<th>Test Pit</th>
<th>Boring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of Organic Horizon Above Mineral Soil (Located Outside of Updated Project Area)</td>
<td>10 Feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texture</td>
<td>Consistency</td>
<td>Color</td>
<td>Molting</td>
</tr>
<tr>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>STRONG BROWN</td>
<td>BEDROCK</td>
</tr>
<tr>
<td>REFUSAL (BEDROCK)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Site Investigator / Soil Scientist Signature: ALBERT FRICK
ALBERT FRICK ASSOCIATES - 96A COUNTY ROAD GORHAM, MAINE 04038 - (207) 839-5563

Date: 6/22/09
### Soil Description and Classification

#### Hole TB9
- **Texture**: Sandy Loam
- **Consistency**: Friable
- **Color**: Yellowish Brown
- **Mottling**: Free Water

#### Hole TP10
- **Texture**: Gravelly Loamy Sand
- **Consistency**: Friable
- **Color**: Light Yellowish Brown
- **Mottling**: Free Water

#### Hole TP11
- **Texture**: Fine Sandy Loam
- **Consistency**: Friable
- **Color**: Strong Brown
- **Mottling**: Free Water

#### Hole TP12
- **Texture**: Organic Loose Black
- **Consistency**: Bedrock

---

**Note:** Depth of organic layer over bedrock varies throughout landform.

---

**Site Evaluator/Soil Scientist: Albert Frick**

**Date:** 6/3/66

**For Waste Water Disposal:**

**For Soil Mapping:**

**Address:** 95A County Road, Gorham, Maine 04038 (207) 839-5563

---

**Owner's Name:** Highland Wind, LLC

**Street, Road Subdivision:** Highland Wind Project

**Town, City, Plantation:** Highland Plantation
**SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)**

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>Soil Classification</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB 17</td>
<td>ORGANIC</td>
<td>GRAY</td>
<td>FRIABLE</td>
<td>OLIVE</td>
<td>GRAY</td>
</tr>
<tr>
<td></td>
<td>SANDY LOAM</td>
<td>OLIVE</td>
<td>FRIABLE</td>
<td>OLIVE</td>
<td>GRAY</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BEDROCK</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SMALL INCLUSION SLIGHTLY OUTSIDE TURBINE AREA</td>
</tr>
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**Soil Series Name: NASKEAS**

<table>
<thead>
<tr>
<th>Slope</th>
<th>Limiting Factor</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-6</td>
<td>2</td>
<td>N/A</td>
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**SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)**

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>Soil Classification</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP 18</td>
<td>ORGANIC</td>
<td>GRAY</td>
<td>FRIABLE</td>
<td>DARK REDDISH</td>
<td>BEDROCK</td>
</tr>
<tr>
<td></td>
<td>SANDY LOAM</td>
<td>OLIVE</td>
<td>FRIABLE</td>
<td>BROWN</td>
<td>STRONG BROWN</td>
</tr>
<tr>
<td></td>
<td>COBLY SANDY LOAM</td>
<td>LIGHT</td>
<td>FRIABLE</td>
<td>BROWN</td>
<td>ADJACENT TURBINE</td>
</tr>
</tbody>
</table>

**Soil Series Name: RICKER**

<table>
<thead>
<tr>
<th>Slope</th>
<th>Limiting Factor</th>
<th>Condition</th>
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<tbody>
<tr>
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<td>11</td>
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**SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)**

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>Soil Classification</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
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</thead>
<tbody>
<tr>
<td>TP 20</td>
<td>ORGANIC</td>
<td>GRAY</td>
<td>FRIABLE</td>
<td>LIGHT YELLOWISH</td>
<td>BEDROCK</td>
</tr>
<tr>
<td></td>
<td>SANDY LOAM</td>
<td>OLIVE</td>
<td>FRIABLE</td>
<td>LIGHT BROWN</td>
<td>STRONG BROWN</td>
</tr>
<tr>
<td></td>
<td>COBLY SANDY LOAM</td>
<td>LIGHT</td>
<td>FRIABLE</td>
<td>BROWN</td>
<td>ADJACENT TURBINE</td>
</tr>
</tbody>
</table>

**Soil Series Name: RAYSONVILLE**

<table>
<thead>
<tr>
<th>Slope</th>
<th>Limiting Factor</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>31</td>
<td>C</td>
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---

**Site Evaluator / Soil Scientist Signature:**

Albert Frick

163/166

6/22 & 6/23/09

SE/SS

ALBERT FRICK ASSOCIATES - 96A COUNTY ROAD GORHAM, MAINE - 04039 - (207) 639-6563
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

**TP 25**
- Observation Hole
- Depth of Organic Horizon Above Mineral Soil: N/A
- Texture: ORGANIC
- Consistency: BLACK
- Color: ORGANIC
- Molling: ORGANIC
- Slope: N/A
- Limiting Factor: N/A
- Ground Water: N/A
- Restrictive Layer: N/A
- Bedrock: N/A
- Pit Depth: N/A
- Soil Series Name: N/A
- Drainage Class: WELL
- Hydrologic Group: D
- Notes: Depth of Organic Layer Over Bedrock Varies

---

**TB 26**
- Observation Hole
- Depth of Organic Horizon Above Mineral Soil: N/A
- Texture: ORGANIC
- Consistency: BEDROCK
- Color: ORGANIC
- Molling: ORGANIC
- Slope: N/A
- Limiting Factor: N/A
- Ground Water: N/A
- Restrictive Layer: N/A
- Bedrock: N/A
- Pit Depth: N/A
- Soil Series Name: N/A
- Drainage Class: WELL
- Hydrologic Group: D
- Notes: Depth of Organic Layer Over Bedrock Varies

---

**TB 27**
- Observation Hole
- Depth of Organic Horizon Above Mineral Soil: N/A
- Texture: DARK BROWN
- Consistency: SANDY LOAM
- Color: DARK BROWN
- Molling: SANDY LOAM
- Slope: N/A
- Limiting Factor: N/A
- Ground Water: N/A
- Restrictive Layer: N/A
- Bedrock: N/A
- Pit Depth: N/A
- Soil Series Name: RICHER
- Drainage Class: WELL
- Hydrologic Group: D
- Notes: Depth of Organic Layer Over Bedrock Varies

---

**TB 28**
- Observation Hole
- Depth of Organic Horizon Above Mineral Soil: N/A
- Texture: ORGANIC
- Consistency: BEDROCK
- Color: ORGANIC
- Molling: ORGANIC
- Slope: N/A
- Limiting Factor: N/A
- Ground Water: N/A
- Restrictive Layer: N/A
- Bedrock: N/A
- Pit Depth: N/A
- Soil Series Name: RICHER (VARIANT)
- Drainage Class: WELL
- Hydrologic Group: D
- Notes: Depth of Organic Layer Over Bedrock Varies

---

**INCLUSION**

Alburt Frick

Site Inspector / Soil Scientist Signature

SE/CSS

ALBERT FRICK ASSOCIATES - 96A COUNTY ROAD, GORHAM, MAINE 04038 - (207) 839-2683
SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole: TB 29
- Test Pit
- Boring

- Depth of Organic Horizon Above Mineral Soil

Texture
- Dark Brown
- Sandy Loam - Friable - Yellowish Brown
- Light Olive Brown

Consistency
- Common - Distinct

Color

Mottling

Observation Hole: TB 30
- Test Pit
- Boring

- Depth of Organic Horizon Above Mineral Soil

Texture
- Dark Brown
- Sandy Loam - Friable - Strong Brown
- Yellowish Brown

Consistency

Color

Mottling

Observation Hole: TB 31
- Test Pit

- Depth of Organic Horizon Above Mineral Soil

Texture
- Organic
- Sandy Sand - Friable - Gray

Consistency

Color

Mottling

NOTE: Probes in area exhibited thicker and thinner organic layer over over thin mineral soil horizon on bedrock inclusions of ricker

Observation Hole: TB 32
- Test Pit
- Boring

- Depth of Organic Horizon Above Mineral Soil

Texture
- Organic

Consistency

Color

Mottling

NOTE: Probes in area exhibited thicker and thinner organic layer over over thin mineral soil horizon on bedrock inclusions of ricker

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole: TP 31
- Test Pit

- Depth of Organic Horizon Above Mineral Soil

Texture
- Organic
- Sandy Sand - Friable - Gray

Consistency

Color

Mottling

NOTE: Probes in area exhibited thicker and thinner organic layer over over thin mineral soil horizon on bedrock inclusions of ricker

Observation Hole: TB 32
- Test Pit
- Boring

- Depth of Organic Horizon Above Mineral Soil

Texture
- Organic

Consistency

Color

Mottling

NOTE: Probes in area exhibited thicker and thinner organic layer over over thin mineral soil horizon on bedrock inclusions of ricker

* Listed as "A" per NECC, State Soil Scientist, J. Angus and Albert Prick. Believe it portrays land below "D"
### Soil Description and Classification

#### Observation Hole TP 37
- **Depth of Organic Horizon Above Mineral Soil**
- **Texture**: Peat
- **Consistency**: Friable
- **Color**: Gray
- **Slope**: 0
- **Limiting Factor**: Not Recorded
- **Soil Classification**: N/A
- **Profile Condition**: Boring
- **Hydrologic Group**: D

#### Observation Hole TB 38
- **Depth of Organic Horizon Above Mineral Soil**
- **Texture**: Sandy Loam
- **Consistency**: Friable
- **Color**: Gray
- **Slope**: 0
- **Limiting Factor**: Not Recorded
- **Soil Classification**: N/A
- **Profile Condition**: Boring
- **Hydrologic Group**: C

#### Observation Hole TB 39
- **Depth of Organic Horizon Above Mineral Soil**
- **Texture**: Organic
- **Consistency**: Bedrock
- **Slope**: 0
- **Limiting Factor**: Not Recorded
- **Soil Classification**: N/A
- **Profile Condition**: Boring
- **Hydrologic Group**: D

#### Observation Hole TP 40
- **Depth of Organic Horizon Above Mineral Soil**
- **Texture**: Peat
- **Consistency**: Friable
- **Color**: Gray
- **Slope**: 0
- **Limiting Factor**: Not Recorded
- **Soil Classification**: N/A
- **Profile Condition**: Boring
- **Hydrologic Group**: D

*Note: Probes in area exhibited thicker and thinner organic layer over over thin mineral soil horizon on bedrock inclusions of Ricker.*
### SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

#### Observation Hole TP 41
- **Texture**: Sandy Loam
- **Consistency**: Friable
- **Color**: Strong Brown
- **Mottling**: Common Distinct

#### Observation Hole TP 42
- **Texture**: Sandy Loam
- **Consistency**: Friable
- **Color**: Strong Brown

#### Observation Hole TP 43
- **Texture**: Organic (Gray Albic)
- **Consistency**: Sandy Loam
- **Color**: Dark Yellowish Brown
- **Mottling**: Bedrock

#### Observation Hole TP 44
- **Texture**: Sandy Loam
- **Consistency**: Friable
- **Color**: Light Olive Brown

---

#### Site Information
- **Town, City, Plantation**: Highland Plantation
- **Street, Road, Subdivision**: Highland Wind Project
- **Owner's Name**: Highland Wind, LLC

---

**Site Investigator**: Albert Frick
**Signature**: [Signature]
**Date**: 6/23 & 6/24/09

---

**Site Investigator**: Albert Frick
**Associate**: R.A. County Road Gorkham, Maine 04038 - (207) 599-6580

---

**Note**: Inclusion (Dixfield Soil 100') - Upslope
### Soil Description and Classification

#### Location of Observation Holes Shown Above

**Observation Hole TP 45**
- **Test Pit**
- **Boring**
- **Depth of Organic Horizon Above Mineral Soil**

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>STRONG BROWN</td>
<td></td>
</tr>
<tr>
<td><strong>BEDROCK</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Observation Hole TP 46**
- **Test Pit**
- **Boring**
- **Depth of Organic Horizon Above Mineral Soil**

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>STRONG BROWN</td>
<td></td>
</tr>
<tr>
<td><strong>BEDROCK</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Observation Hole TP 47**
- **Test Pit**
- **Boring**
- **Depth of Organic Horizon Above Mineral Soil**

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORGANIC</td>
<td>LOOSE</td>
<td>DARK REDDISH BROWN</td>
<td></td>
</tr>
<tr>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>GRAY</td>
<td></td>
</tr>
<tr>
<td><strong>BEDROCK</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Observation Hole TP 48**
- **Test Pit**
- **Boring**
- **Depth of Organic Horizon Above Mineral Soil**

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORGANIC</td>
<td>LOOSE</td>
<td>REDDISH BROWN</td>
<td></td>
</tr>
<tr>
<td><strong>BEDROCK</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Site Evaluator / Soil Scientist Signature**: Albert Frick
- Listed as "A" per NECP, State Soil Scientist, D. Rogge and Albert Frick
- Believe it performs like Abram "D"

**Date**: 6/24/09

**Site Evaluator / Soil Scientist Signature**: SE/CSS
### Soil Description and Classification (Location of Observation Holes Shown Above)

#### Observation Hole TP 53
- **Test Pit**: Yes
- **Boring**: No
- **Depth of Organic Horizon Above Mineral Soil**: 0 ft
- **Locating Outside of Updated Project Area**: Yes

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>Loose</td>
<td>Reddish Brown</td>
<td></td>
</tr>
<tr>
<td>Sandy Loam</td>
<td>Friable</td>
<td>Gray</td>
<td>△△△</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free Water</td>
<td></td>
</tr>
</tbody>
</table>

- **Bedrock**

#### Observation Hole TP 54
- **Test Pit**: Yes
- **Boring**: No
- **Depth of Organic Horizon Above Mineral Soil**: 0 ft
- **Locating Outside of Updated Project Area**: Yes

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peat</td>
<td>Loose</td>
<td>Reddish Brown</td>
<td></td>
</tr>
<tr>
<td>Sandy Loam</td>
<td>Friable</td>
<td>Gray</td>
<td>△△△</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free Water</td>
<td></td>
</tr>
</tbody>
</table>

- **Bedrock**

#### Observation Hole TB 55
- **Test Pit**: Yes
- **Boring**: No
- **Depth of Organic Horizon Above Mineral Soil**: 0 ft
- **Locating Outside of Updated Project Area**: Yes

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
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<tr>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Bedrock**

#### Observation Hole TP 56
- **Test Pit**: Yes
- **Boring**: No
- **Depth of Organic Horizon Above Mineral Soil**: 0 ft
- **Locating Outside of Updated Project Area**: Yes

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peat</td>
<td>Loose</td>
<td>Reddish Brown</td>
<td></td>
</tr>
<tr>
<td>Sandy Loam</td>
<td>Friable</td>
<td>Gray</td>
<td>△△△</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Free Water</td>
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</tr>
</tbody>
</table>

- **Bedrock**

---

**Novelty Note:**
- Listed as "A" per NDSU State Soil Scientist, D. Rocke and Albert Frick believe it performs like ABRAM "D".

---

**Site Evaluator / Soil Scientist Signature:**
- Albert Frick
- 6/3/09

**Dates:**
- 6/3/09
- 6/24/09
### Soil Description and Classification

**Location of Observation Holes Shown Above**

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TP 4</th>
<th>Test Pit</th>
<th>Boring</th>
<th>Texture</th>
<th>Consistency</th>
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<td>Peat</td>
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<td></td>
<td>Loose</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Bedrock</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Profile:** N/A  
**Slope:** 8-20%  
**Limiting Factor:** 4  
**Ground Water:**  
**Restrictive Layer:**  
**Bedrock:**  
**Pit Depth:**  

**Soil Series Name:** Abram  
**Drainage Class:** Well  
**Hydrologic Group:** D

---

**Location of Observation Holes Shown Above**

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TP 63</th>
<th>Test Pit</th>
<th>Boring</th>
<th>Texture</th>
<th>Consistency</th>
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</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td>Peat</td>
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<td></td>
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<td></td>
<td>Loose</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Gray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bedrock</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Profile:** N/A  
**Slope:** 8-20%  
**Limiting Factor:** 4  
**Ground Water:**  
**Restrictive Layer:**  
**Bedrock:**  
**Pit Depth:**  

**Soil Series Name:** Abram  
**Drainage Class:** Well  
**Hydrologic Group:** D

---

**Location of Observation Holes Shown Above**

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TP 64</th>
<th>Test Pit</th>
<th>Boring</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Peat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Loose</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Gray</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bedrock</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Profile:** N/A  
**Slope:** 8-20%  
**Limiting Factor:** 4  
**Ground Water:**  
**Restrictive Layer:**  
**Bedrock:**  
**Pit Depth:**  

**Soil Series Name:** Abram  
**Drainage Class:** Well  
**Hydrologic Group:** D

---

**Note:** Depth of organic later over bedrock varies.

---

**Site Evaluator / Soil Scientist Signature:** Albert Frick  
**Date:** 6/24/09  
**Site Evaluator / Soil Scientist Signature:**  
**Date:** 10/3/06  
**SE/CSS:**  
**Owner's Name:** Highland Wind, LLC  
**Street, Road Subdivision:** Highland Wind Project  
**Highland Plantation**

---

**FOR WASTEWATER DISPOSAL**  
**FOR SOILS MAPPING**
### Soil Description and Classification

**Observation Hole: TB 69**
- **Test Pit:** No
- **Boring:** Yes
- **Depth of Organic Horizon Above Mineral Soil:**
  - Limiting Factor: 4
  - Ground Water: Restrictive Layer
  - Slope: 8-20
- **Sandy Loam:**
  - Texture: Sandy Loam
  - Consistency: Friable
  - Color: Dark Brown
  - Matting: Common Brown
  - Refusal (Bedrock)

**Observation Hole: TP 70**
- **Test Pit:** Yes
- **Boring:** No
- **Depth of Organic Horizon Above Mineral Soil:**
  - Limiting Factor: 9
  - Ground Water: Restrictive Layer
  - Slope: 8-20
- **Sandy Loam:**
  - Texture: Sandy Loam
  - Consistency: Friable
  - Color: Light Yellowish Brown
  - Matting: Common Brown
  - Refusal (Bedrock)

**Observation Hole: TP 71**
- **Test Pit:** Yes
- **Boring:** No
- **Depth of Organic Horizon Above Mineral Soil:**
  - Limiting Factor: 8
  - Ground Water: Restrictive Layer
  - Slope: 3-8
- **Sandy Loam:**
  - Texture: Sandy Loam
  - Consistency: Friable
  - Color: Gray
  - Matting: Common Brown
  - Refusal (Bedrock)

### Soil Description and Classification (Location of Observation Holes Shown Above)

**Observation Hole: TB 72**
- **Test Pit:** No
- **Boring:** Yes
- **Depth of Organic Horizon Above Mineral Soil:**
  - Limiting Factor: 3-8
  - Ground Water: Restrictive Layer
  - Slope: 3-8
- **Sandy Loam:**
  - Texture: Sandy Loam
  - Consistency: Friable
  - Color: Gray
  - Matting: Common Brown
  - Refusal (Bedrock)

