3. PROPERTY LOCATION. Provide the following details about your property location. Tax plan and lot numbers are listed on your property tax bill. Book and page numbers are listed on your deed. If you lease your property, check your lease to find out whether any unique lease lot numbers have been assigned to the property.

Township, Town or Plantation T6R6 WELS, Maine	County Penobscot
If your property is located in one of the following Prospectively Zoned Plantations or Townships, please contact the LUPC office that serves your area prior to completing this form: Adamstown Twp., Dallas Plt., Lincoln Plt., Magalloway Plt., Rangeley Plt., Richardsontown Twp., Sandy River Plt., Township C, Township D, or Township E.	
Tax Information *(check tax bill)* Map:1 Plan: Lot: 2 Map: Plan: Lot: Map: Plan: Lot:	Deed or Lease Information *(check deed or lease)* Book:14672 Page:27 Lease #: Book: Page: Lease #:
Lot size 7,145 Acres *(in acres, or in square feet if less than 1 acre)*	**Lot Coverage** *(in square feet)*
All Current Zoning on Property *(check the appropriate LUPC map)* **M-GN, P-GP, P-WL1,P-WL-2, P-WL3, P-SG, P-SL2**	**Current Zoning at Development Site: M-GN**
Road Frontage. List the name(s) and frontage(s) (in feet) for any public or private roads, or other rights-of-way adjacent to your lot: Road #1 NA Frontage ft. Road #2 Frontage	**Water Frontage.** List the name(s) and frontage(s) (in feet) for any lakes, ponds, rivers, streams, or other waters **on** or **(&) adjacent** to your lot: Waterbody #1 Pickett Mountain Pond Frontage 17,300 ft. Waterbody #2 Pleasant and Mud Lakes Frontage 48,860 ft.
Provide, as **EXHIBIT A**, a location map. See page iv of the instructions for more detail regarding this exhibit. Provide, as **EXHIBIT B**, your deed, lease or easement. See page iv of the instructions for more detail regarding this exhibit.	

4. PROJECT DESCRIPTION. Provide a brief summary of your proposal, including a general description of the project, including proposed development, number of lots (if applicable), roads, and land use activities.

The proposed development includes construction of facilities necessary for development, operation and closure of an underground metallic mineral mine. Access to the mine operations area will be by existing gravel roads that will be subject to ongoing maintenance and improvements for safety. The area to be rezoned from a General Management (M-GN) to a Planned Development (D-PD) subdistrict encompasses approximately 528.2 acres. Impervious surfaces represent a total of 17.5% of the proposed footprint and 1.3% of the wholly owned 7145 acre parcel. Building structures represent an area of 2.8 acres, lined facilities and impervious areas represent an area of 89.7 acres (including 78.4 acres for a lined tailings facility). An additional 22.8 acres outside of the proposed boundary is required for access road upgrades. The total impacted or cleared area within the proposed boundary for rezoning is 105.7 acres. The total impacted area including access road upgrades leading to the property is 128.5 acres.

The project will be completed in four phases:

Phase 1 Permitting

Phase 2 Construction

Phase 3 Operations

Phase 4 Restoration, Reclamation and Monitoring

Proposed Zoning. List all proposed zoning designations (contact the LUPC office that serves your area if you have questions).

If your proposal includes rezoning lands to or from one of the following subdistricts, be sure to provide as **EXHIBIT G,** the necessary documentation, data, and/or maps that support the proposed change:

Aquifer Protection (P-AR) Subdistrict;
Fish and Wildlife Protection (P-FW) Subdistrict;
Soil and Geology Protection (P-SG) Subdistrict; or
Wetland Protection (P-WL) Subdistrict

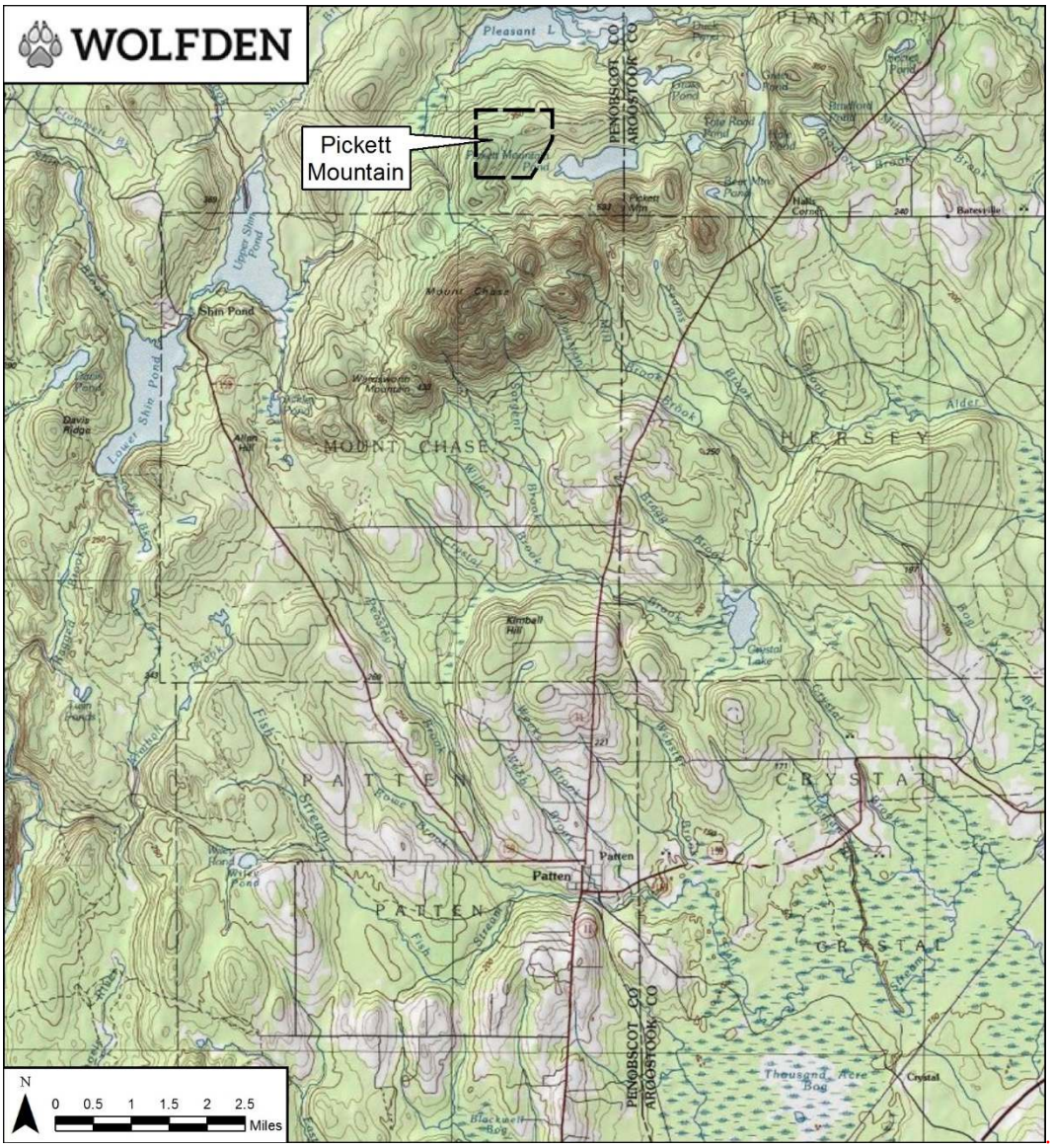
See page v of the instructions for more detail regarding this exhibit.

Proposed Project Name *(if applicable)* ***Pickett Mountain Mine***

Project Description

Wolfden Mt. Chase LLC (Wolfden) is requesting a subdistrict change to a 528.2 acre area of land that is currently within a General Management subdistrict in order to allow for construction, mining, milling, closure and reclamation activities to occur over an estimated duration of 10-15 years. This specific area is required for subdistrict change due to the nature of mining operations. The geological resource has been identified in this location and in order to safely, and responsibly extract the minerals, the project site is fixed. The design takes advantage of topographic relief in a manner that supports future closure of the property with little impact to the original landscape.