**Observation Hole: TB 72**
- **Test Pit:** Yes
- **Boring:** No
- **Depth of Organic Horizon Above Mineral Soil:**
  - Limiting Factor: 3-8
  - Ground Water: Restrictive Layer
  - Slope: 3-8
- **Sandy Loam:**
  - Texture: Sandy Loam
  - Consistency: Friable
  - Color: Gray
  - Matting: Common Brown
  - Refusal (Bedrock)

### Soil Classification

- **Classification:** N/A
- **Profile:** Condition
- **Hydrologic Group:** C

### Additional Information

- **Site Valuator/Soil Scientist Signature:**
  - Albert Frick

- **Date:**
  - 6/30/09
## Soil Description and Classification

### Location of Observation Holes Shown Above

#### Observation Hole TP 73
- **Texture:** Sandy Loam
- **Consistency:** Friable
- **Color:** Gray
- **Moisture:** Wet
- **Soil Classification:** N/A
- **Profile Condition:** 20%
- **Limiting Factor:** Free Water

#### Observation Hole TB 74
- **Texture:** Sandy Loam
- **Consistency:** Friable
- **Color:** Gray
- **Moisture:** Free Water
- **Soil Classification:** N/A
- **Profile Condition:** 20%
- **Limiting Factor:** Free Water

### Location Outside of Updated Project Area

#### Observation Hole TB 75
- **Texture:** Sandy Loam
- **Consistency:** Friable
- **Color:** Yellowish Brown
- **Moisture:** Wet
- **Soil Classification:** Berkshire/Sunaape
- **Profile Condition:** 20%
- **Limiting Factor:** Free Water

#### Observation Hole TP 76
- **Texture:** Sandy Loam
- **Consistency:** Friable
- **Color:** Yellowish Brown
- **Moisture:** Wet
- **Soil Classification:** Berkshire/Sunaape
- **Profile Condition:** 20%
- **Limiting Factor:** Free Water

### Limit of Excavation

#### Observation Hole TP 73
- **Limit of Excavation:** 50'

#### Observation Hole TB 75
- **Limit of Excavation:** 40'

---

**Site: Evander / Soil Scientist Signature:** Albert Frick

**Date:** 6/30/09

**Site Evader / Soil Scientist Signature:** Albert Frick Associates - 98A County Road, Gorham, ME 04038 - (207) 830-3663
### Soil Description and Classification (Location of Observation Holes Shown Above)

**Observation Hole TP 81**  
- **Texture:** Dark Reddish Brown  
- **Color:** Delta Delta Free Water  
- **Consistency:** Peat  
- **Moisture:** Loose  
- **DepthBelowMineralSoilSurface:** 0

**Observation Hole TP 82**  
- **Texture:** Organic Sandy Loam  
- **Color:** Friable Black Gray  
- **Consistency:** Bedrock  
- **Moisture:** Excessively  
- **DepthBelowMineralSoilSurface:** 0

**Observation Hole TB 83**  
- **Texture:** Sandy Loam  
- **Color:** Friable Yellowish Brown  
- **Consistency:** Bedrock  
- **Moisture:**  
- **DepthBelowMineralSoilSurface:** 0

**Observation Hole TP 84**  
- **Texture:** Organic Loose Reddish Brown  
- **Consistency:** Bedrock  
- **Moisture:**  
- **DepthBelowMineralSoilSurface:** 0

---

**SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)**

**Observation Hole TP 81**  
- **Texture:** Dark Reddish Brown  
- **Color:** Delta Delta Free Water  
- **Consistency:** Peat  
- **Moisture:** Loose  
- **DepthBelowMineralSoilSurface:** 0

**Observation Hole TP 82**  
- **Texture:** Organic Sandy Loam  
- **Color:** Friable Black Gray  
- **Consistency:** Bedrock  
- **Moisture:** Excessively  
- **DepthBelowMineralSoilSurface:** 0

**Observation Hole TB 83**  
- **Texture:** Sandy Loam  
- **Color:** Friable Yellowish Brown  
- **Consistency:** Bedrock  
- **Moisture:**  
- **DepthBelowMineralSoilSurface:** 0

**Observation Hole TP 84**  
- **Texture:** Organic Loose Reddish Brown  
- **Color:** Bedrock  
- **Consistency:**  
- **Moisture:**  
- **DepthBelowMineralSoilSurface:** 0

---

**Site Evaluator/Soil Scientist Signature:**

Albert J. Nick  
143/66  
SE/CSS  
6/30/09

**Owner's Name:** Highland Wind, LLC

---

**FOR WASTEWATER DISPOSAL**

**FOR SOILS MAPPING**

---

**Highland Plantation**  
**Highland Wind Project**  
**Highland Wind, LLC**

---

**Site Evaluator/Soil Scientist Signature:**

Albert J. Nick  
143/66  
SE/CSS  
6/30/09

**Owner's Name:** Highland Wind, LLC

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**FOR WASTEWATER DISPOSAL**

**FOR SOILS MAPPING**

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143/66  
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6/30/09

**Owner's Name:** Highland Wind, LLC

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**FOR WASTEWATER DISPOSAL**

**FOR SOILS MAPPING**

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**Highland Plantation**  
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**Highland Wind, LLC**

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143/66  
SE/CSS  
6/30/09

**Owner's Name:** Highland Wind, LLC

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**FOR WASTEWATER DISPOSAL**

**FOR SOILS MAPPING**

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**Highland Plantation**  
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**Highland Wind, LLC**

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**Site Evaluator/Soil Scientist Signature:**

Albert J. Nick  
143/66  
SE/CSS  
6/30/09

**Owner's Name:** Highland Wind, LLC

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**FOR WASTEWATER DISPOSAL**

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**Highland Plantation**  
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**Site Evaluator/Soil Scientist Signature:**

Albert J. Nick  
143/66  
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**Owner's Name:** Highland Wind, LLC

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**FOR WASTEWATER DISPOSAL**

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**Owner's Name:** Highland Wind, LLC

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**FOR WASTEWATER DISPOSAL**

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143/66  
SE/CSS  
6/30/09

**Owner's Name:** Highland Wind, LLC

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**FOR WASTEWATER DISPOSAL**

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**Site Evaluator/Soil Scientist Signature:**

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143/66  
SE/CSS  
6/30/09

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**FOR WASTEWATER DISPOSAL**

**FOR SOILS MAPPING**

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**Highland Wind Project**  
**Highland Wind, LLC**

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**Site Evaluator/Soil Scientist Signature:**

Albert J. Nick  
143/66  
SE/CSS  
6/30/09

**Owner's Name:** Highland Wind, LLC

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**FOR WASTEWATER DISPOSAL**

**FOR SOILS MAPPING**

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**Highland Plantation**  
**Highland Wind Project**  
**Highland Wind, LLC**

---

**Site Evaluator/Soil Scientist Signature:**

Albert J. Nick  
143/66  
SE/CSS  
6/30/09

**Owner's Name:** Highland Wind, LLC

---
# Soil Description and Classification

## Location of Observation Holes Shown Above

### Observation Hole TP 85
- **Texture**: Sandy Loam
- **Consistency**: Friable
- **Color**: Strong Brown
- **Mottling**: Gray
- **Profile**: 0 - 10
- **Hydrologic Group**: C
- **Slope**: 6 - 20
- **Drainage Class**: Excessively

### Observation Hole TP 86
- **Texture**: Sandy Loam
- **Consistency**: Friable
- **Color**: Strong Brown
- **Mottling**: Dark Brown
- **Profile**: 0 - 10
- **Hydrologic Group**: C
- **Slope**: 20 - 22
- **Drainage Class**: Well

### Observation Hole TP 87
- **Texture**: Peat
- **Consistency**: Loose
- **Color**: Black
- **Mottling**: Sandy Loam
- **Profile**: 0 - 10
- **Hydrologic Group**: D
- **Slope**: 20

### Observation Hole TP 88
- **Texture**: Organic
- **Consistency**: Loose
- **Color**: reddish brown
- **Mottling**: Sandy Loam
- **Profile**: 0 - 10
- **Hydrologic Group**: D
- **Slope**: 20

### Additional Notes
- **Site Evaluator/Special Scientist Signature**: Albert Frick
- **Date**: 6/30/09

*Listed as "A" per WSC, State Soil Scientist, D. Ricker and Albert Frick believe it performs like Abram "D*. **
### Soil Description and Classification (Location of Observation Holes Shown Above)

**Observation Hole TB 9**
- **Texture:** Organic
- **Consistency:** Loose
- **Color:** Dark Reddish Brown
- **Moisture:** Bedrock

**Observation Hole TB 92**
- **Texture:** Organic
- **Consistency:** Bedrock

**Observation Hole TP 90**
- **Texture:** Fine Sandy Loam
- **Consistency:** Friable
- **Color:** Olive Gray
- **Moisture:** Bedrock

**Observation Hole TP 91**
- **Texture:** Peat
- **Consistency:** Loose
- **Color:** Black
- **Moisture:** Bedrock

### Soil Description and Classification (Location of Observation Holes Shown Above)

**Observation Hole TP 90**
- **Texture:** Fine Sandy Loam
- **Consistency:** Friable
- **Color:** Olive Gray
- **Moisture:** Bedrock

**Observation Hole TB 91**
- **Texture:** Organic
- **Consistency:** Bedrock

**Observation Hole TB 92**
- **Texture:** Organic
- **Consistency:** Bedrock

### Soil Description and Classification (Location of Observation Holes Shown Above)

**Observation Hole TP 91**
- **Texture:** Peat
- **Consistency:** Loose
- **Color:** Black
- **Moisture:** Bedrock

**Observation Hole TP 90**
- **Texture:** Fine Sandy Loam
- **Consistency:** Friable
- **Color:** Olive Gray
- **Moisture:** Bedrock

**Observation Hole TB 92**
- **Texture:** Organic
- **Consistency:** Bedrock

**Observation Hole TB 91**
- **Texture:** Organic
- **Consistency:** Bedrock
### Soil Description and Classification

**Location of Observation Holes Shown Above**

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TB 97</th>
<th>Test Pit</th>
<th>Boring</th>
<th>Depth of Organic Horizon Above Mineral Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texture</td>
<td>SANDY</td>
<td>PRIABLE</td>
<td>NO COLORS</td>
<td></td>
</tr>
<tr>
<td>Consistency</td>
<td>LOAM</td>
<td>TAKEN ON</td>
<td>BORING</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TP 98</th>
<th>Test Pit</th>
<th>Boring</th>
<th>Depth of Organic Horizon Above Mineral Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texture</td>
<td>SANDY</td>
<td>PRIABLE</td>
<td>OLIVE</td>
<td></td>
</tr>
<tr>
<td>Consistency</td>
<td>LOAM</td>
<td>GRAY</td>
<td>FREE WATER</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TB 100</th>
<th>Test Pit</th>
<th>Boring</th>
<th>Depth of Organic Horizon Above Mineral Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texture</td>
<td>SANDY</td>
<td>PRIABLE</td>
<td>STRONG</td>
<td></td>
</tr>
<tr>
<td>Consistency</td>
<td>LOAM</td>
<td>BROWN</td>
<td>FREE WATER</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Soil Series Name:**
- TB 97: HOSBACK
- TP 98: NASKEAG
- TB 100: NASKEAG

**Drainage Class:**
- HOSBACK: WELL
- NASKEAG: POORLY

**Hydrologic Group:**
- B

---

**Site Evaluation/Soil Scientist Signature:**

ALBERT FRICK ASSOCIATES - 95A COUNTY ROAD GORHAM, MAINE 04038 - (207) 838-8663

6/30/09 Date
### Soil Description and Classification

**Observation Hole TP 101**
- **Test Pit**: No
- **Boring**: Yes
- **Depth of Organic Horizon Above Mineral Soil**: 0 feet

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>Black</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Observation Hole TB 103**
- **Test Pit**: No
- **Boring**: Yes
- **Depth of Organic Horizon Above Mineral Soil**: 0 feet

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine Sandy Loam</td>
<td>Friable</td>
<td>No Colors Taken on Boring</td>
<td></td>
</tr>
</tbody>
</table>

**Observation Hole TP 104**
- **Test Pit**: No
- **Boring**: Yes
- **Depth of Organic Horizon Above Mineral Soil**: 0 feet

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic</td>
<td>Dark Reddish Brown</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Observation Hole TB 102**
- **Test Pit**: No
- **Boring**: Yes
- **Depth of Organic Horizon Above Mineral Soil**: 0 feet

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse Sandy Loam</td>
<td>Bedrock</td>
<td>High Water</td>
<td></td>
</tr>
</tbody>
</table>

### Soil Classification

**Observation Hole TP 103**
- **Soil Series Name**: Hogback
- **Drainage Class**: Well
- **Hydrologic Group**: B

**Observation Hole TP 104**
- **Soil Series Name**: Hogback
- **Drainage Class**: Well
- **Hydrologic Group**: B

---

*Listed as "A" per ARCSS, State Soil Scientist, J. Rocque and Albert Frick, believe it performs like ABBREX "D"*
### Soil Description and Classification

#### Observation Hole TP 105
- **Texture**: Organic
- **Consistency**: Friable
- **Color**: Dark reddish brown
- **Mottling**: None

#### Observation Hole TP 106
- **Texture**: Organic
- **Consistency**: Friable
- **Color**: Light yellowish brown
- **Mottling**: None

#### Soil Classification
- **Profile Condition**: Slope 8-20
- **Limiting Factor**: 12
- **Ground Water**: None
- **Restrictive Layer**: None
- **Drainage Class**: Well
- **Hydrologic Group**: B

#### Soil Series Name: Hogback

#### Observation Hole TP 107
- **Texture**: Fine sandy loam
- **Consistency**: Friable
- **Color**: Dark brown
- **Mottling**: None

#### Observation Hole TP 108
- **Texture**: Fine sandy loam
- **Consistency**: Friable
- **Color**: Gray (albic)
- **Mottling**: None

#### Soil Classification
- **Profile Condition**: Slope 8-20
- **Limiting Factor**: 23
- **Ground Water**: None
- **Restrictive Layer**: None
- **Drainage Class**: Well
- **Hydrologic Group**: C

#### Soil Series Name: Rawsonville

---

**Site Inspector / Soils Scientist Signature**: SE/CSS

**Date**: 7/1/09

**Location of Observation Holes Shown Above**

---

**FOR WASTEWATER DISPOSAL — FOR SOILS MAPPING**

---

**Gricher Inclusion in Hogback Mappings Unit**

---

**FOR WASTEWATER DISPOSAL — FOR SOILS MAPPING**

---

**Highland Plantation**

---

**Highland Wind Project**

---

**Highland Wind, LLC**

---

**Owner's Name**

---

**Street Road Subdivision**

---

**Town, City, Plantation**

---

**Highland Wind Project**
### Soil Description and Classification (Location of Observation Holes Shown Above)

#### Observation Hole TB 109
- **Test Pit**
- **Boring**
- Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINE SANDY LOAM</td>
<td>FRIABLE</td>
<td>BROWN</td>
<td></td>
</tr>
</tbody>
</table>

**Bedrock**

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRE</td>
<td>STRONG</td>
<td>BROWN</td>
<td></td>
</tr>
</tbody>
</table>

#### Observation Hole TP 110
- **Test Pit**
- **Boring**
- Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINE SANDY LOAM</td>
<td>FRIABLE</td>
<td>BROWN</td>
<td></td>
</tr>
</tbody>
</table>

**Bedrock**

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRE</td>
<td>STRONG</td>
<td>BROWN</td>
<td></td>
</tr>
</tbody>
</table>

#### Observation Hole TB 111
- **Test Pit**
- **Boring**
- Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINE SANDY LOAM</td>
<td>FRIABLE</td>
<td>BROWN</td>
<td></td>
</tr>
</tbody>
</table>

**Bedrock**

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRE</td>
<td>STRONG</td>
<td>BROWN</td>
<td></td>
</tr>
</tbody>
</table>

#### Observation Hole TP 112
- **Test Pit**
- **Boring**
- Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRE</td>
<td>FRIABLE</td>
<td>BROWN</td>
<td></td>
</tr>
</tbody>
</table>

**Bedrock**

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRE</td>
<td>STRONG</td>
<td>BROWN</td>
<td></td>
</tr>
</tbody>
</table>

---

**Site Evaluator / Soil Scientist Signature:** Albert Frick

**Site:** Highland Plantation
**Location:** Highland Wind Project
**Date:** 7/1/09
### Soil Description and Classification (Location of Observation Holes Shown Above)

#### Observation Hole TB 13
- **Texture**: Fine Sandy Loam
- **Consistency**: Friable
- **Color**: Strong Brown
- **Matting**: N/A

#### Observation Hole TP 14
- **Texture**: Organic Sandy Loam
- **Consistency**: Friable
- **Color**: Gray
- **Matting**: Bedrock

---

### Note:
Free water on bedrock on day of observation due to 8.33" of rain in June.

### Observation Hole TP 15
- **Texture**: Sandy Loam
- **Consistency**: Friable
- **Color**: Dark Brown
- **Matting**: N/A

#### Observation Hole TB 16
- **Texture**: Sandy Loam
- **Consistency**: Friable
- **Color**: Dark Brown
- **Matting**: N/A

#### Observation Hole TP 15
- **Texture**: Gravelly Sandy Loam
- **Consistency**: Very Firm
- **Color**: Olive Few Paint
- **Matting**: N/A

#### Observation Hole TB 16
- **Texture**: Gravelly Loamy Sand
- **Consistency**: Firm
- **Color**: Olive Common Distinct
- **Matting**: N/A

### Limit of Observation

#### Soil Classification
- **Soil Series Name**: Rawsonville
- **Drainage Class**: Well
- **Hydrologic Group**: C

#### Soil Classification
- **Soil Series Name**: Abram
- **Drainage Class**: Excessively
- **Hydrologic Group**: D

#### Soil Classification (Variant)
- **Soil Series Name**: Dixfield/Skerry
- **Drainage Class**: Moderately Well
- **Hydrologic Group**: C

---

**Date:** 7/1 & 9/4/09

**S.M. Frick / Soil Scientist Signature**

**SE/CSS**

**ALBERT FRICK ASSOCIATES - 95A COUNTY ROAD GORHAM, MAINE 04038 - (207) 838-5563**
### SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

**Observation Hole TP 17**
- Test Pit
- Boring
- Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

**Observation Hole TB 1 9**
- Test Pit
- Boring
- Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**Observation Hole TP 1 9**
- Test Pit
- Boring
- Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

**Observation Hole TB 1 9**
- Test Pit
- Boring
- Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

**Observation Hole TP 1 9**
- Test Pit
- Boring
- Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

### Soil Classification

<table>
<thead>
<tr>
<th>Soil Classification</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Soil Series Name
- RAWSONVILLE

#### Drainage Class
- SOMEWHAT EXCESSIVELY WELL

#### Hydraulic Group
- A/C

---

**Signature:** 
Alber Frick

**Site Inspector / Soil Scientist Signature:** 
SE/CSS

**Date:** 9/14/09

**Site Inspector / Soil Scientist:**
ALBERT FRICK ASSOCIATES - 96A COUNTY ROAD GORHAM, MAINE 04038 - (207) 830-5683
**SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)**