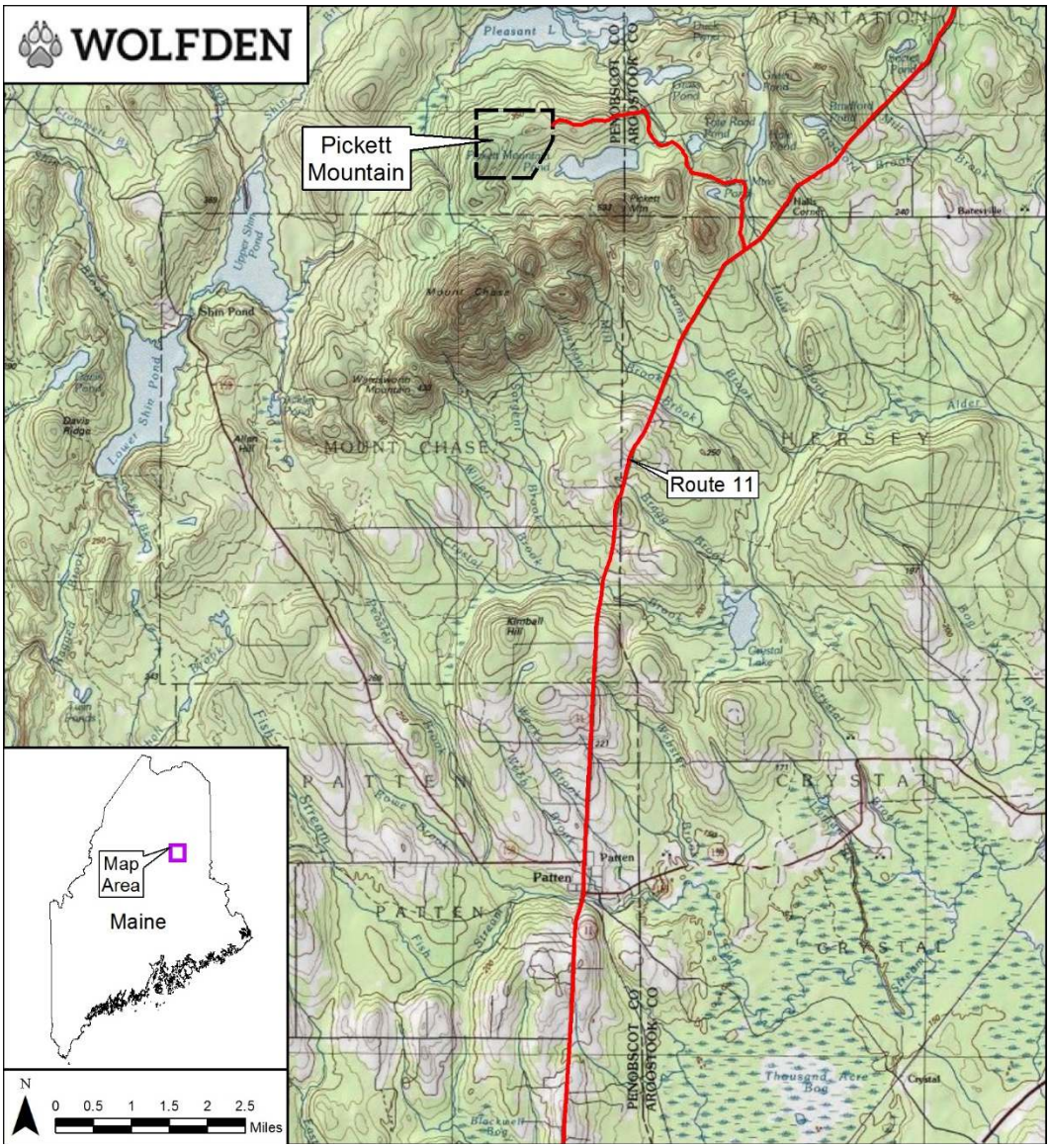
The project has been named Pickett Mountain and is located north of Patten bordering both Penobscot and Aroostook Counties as shown in the following location map.



Location Map of Proposed Project

Access to the project site is via an existing logging road. The road is constructed in a manner that is sufficient to support the concentrate truck fleet, as well as delivery logistics and employee traffic. The road width currently ranges between 12-15 feet based on Maine DOT "Lane Width and Shoulder Width – C1" dated November 10/2010, a minimum road with of a HCP 6 roadway with a speed limit of less than 40 mph is 11 – 12 feet with a 1-

3 feet shoulder per lane for a total minimum of 22-24 feet with a 2-6 feet shoulder. In order to support safe travel of additional traffic, a road expansion of ~8-12 feet to ~24 feet is required over the total road length of 5.1 miles. In addition to the road way expansion, additional clearing of 10' on each side of the road way will take place in areas where visibility is constricted. Finally, 18 feet (inclusive of the 10' visibility clearing) of clearing will be completed along the one side of the access road to accommodate the over head power line. Discussed later in this report.

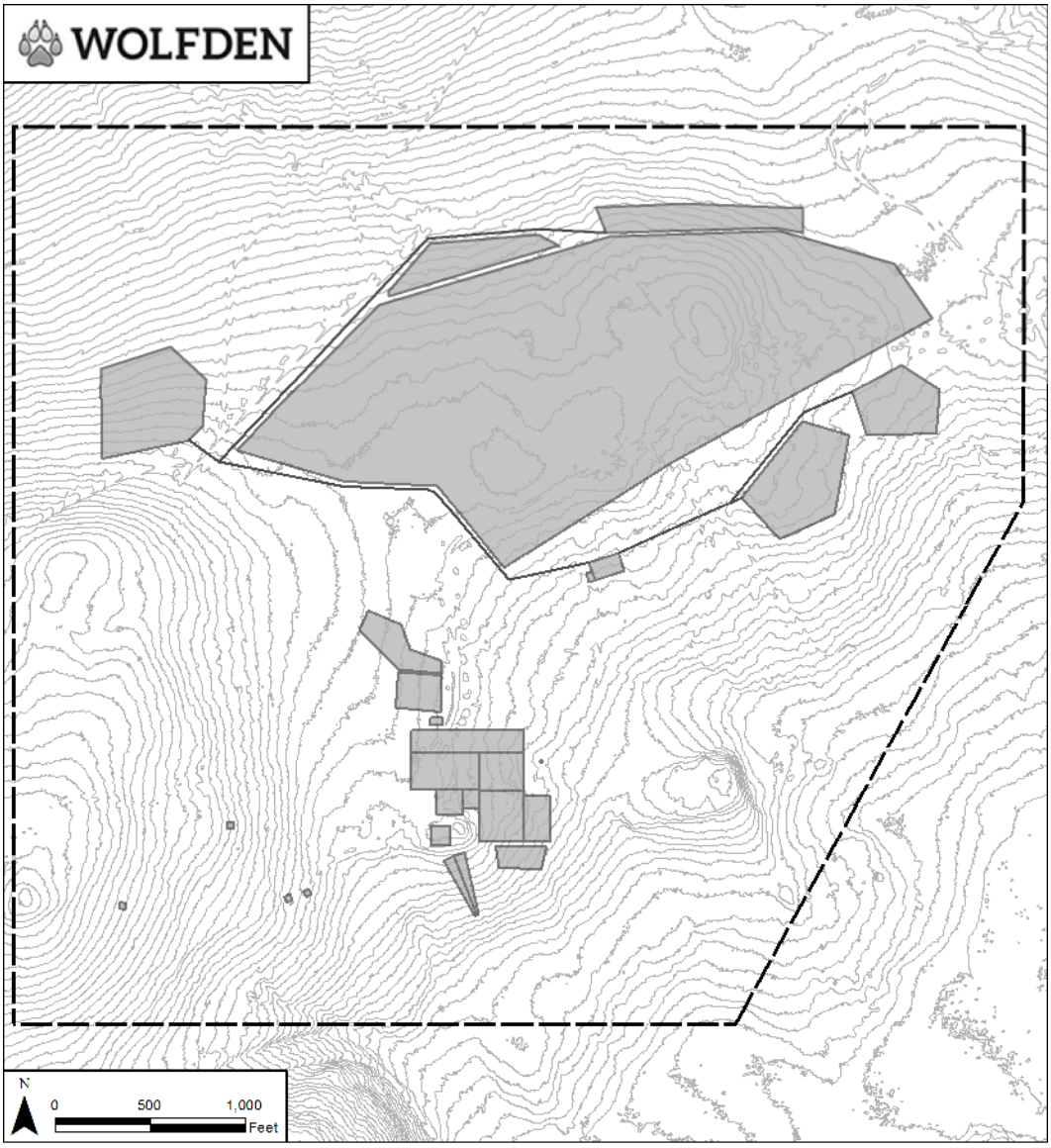


Site Access from Route 11 North of Patten Maine.

Pickett Mountain, is a high-grade base metal deposit primarily composed of Zinc, Lead, Copper, Silver and Gold as economic minerals of interest. The intended process is to excavate valuable in-situ minerals (ore) from underground via drilling and blasting into manageable sized fragments that can be loaded into underground trucks and hauled to surface to be stored on a temporary stockpile for milling (crushing and grinding to a fine dust) and concentrating. Milling and concentrating with occur continuously at a nominal rate of 1000 tonnes per day (tpd). The concentrator will use flotation technology to separate the valuable minerals (concentrate) from the non-valuable minerals (tailings). Three concentrates will be produced in sequence; copper, lead then zinc, with each dewatered and stored separately for transportation to a selected smelter outside the State of Maine. Transportation will be facilitated using truck and trailer combinations with optimized capacity for the amount of