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>Soil Classification</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
<th>Slope</th>
<th>Limiting Factor</th>
<th>Hydrologic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP 125</td>
<td>N/A</td>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>BEDROCk</td>
<td>8-20</td>
<td>5</td>
<td>Ground Water</td>
<td>Well</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td>Restrictive Layer</td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
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<td>Bedrock</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pit Depth</td>
<td></td>
</tr>
<tr>
<td>TB 126</td>
<td>N/A</td>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>NO COLORS</td>
<td>8-20</td>
<td>22</td>
<td>Ground Water</td>
<td>Well</td>
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<td>Restrictive Layer</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Pit Depth</td>
<td></td>
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<tr>
<td>TP 127</td>
<td>N/A</td>
<td>GRAY (ALBIC)</td>
<td>FRIABLE</td>
<td>DARK REDDISH BROWN</td>
<td>8-20</td>
<td>27</td>
<td>Ground Water</td>
<td>Well</td>
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<td></td>
<td>Bedrock</td>
<td></td>
</tr>
<tr>
<td>TB 128</td>
<td>N/A</td>
<td>LOAM</td>
<td>FRIABLE</td>
<td>NO COLORS</td>
<td>8-20</td>
<td>21</td>
<td>Ground Water</td>
<td>Well</td>
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<tr>
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<td>Restrictive Layer</td>
<td></td>
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<td></td>
<td>Bedrock</td>
<td></td>
</tr>
</tbody>
</table>

**Site Evaulator, Soil Scientist Signature:**

ALBERT FRICK ASSOCIATES - 95A COUNTY ROAD DORRISH, MAINE 04038 - (207) 639-5553
# Soil Description and Classification

**Location of Observation Holes Shown Above**

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB 129</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TP 130</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

## Soil Description

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB 129</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>TP 130</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

## Soil Series Names
- **Ricker**
- **Rawsonville**

**Site Evaluation / Soil Scientist Signature**

**Date**

**9/4/09**

**ALBERT FRICK ASSOCIATES - 86A COUNTY ROAD GORHAM, MAINE 04038 - (207) 838-5563**
### Soil Description and Classification

#### Observation Hole TP 137
- **Texture:** Sandy Loam
- **Consistency:** Friable
- **Color:** Dark reddish brown
- **Matting:** Light olive brown

#### Observation Hole TP 138
- **Texture:** Sandy Loam
- **Consistency:** Friable
- **Color:** Dark brown

#### Observation Hole TP 139
- **Texture:** Gravelly sandy loam
- **Consistency:** Firm
- **Color:** Olive, few faint

#### Observation Hole TP 140
- **Texture:** Sandy Loam
- **Consistency:** Friable
- **Color:** Dark brown

---

**FOR WASTEWATER DISPOSAL**  
**FOR SOILS MAPPING**

---

**Soil Series Name:** Dixfield  
**Drainage Class:** Moderately well  
**Hydrologic Group:** C

**Soil Series Name:** Sherbert (incl/excl/variant)  
**Drainage Class:** Moderately well to somewhat poorly  
**Hydrologic Group:** C

---

**FOR WASTEWATER DISPOSAL**  
**FOR SOILS MAPPING**

---

**Soil Series Name:** Jermont
  
**Drainage Class:** Somewhat excessively
  
**Hydrologic Group:** A

**Soil Series Name:** Colonel (variant)
  
**Drainage Class:** Somewhat poorly
  
**Hydrologic Group:** C

---

**Site Evaluator / Soil Scientist Signature:** Albert Frick
  
**Date:** 1/6/96
  
**SE/CSS:**

**Owner's Name:** Highland Wind, LLC

---

**Address:** Highland Plantation  
**Street, Road Subdivision:** Highland Wind Project  
**Location of Observation Holes Shown Above**

---

**Alpert Frick Associates - 95A County Road, Gorham, Maine 04038 - (207) 839-5553**
### SOIL DESCRIPTION AND CLASSIFICATION

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>NO COLORS</td>
<td>TAKEN ON BORING</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FEW, FAINT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>REFUSAL IN BASAL TILL</td>
<td></td>
</tr>
</tbody>
</table>

**Soil Classification:**
- **Profile:** N/A
- **Condition:** Moderately Well

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>DARK BROWN</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LIGHT YELLOW BROWN</td>
<td>FEW, FAINT</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OLIVE BROWN</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>REFUSAL ON LARGE BOLDER OR BASAL TILL</td>
<td></td>
</tr>
</tbody>
</table>

**Soil Classification:**
- **Profile:** N/A
- **Condition:** Moderately Well

---

**Site Evaluator/Site Scientist Signature:**

**Site:** ALBERT FRICK ASSOCIATES - 65A COUNTY ROAD GORHAM, MAINE

**Date:**

14/6/66

9/15/09
**SOIL DESCRIPTION AND CLASSIFICATION**

(Location of Observation Holes Shown Above)

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP 145</td>
<td>SAVAGE</td>
<td>FRIABLE</td>
<td>DARK</td>
<td>BROWN</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>OLIVE</td>
<td>COMMON,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BROWN</td>
<td>DISTINCT</td>
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</table>

**FOR WASTEWATER DISPOSAL**

<table>
<thead>
<tr>
<th>Soil Series Name</th>
<th>Profile</th>
<th>Condition</th>
<th>Drainage Class</th>
<th>Hydraulc Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>COLONEL</td>
<td></td>
<td></td>
<td>POORLY</td>
<td>C</td>
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<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
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<tbody>
<tr>
<td>TP 146</td>
<td></td>
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</tbody>
</table>

**LIMIT OF EXCAVATION**

- Ground Water
- Restrictive Layer
- Bedrock
- Pit Depth

**SOIL DESCRIPTION AND CLASSIFICATION**

(Location of Observation Holes Shown Above)

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP 147</td>
<td>LOAM</td>
<td>FRIABLE</td>
<td>LIGHT</td>
<td>OLIVE</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>BROWN</td>
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</tbody>
</table>

**FOR WASTEWATER DISPOSAL**

<table>
<thead>
<tr>
<th>Soil Series Name</th>
<th>Profile</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAWSONVILLE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Bedrock**

- Ground Water
- Restrictive Layer
- Bedrock
- Pit Depth

**SOIL DESCRIPTION AND CLASSIFICATION**

(Location of Observation Holes Shown Above)

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
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</thead>
<tbody>
<tr>
<td>TB 148</td>
<td>LOAM</td>
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<td>DARK</td>
<td>BROWN</td>
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</tbody>
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**FOR WASTEWATER DISPOSAL**

<table>
<thead>
<tr>
<th>Soil Series Name</th>
<th>Profile</th>
<th>Condition</th>
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</thead>
<tbody>
<tr>
<td>HOGBACK</td>
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<td></td>
</tr>
</tbody>
</table>

**Bedrock**

- Ground Water
- Restrictive Layer
- Bedrock
- Pit Depth

*Albert Frick Associates - 96A COUNTY ROAD GORHAM, MAINE 04038 - (207) 839-9563

Site Evaluator / Soil Scientist Signature

4/3/66  9/15/09

Date
## SOIL DESCRIPTION AND CLASSIFICATION

### Observation Hole TP 149
- **Test Pit**: Yes
- **Boring**: No
- **Depth of Organic Horizon Above Mineral Soil**: 60 inches

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOAM</td>
<td>FRIABLE</td>
<td>DARK</td>
<td>BROWN</td>
</tr>
<tr>
<td>SANDY</td>
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<td>OLIVE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FEW, FAINT</td>
</tr>
</tbody>
</table>

**Refusal on Large Boulder**

### Observation Hole TP 150
- **Test Pit**: Yes
- **Boring**: Yes
- **Depth of Organic Horizon Above Mineral Soil**: 60 inches

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANDY</td>
<td>FRIABLE</td>
<td>DARK</td>
<td>BROWN</td>
</tr>
<tr>
<td>LOAM</td>
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<td>LIGHT</td>
<td>OLIVE</td>
</tr>
<tr>
<td>SAND</td>
<td></td>
<td></td>
<td>FEW, FAINT</td>
</tr>
</tbody>
</table>

**Limit of Excavation**

### Observation Hole TP 151
- **Test Pit**: Yes
- **Boring**: No
- **Depth of Organic Horizon Above Mineral Soil**: 60 inches

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANDY</td>
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<td>LIGHT</td>
<td>OLIVE</td>
</tr>
<tr>
<td>LOAMY</td>
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<td>FEW, FAINT</td>
</tr>
<tr>
<td>SANDY</td>
<td>FIRM</td>
<td>LIGHT</td>
<td>OLIVE</td>
</tr>
<tr>
<td>LOAM</td>
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<td>FEW, FAINT</td>
</tr>
</tbody>
</table>

**Limit of Excavation**

### Observation Hole TP 152
- **Test Pit**: Yes
- **Boring**: Yes
- **Depth of Organic Horizon Above Mineral Soil**: 60 inches

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANDY</td>
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<td>LIGHT</td>
<td>OLIVE</td>
</tr>
<tr>
<td>LOAMY</td>
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<td>FEW, FAINT</td>
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<tr>
<td>SANDY</td>
<td>FIRM</td>
<td>LIGHT</td>
<td>OLIVE</td>
</tr>
<tr>
<td>LOAM</td>
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<td></td>
<td>FEW, FAINT</td>
</tr>
</tbody>
</table>

**Limit of Excavation**

### Soil Series Names
- **DIXFIELD/SKERRY**: Moderately Well
- **COLONEL (VARIANT)**: Somewhat Poorly

### Soil Classification
- **N/A**: Profile Condition

### Drainage Class
- **DIXFIELD**: Moderately Well
- **SKERRY**: Moderately Well

### Depth Below Ground Surface
- **60 inches**

---

**Albert Frick**

143/46

9/15/09

SE/CSS *

Albert Frick Associates - 96A County Road, Gorham, Maine 04038 - (207) 838-5853
# SOIL DESCRIPTION AND CLASSIFICATION

## Location of Observation Holes Shown Above

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>153</th>
<th>154</th>
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<tbody>
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<td>SANDY LOAM</td>
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<tr>
<td><strong>Consistency</strong></td>
<td>FRIABLE</td>
<td>FIRM</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>GRAY (ALBIC)</td>
<td>FIRM</td>
</tr>
<tr>
<td><strong>Matting</strong></td>
<td>STRONG BROWN</td>
<td>PEW, FAINT</td>
</tr>
</tbody>
</table>

## Limit of Excavation

**Location:** SKERRY (INCLUSION) (IN DIXFIELD UNIT)

<table>
<thead>
<tr>
<th>Soil Classification</th>
<th>N/A</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Slope Limiting Factor</strong></td>
<td>8-20</td>
<td>8-20</td>
</tr>
<tr>
<td><strong>Ground Water</strong></td>
<td>Restrictive Layer</td>
<td>Restrictive Layer</td>
</tr>
<tr>
<td><strong>Bedrock</strong></td>
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<tr>
<td><strong>Pit Depth</strong></td>
<td>Pit Depth</td>
<td>Pit Depth</td>
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<tr>
<td><strong>Drainage Class</strong></td>
<td>MODERATELY WELL</td>
<td>COMMONLY POORLY</td>
</tr>
<tr>
<td><strong>Hydrologic Group</strong></td>
<td>C</td>
<td>C</td>
</tr>
</tbody>
</table>

## Soil Description

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>155</th>
<th>156</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Texture</strong></td>
<td>SANDY LOAM</td>
<td>SANDY LOAM</td>
</tr>
<tr>
<td><strong>Consistency</strong></td>
<td>FRIABLE</td>
<td>FIRM</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>REDDISH GRAY (ALBIC)</td>
<td>DARK BROWN</td>
</tr>
<tr>
<td><strong>Matting</strong></td>
<td>FEW, FAINT</td>
<td>FEW, FAINT</td>
</tr>
</tbody>
</table>

## Limit of Excavation

**Location:** WESTBURY / COLONEL (INCLUSION)

<table>
<thead>
<tr>
<th>Soil Classification</th>
<th>N/A</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Slope Limiting Factor</strong></td>
<td>8-20</td>
<td>8-20</td>
</tr>
<tr>
<td><strong>Ground Water</strong></td>
<td>Restrictive Layer</td>
<td>Restrictive Layer</td>
</tr>
<tr>
<td><strong>Bedrock</strong></td>
<td>Bedrock</td>
<td>Bedrock</td>
</tr>
<tr>
<td><strong>Pit Depth</strong></td>
<td>Pit Depth</td>
<td>Pit Depth</td>
</tr>
<tr>
<td><strong>Drainage Class</strong></td>
<td>SOMEWHAT POORLY</td>
<td>POORLY</td>
</tr>
<tr>
<td><strong>Hydrologic Group</strong></td>
<td>C</td>
<td>C</td>
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</table>

## Site Investigator / Soil Scientist Signature

Albert Frick

Date: 9/15/09
# Soil Description and Classification

**Location of Observation Holes Shown Above**

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TP 157</th>
<th>Test Pit</th>
<th>Boring</th>
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</thead>
<tbody>
<tr>
<td>Depth of Organic Horizon Above Mineral Soil</td>
<td>Located Outside of Updated Project Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texture</td>
<td>Consistency</td>
<td>Color</td>
<td>Motting</td>
</tr>
<tr>
<td>LOAM</td>
<td>FRIABLE</td>
<td>DARK YELLOWISH BROWN</td>
<td></td>
</tr>
<tr>
<td>Gray (ALBT)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bedrock</td>
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<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TB 158</th>
<th>Test Pit</th>
<th>Boring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of Organic Horizon Above Mineral Soil</td>
<td>Located Outside of Updated Project Area</td>
<td></td>
<td></td>
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<tr>
<td>Texture</td>
<td>Consistency</td>
<td>Color</td>
<td>Motting</td>
</tr>
<tr>
<td>LOAM</td>
<td>FRIABLE</td>
<td>DARK YELLOWISH BROWN</td>
<td></td>
</tr>
<tr>
<td>Bedrock</td>
<td></td>
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<td></td>
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**Location of Observation Holes Shown Above**

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TP 159</th>
<th>Test Pit</th>
<th>Boring</th>
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</thead>
<tbody>
<tr>
<td>Depth of Organic Horizon Above Mineral Soil</td>
<td>Located Outside of Updated Project Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texture</td>
<td>Consistency</td>
<td>Color</td>
<td>Motting</td>
</tr>
<tr>
<td>LOAM</td>
<td>FRIABLE</td>
<td>DARK YELLOWISH BROWN</td>
<td></td>
</tr>
<tr>
<td>Bedrock</td>
<td></td>
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<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TP 160</th>
<th>Test Pit</th>
<th>Boring</th>
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<tr>
<td>Depth of Organic Horizon Above Mineral Soil</td>
<td>Located Outside of Updated Project Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texture</td>
<td>Consistency</td>
<td>Color</td>
<td>Motting</td>
</tr>
<tr>
<td>LOAM</td>
<td>FRIABLE</td>
<td>DARK BROWN</td>
<td></td>
</tr>
<tr>
<td>Bedrock</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Ricker-like soils with deeper organic in area

<table>
<thead>
<tr>
<th>Soil Series Name</th>
<th>RAWSONVILLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drainage Class</td>
<td>WELL</td>
</tr>
<tr>
<td>Hydrologic Group</td>
<td>C</td>
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<table>
<thead>
<tr>
<th>Soil Series Name</th>
<th>ABRAM INCLUSION</th>
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<tbody>
<tr>
<td>Drainage Class</td>
<td>WELL</td>
</tr>
<tr>
<td>Hydrologic Group</td>
<td>D</td>
</tr>
</tbody>
</table>

**Site, Engineer/Geologist Signature:**

- Albert Frick

16/3/06

**Date:** 9/24/09

ALBERT FRICK ASSOCIATES - 96A COUNTY ROAD GORHAM, MAINE 04038 - (207) 630-5663
## Soil Description and Classification

### Location of Observation Holes Shown Above

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>Profile</th>
<th>Texture</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB 161</td>
<td>N/A</td>
<td>LOAM</td>
<td>NO COLORS</td>
<td>FRIABLE</td>
</tr>
<tr>
<td>TB 162</td>
<td>N/A</td>
<td>ORGANIC</td>
<td>FRIABLE</td>
<td>BROWN</td>
</tr>
<tr>
<td>TB 163</td>
<td>N/A</td>
<td>ORGANIC</td>
<td>LOOSE</td>
<td></td>
</tr>
<tr>
<td>TB 164</td>
<td>N/A</td>
<td>NO COLORS</td>
<td>FRIABLE</td>
<td>TAKEN ON BORING</td>
</tr>
</tbody>
</table>

### Soil Quality

- **Rawsonville**: Well Draining, Hydric Group A
- **Hogback**: Well Draining, Hydric Group B

### Soil Properties

- **Slope**:
  - TB 161: 30°
  - TB 162: 30°
  - TB 163: 30°
  - TB 164: 30°

- **Limiting Factor**
  - TB 161: 27
  - TB 162: 12
  - TB 163: 3
  - TB 164: 34

- **Ground Water**:
  - TB 161: Bedrock
  - TB 162: Bedrock
  - TB 163: Bedrock
  - TB 164: Bedrock

- **Soil Series**:
  - TB 161: Rawsonville
  - TB 162: Hogback
  - TB 163: Rock Outcrop/Abram
  - TB 164: Rawsonville

- **Drainage Class**: Well

### Site Evaluation

**Signature**:

**Date**: 3/21/09

**Site Evaluator / Soil Scientist Signature**: Albert Frick

**Address**: ALBERT FRICK ASSOCIATES - 96A COUNTY ROAD GORHAM, MAINE 04003 - (207) 836-5663
### Soil Description and Classification

**Location of Observation Holes Shown Above**

#### Observation Hole: TP 165

- **Texture:** Organic
- **Consistency:** Loose
- **Color:** Dark Brown
- **Mottling:**

#### Observation Hole: TP 166

- **Texture:** Organic
- **Consistency:** Friable
- **Color:** Black
- **Mottling:**

**Note:** Depth of organic layer and mineral vary in area

### Soil Description and Classification

**Location of Observation Holes Shown Above**

#### Observation Hole: TB 167

- **Texture:** Organic
- **Consistency:** Loose
- **Color:** Dark Brown
- **Mottling:**

#### Observation Hole: TP 168

- **Texture:** Organic
- **Consistency:** Loamy
- **Color:** Dark Reddish Brown
- **Mottling:**

**Note:** Depth of organic layer and mineral vary in area

---

**Soil Series Name:**
- Ricker
- ABRAM/HOGBACK

**Hydrologic Group:**
- D*
- D/B

---

**Profile Condition:**
- N/A
- N/A

**Drainage Class:**
- WELL
- EXCESSIVELY WET

---

**Slope Limiting Factor:**
- 20\%
- 14\%

**Ground Water Depth:**
- Bedrock
- Bedrock

---

**Signatures:**
- Albert Frick Associates - 99A County Road, Gorham, Maine 04038 - (207) 809-5663

---

**Date:** 9/31/09

---

*Listed as "A" per MECS State Soil Scientist, D. Kocoge and Albert Frick. Believe it performs like ABRAM 'D'.
### Soil Description and Classification

**Observation Hole TP 169**
- **Test Pit**: Yes
- **Boring**: No
- **Depth of Organic Horizon Above Mineral Soil**: 10 feet