concentrate produced. Waste byproduct (Tailings) will be dewatered and thickened into a "tacky sand" consistency and delivered via trucks and dozers to an approved Tailings Management Facility (TMF) where they can be shaped and contoured. Water from the dewatering of the tailings and concentrates will be recirculated in the processing plant. The TMF will be lined in such a way as to ensure that any decant water, precipitation, or other water introductions will be collected and not allowed to come in contact with the water table below. The total footprint of the TMF is expected to be approximately 78.4 acres built in 5 sections sequentially over the life of the operation. Each section shall be ~15 acres and will be operated and then closed as the section opens in order to manage the reclamation process on an ongoing basis and minimize risks and exposure. All water collected from the TMF will be and pumped back into the milling circuit described above along with some make up water. The milling process is expected to have a net negative water balance, such that some fresh ground water will be required to keep the entire milling and concentrating process working and none of these waters will be discharged to the environment.

A series of ancillary activities will be required to support the project. These include electrical generation/distribution, maintenance/mechanical support, security, water management and treatment, warehousing and procurement, accounting, human resources management, health and safety management, environmental management and community relations. All ancillary activities will occur on the project site. The conceptual location of each of these activities is shown in the following figure. The building designations, including their functions and approximate sizes and types are identified in Exhibit D-2. The tallest structure on the project site will be the concentrator building at an estimated 60 feet tall.



Conceptual Location of Buildings and Facilities

The project will also, separate from this Petition, establish a new power transmission service line to supply additional needed electrical power for the project.

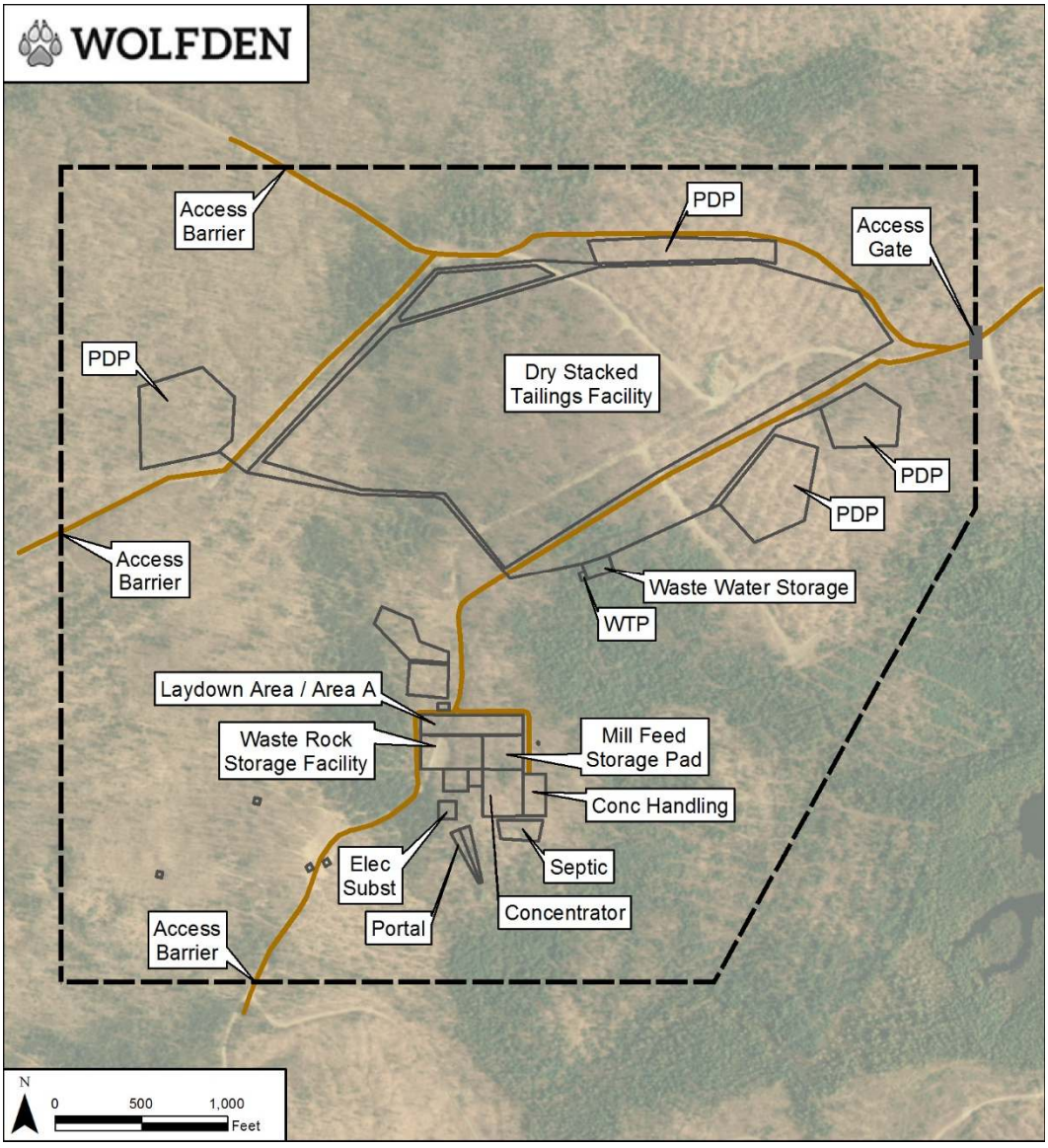
The power transmission route has been discussed with Emera Maine and would run from their substation located on Route 11, located approximately 0.6 miles south of downtown Patten, Maine. The transmission line would run north and northeast along Route 11 for approximately 9.5 miles then follow the same gravel access road proposed for the mine for approximately 5.1 miles. The corridor width for the power transmission route is considered in the forecasted road width and is 18 feet in addition to the shoulder of the proposed expanded roadway. Main transmission powerlines will be managed by Emera to a termination point at the main substation on the property. The main site power infrastructure will be managed by employees and contractors hired by the company. The estimated footprint of the main substation area is 10,000 square feet and it is identified on the following map west of the access road.

Access to the property will be managed by a series of fixed barricades at each road access to the property as well as a stationed security facility and traffic gate at the east boundary of the re-zoned property as shown in the following image. "Danger" and "No Unauthorized Entry" signs will be posted around the perimeter of the property boundary within visual distance of any point of the boundary. The boundary will not be fenced at any

point of the project life. Security will be hired through contract for 24 hour per day/ 7 day per week coverage. Within the property, the explosives are stored in locked facilities with regular logging of activity and management of supply. Once the mine has been developed substantially, the explosives are then stored in an excavation specifically designed to contain explosives and managed by specifically assigned employees. Explosives will be managed per federal and state regulations.

All high voltage electrical infrastructure is fenced in or otherwise enclosed to ensure access is restricted to trained employees only.