**Located Outside of Updated Project Area**
- **Texture**: Organic
- **Consistency**: Loose
- **Color**: Reddish Brown
- **Moisture**: Saturation

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Soil Classification</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Organic</td>
<td>Loose</td>
<td>Reddish Brown</td>
<td>Saturation</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Organic</td>
<td>Loose</td>
<td>Reddish Brown</td>
<td>Saturation</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Organic</td>
<td>Loose</td>
<td>Reddish Brown</td>
<td>Saturation</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Organic</td>
<td>Loose</td>
<td>Reddish Brown</td>
<td>Saturation</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Organic</td>
<td>Loose</td>
<td>Reddish Brown</td>
<td>Saturation</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Organic</td>
<td>Loose</td>
<td>Reddish Brown</td>
<td>Saturation</td>
<td></td>
</tr>
</tbody>
</table>

**Observation Hole TP 170**
- **Test Pit**: Yes
- **Boring**: No
- **Depth of Organic Horizon Above Mineral Soil**: 10 feet

**Located Outside of Updated Project Area**
- **Texture**: Organic
- **Consistency**: Loose
- **Color**: Dark Reddish Brown
- **Moisture**: Saturation

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Soil Classification</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Organic</td>
<td>Loose</td>
<td>Dark Reddish Brown</td>
<td>Saturation</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Organic</td>
<td>Loose</td>
<td>Dark Reddish Brown</td>
<td>Saturation</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Organic</td>
<td>Loose</td>
<td>Dark Reddish Brown</td>
<td>Saturation</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Organic</td>
<td>Loose</td>
<td>Dark Reddish Brown</td>
<td>Saturation</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Organic</td>
<td>Loose</td>
<td>Dark Reddish Brown</td>
<td>Saturation</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Organic</td>
<td>Loose</td>
<td>Dark Reddish Brown</td>
<td>Saturation</td>
<td></td>
</tr>
</tbody>
</table>

**Observation Hole TB 171**
- **Test Pit**: Yes
- **Boring**: Yes
- **Depth of Organic Horizon Above Mineral Soil**: 10 feet

**Located Outside of Updated Project Area**
- **Texture**: Organic
- **Consistency**: Bedrock
- **Color**: Reddish Brown
- **Moisture**: Dry

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Soil Classification</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Organic</td>
<td>Bedrock</td>
<td>Reddish Brown</td>
<td>Dry</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Organic</td>
<td>Bedrock</td>
<td>Reddish Brown</td>
<td>Dry</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Organic</td>
<td>Bedrock</td>
<td>Reddish Brown</td>
<td>Dry</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Organic</td>
<td>Bedrock</td>
<td>Reddish Brown</td>
<td>Dry</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Organic</td>
<td>Bedrock</td>
<td>Reddish Brown</td>
<td>Dry</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Organic</td>
<td>Bedrock</td>
<td>Reddish Brown</td>
<td>Dry</td>
<td></td>
</tr>
</tbody>
</table>

**Observation Hole TB 172**
- **Test Pit**: Yes
- **Boring**: Yes
- **Depth of Organic Horizon Above Mineral Soil**: 10 feet

**Located Outside of Updated Project Area**
- **Texture**: Sandy
- **Consistency**: Friable
- **Color**: No Colors
- **Moisture**: Taken On Boring

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Soil Classification</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Moisture</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Sandy</td>
<td>Friable</td>
<td>No Colors</td>
<td>Taken On Boring</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Sandy</td>
<td>Friable</td>
<td>No Colors</td>
<td>Taken On Boring</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Sandy</td>
<td>Friable</td>
<td>No Colors</td>
<td>Taken On Boring</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Sandy</td>
<td>Friable</td>
<td>No Colors</td>
<td>Taken On Boring</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Sandy</td>
<td>Friable</td>
<td>No Colors</td>
<td>Taken On Boring</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Sandy</td>
<td>Friable</td>
<td>No Colors</td>
<td>Taken On Boring</td>
<td></td>
</tr>
</tbody>
</table>

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**Site Evaluator / Soil Scientist Signature**: Albert Frick

**Date**: 9/21/09

**Address**: Albert Frick Associates - 96A County Road Gorham, Maine 04038 - (207) 829-5563
<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>Test Pit</th>
<th>Boring</th>
<th>Depth of Organic Horizon Above Mineral Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TP 173</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TP 174</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)**

**Texture** | **Consistency** | **Color** | **Matting**
--- | --- | --- | ---
**Organic** | **Loam** | **Brown** | **Gray**

**Soil Series Name:**
- **ABRAM**
- **HOGBACK**

**Soil Classification:**
- **N/A**

**Slope:**
- 6-20%

**Limiting Factor:**
- 5

**Ground Water:**
- No Colors

**Restricted Layer:**
- Taken on Boring

**Depth Below Mineral Soil Surface:**
- 0

**Hydrologic Group:**
- A

**Profile Condition:**
- Well

**Drainage Class:**
- Well

**Hydrologic Group:**
- B

---

**TP 175**

**Texture** | **Consistency** | **Color** | **Matting**
--- | --- | --- | ---
**Organic** | **Loam** | **Brown** | **Gray**

**Soil Series Name:** **RICKER**

**Soil Classification:**
- **N/A**

**Slope:**
- 30%

**Limiting Factor:**
- 10

**Ground Water:**
- No Colors

**Restricted Layer:**
- Taken on Boring

**Depth Below Mineral Soil Surface:**
- 0

**Hydrologic Group:**
- D

**Profile Condition:**
- Well

**Drainage Class:**
- Well

**Hydrologic Group:**
- B

---

**TP 176**

**Texture** | **Consistency** | **Color** | **Matting**
--- | --- | --- | ---
**Clayey** | **Clayey** | **Brown** | **Gray**

**Soil Series Name:** **HOGBACK**

**Soil Classification:**
- **N/A**

**Slope:**
- 30%

**Limiting Factor:**
- 13

**Ground Water:**
- No Colors

**Restricted Layer:**
- Taken on Boring

**Depth Below Mineral Soil Surface:**
- 0

**Hydrologic Group:**
- B

**Profile Condition:**
- Well

**Drainage Class:**
- Well

**Hydrologic Group:**
- B

---

**Evaluations / Soil Scientist Signature:**

Albert Frick

Evaluations / Soil Scientist Signature: SE/CSS

Date: 9/21/09

Albert Frick, Associates - 95A County Road, Gorham, Maine 04038 - (207) 639-5563
### SOIL DESCRIPTION AND CLASSIFICATION

#### Location of Observation Holes Shown Above

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TB 18</th>
<th>Test Pit</th>
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<tbody>
<tr>
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</table>

#### Located Outside of Updated Project Area

<table>
<thead>
<tr>
<th>Layer</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Fine Sandy Loam</td>
<td>Friable</td>
<td>No Colors Taken on Boring</td>
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<tr>
<td>10</td>
<td></td>
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<td></td>
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<tr>
<td>20</td>
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<td></td>
</tr>
<tr>
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</table>

#### Bedrock

#### Soil Classification

<table>
<thead>
<tr>
<th>Profile</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rawsonville</td>
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</table>

#### Drainage Class

<table>
<thead>
<tr>
<th>Ground Water Restrictive Layer</th>
<th>Bedrock</th>
<th>Pit Depth</th>
</tr>
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<tbody>
<tr>
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#### Slope Factor

<table>
<thead>
<tr>
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<tbody>
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</tr>
</tbody>
</table>

#### Refusal

<table>
<thead>
<tr>
<th>Large Stones/Bedrock</th>
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</thead>
<tbody>
<tr>
<td>Few Faint</td>
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</table>

### SOIL DESCRIPTION AND CLASSIFICATION

#### Location of Observation Holes Shown Above

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TB 182</th>
<th>Test Pit</th>
<th>Boring</th>
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</thead>
<tbody>
<tr>
<td>Depth of Organic Horizon Above Mineral Soil</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Soil Description

<table>
<thead>
<tr>
<th>Layer</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Loam</td>
<td>Friable</td>
<td>No Colors Taken on Boring</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
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<td></td>
</tr>
<tr>
<td>50</td>
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</tbody>
</table>

#### Bedrock

#### Soil Classification

<table>
<thead>
<tr>
<th>Profile</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rawsonville (VARIANT)</td>
<td></td>
</tr>
</tbody>
</table>

#### Drainage Class

<table>
<thead>
<tr>
<th>Ground Water Restrictive Layer</th>
<th>Bedrock</th>
<th>Pit Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Slope Factor

<table>
<thead>
<tr>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-20</td>
</tr>
</tbody>
</table>

#### Refusal

<table>
<thead>
<tr>
<th>Large Stones/Bedrock</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEW FAINT</td>
</tr>
</tbody>
</table>

### SOIL DESCRIPTION AND CLASSIFICATION

#### Location of Observation Holes Shown Above

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TP 183</th>
<th>Test Pit</th>
<th>Boring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of Organic Horizon Above Mineral Soil</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Soil Description

<table>
<thead>
<tr>
<th>Layer</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Loam</td>
<td>Friable</td>
<td>Gray (Albic)</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td>Dark Yellowish Brown</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td>Light Yellowish Brown</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Bedrock

#### Soil Classification

<table>
<thead>
<tr>
<th>Profile</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rawsonville</td>
<td></td>
</tr>
</tbody>
</table>

#### Drainage Class

<table>
<thead>
<tr>
<th>Ground Water Restrictive Layer</th>
<th>Bedrock</th>
<th>Pit Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Slope Factor

<table>
<thead>
<tr>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-20</td>
</tr>
</tbody>
</table>

### SOIL DESCRIPTION AND CLASSIFICATION

#### Location of Observation Holes Shown Above

<table>
<thead>
<tr>
<th>Observation Hole</th>
<th>TB 184</th>
<th>Test Pit</th>
<th>Boring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of Organic Horizon Above Mineral Soil</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Soil Description

<table>
<thead>
<tr>
<th>Layer</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Loam</td>
<td>Friable</td>
<td>No Colors Taken on Boring</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
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</tr>
</tbody>
</table>

#### Bedrock

#### Soil Classification

<table>
<thead>
<tr>
<th>Profile</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rawsonville</td>
<td></td>
</tr>
</tbody>
</table>

#### Drainage Class

<table>
<thead>
<tr>
<th>Ground Water Restrictive Layer</th>
<th>Bedrock</th>
<th>Pit Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
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#### Slope Factor

<table>
<thead>
<tr>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
</tr>
</tbody>
</table>

### Notes

- Albert Frick Signature: 16/3/64
- Site Evaluator/Site Scientist Signature: SE/CS8
- Site: Highland Plantation
- Location: Highland Wind Project
- Owner: Highland Wind, LLC

- Date: 9/24/09

ALBERT FRICK ASSOCIATES - 96A COUNTY ROAD GORHAM, MAINE 04038 - (207) 838-5563
### SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

#### Observation Hole TP 193
- **Texture**: Boron
- **Consistency**: Dark Brown
- **Color**: Boron
- **Mottling**: Boron
- **Depth of Organic Horizon Above Mineral Soil**: N/A
- **Profile**: Boron
- **Limiting Factor**: Boron
- **Ground Water**: Boron
- **Restrictive Layer**: Boron
- **Bedrock**: Boron
- **Pit Depth**: Boron

#### Observation Hole TB 194
- **Texture**: Boron
- **Consistency**: No Colors
- **Color**: No Colors
- **Mottling**: No Colors
- **Depth of Organic Horizon Above Mineral Soil**: N/A
- **Profile**: Boron
- **Limiting Factor**: Boron
- **Ground Water**: Boron
- **Restrictive Layer**: Boron
- **Bedrock**: Boron
- **Pit Depth**: Boron

#### Observation Hole TB 195
- **Texture**: Boron
- **Consistency**: FRIABLE
- **Color**: No Colors
- **Mottling**: No Colors
- **Depth of Organic Horizon Above Mineral Soil**: N/A
- **Profile**: Boron
- **Limiting Factor**: Boron
- **Ground Water**: Boron
- **Restrictive Layer**: Boron
- **Bedrock**: Boron
- **Pit Depth**: Boron

#### Observation Hole TP 196
- **Texture**: Organic
- **Consistency**: Dark Brown
- **Color**: Yellowish Brown
- **Mottling**: Yellowish Brown
- **Depth of Organic Horizon Above Mineral Soil**: N/A
- **Profile**: Boron
- **Limiting Factor**: Boron
- **Ground Water**: Boron
- **Restrictive Layer**: Boron
- **Bedrock**: Boron
- **Pit Depth**: Boron

---

**Note:** Inclusion in shallow to bedrock landform.

---

**Site Inspector /Soil Scientist Signature:**

**Date:** 9/23/09

**SE/CSS**

ALBERT FRICK ASSOCIATES - 35A COUNTY ROAD GORHAM, MAINE 04038 - (207) 809-5663
## Soil Description and Classification (Location of Observation Holes Shown Above)

### Observation Hole: TB 197

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORGANIC</td>
<td>LOOSE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BEDROCK</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Depth to organic layer on bedrock varies.

### Observation Hole: TB 198

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>GRAY</td>
<td></td>
</tr>
<tr>
<td>GRAVELLY LOAM</td>
<td>FRIABLE</td>
<td>YELLOWISH BROWN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LIGHT BROWN</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BEDROCK</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Observation Hole: TP 199

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORGANIC</td>
<td>LOOSE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BEDROCK</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Depth of organic layer on bedrock varies with mineral layer.

### Observation Hole: TP 200

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORGANIC</td>
<td>LOOSE</td>
<td>BLACK</td>
<td></td>
</tr>
<tr>
<td>LOAM</td>
<td>FRIABLE</td>
<td>BLACK</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Common distinct free water.

---

**Site Evaluator / Soil Scientist Signature:**

Albert Frick

163/66

Date: 9/3/09

Albert Frick Associates - 96A County Road, Gorham, Maine 04038 - (207) 838-5583
### Soil Description and Classification

#### Observation Hole TB 205
- **Texture:** Organic
- **Consistency:** Black
- **Color:** Gray
- **Moisture:**
- **Depth of Organic Horizon Above Mineral Soil:**
- **Soil Classification:** N/A
- **Slope:** 8-20%
- **Limiting Factor:** 22
- **Ground Water:**
- **Refractory Layer:**
- **Bedrock:**
- **Pit Depth:**

#### Observation Hole TB 206
- **Texture:** Gravelly Sandy Loam
- **Consistency:** Friable
- **Color:** Yellowish Brown
- **Moisture:**
- **Depth of Organic Horizon Above Mineral Soil:**
- **Soil Classification:** N/A
- **Slope:** 8-20%
- **Limiting Factor:** 32
- **Ground Water:**
- **Refractory Layer:**
- **Bedrock:**
- **Pit Depth:**

#### Observation Hole TB 207
- **Texture:** Gravelly Sandy Loam
- **Consistency:** Friable
- **Color:** Yellowish Brown
- **Moisture:**
- **Depth of Organic Horizon Above Mineral Soil:**
- **Soil Classification:** N/A
- **Slope:** 8-20%
- **Limiting Factor:** 32
- **Ground Water:**
- **Refractory Layer:**
- **Bedrock:**
- **Pit Depth:**

#### Observation Hole TB 208
- **Texture:** Gravelly Sandy Loam
- **Consistency:** Friable
- **Color:** Yellowish Brown
- **Moisture:**
- **Depth of Organic Horizon Above Mineral Soil:**
- **Soil Classification:** N/A
- **Slope:** 8-20%
- **Limiting Factor:** 32
- **Ground Water:**
- **Refractory Layer:**
- **Bedrock:**
- **Pit Depth:**

### Site Evaluator / Soil Scientist Signature
Albert Frick

**Date:** 9/23/09
### Soil Description and Classification (Location of Observation Holes Shown Above)

**Observation Hole: TP 209**  
- **Texture:** Loam  
- **Consistency:** Firm  
- **Color:** Gray  
- **Soil Type:** A gravelly loamy sand  
- **Depth:** Below mineral soil surface

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Loam</td>
<td>Firm</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>10</td>
<td>Loam</td>
<td>Firm</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>20</td>
<td>Loam</td>
<td>Firm</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>30</td>
<td>Loam</td>
<td>Firm</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>40</td>
<td>Loam</td>
<td>Firm</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>50</td>
<td>Loam</td>
<td>Firm</td>
<td>Gray</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Observation Hole: TP 210**  
- **Texture:** Sandy  
- **Consistency:** Friable  
- **Color:** Gray  
- **Soil Type:** A gravelly loamy sand  
- **Depth:** Below mineral soil surface

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>10</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>20</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>30</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>40</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>50</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Note:** Portion of site previously used as staging area for timber harvesting. Area subject to disturbance.

---

### Soil Description and Classification (Location of Observation Holes Shown Above)

**Observation Hole: TP 211**  
- **Texture:** Sandy  
- **Consistency:** Friable  
- **Color:** Gray  
- **Soil Type:** A gravelly loamy sand  
- **Depth:** Below mineral soil surface

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>10</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>20</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>30</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>40</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>50</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Note:** Portion of site previously used as staging area for timber harvesting. Area subject to disturbance.

---

### Soil Description and Classification (Location of Observation Holes Shown Above)

**Observation Hole: TP 212**  
- **Texture:** Sandy  
- **Consistency:** Friable  
- **Color:** Gray  
- **Soil Type:** A gravelly loamy sand  
- **Depth:** Below mineral soil surface

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>10</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
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<tr>
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<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>30</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
<tr>
<td>40</td>
<td>Sandy</td>
<td>Friable</td>
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</tr>
<tr>
<td>50</td>
<td>Sandy</td>
<td>Friable</td>
<td>Gray</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Note:** Portion of site previously used as staging area for timber harvesting. Area subject to disturbance.

---

**Site Evaluator/Soil Scientist Signature:** Albert Frick  
**Date:** 10/13/09

Albert Frick Associates - 85A County Road Gorham, Maine 04038 - (207) 835-5663
# Soil Description and Classification

**Observation Hole: TP 213**
- Test Pit
- Boring
- Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>STRONGS</td>
<td>BROWN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FEW, FAINT</td>
</tr>
</tbody>
</table>

**Observation Hole: TP 214**
- Test Pit
- Boring
- Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>STRONGS</td>
<td>BROWN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FEW, FAINT</td>
</tr>
</tbody>
</table>

**Observation Hole: TP 215**
- Test Pit
- Boring
- Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>COBBLY SANDY LOAM</td>
<td>FRIABLE</td>
<td>STRONGS</td>
<td>BROWN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FEW, FAINT</td>
</tr>
</tbody>
</table>

**Observation Hole: TP 216**
- Test Pit
- Boring
- Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>STRONGS</td>
<td>BROWN</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FEW, FAINT</td>
</tr>
</tbody>
</table>

**For Wastewater Disposal**
- FOR SOILS MAPPING

<table>
<thead>
<tr>
<th>Soil Classification</th>
<th>Slope</th>
<th>Limiting Factor</th>
<th>Profile Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>8-20%</td>
<td>18</td>
<td>C</td>
</tr>
</tbody>
</table>

**Soil Series Name:** DIXFIELD
**Drainage Class:** MODERATELY WELL
**Hydrologic Group:** C

**Limit of Excavation**

**For Wastewater Disposal**
- FOR SOILS MAPPING

<table>
<thead>
<tr>
<th>Soil Classification</th>
<th>Slope</th>
<th>Limiting Factor</th>
<th>Profile Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>20</td>
<td>10</td>
<td>C</td>
</tr>
</tbody>
</table>

**Soil Series Name:** DIXFIELD
**Drainage Class:** MODERATELY WELL
**Hydrologic Group:** C

**Signature:**
- Albert Frick
- Soil Scientist Signature

**Date:** 10/13/09

**ALBERT FRICK ASSOCIATES - 85A COUNTY ROAD GORHAM, MAINE 04038 - (207) 833-5563**
### SOIL DESCRIPTION AND CLASSIFICATION

#### Observation Hole TP 247

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Ft)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SANDY</td>
<td>LOAM</td>
<td>DARK</td>
<td>BROWN</td>
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<tr>
<td>10</td>
<td></td>
<td>FRIABLE</td>
<td>STRONG</td>
<td>BROWN</td>
</tr>
<tr>
<td>20</td>
<td>COBBLY</td>
<td>LOAM</td>
<td>LIGHT</td>
<td>BROWN</td>
</tr>
<tr>
<td></td>
<td>SANDY</td>
<td></td>
<td>YELLOW</td>
<td>BROWN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FIRM</td>
<td>OLIVE</td>
<td>BROWN</td>
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<td>COMMON</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DISTINCT</td>
</tr>
</tbody>
</table>

**Limit of Excavation (2 ft)**

#### Soil Classification

<table>
<thead>
<tr>
<th>Soil Series Name</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>Drainage Class</td>
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<tr>
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#### Observation Hole TP 258

<table>
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<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
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<tbody>
<tr>
<td>0</td>
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</tr>
<tr>
<td>10</td>
<td></td>
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<td>STRONG</td>
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<td>YELLOW</td>
<td>BROWN</td>
</tr>
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<td></td>
<td></td>
<td>FIRM</td>
<td>OLIVE</td>
<td>BROWN</td>
</tr>
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**Limit of Excavation (2 ft)**

#### Soil Classification

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### SOIL DESCRIPTION AND CLASSIFICATION

#### Observation Hole TP 249

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**Limit of Excavation**

#### Soil Classification

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#### Observation Hole TP 250

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<th>Color</th>
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<td>GRAY</td>
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<tr>
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<td>DISTINCT</td>
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<tr>
<td>20</td>
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**Limit of Excavation**

#### Soil Classification

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<tr>
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<td>C</td>
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### Soil Description and Classification

#### Location of Observation Holes Shown Above

**Observation Hole: TP 221**
- **Texture:** Sandy, Loam
- **Consistency:** Firm
- **Color:** Dark Gray (Albic)
- **Mottling:** Few, Faint
- **Soil Classification:** N/A
- **Profile:** DIXFIELD/ SKERRY
- **Slope:** 8.20
- **Limiting Factor:** 18
- **Ground Water:** Restrictive Layer
- **Bedrock:** Pit Depth
- **Drainage Class:** Moderately Well
- **Hydrologic Group:** C

**Observation Hole: TP 222**
- **Texture:** Sandy, Loam
- **Consistency:** Friable
- **Color:** Gray
- **Mottling:** Few, Faint
- **Soil Classification:** N/A
- **Profile:** DIXFIELD
- **Slope:** 8.20
- **Limiting Factor:** 18
- **Ground Water:** Restrictive Layer
- **Bedrock:** Pit Depth
- **Drainage Class:** Moderately Well
- **Hydrologic Group:** C

**Observation Hole: TP 223**
- **Texture:** Sandy, Loam
- **Consistency:** Friable
- **Color:** Yellow
- **Mottling:** Few, Faint
- **Soil Classification:** N/A
- **Profile:** DIXFIELD
- **Slope:** 8.20
- **Limiting Factor:** 18
- **Ground Water:** Restrictive Layer
- **Bedrock:** Pit Depth
- **Drainage Class:** Moderately Well
- **Hydrologic Group:** C

**Observation Hole: TP 224**
- **Texture:** Sandy, Loam
- **Consistency:** Friable
- **Color:** Light Olive
- **Mottling:** Few, Faint
- **Soil Classification:** N/A
- **Profile:** DIXFIELD
- **Slope:** 8.20
- **Limiting Factor:** 18
- **Ground Water:** Restrictive Layer
- **Bedrock:** Pit Depth
- **Drainage Class:** Moderately Well
- **Hydrologic Group:** C

**Site Evacuator/Soil Scientist Signature:**

**Albert Frick Associates - 96A County Road Gorham, Maine 04038 - (207) 838-5563**

**163/66**

**Site Date:**

**10/13/09**

**SE/CSS**

**Date:**

**10/13/09**

**Hydrologic Group:** C
### Soil Description and Classification

#### Observation Hole TB 215
- **Town, City, Plantation:** Highland Plantation
- **Street, Road Subdivision:** Highland Wind Project
- **Owner’s Name:** Highland Wind, LLC

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<th>Motting</th>
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<td>Firm</td>
<td>Light Olive</td>
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#### Observation Hole TB 216

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#### Observation Hole TB 222

<table>
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</tr>
<tr>
<td>Firm</td>
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#### Observation Hole TP 228

<table>
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<th>Motting</th>
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<td>Firm</td>
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<td>Common</td>
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<td></td>
<td>Limit of Excavation</td>
</tr>
</tbody>
</table>

#### Soil Series Name
- Dixfield: Moderately Well

---

**Site Investigator / Soil Scientist Signature:**

Albert Frick

**Date:**

16-3-66

10-13-09

Albert Frick Associates - 96A County Road Goffam, Maine 04038 - (207) 839-5563
### SOIL DESCRIPTION AND CLASSIFICATION

**Location of Observation Holes Shown Above**

<table>
<thead>
<tr>
<th>Observation Hole</th>
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<td>BROWN</td>
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</tr>
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<td><strong>Color</strong></td>
<td>3.5 YR 4/8</td>
<td>10 YR 6/2</td>
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<td><strong>Mottling</strong></td>
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<td>FEW FAINT</td>
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<tr>
<td><strong>Texture</strong></td>
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<td>FRIABLE</td>
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<tr>
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<td>LIGHT</td>
<td>DARK</td>
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<td><strong>Mottling</strong></td>
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<tr>
<td><strong>Mottling</strong></td>
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**Soil Classification**
- **N/A**
- **Profile Condition**: 0-8
- **Limiting Factor**: 14
- **Hydrologic Group**: C

**Soil Series Name**: CORNISH (VARIANT)
- **Drainage Class**: SOMEWHAT POORLY

---

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**Soil Classification**
- **N/A**
- **Profile Condition**: 8-20
- **Limiting Factor**: 18
- **Hydrologic Group**: C

**Soil Series Name**: DIXFIELD
- **Drainage Class**: MODERATELY WELL

---

**Site Evaulator / Soil Scientist Signature**: ALBERT FRICK

**Date**: 10/6/09

**Site Evaulator / Soil Scientist Signature**: SE / CSS

**Date**: 10/6/09

ALBERT FRICK ASSOCIATES - 96A COUNTY ROAD GORHAM, MAINE 04038 - (207) 839-5563
### SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

#### Observation Hole TP 233

<table>
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<th>Depth Below Mineral Soil Surface (in.)</th>
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#### Observation Hole TP 234

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#### Observation Hole TB 235

<table>
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#### Observation Hole TP 236

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<th>20</th>
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<td>FRIABLE</td>
<td>FRIABLE</td>
<td>FRIABLE</td>
<td>FRIABLE</td>
</tr>
<tr>
<td>Color</td>
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<td>STRONG BROWN</td>
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<td>FEW FAINT</td>
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<td>8-20</td>
<td>8-20</td>
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</tbody>
</table>

---

Site Evaluation / Soil Scientist Signature: Albert Frick

Date: 10/6 & 10/7/09

ALBERT FRICK ASSOCIATES - 95A COUNTY ROAD, ORCHARD, MAINE 04028 - (207) 888-5883
### Soil Description and Classification (Location of Observation Holes Shown Above)

**Observation Hole: TB 237**  
- **Test Pit**: No
- **Boring**: Yes
- **Depth of Organic Horizon Above Mineral Soil**: 50 ft

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
</tr>
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<tbody>
<tr>
<td>0-10</td>
<td>Sandy Loam</td>
<td>Friable</td>
<td>No Colors</td>
<td>Taken on Boring</td>
</tr>
<tr>
<td>10-20</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>20-30</td>
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<tr>
<td>30-40</td>
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<tr>
<td>40-50</td>
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<tr>
<td>50</td>
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</table>

- **Soil Classification**: N/A
- **Profile Condition**: 8-20
- **Limiting Factor**: 26
- **Ground Water**: No
- **Restrictive Layer**: No
- **Bedrock**: Yes
- **Pit Depth**: 60 ft

**Soil Series Name**: Rawsonville/Dixfield
- **Drainage Class**: Well
- **Hydrologic Group**: C

---

**Observation Hole: TB 238**  
- **Test Pit**: No
- **Boring**: Yes
- **Depth of Organic Horizon Above Mineral Soil**: 50 ft

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Matting</th>
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</thead>
<tbody>
<tr>
<td>0-10</td>
<td>Sandy Loam</td>
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<td>No Colors</td>
<td>Taken on Boring</td>
</tr>
<tr>
<td>10-20</td>
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<tr>
<td>50</td>
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</table>

- **Soil Classification**: N/A
- **Profile Condition**: 20
- **Limiting Factor**: 26
- **Ground Water**: No
- **Restrictive Layer**: No
- **Bedrock**: Yes
- **Pit Depth**: 60 ft

**Soil Series Name**: Rawsonville/Dixfield
- **Drainage Class**: Well/Moderately Well
- **Hydrologic Group**: C

---

**Observation Hole: TP 240**  
- **Test Pit**: Yes
- **Boring**: No
- **Depth of Organic Horizon Above Mineral Soil**: 50 ft

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
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<tr>
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- **Soil Classification**: N/A
- **Profile Condition**: 6-20
- **Limiting Factor**: 7
- **Ground Water**: No
- **Restrictive Layer**: No
- **Bedrock**: Yes
- **Pit Depth**: 60 ft

**Soil Series Name**: ABRAM
- **Drainage Class**: Extremely Well
- **Hydrologic Group**: D

---

**Alburt Frick**  
Elevator/Soil Scientist Signature

**Date**: 10/7/09

ALBERT FRICK ASSOCIATES - 982 COUNTY ROAD GORHAM, MAINE 04038 - (207) 838-6563
### SOIL DESCRIPTION AND CLASSIFICATION

#### Location of Observation Holes Shown Above

**Observation Hole: TB 249**
- **Test Pit:**
- **Boring:**

- **Depth of Organic Horizon Above Mineral Soil:**

<table>
<thead>
<tr>
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<th>Consistency</th>
<th>Color</th>
<th>Molting</th>
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</thead>
<tbody>
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<td></td>
<td></td>
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</table>

- **Bedrock**

**Observation Hole: TP 250**
- **Test Pit:**
- **Boring:**
- **Limiting Factor:** 3:

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<tr>
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<td>BEDROCK</td>
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</table>

**Observation Hole: TB 252**
- **Test Pit:**
- **Boring:**
- **Limiting Factor:** 10:

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<th>Molting</th>
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</table>

#### Soil Series Name:
- **Ravonville**

#### Drainage Class:
- **WELL**

#### Hydrologic Group:
- **C**

#### Soil Classification:
- **N/A**

#### Profile Condition:
- **Profile:**
- **Condition:**

---

### SOIL DESCRIPTION AND CLASSIFICATION

#### Location of Observation Holes Shown Above

**Observation Hole: TB 251**
- **Test Pit:**
- **Boring:**

- **Depth of Organic Horizon Above Mineral Soil:**

<table>
<thead>
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<th>Color</th>
<th>Molting</th>
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- **Bedrock**

**Observation Hole: TB 252**
- **Test Pit:**
- **Boring:**

- **Limiting Factor:** 20:

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<th>Molting</th>
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- **Bedrock**

**Observation Hole: TB 253**
- **Test Pit:**
- **Boring:**

- **Limiting Factor:** 10:

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<th>Molting</th>
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- **Bedrock**

**Observation Hole: TB 254**
- **Test Pit:**
- **Boring:**

- **Limiting Factor:** 20:

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<tbody>
<tr>
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</table>

- **Bedrock**

#### Soil Series Name:
- **Ravonville**

#### Drainage Class:
- **WELL**

#### Hydrologic Group:
- **B/C**

#### Soil Classification:
- **N/A**

#### Profile Condition:
- **Profile:**
- **Condition:**

---

**Site Evaluator / Soil Scientist Signature:** Albert Frick

**Date:** 10/7/09

**Site Evaluator / Soil Scientist Signature:** SE/CSS

**Address:** Albert Frick Associates – 96A County Road, Damariscotta, Maine 04543 – (207) 838-5563

**Owner’s Name:** Highland Wind, LLC

**Street, Road Subdivision:** Highland Wind Project

**Town, City, Plantation:** Highland Plantation
## Soil Description and Classification (Location of Observation Holes Shown Above)

### Observation Hole TP 253
- **Texture:** Sandy Loam
- **Consistency:** Firm
- **Color:** Gray
- **Matting:** BEDROCK
- **Slope:** 0 - 30
- **Limiting Factor:** 3
- **Ground Water Restrictive Layer:** No
- **Bedrock:** Yes
- **Pit Depth:** No

### Observation Hole TP 254
- **Texture:** Sandy Loam
- **Consistency:** Firm
- **Color:** Dark Gray
- **Matting:** BEDROCK
- **Slope:** 0 - 30
- **Limiting Factor:** 6
- **Ground Water Restrictive Layer:** No
- **Bedrock:** Yes
- **Pit Depth:** No

### Observation Hole TB 255
- **Texture:** Sandy Loam
- **Consistency:** Friable
- **Color:** Brown
- **Matting:** NO COLORS
- **Slope:** 0 - 30
- **Limiting Factor:** 14
- **Ground Water Restrictive Layer:** No
- **Bedrock:** Yes
- **Pit Depth:** No

### Observation Hole TB 256
- **Texture:** Sandy Loam
- **Consistency:** Friable
- **Color:** Brown
- **Matting:** NO COLORS
- **Slope:** 0 - 30
- **Limiting Factor:** 22
- **Ground Water Restrictive Layer:** No
- **Bedrock:** Yes
- **Pit Depth:** No

---

**Site Evaluator / Soil Scientist Signature:** Albert Frick
**Date:** 10/1/09
**Address:** Albert Frick Associates - 95A County Road, Gorham, ME 04038 - (207) 639-5553

**Owner's Name:** HIGHLAND WIND, LLC
**Street, Road Subdivision:** HIGHLAND WIND PROJECT
**Town, City, Plantation:** HIGHLAND PLANTATION
**SOIL DESCRIPTION AND CLASSIFICATION**

**Observation Hole TP 257**  
Test Pit  | Boring  
---|---
Depth of Organic Horizon Above Mineral Soil

<table>
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<td>GRAYISH BROWN</td>
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<tr>
<td>BEDROCK</td>
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**Observation Hole TP 258**  
Test Pit  | Boring  
---|---
Depth of Organic Horizon Above Mineral Soil

<table>
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<td>FRIABLE</td>
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<tr>
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**Observation Hole TP 259**  
Test Pit  | Boring  
---|---
Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
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<th>Color</th>
<th>Motting</th>
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<td>SANDY LOAM</td>
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**Observation Hole TP 260**  
Test Pit  | Boring  
---|---
Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Motting</th>
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<tbody>
<tr>
<td>VERY DARK BROWN</td>
<td>OLIVE BROWN</td>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DARK OLIVE BROWN</td>
<td>OLIVE BROWN</td>
<td>COBBLY SANDY LOAM</td>
<td>FIRM</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td>FREE WATER</td>
<td></td>
<td></td>
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</tr>
<tr>
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<tr>
<td>LIMIT OF EXCAVATION</td>
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</tr>
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</table>

---

Site Evaluator / Soil Scientist Signature: Albert Frick  
SE/CSS:  
ALBERT FRICK ASSOCIATES - 90A COUNTY ROAD, GORHAM, MAINE  04038 - (207) 838-0563  
Date: 10/7/09 & 10-10-10
### Highland Plantation, ME

#### Detailed Description of Subsurface Conditions at Project Sites

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Hydric</th>
<th>Non-hydric</th>
<th>Slope %</th>
<th>Limiting Factor</th>
<th>Ground Water</th>
<th>Restrictive Layer</th>
<th>Bedrock</th>
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<tr>
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#### Soil Series / phase name:

**Drainage Class**

**Hydrologic Group**

**Design Class**

**Soil Classification**

**Profile**

**Soil Series / phase name:**

**Drainage Class**

**Hydrologic Group**

**Design Class**

**Soil Classification**

**Profile**

**Soil Series / phase name:**

**Drainage Class**

**Hydrologic Group**

**Design Class**

**Soil Classification**

**Profile**

---

**Professional Endorsements (as applicable)**

**C.S.S.**

signature: 

Lic.#:

name printed/typed: Michael Glessner

**L.S.E.**

signature: 

Lic.#:

10/6/09

extra professional seal

Stantec Consulting
## Soil Profile/Classification Information

### Detailed Description of Subsurface Conditions at Project Sites

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Highland Wind Project</th>
<th>Applicant Name:</th>
<th>Highland Wind LLC</th>
<th>Project Location (municipality):</th>
<th>Highland Plantation, ME</th>
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### Soil Description and Classification

#### Exploration Symbol: TP-77

<table>
<thead>
<tr>
<th>Texture</th>
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<th>Color</th>
<th>Mottling</th>
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<tbody>
<tr>
<td>LOAMY FINE SAND</td>
<td>FRIABLE</td>
<td>LIGHT GRAY</td>
<td></td>
</tr>
<tr>
<td>SANDY LOAM W/ COARSE FRAGS</td>
<td>OLIVE BROWN</td>
<td>COMMON, MEDIUM, DISTINCT</td>
<td></td>
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</table>

**LIMIT OF EXCAVATION = 14"**

#### Exploration Symbol: TP-78

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
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<tbody>
<tr>
<td>LOAM</td>
<td>FRIABLE</td>
<td>VERY DARK</td>
<td></td>
</tr>
<tr>
<td>SILT LOAM</td>
<td>FRIABLE</td>
<td>DARK OLIVE</td>
<td>BROWN</td>
</tr>
<tr>
<td>Silt Loam</td>
<td>MUCKY</td>
<td>BLACK</td>
<td></td>
</tr>
</tbody>
</table>

**LIMIT OF EXCAVATION = 12"**

### Professional Endorsements

**C.S.S.:**

- Signature: [Signature]
- License #: 397

**L.S.E.:**

- Signature: [Signature]
- License #: [License Number]

**Stantec Consulting**

**Date:** 10/6/09
# SOIL PROFILE/CLASSIFICATION INFORMATION

**Detailed Description of Subsurface Conditions at Project Sites**

## Highland Wind Project

### SOIL DESCRIPTION AND CLASSIFICATION

<table>
<thead>
<tr>
<th>Exploration Symbol:</th>
<th>TP-73</th>
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<td>DARK BROWN</td>
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<tr>
<td><strong>Consistency</strong></td>
<td>SANDY LOAM</td>
<td>DARK OILY</td>
<td>BROWN</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>VERY FINE</td>
<td>DARK OILY</td>
<td>BROWN</td>
</tr>
<tr>
<td><strong>Mottling</strong></td>
<td>SANDY LOAM</td>
<td>SOMEWHAT FIRM</td>
<td>FEW, FINE, FAINT</td>
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**Limit of Excavation = 14”**

### SOIL DESCRIPTION AND CLASSIFICATION

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<tr>
<td><strong>Consistency</strong></td>
<td>SILT LOAM</td>
<td>FRIABLE</td>
<td>DARK OLIVE</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>SILT LOAM W/ COARSE FRAgs</td>
<td>GRAYISH BROWN</td>
<td></td>
</tr>
</tbody>
</table>

**Limit of Excavation = 18”**

---

### SOIL DESCRIPTION AND CLASSIFICATION

<table>
<thead>
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<th>Boring:</th>
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<td><strong>Texture</strong></td>
<td>SILT LOAM</td>
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<tr>
<td><strong>Consistency</strong></td>
<td>LOAMY SAND</td>
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<td>GRAY</td>
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**Limit of Excavation = 18”**

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### SOIL DESCRIPTION AND CLASSIFICATION

<table>
<thead>
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<th>Test Pit:</th>
<th>Boring:</th>
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<tr>
<td><strong>Texture</strong></td>
<td>SILT LOAM</td>
<td>FRIABLE</td>
<td>DARK OLIVE</td>
</tr>
<tr>
<td><strong>Consistency</strong></td>
<td>SANDY LOAM W/</td>
<td>LIGHT YELLOWISH</td>
<td></td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>COARSE FRAgs</td>
<td>BROWN</td>
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**Limit of Excavation = 10”**

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### SOIL DESCRIPTION AND CLASSIFICATION

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<tr>
<td><strong>Texture</strong></td>
<td>HYDROCLAY</td>
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<td>Silt Clay</td>
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<td><strong>Consistency</strong></td>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>BROWN</td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>SANDY LOAM W/</td>
<td>COARSE FRAgs</td>
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<tr>
<td><strong>Mottling</strong></td>
<td>BEDROCK</td>
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**Limit of Excavation = 14”**

---

Professional Endorsements (as applicable)

<table>
<thead>
<tr>
<th>C.S.S.</th>
<th>Date:</th>
<th>Lic.#:</th>
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<tr>
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<td>name printed/typed:</td>
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<table>
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<tr>
<th>L.S.E.</th>
<th>Date:</th>
<th>Lic.#:</th>
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<tbody>
<tr>
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<td></td>
<td>professional seal</td>
</tr>
</tbody>
</table>
### Soil Description and Classification

#### Highland Wind Project

**Applicant Name:** Highland Wind LLC

**Project Location:** Highland Plantation, ME

#### Soil Profile/Classification Information

**Detailed Description of Subsurface Conditions at Project Sites**

#### Soil Description and Classification

**Exploration Symbol:** TP-69

- **Test Pit:** 
- **Boring:**

**Texture** | **Consistency** | **Color** | **Mottling**
---|---|---|---
SILT LOAM | FRIABLE | DARK OLIVE | BROWN

**Exploration Symbol:** TP-76

- **Test Pit:** 
- **Boring:**

**Texture** | **Consistency** | **Color** | **Mottling**
---|---|---|---
SANDY LOAM | FRIABLE | DARK OLIVE | BROWN

#### Depth Below Mineral Soil Surface (Inches)

**Mottling**

- FEW, FINE, FAINT
- MANY, COARSE, PROMINENT

**Hydrologic Group**

- **Non-hydric**
- **Hydric**

**Design Class**

- **C.S.S.**
- **L.S.E.**

**Limit of Excavation**

- **18”**

---

**Professional Endorsements (as applicable)**

**C.S.S.**

- **Date:**
- **Signature:**
- **License #:**

**L.S.E.**

- **Date:** 10/7/09
- **Signature:** Michael Glessner
- **License #:** 397

**Stantec Consulting**
### Detailed Description of Subsurface Conditions at Project Sites

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Applicant Name:</th>
<th>Project Location (municipality):</th>
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<td>Highland Wind Project</td>
<td>Highland Wind LLC</td>
<td>Highland Plantation, ME</td>
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#### Soil Description and Classification

**SOIL DESCRIPTION AND CLASSIFICATION**

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<tbody>
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<td>TP-65</td>
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**Texture**

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<thead>
<tr>
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<th>2</th>
<th>3</th>
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<tbody>
<tr>
<td>Silt Loam</td>
<td>FRIABLE</td>
<td>Dark Olive</td>
</tr>
<tr>
<td>Sand</td>
<td>SOMewhat firm</td>
<td>Light Brownish</td>
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**Consistency**

<table>
<thead>
<tr>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>Very Firm</td>
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**Color**

<table>
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<tbody>
<tr>
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**Mottling**

<table>
<thead>
<tr>
<th>7</th>
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</thead>
<tbody>
<tr>
<td>Many, Coarse, Gray, Prominent</td>
</tr>
</tbody>
</table>

**LIMIT OF EXCAVATION = 14"**

**SOIL DESCRIPTION AND CLASSIFICATION**

<table>
<thead>
<tr>
<th>Exploration Symbol:</th>
<th>Test Pit</th>
<th>Boring</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP-66</td>
<td></td>
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</tbody>
</table>

**Texture**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
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<tbody>
<tr>
<td>Sandy Loam</td>
<td>FRIABLE</td>
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<tr>
<td>Loamy Sand</td>
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**Consistency**

<table>
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<tr>
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<th>4</th>
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<tr>
<td>Firm</td>
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**Color**

<table>
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<tr>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>Dark Brown</td>
</tr>
</tbody>
</table>

**Mottling**

<table>
<thead>
<tr>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Many, Coarse, Gray, Prominent</td>
</tr>
</tbody>
</table>

**LIMIT OF EXCAVATION = 20"**

### Professional Endorsements (as applicable)

**C.S.S.**

- Signature: [name printed/typed]
- Date: [10/7/09]
- Lic.#: [397]

**L.S.E.**

- Signature: Michael Glessner
- Date: 10/7/09
- Lic.#: [397]

Stantec Consulting
### Highland Wind Project

**SOIL PROFILE/CLASSIFICATION INFORMATION**

**Detailed Description of Subsurface Conditions at Project Sites**

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Applicant Name:</th>
<th>Project Location (municipality):</th>
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<tbody>
<tr>
<td>Highland Wind Project</td>
<td>Highland Wind LLC</td>
<td>Highland Plantation, ME</td>
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</tbody>
</table>

#### SOIL DESCRIPTION AND CLASSIFICATION

**Exploration Symbol:** TP-61  
**Test Pit**  
**Boring**

<table>
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<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
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<tbody>
<tr>
<td>0</td>
<td>LOAM</td>
<td>Mucky</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>LOAMY COARSE</td>
<td>FRIABLE</td>
<td>OLIVE GRAY</td>
<td>PROMINENT</td>
</tr>
</tbody>
</table>

**LIMIT OF EXCAVATION = 12”**

- **Slope %** 3-8
- **Limiting factor** 5”
- **Hydric** non-hydric

**Bedrock**

#### SOIL PROFILE/CLASSIFICATION INFORMATION

**Detailed Description of Subsurface Conditions at Project Sites**

**Exploration Symbol:** TP-62  
**Test Pit**  
**Boring**

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>LOAM</td>
<td>FRIABLE</td>
<td>VERY DARK</td>
<td>GRAYISH BROWN</td>
</tr>
<tr>
<td>0</td>
<td>Silt Loam</td>
<td>DARK OLIVE</td>
<td>COMMON, MEDIUM, FAINT</td>
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</tr>
</tbody>
</table>

**LIMIT OF EXCAVATION = 12”**

- **Slope %** 0-3
- **Limiting factor** 4”
- **Hydric** non-hydric

**Bedrock**

#### SOIL PROFILE/CLASSIFICATION INFORMATION

**Detailed Description of Subsurface Conditions at Project Sites**

**Exploration Symbol:** TP-63  
**Test Pit**  
**Boring**

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Silt Loam</td>
<td>DARK BROWNISH</td>
<td>GRAY</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Very Fine</td>
<td>SOMEWHAT FIRM</td>
<td>LIGHT OLIVE</td>
<td>COMMON, MEDIUM, DISTINCT</td>
</tr>
</tbody>
</table>

**LIMIT OF EXCAVATION = 14”**

- **Slope %** 0-3
- **Limiting factor** 0”
- **Hydric** non-hydric

**Bedrock**

#### SOIL PROFILE/CLASSIFICATION INFORMATION

**Detailed Description of Subsurface Conditions at Project Sites**

**Exploration Symbol:** TP-64  
**Test Pit**  
**Boring**

<table>
<thead>
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<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Silty Loam</td>
<td>VERY FINE</td>
<td>SOMEWHAT FIRM</td>
<td>LIGHT OLIVE</td>
</tr>
<tr>
<td>0</td>
<td>Sandy Loam</td>
<td>FRIABLE</td>
<td>OLIVE GRAY</td>
<td>PROMINENT</td>
</tr>
</tbody>
</table>

**LIMIT OF EXCAVATION = 14”**

- **Slope %** 0-3
- **Limiting factor** 0”
- **Hydric** non-hydric

**Bedrock**

### Professional Endorsements (as applicable)

**C.S.S.**

- **Signature:**
- **Name Printed/Typed:** Michael Glessner
- **Lic.#:** 397
- **Date:** 10/7/09
- **Affix Professional Seal**
## SOIL PROFILE/CLASSIFICATION INFORMATION

### Detailed Description of Subsurface Conditions at Project Sites

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Highland Wind Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicant Name:</td>
<td>Highland Wind LLC</td>
</tr>
<tr>
<td>Project Location (municipality):</td>
<td>Highland Plantation, ME</td>
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</tbody>
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### Soil Description and Classification

<table>
<thead>
<tr>
<th>Soil Series / phase name:</th>
<th>Drainage Class</th>
<th>Hydrologic Group</th>
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</thead>
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**SOIL DESCRIPTION AND CLASSIFICATION**

### Exploration Symbol: TP-57

#### Depth of Organic Horizon Above Mineral Soil

<table>
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<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>SILT LOAM W/ COARSE FRAGS</td>
<td>FRIABLE</td>
<td>DARK BROWNISH</td>
<td>NONE OBSERVED</td>
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</table>

#### Depth Below Mineral Soil Surface (Inches)

**LIMIT OF EXCAVATION = 22”**

<table>
<thead>
<tr>
<th>Slope %</th>
<th>Limiting factor</th>
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<tbody>
<tr>
<td>0-3</td>
<td>&gt;22”</td>
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</table>

#### Ground Water

*Hydric*

**Design Class**

<table>
<thead>
<tr>
<th>C.S.S.</th>
<th>L.S.E.</th>
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</thead>
</table>

#### Mottling

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEW, FINE, FAINT</td>
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</table>

### Exploration Symbol: TP-58

#### Depth of Organic Horizon Above Mineral Soil

<table>
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<th>Mottling</th>
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</thead>
<tbody>
<tr>
<td>SILT LOAM</td>
<td>FRIABLE</td>
<td>LIGHT GRAYISH</td>
<td>NONE OBSERVED</td>
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#### Depth Below Mineral Soil Surface (Inches)

**LIMIT OF EXCAVATION = 16”**

<table>
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<td>&gt;16”</td>
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#### Ground Water

*Non-Hydric*

**Design Class**

#### Mottling

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEW, FINE, FAINT</td>
<td></td>
</tr>
</tbody>
</table>

### Exploration Symbol: TP-59

#### Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAND</td>
<td>FRIABLE</td>
<td>YELLOWISH BROWN</td>
<td></td>
</tr>
</tbody>
</table>

#### Depth Below Mineral Soil Surface (Inches)

**LIMIT OF EXCAVATION = 30”**

<table>
<thead>
<tr>
<th>Slope %</th>
<th>Limiting factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>&gt;30”</td>
</tr>
</tbody>
</table>

#### Ground Water

*Hydric*

**Design Class**

#### Mottling

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEW, FINE, FAINT</td>
<td></td>
</tr>
</tbody>
</table>

### Exploration Symbol: TP-60

#### Depth of Organic Horizon Above Mineral Soil

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOAM</td>
<td>FRIABLE</td>
<td>VERY DARK BROWN</td>
<td></td>
</tr>
</tbody>
</table>

#### Depth Below Mineral Soil Surface (Inches)

**LIMIT OF EXCAVATION = 30”**

<table>
<thead>
<tr>
<th>Slope %</th>
<th>Limiting factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>&gt;30”</td>
</tr>
</tbody>
</table>

#### Ground Water

*Non-Hydric*

**Design Class**

#### Mottling

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEW, FINE, FAINT</td>
<td></td>
</tr>
</tbody>
</table>

### Professional Endorsements (as applicable)

**C.S.S.**

- Signature: [Michael Glessner](signature)
- Date: 10/7/09
- Lic.#: 397

**L.S.E.**

- Signature: [Michael Glessner](signature)
- Date: 10/7/09
- Lic.#: 397

Stantec Consulting
### Highland Wind Project

#### Application Name: Highland Wind LLC

**Project Location (municipality): Highland Plantation, ME**

**SOIL DESCRIPTION AND CLASSIFICATION**

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>SILT LOAM</td>
<td>FRIABLE</td>
<td>DARK OLIVE</td>
<td>BROWN</td>
</tr>
<tr>
<td>3-8</td>
<td>LOAMY SAND</td>
<td>LIGHT OLIVE</td>
<td>FEW, FINE, FAINT</td>
<td>GRAY</td>
</tr>
</tbody>
</table>

**Limit of Excavation = 16”**

**SOIL DESCRIPTION AND CLASSIFICATION**

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>SILT LOAM</td>
<td>FRIABLE</td>
<td>DARK OLIVE</td>
<td>BROWN</td>
</tr>
<tr>
<td>18</td>
<td>LOAMY SAND</td>
<td>LIGHT OLIVE</td>
<td>FEW, FINE, FAINT</td>
<td>GRAY</td>
</tr>
</tbody>
</table>

**Limit of Excavation = 19”**

**SOIL DESCRIPTION AND CLASSIFICATION**

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>SILT LOAM</td>
<td>MUCKY</td>
<td>DARK BROWN</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>LOAMY SAND</td>
<td>LIGHT OLIVE</td>
<td>FEW, FINE, FAINT</td>
<td>GRAY</td>
</tr>
</tbody>
</table>

**Limit of Excavation = 22”**

### Professional Endorsements (as applicable)

**C.S.S.:**
- Signature: Michael Glessner
- Date: 10/6/09
- Lic.#: 397

**L.S.E.:**
- Signature: Michael Glessner
- Date: 10/6/09
- Lic.#: 397
### Soil Profile/Classification Information

#### Detailed Description of Subsurface Conditions at Project Sites

**Project Name:** Highland Wind Project  
**Applicant Name:** Highland Wind LLC  
**Project Location (municipality):** Highland Plantation, ME

#### Soil Description and Classification

**TP-49**
- **Test Pit**
- **Boring**

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEDGE @ SURFACE</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TP-50**
- **Test Pit**
- **Boring**

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINE SANDY LOAM</td>
<td>FRIABLE</td>
<td>LIGHT OLIVE</td>
<td>NONE OBSERVED</td>
</tr>
</tbody>
</table>

**TP-51**
- **Test Pit**
- **Boring**

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>SILT LOAM W</td>
<td>FRIABLE</td>
<td>DARK BROWN</td>
<td></td>
</tr>
</tbody>
</table>

**TP-52**
- **Test Pit**
- **Boring**

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOAMY FINE SAND</td>
<td>LIGHT GRAY</td>
<td>MANY, COARSE, DISTRICT</td>
<td></td>
</tr>
</tbody>
</table>

### Professional Endorsements (as applicable)

**C.S.S.:**
- **signature:**
- **name printed/typed:**
  [Signature]
  [Name]

**L.S.E.:**
- **signature:**
- **name printed/typed:**
  [Signature]
  [Name]

**Michael Glessner**
- **signature:**
- **name printed/typed:**
  [Signature]
  [Name]

**Date:** 10/7/09

**License No.:** 397

**Affix professional seal:**

---

**Note:** This is a scanned PDF of the document, which contains detailed information about the subsurface conditions at the Highland Wind Project, including soil descriptions, classifications, and professional endorsements for the project's design and hydrologic group.
### SOIL DESCRIPTION AND CLASSIFICATION

**Highland Wind Project**

<table>
<thead>
<tr>
<th>Soil Series / phase name:</th>
<th>Drainage Class</th>
<th>Hydrologic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Classification:</td>
<td>Profile</td>
<td>Drainage Class</td>
</tr>
</tbody>
</table>

**SOIL DESCRIPTION AND CLASSIFICATION**

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>10YR 3/2</td>
<td>NONE OBSERVED</td>
</tr>
<tr>
<td>3-8</td>
<td>LOAMY SAND</td>
<td>FRIABLE</td>
<td>10YR 4/6</td>
<td>DARK YELLOWISH</td>
</tr>
</tbody>
</table>

**LIMIT OF EXCAVATION = 18"**

<table>
<thead>
<tr>
<th>Slope %</th>
<th>Limiting factor</th>
<th>Ground Water</th>
<th>L.E.</th>
<th>Slope %</th>
<th>Limiting factor</th>
<th>Ground Water</th>
<th>L.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>&gt;18&quot;</td>
<td>restrictive layer</td>
<td></td>
<td>0-3</td>
<td>&gt;18&quot;</td>
<td>restrictive layer</td>
<td></td>
</tr>
</tbody>
</table>

**Ground Water**

- **Non-hydric**
- **Hydric**

**SOIL DESCRIPTION AND CLASSIFICATION**

<table>
<thead>
<tr>
<th>Soil Series / phase name:</th>
<th>Drainage Class</th>
<th>Hydrologic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil Classification:</td>
<td>Profile</td>
<td>Drainage Class</td>
</tr>
</tbody>
</table>

**SOIL DESCRIPTION AND CLASSIFICATION**

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5 Y 6/3</td>
<td>LOAMY FINE SAND</td>
<td>FRIABLE</td>
<td>10YR 4/4</td>
<td>DARK YELLOWISH</td>
</tr>
</tbody>
</table>

**LIMIT OF EXCAVATION = 18"**

<table>
<thead>
<tr>
<th>Slope %</th>
<th>Limiting factor</th>
<th>Ground Water</th>
<th>L.E.</th>
<th>Slope %</th>
<th>Limiting factor</th>
<th>Ground Water</th>
<th>L.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5 Y 6/3</td>
<td>SOMEWHAT FIRM</td>
<td>LIGHT OLIVE BROWN</td>
<td></td>
<td>0-3</td>
<td>&gt;18&quot;</td>
<td>restrictive layer</td>
<td></td>
</tr>
</tbody>
</table>

**Professional Endorsements (as applicable)**

C.S.S.

- **signature:** 
- **name printed/typed:** Michael Glessner
- **License #:** 397

L.S.E.

- **signature:** 
- **name printed/typed:** 
- **License #:** 

Stantec Consulting
**SOIL PROFILE/CLASSIFICATION INFORMATION**

**Detailed Description of Subsurface Conditions at Project Sites**

**Project Name:** Highland Wind Project  
**Applicant Name:** Highland Wind LLC  
**Project Location (municipality):** Highland Plantation, ME

---

### SOIL DESCRIPTION AND CLASSIFICATION

**Exploration Symbol:** TP-44  
**Test Pit:** ☑  
**Boring:**

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Silt Loam W</td>
<td>2.5Y 3/2</td>
<td>Dark Olive Brown</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Sandy Loam</td>
<td>2.5Y 3/3</td>
<td>Brown</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Sandy Loam W</td>
<td>2.5Y 4/4</td>
<td>Few, Fine, Faint OLIVE BROWN</td>
<td></td>
</tr>
</tbody>
</table>

**Limit of Excavation = 18”**

---

### SOIL PROFILE/CLASSIFICATION INFORMATION

**Detailed Description of Subsurface Conditions at Project Sites**

---

**Professional Endorsements (as applicable)**

**C.S.S.:**

- Signature:  
- Name printed/typed: Michael Glessner  
- Date: 10/6/09  
- Lic. #: 397

**L.S.E.:**

- Signature:  
- Name printed/typed:  
- Date:  
- Lic. #:  

**Stantec Consulting**
### SOIL PROFILE/CLASSIFICATION INFORMATION

#### Detailed Description of Subsurface Conditions at Project Sites

**Project Name:** Highland Wind Project  
**Applicant Name:** Highland Wind LLC  
**Project Location (municipality):** Highland Plantation, ME

#### SOIL DESCRIPTION AND CLASSIFICATION

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOAMY SAND</td>
<td>FRIABLE</td>
<td>LIGHT BROWN</td>
<td></td>
</tr>
<tr>
<td>FINE SANDY LOAM</td>
<td>2.5Y 4/3</td>
<td>OLIVE BROWN</td>
<td></td>
</tr>
<tr>
<td>LOAMY SAND</td>
<td>SOMewhat FIRM</td>
<td>GRAYISH BROWN</td>
<td>DISTINCT</td>
</tr>
</tbody>
</table>

#### LIMIT OF EXCAVATION = 23"

#### SOIL DESCRIPTION AND CLASSIFICATION

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOAMY SAND</td>
<td>FRIABLE</td>
<td>LIGHT BROWN</td>
<td></td>
</tr>
<tr>
<td>FINE SANDY LOAM</td>
<td>2.5Y 4/3</td>
<td>OLIVE BROWN</td>
<td></td>
</tr>
<tr>
<td>LOAMY SAND</td>
<td>SOMewhat FIRM</td>
<td>GRAYISH BROWN</td>
<td>DISTINCT</td>
</tr>
</tbody>
</table>

#### LIMIT OF EXCAVATION = 28"

#### SOIL DESCRIPTION AND CLASSIFICATION

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOAMY SAND</td>
<td>FRIABLE</td>
<td>LIGHT BROWN</td>
<td></td>
</tr>
<tr>
<td>FINE SANDY LOAM</td>
<td>2.5Y 4/3</td>
<td>OLIVE BROWN</td>
<td></td>
</tr>
<tr>
<td>LOAMY SAND</td>
<td>SOMewhat FIRM</td>
<td>GRAYISH BROWN</td>
<td>DISTINCT</td>
</tr>
</tbody>
</table>

#### LIMIT OF EXCAVATION = 24"

#### SOIL DESCRIPTION AND CLASSIFICATION

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOAMY SAND</td>
<td>FRIABLE</td>
<td>LIGHT BROWN</td>
<td></td>
</tr>
<tr>
<td>FINE SANDY LOAM</td>
<td>2.5Y 4/3</td>
<td>OLIVE BROWN</td>
<td></td>
</tr>
<tr>
<td>LOAMY SAND</td>
<td>SOMewhat FIRM</td>
<td>GRAYISH BROWN</td>
<td>DISTINCT</td>
</tr>
</tbody>
</table>

### Professional Endorsements (as applicable)

**C.S.S.**  
**signature:**  
**name printed/typed:** Michael Glessner  
**Lic.#:** 397  
**Date:** 10/6/09  
**Professional Endorsement:** Stantec Consulting

**L.S.E.**  
**signature:**  
**name printed/typed:** Michael Glessner  
**Lic.#:** 397  
**Date:** 10/6/09  
**Professional Endorsement:** Stantec Consulting
### Soil Description and Classification

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERY FINE SAND</td>
<td>LOOSE</td>
<td>2.5Y 5/4</td>
<td></td>
</tr>
<tr>
<td>TO</td>
<td>LIGHT OLIVE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRIABLE</td>
<td>BROWN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SILT LOAM</td>
<td>FRIABLE</td>
<td>2.5Y 3/2</td>
<td>GREY</td>
</tr>
<tr>
<td>TO</td>
<td>VERY DARK</td>
<td></td>
<td>GRAYISH BROWN</td>
</tr>
<tr>
<td>LOAMY VERY</td>
<td>FIRE SAND</td>
<td>2.5Y 4/4</td>
<td>SOMETHOW FIRM</td>
</tr>
<tr>
<td>FINE SAND</td>
<td></td>
<td></td>
<td>FEW, FINE, FAINT</td>
</tr>
<tr>
<td>Coarse Sand &amp;</td>
<td>OLIVE BROWN</td>
<td></td>
<td>MANY, COARSE.</td>
</tr>
<tr>
<td>Gravel</td>
<td>PROMINENT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LIMIT OF EXCAVATION = 22”**

### Soil Profile/Classification Information

#### Detailed Description of Subsurface Conditions at Project Sites

<table>
<thead>
<tr>
<th>Soil Series / phase name:</th>
<th>Drainage Class</th>
<th>Hydric Group</th>
<th>Slope %</th>
<th>Limiting factor</th>
<th>Ground Water</th>
<th>Restrictive Layer</th>
<th>Bedrock</th>
</tr>
</thead>
<tbody>
<tr>
<td>H. Wind</td>
<td></td>
<td></td>
<td>3-8</td>
<td>14”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C.S.S.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.S.E.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dates:**
- **C.S.S:** 9/18/09
- **L.S.E:** 9/18/09

**Professional Endorsements:**
- **C.S.S:** Michael Glessner
  - Signature:
  - Name printed/typed:
  - Lic.#:
- **L.S.E:**
  - Signature:
  - Name printed/typed:
  - Lic.#:

**Stantec Consulting**
## Soil Profile/Classification Information

### Detailed Description of Subsurface Conditions at Project Sites

**Project Name:** Highland Wind Project  
**Applicant Name:** Highland Wind LLC  
**Project Location (municipality):** Highland Plantation, ME

#### SOIL DESCRIPTION AND CLASSIFICATION

<table>
<thead>
<tr>
<th>Exploration Symbol: TP-36</th>
<th>Test Pit</th>
<th>Boring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Texture</strong></td>
<td>Consistency</td>
<td>Color</td>
</tr>
<tr>
<td>LOAM</td>
<td>10YR 2/2 V. DK. BROWN</td>
<td></td>
</tr>
<tr>
<td>W/ COARSE FRAGS</td>
<td>FRIABLE</td>
<td>OLIVE</td>
</tr>
<tr>
<td>LOAMY SAND</td>
<td>VERY FIRM</td>
<td>LIGHT OLIVE</td>
</tr>
</tbody>
</table>

**LIMIT OF EXCAVATION = 15”**

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Limiting factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2”</td>
<td>3-8</td>
</tr>
<tr>
<td>12”</td>
<td>LIMIT OF EXCAVATION = 16”</td>
</tr>
</tbody>
</table>

#### Hydrologic Group

<table>
<thead>
<tr>
<th>C.S.S.</th>
<th>L.S.E.</th>
<th>Design Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydric</td>
<td>non-hydric</td>
<td>ground water / restrictive layer</td>
</tr>
<tr>
<td>hydric</td>
<td>non-hydric</td>
<td>ground water / restrictive layer</td>
</tr>
</tbody>
</table>

#### SOIL DESCRIPTION AND CLASSIFICATION

<table>
<thead>
<tr>
<th>Exploration Symbol: TP-37</th>
<th>Test Pit</th>
<th>Boring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Texture</strong></td>
<td>Consistency</td>
<td>Color</td>
</tr>
<tr>
<td>LOAMY SAND</td>
<td>10YR 6/2 LT. BRN. GRY</td>
<td></td>
</tr>
<tr>
<td>FINE SANDY LOAM</td>
<td>FRIABLE</td>
<td>DARK YELLOWISH</td>
</tr>
</tbody>
</table>

**LIMIT OF EXCAVATION = 25”**

<table>
<thead>
<tr>
<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Limiting factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;16”</td>
<td>3-8</td>
</tr>
</tbody>
</table>

#### Hydrologic Group

<table>
<thead>
<tr>
<th>C.S.S.</th>
<th>L.S.E.</th>
<th>Design Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydric</td>
<td>non-hydric</td>
<td>ground water / restrictive layer</td>
</tr>
<tr>
<td>hydric</td>
<td>non-hydric</td>
<td>ground water / restrictive layer</td>
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#### SOIL DESCRIPTION AND CLASSIFICATION

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<th>Exploration Symbol: TP-39</th>
<th>Test Pit</th>
<th>Boring</th>
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<tr>
<td><strong>Texture</strong></td>
<td>Consistency</td>
<td>Color</td>
</tr>
<tr>
<td>SANDY LOAM</td>
<td>FRIABLE</td>
<td>7.5YR 3/4</td>
</tr>
<tr>
<td>LOAMY FINE SAND</td>
<td>LIGHT OLIVE</td>
<td>BROWN</td>
</tr>
<tr>
<td>LOAMY FINE SAND</td>
<td>VERY FIRM</td>
<td>2.5Y 1/4</td>
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**LIMIT OF EXCAVATION = 40”**

<table>
<thead>
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<th>Depth Below Mineral Soil Surface (Inches)</th>
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<tr>
<td>&gt;30”</td>
<td>3-8</td>
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</table>

#### Hydrologic Group

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<th>L.S.E.</th>
<th>Design Class</th>
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<td>ground water / restrictive layer</td>
</tr>
<tr>
<td>hydric</td>
<td>non-hydric</td>
<td>ground water / restrictive layer</td>
</tr>
</tbody>
</table>

---

### Professional Endorsements (as applicable)

**C.S.S.**  
**signature:**  
**name printed/typed:**  
**Lic.#:**

**L.S.E.**  
**signature:**  
**name printed/typed:** Michael Glessner  
**Lic.#:** 397  
**Date:** 9/18/09  
**signature:**  
**affix professional seal**
## SOIL PROFILE/CLASSIFICATION INFORMATION

### Detailed Description of Subsurface Conditions at Project Sites

### Project Name: Highland Wind Project
### Applicant Name: Highland Wind LLC
### Project Location (municipality): Highland Plantation, ME

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
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<td>GRAY</td>
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<tr>
<td>FINE SANDY LOAM</td>
<td>FRIABLE</td>
<td>7.5YR 4/4</td>
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**LIMIT OF EXCAVATION = 24”**

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<td>10YR 6/6</td>
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**LIMIT OF EXCAVATION = 30”**

- hydric Slope % Limiting factor
- non-hydric 3-8 28”

**LIMIT OF EXCAVATION = 26”**

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### Professional Endorsements (as applicable)

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Michael Glessner

Stantec Consulting
### Highland Wind Project

**Project Name:** Highland Wind Project
**Applicant Name:** Highland Wind LLC
**Project Location (municipality):** Highland Plantation, ME

#### Soil Profile/Classification Information

**SOIL DESCRIPTION AND CLASSIFICATION**

**Exploration Symbol:** TP-28  
- Test Pit  
- Boring

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<td>7.5YR 6/8</td>
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<tr>
<td>FINE SANDY LOAM</td>
<td>STRONG BROWN</td>
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**Depth of Organic Horizon Above Mineral Soil:**

- 0 inches

**LIMIT OF EXCAVATION:** 22"

**SOIL DESCRIPTION AND CLASSIFICATION**

**Exploration Symbol:** TP-29  
- Test Pit  
- Boring

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<td>FINE SANDY LOAM</td>
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**Depth of Organic Horizon Above Mineral Soil:**

- 0 inches

**LIMIT OF EXCAVATION:** 30"

#### Additional Information

**SOIL PROFILE/CLASSIFICATION INFORMATION**

**Detailed Description of Subsurface Conditions at Project Sites**

- Description:
  - Hydric:
  - Non-hydric:

- Slope %: 3-8
- Limiting factor: ground water
- Restrictive layer: bedrock

**Hydrologic Group**

- C.S.S.:
- L.S.E.:

**Limit of Excavation**

- 22"
- 30"

**Professional Endorsements**

**C.S.S.:**
- Signature:
- Name printed/typed: Michael Glessner
- License #: 397

**L.S.E.:**
- Signature:
- Name printed/typed: Sebago Technics, Inc.
- Date: 9/18/09
- License #: 397

---

**Highland Wind LLC**

Sebago Technics, Inc.
### Highland Plantation, ME

#### Limit of Excavation

**LIMIT OF EXCAVATION = 28"**

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<th>Hydrologic Group</th>
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<th>Hydrologic Group</th>
<th>Design Class</th>
<th>Slope %</th>
<th>Limiting factor</th>
<th>Text</th>
<th>Consistency</th>
<th>Color</th>
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#### Limit of Excavation

**LIMIT OF EXCAVATION = 28"**

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<thead>
<tr>
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<th>Hydrologic Group</th>
<th>Design Class</th>
<th>Slope %</th>
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### Highland Wind Project

#### Limit of Excavation

**LIMIT OF EXCAVATION = 24"**

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<th>Hydrologic Group</th>
<th>Design Class</th>
<th>Slope %</th>
<th>Limiting factor</th>
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#### Limit of Excavation

**LIMIT OF EXCAVATION = 24"**

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**SOIL PROFILE/CLASSIFICATION INFORMATION**

Detailed Description of Subsurface Conditions at Project Sites

**SOIL DESCRIPTION AND CLASSIFICATION**

**Exploration Symbol:**

- TP-24
  - Test Pit
  - Boring

**Texture**

<table>
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<th>LOAM</th>
<th>FINE SAND</th>
<th>LOAMY SAND</th>
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<tbody>
<tr>
<td>10YR 3/2 VERY DARK</td>
<td>10YR 6/1 LIGHT BROWN</td>
<td>10YR 6/1 DARK BROWN</td>
<td>10YR 5/6 YELLOWISH BROWN</td>
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**Consistency**

<table>
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<tbody>
<tr>
<td>FRIABLE</td>
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**Color**

<table>
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<th>SANDY LOAM</th>
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</thead>
<tbody>
<tr>
<td>10YR 3/2 VERY DARK</td>
<td>10YR 6/1 LIGHT BROWN</td>
<td>10YR 6/1 DARK BROWN</td>
<td>10YR 5/6 YELLOWISH BROWN</td>
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**Mottling**

<table>
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<tbody>
<tr>
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**SOIL DESCRIPTION AND CLASSIFICATION**

**Exploration Symbol:**

- TP-25
  - Test Pit
  - Boring

**Texture**

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<tr>
<td>10YR 3/2 VERY DARK</td>
<td>10YR 6/1 LIGHT BROWN</td>
<td>10YR 6/1 DARK BROWN</td>
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**Consistency**

<table>
<thead>
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**Color**

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<tbody>
<tr>
<td>10YR 3/2 VERY DARK</td>
<td>10YR 6/1 LIGHT BROWN</td>
<td>10YR 6/1 DARK BROWN</td>
<td>10YR 5/6 YELLOWISH BROWN</td>
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**Mottling**

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---

**Professional Endorsements**

(as applicable)

**C.S.S.**

- Signature: [Signature]
- Date: 9/18/09
- License #: 397

**L.S.E.**

- Signature: Michael Glessner
- Date: 9/18/09
- License #: 397

---

Stantec Consulting
### Project Name: Highland Wind Project
### Applicant Name: Highland Wind LLC
### Project Location: Highland Plantation, ME

#### SOIL DESCRIPTION AND CLASSIFICATION

**SOIL PROFILE/CLASSIFICATION INFORMATION**

*Detailed Description of Subsurface Conditions at Project Sites*

<table>
<thead>
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<th>Test Pit</th>
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<td>TP-23</td>
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#### SOIL DESCRIPTION AND CLASSIFICATION

<table>
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<th>Depth Below Mineral Soil Surface (Inches)</th>
<th>Texture</th>
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#### Soil Series / phase name:

- **Hydric**: Slope % 8-15, Limiting Factor 19", Ground water restrictive layer, Bedrock
- **Non-hydric**: Slope % 15-25, Limiting Factor 9", Ground water restrictive layer, Bedrock

#### Soil Classification:

- **Profile**: Drainage Class, Design Class
- **Drainage Class**: Hydric, Non-hydric
- **Design Class**: Hydric, Non-hydric

#### Professional Endorsements

- **C.S.S.**
  - Signature: Michael Glessner
  - Date: 9/17/09
  - License #: 397
  - Affix professional seal

- **L.S.E.**
  - Signature: Michael Glessner
  - Date: 9/17/09
  - License #: 397
  - Affix professional seal
### Highland Wind Project

**Project Name:** Highland Wind Project  
**Applicant Name:** Highland Wind LLC  
**Project Location (municipality):** Highland Plantation, ME

#### Detailed Description of Subsurface Conditions at Project Sites

<table>
<thead>
<tr>
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<th><strong>Boring</strong></th>
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<td><strong>Color</strong></td>
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<td>7.5YR 4/6</td>
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<td>7.5Y 5/6</td>
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**LIMIT OF EXCAVATION = 17”**

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<td>FINE SANDY LOAM</td>
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<td>7.5YR 4/6</td>
<td>BROWN</td>
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<tr>
<td>SOMETHAT FIRM</td>
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**LIMIT OF EXCAVATION = 20”**

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</tr>
<tr>
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**LIMIT OF EXCAVATION = 17”**

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<tr>
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<td>BROWN</td>
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<td>SOMETHAT FIRM</td>
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**LIMIT OF EXCAVATION = 20”**

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<thead>
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<th>Texture</th>
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<th>Mottling</th>
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<td>SOMETHAT FIRM</td>
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<td>YELLOWISH BROWN</td>
</tr>
</tbody>
</table>

### Professional Endorsements (as applicable)

**C.S.S.**

- **signature:**  
  - **Name printed/typed:**  
  - **License #:**

**L.S.E.**

- **signature:**  
  - **Name printed/typed:** Michael Glessner  
  - **License #:** 397  
  - **Affix professional seal**
### SOIL PROFILE/CLASSIFICATION INFORMATION

#### Detailed Description of Subsurface Conditions at Project Sites

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Applicant Name:</th>
<th>Project Location (municipality):</th>
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</thead>
<tbody>
<tr>
<td>Highland Wind Project</td>
<td>Highland Wind LLC</td>
<td>Highland Plantation, ME</td>
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#### Soil Description and Classification

**SOIL DESCRIPTION AND CLASSIFICATION**

- **Exploration Symbol:** TP-13  
- **Test Pit:** Boring

<table>
<thead>
<tr>
<th>Layer</th>
<th>Texture</th>
<th>Consistency</th>
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<th>Mottling</th>
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</table>

**LIMIT OF EXCAVATION = 18"**

- **Slope %:** 25-40  
- **Limiting factor:** >18"  
- **Soil Series / phase name:** Drainage Class Hydric Group  
- **Soil Classification:** Profile Drainage Class Design Class

---

**SOIL DESCRIPTION AND CLASSIFICATION**

- **Exploration Symbol:** TP-14  
- **Test Pit:** Boring

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<tr>
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**LIMIT OF EXCAVATION = 24"**

- **Slope %:** 0-3  
- **Limiting factor:** 19"  
- **Soil Series / phase name:** Drainage Class Hydric Group  
- **Soil Classification:** Profile Drainage Class Design Class

---

**SOIL DESCRIPTION AND CLASSIFICATION**

- **Exploration Symbol:** TP-15  
- **Test Pit:** Boring

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**LIMIT OF EXCAVATION = 28"**

- **Slope %:** 0-3  
- **Limiting factor:** 6"  
- **Soil Series / phase name:** Drainage Class Hydric Group  
- **Soil Classification:** Profile Drainage Class Design Class

---

**SOIL DESCRIPTION AND CLASSIFICATION**

- **Exploration Symbol:** TP-16  
- **Test Pit:** Boring

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**LIMIT OF EXCAVATION = 30"**

- **Slope %:** 0-3  
- **Limiting factor:** 6"  
- **Soil Series / phase name:** Drainage Class Hydric Group  
- **Soil Classification:** Profile Drainage Class Design Class

---

**Professional Endorsements (as applicable)**

**C.S.S.**

- **signature:** Michael Glessner  
- **Lic.#:** 397  
- **Date:** 9/17/09

**L.S.E.**

- **signature:**  
- **Lic.#:**  
- **Date:**  

*Stantec Consulting*
SOIL PROFILE/CLASSIFICATION INFORMATION

Detailed Description of Subsurface Conditions at Project Sites

Project Name: Highland Wind Project
Applicant Name: Highland Wind LLC
Project Location (municipality): Highland Plantation, ME

SOIL DESCRIPTION AND CLASSIFICATION

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LIMIT OF EXCAVATION = 22" 

SOIL DESCRIPTION AND CLASSIFICATION

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LIMIT OF EXCAVATION = 23" 

SOIL PROFILE/CLASSIFICATION INFORMATION

Detailed Description of Subsurface Conditions at Project Sites

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SOIL PROFILE/CLASSIFICATION INFORMATION

Detailed Description of Subsurface Conditions at Project Sites

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SOIL PROFILE/CLASSIFICATION INFORMATION

Detailed Description of Subsurface Conditions at Project Sites

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Professional Endorsements (as applicable)

C.S.S.: 
signature: __________________________
name printed/typed: Michael Glessner
Lic.#: 397

L.S.E.: 
signature: __________________________
name printed/typed: Stantec Consulting
Lic.#: __________________________

PAGE 3
## Soil Profile/Classification Information

### Detailed Description of Subsurface Conditions at Project Sites

<table>
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<th>Depth Below Mineral Soil Surface (inches)</th>
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<th>Limiting Factor</th>
<th>Slope %</th>
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### Soil Description and Classification

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<th>Color</th>
<th>Mottling</th>
<th>Texture</th>
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<tbody>
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<tr>
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<td>FINE SANDY LOAM</td>
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<td>7.5YR 5/6 STRONG BROWN</td>
<td>DARK BROWN</td>
</tr>
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</tbody>
</table>

### Professional Endorsements

**C.S.S.**
- C.S.S. Name: Michael Glessner
- Date: 9/17/09
- Signature: [Signature]

**L.S.E.**
- L.S.E. Name: [Name]
- Date: [Date]
- Signature: [Signature]
- License #: [397]

Stantec Consulting
### Highland Wind Project

- **Project Name:** Highland Wind Project
- **Applicant Name:** Highland Wind LLC
- **Project Location (municipality):** Highland Plantation, ME

#### SOIL PROFILE/CLASSIFICATION INFORMATION

**Detailed Description of Subsurface Conditions at Project Sites**

<table>
<thead>
<tr>
<th>Soil Series / phase name:</th>
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<th>Design Class</th>
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**SOIL DESCRIPTION AND CLASSIFICATION**

- **Exploration Symbol:** TP-1
- **Test Pit:**
- **Boring:**

<table>
<thead>
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<th>Texture</th>
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<th>Mottling</th>
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<tr>
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<td>VERY DARK GRAY</td>
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<td>LOAMY SAND</td>
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<td>MANY, COARSE, DISTINCT</td>
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</tbody>
</table>

**DEPTH BELOW MINERAL SOIL SURFACE (Inches):**

- **LIMIT OF EXCAVATION = 27”**

<table>
<thead>
<tr>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE OBSERVED</td>
</tr>
</tbody>
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#### SOIL DESCRIPTION AND CLASSIFICATION

- **Exploration Symbol:** TP-2
- **Test Pit:**
- **Boring:**

<table>
<thead>
<tr>
<th>Texture</th>
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</thead>
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<tr>
<td>SILT LOAM</td>
<td>FRIABLE</td>
<td>7.5Y 3/3</td>
<td>NONE OBSERVED</td>
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<tr>
<td>LOAMY SAND</td>
<td>7.5Y 3/3</td>
<td>DARK BROWN</td>
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**DEPTH BELOW MINERAL SOIL SURFACE (Inches):**

- **LIMIT OF EXCAVATION = 22”**

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</thead>
<tbody>
<tr>
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#### SOIL DESCRIPTION AND CLASSIFICATION

- **Exploration Symbol:** TP-3
- **Test Pit:**
- **Boring:**

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<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
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<td>FRIABLE</td>
<td>7.5Y 3/3</td>
<td>GREY</td>
</tr>
<tr>
<td>SANDY LOAM</td>
<td>5Y 5/3</td>
<td>DARK BROWN</td>
<td></td>
</tr>
<tr>
<td>OLIVE BROWN</td>
<td>2.5Y 4/4</td>
<td>LIGHT OLIVE BROWN</td>
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</table>

**DEPTH BELOW MINERAL SOIL SURFACE (Inches):**

- **LIMIT OF EXCAVATION = 22”**

<table>
<thead>
<tr>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE OBSERVED</td>
</tr>
</tbody>
</table>

#### SOIL DESCRIPTION AND CLASSIFICATION

- **Exploration Symbol:** TP-4
- **Test Pit:**
- **Boring:**

<table>
<thead>
<tr>
<th>Texture</th>
<th>Consistency</th>
<th>Color</th>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOAMY SAND</td>
<td>FRIABLE</td>
<td>7.5Y 3/3</td>
<td>LIGHT YELLOWISH</td>
</tr>
<tr>
<td>FINE SANDY LOAM</td>
<td>2.5Y 6/4</td>
<td>BROWN</td>
<td></td>
</tr>
</tbody>
</table>

**DEPTH BELOW MINERAL SOIL SURFACE (Inches):**

- **LIMIT OF EXCAVATION = 27”**

<table>
<thead>
<tr>
<th>Mottling</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONE OBSERVED</td>
</tr>
</tbody>
</table>

---

**Professional Endorsements (as applicable):**

- **C.S.S.:**
  - **signature:**
  - **name printed/typed:**
  - **Lic.#:**
  - **Date:**

- **L.S.E.:**
  - **signature:**
  - **name printed/typed:** Michael Glessner
  - **Lic.#:**
  - **Date:** 9/17/09

**Stantec Consulting**
APPENDIX E

Glossary Of Soil Terminology

Depth Classes

These refer to the depth of the particle control section used to describe the central concept of each taxonomic unit. These are as follows:

- Very shallow: less than 10” to bedrock
- Shallow: 10” to 20” to bedrock
- Moderately deep: 20” to 40” to bedrock
- Deep: 40” to 60” deep
- Very deep: greater than 60”

Drainage Class

Drainage class is a reference to the frequency and duration of periods of soil saturation and/or action by seasonal groundwater tables, as evidenced by soil morphologic features identified within each respective soil profile.

Seven classes of soil drainage are recognized:

- Excessively drained: water is removed from the soil very rapidly. These are commonly very coarse-textured, rocky or shallow. All are free of soil mottling related to wetness.
- Somewhat excessively drained: water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy-textured and very pervious/porous. Some are shallow. Some occur on steep slopes where much of the water they receive is lost as runoff. These too are free of observed mottling due to wetness.
- Well drained: Water is removed from the soil readily, but not rapidly. It may be available for plant growth at the deepest rooting depths, and not so wet as to inhibit the growth of plant roots for significant periods during most growing seasons. Well drained soils are often medium textured, or contain restrictive subhorizons generally below 24”. They are mainly free of mottling related to wetness.
- Moderately well drained: water is removed from the spoils somewhat slowly during wet periods and spring
seasons. Moderately well drained soils are saturated in the upper soil profile for short duration during the growing season. Often, they contain a slowly pervious (or restrictive) layer beneath the solum, and may receive additional runoff from upslope areas.

**Somewhat poorly drained** water is removed so slowly that the soil is wet for significant periods during the growing season. Somewhat poorly drained soils commonly have an impervious substratum that contributes to a perched water table, additional water through sideslope seeps, long continuous sheet flows below large watershed areas with few or no outlets, or a combination of these together.

**Poorly drained** water is removed from these soils so slowly that the soil is saturated during the growing season or remains wet for long durations. Water is present during the growing season which may be prohibitive to plant root growth, due to anaerobic/saturated conditions. These soils are classified as hydric, and may also have implications as wetlands.

**Very poorly drained** water is removed from these soils so slowly that free water can be observed at or very near the mineral soil surface for long durations during the growing season. These commonly occur on nearly level slopes or in depressional areas, and can be frequently ponded. Often they include thick organic surface horizons.

**Hydrologic Soil Groups**

A hydrologic soil group is a class of numerous soil series that all have the same runoff potential under similar climate and vegetative conditions. Soil properties that can influence runoff are those that affect minimum infiltration rates for a bare soil after prolonged wetting and with no frozen ground surface. Most important are depth to seasonal high groundwater table, permeability rates after prolonged wetting, and depth to slowly permeable (restrictive) layer.

**Permeability**
Permeability is the soil property which enables water to move downward through the soil profile. It is measured as the number of inches per hour of water that can be added to a particular soil as it moves downward through the unsaturated soil. Terminology and ranges are as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very slow</td>
<td>less than 0.06 in./hr</td>
</tr>
<tr>
<td>Slow</td>
<td>0.06 to 0.20 in./hr</td>
</tr>
<tr>
<td>Moderately slow</td>
<td>0.20 to 0.60 in./hr</td>
</tr>
<tr>
<td>Moderate</td>
<td>0.6 to 2.0 in./hr</td>
</tr>
<tr>
<td>Moderately rapid</td>
<td>2.0 to 6.0 in./hr</td>
</tr>
<tr>
<td>Rapid</td>
<td>6.0 to 20 in./hr</td>
</tr>
</tbody>
</table>

**Soil Erodibility (K Factor)**

The measure of soil erodability, or K factor, is the susceptibility of a soil particle to detachment and transport by rainfall. K factors for soil in Maine vary from 0.02 to 0.69. The higher the value, the more susceptible the named soil is to sheet or rill erosion by water.

Soil properties which influence erosion are those that can affect infiltration rates, movement of water through the soil profile and the water storage capacity of a soil. Other soil properties can affect the dispersion and mobility of soil particles by rainfall ad/or runoff. Some of the most important of these properties include soil layer, and the size and stability of the soil structural aggregates in the exposed faces of subsoils. Background levels of soil moisture and the presence of frozen soil horizons also can influence erosion.

**Soil Texture**

Soil texture refers to the USDA classification for the relative proportions by weight of the several soil particle size classes that are finer than 2 millimeters in diameter, which form the fine earth fraction. (Materials larger than 2 mm. in diameter are considered rock fragments).

Soil texture can influence on plant growth, or the soil mechanics of a particular site when used as construction and/or backfill material for foundations, etc. It influences such physical properties as load bearing strength, permeability, shrink/swell potential (frost action or due to wetness), compressibility and compaction. Rock fragment size and content can also affect applications for use as construction materials.

**Soil Texture Modifiers**
Named soil texture classes can be further modified by the addition of appropriate adjectives when rock fragment content approaches 15% by volume (i.e. gravelly sandy loam). “Mucky” or “peaty” are modifying terms used when organic matter content reaches 40% (i.e. mucky silt/loam).

Surface Runoff

Surface runoff is water that flows away from the soil over the surface of the site without infiltrating into the ground surface. It may originate from precipitation, or as drainage water from adjacent, upslope areas. The rate and amount of runoff are affected by internal physical characteristics of the soil as well as slope gradient ranges and landform shape (i.e. concave vs. convex slopes). Runoff can be significantly different on a given soil under natural vegetation, cultivation by man, or other kinds of management. Runoff from a particular site can also be affected by other factors such as rainfall amounts, snow pack accumulation or other climatic fluctuations. Surface runoff is usually significantly greater on frozen ground surfaces.

Six categories for runoff rates are provided:

**Ponded**
Little or none of the precipitation and run-on (from surrounding, higher elevations) escapes the site as runoff. Free water stands on or above the existing soil surface for significant periods of time. Ponding normally appears on level to nearly level (i.e. <3%) slopes, in depressions or within concavities in a pit/mound micro-relief topography. Water depth may vary considerably throughout the year, or from year to year. Often this is consistent with very poorly drained soils.

**Very slow**
Surface water flows away slowly, and free water may be present at the soil surface for portions of the year, or may infiltrate slowly into the soil surface when not ponded. These soils may be consistent with very poorly drained, or poorly drained soils that are coarser textured and somewhat porous.

**Slow**
Surface water flows away from the soil quickly enough, either due to slope or the porosity of the soils, so that free water can be observed at the soil surface for moderate periods immediately following spring snowmelt or prolonged storm rainfall events. Most of the water passes through the soil, is used by plants, or evaporates.

**Medium**
Surface water flows away quickly enough due to slope or soil porosity that water is observed at or near the soil surface for short durations, usually during spring snowmelt or immediately following significant storm rainfall events.

**Rapid**
Surface water flows away quickly enough that any period of saturation is brief, and free water does not stand on the soil
surface. Only a small portion of the water enters the soil as infiltration, either due to steep slopes and/or fine textures with slow rates of absorption.

**Very rapid**

surface water flows away so quickly that duration of any event is brief, and water never stands on the soil surface. Only a very small portion of the available moisture enters the soil as infiltration.

### ADDITIONAL SOIL TERMS

**Flooding (Hazard to flooding)**

Flooding is the temporary covering of the soil surface by flowing water from any source, including but not limited to: streams or rivers overflowing their banks, runoff from adjacent or upslope areas, inflow from high tide action, or a combination of sources. Water due to snowmelt is excluded from this definition, as is standing or ponded water that forms a permanent or semi-permanent cover above the soil surface.

Flooding hazard is further expressed by frequency classes, duration, and the time of year that the flooding occurs. The velocity and depth of the floodwater are also important factors.

**Oxyaquic**

Soil drainage conditions that imply soil saturation for prolonged periods, which are rich in dissolved oxygen and therefore do not exhibit the anaerobic conditions necessary to create hydric soil morphology.

**Ponding**

Ponding is standing water in a closed depression. The water is removed only by evaporation, transpiration by plants, or percolation through the ground.

**Soil complex**

A map unit that consist of two or more kinds of soils (i.e. soil series/taxonomic unit) that occur on a non-regular, non-repeating pattern that cannot be separated out at the scale provided. The order of the soils named are generally in order of predominance within the map unit.

**Soil map unit**

A collection of soils or soil areas that are delineated during soils mapping. It generally is an aggregate of several soil entities with a predominant named soil type. Kinds of soil map units may include complexes, consociations, or associations.

**Soil slope gradient range**
The slope identified for any given map unit, based on the immediate topography within a specific portion of the mapping site. Designations generally are as follows:

A  0-3%  nearly level to level
B  3-8%  gently sloping
C  8-20%  moderately sloping
D  20%+  steeply sloping

Stoniness  This is a phase of surface characteristic that may be identified in soils mapping, ranging from stony or bouldery (0.01 to 0.1% of soil surface covered with stones) to rubbly or rubble land, in which up to 75% of the soil surface is covered with stones. Extremely stony sites or sites with rubble land may have additional limitations for use of mechanized equipment.

Stony  The areas have enough stones at or near the surface to be a continuing nuisance during operations that mix the surface layer, but they do not make most such operations impractical. Conventional, wheeled vehicles can move with reasonable freedom over the area. Stones may damage both the equipment that mixes the soil and the vehicles that move on the surface. Usually these areas have Class 1 stoniness. If necessary in a highly detailed survey, these areas may be designated as “slightly stony” and “moderately stony”.

Very Stony  The areas have so many stones at or near the surface that operations which mix the surface layer either require heavy equipment or use of implements that can operate between the larger stones. Tillage with conventionally powered farm equipment is impractical. Wheeled tractors and vehicles with high clearance can operate on carefully chosen routes over and around the stones. Usually, these areas have Class 2 stoniness.

Extremely Stony  The areas have so many stones at or near the surface that wheeled power equipment, other than some special types, can operate only along selected routes. Tracked vehicles may be used in most places, although some routes have to be cleared. Usually, these areas have Class 3 stoniness.

Rubbly  The areas have so many stones at or near the surface that tracked vehicles cannot be used in most places. Usually, these areas have class 4 or 5 stoniness. If necessary in a highly detailed survey, they may be designated as “rubbly” and “very rubbly”.
If the soil has stones, boulders, and smaller fragments, the name includes the kind of rock fragment that are most limiting in the use or management of the soil. This is not necessarily the kind that is most abundant or the kind that is used to modify texture class of horizons in the profile description.
APPENDIX F

Photographs
HIGHLAND WINDPOWER PROJECT
PHOTOGRAPHS

Photo 1: Existing Transmission Line 6.5 miles +/- from Wyman Dam (Extremely Stony).

Photo 2: Dry DEP stream channel near Test Pit 134.
Photo 3: Fractured bedrock escarpment near Test Boring 179.
Photo 4: Portion of existing access road to westerly turbines.

Photo 5: Mahoosuc soil surface near Test Pit 189.
Photo 6: Mile 6 of existing transmission line viewed toward east.
Photo 7: Houston Brook on existing Transmission Line south of Rowe Pond Road.
Photo 8: Shallow to bedrock outcropping with thin layer of organic Rock Outcrop/Ricker land form.
Photo 9: Test Pit 11, Rawsonville, sandy loam textured soil greater than 20 inches but less than 40 inches to bedrock.
Photo 10: Test Pit 14, *Ricker*, shallow organic horizon overlying bedrock.
Photo 11: Test Pit 115 Dixfield/Skerry.
Photo 12: Test Pit 114 Abram, shallow to bedrock sandy loam soil overlying bedrock less than 10 inches in depth.