Signage throughout the site will be posted to notify all people access requirements such as personal protective equipment and training.



Security and Fixed Barrier Locations

The life of the project can be broken down into four phases. Permitting, Construction, Production and, Reclamation/Remediation. Each of these phases will occur sequentially however the latter three phases will also overlap to ensure smooth transitions, including concurrent reclamation, as described below.

Phase 1 – Permitting:

The permitting steps for this project under chapters 10, 12 and 13 of the LUPC's rules and DEP's Chapter 200 rules are as follows:

- Rezoning for appropriate land use.

The land that the Picket Mountain deposit is located on is currently zoned as General Management subdistrict (M-GN). For construction, operating and rehabilitation work to take place, it must be rezoned to a Planned Development subdistrict (P-DP) which allows for development work outside of standard development. The process of rezoning is to:

- Establish a conceptual project plan.
- Submit a rezoning petition outlining the details and potential impacts of the plan.
- Confer with the LUPC and public identifying all opportunities and risks and mitigation plans to address risks.
- Receive the LUPC's approval of the rezoning petition.

Once the land has been rezoned for project development, a mining permit application may be submitted to the DEP. The following steps would be taken as part of submitting a mining permit application for approval:

- Design of the baseline study work for environmental, biological, and archeological status of the property.
- Review and approval of the baseline work with the DEP.
- Complete baseline study work for environmental, biological, and archeological status of the property.
- Submit the baseline study results as well as detailed construction, operation, and reclamation plans for the life of the project including the project outcomes such as economics and anticipated impacts on the environment, population, economy, infrastructure, etc.
- Receive DEP's conditional approval of the mining permit application.

Phase 2 - Construction:

Upon completion and approval of the mining permit application, the project may move forward to construction. Construction of the Pickett Mountain Mine project will include the following activities (not necessarily in this order):

- Removal of trees and grub the land to be used will happen throughout the construction on an as needed basis to ensure no over stripping of land.
- Construction of roadways to various locations at site.
- Construction of mineralized and waste rock pads.
- Installation of temporary explosives magazines (Rental from supplier).
- Installation of ground and surface water monitoring locations.
- Installation of air monitoring systems.
- Construction of the water management ponds and discharge structures.
- Construction of the water treatment facility.
- Construction of temporary shop facility.
- Excavation of the mine portal and installation of temporary mining services (compressed air, power generation, ventilation, process water).
- Commence mining development.

- Excavation of ventilation raise to surface.
- Installation of potable water system.
- Installation of security infrastructure.
- Installation of mine offices and dry facility (Change house).
- Installation of warehouse and laydown area.
- Installation of electrical substation
- Tie in electrical infrastructure to newly installed grid (Completed by others)
- Construction of TMF stage 1.
- Construction of concentrator and supporting facilities.
- Construction of permanent shop facility.

Grubbed material will be managed on-site. Most of the timber and stumps are small, and to the extent timber removed has limited or no economic value, it will be chipped on-site for use as erosion control materials, including stumpage. Stumps too large for chipping will be stored with the organic topsoils in a pen less than one acre and allowed to decompose until used at the end of the project during reclamation.

Waste materials during construction such as excess concrete are sent back to the supplier for proper management.

Construction will typically utilize as much local or state skill sets as possible and the majority of material used during construction will be sourced locally or within the State of Maine. Specialty skillsets, services, and materials will be sourced externally as required and are expected to include such items as the flotation and ball mill equipment and services within the concentrator, as well as initial or contract mining services. As programs advance through construction, skillsets will be built and trained locally to continuously convert external services to in-state services.

Phase 3 – Operation:

As the site is constructed and the concentrator facilities are finalized, development of underground workings will continue to take place. Waste rock excavated from the mine will be deposited and stored on the surface pad and mineralized material will be stored on the mill feed pad. The mineralized ore will be stockpiled on the pad and used during the commissioning of the concentrator. Upon completion of commissioning of the concentrator, regular operations of mining, crushing, concentration and shipping will commence. During this phase of steady-state operations, significant and continuous training to upskill a local workforce is anticipated related to the mining, processing and support services which are currently estimated to last 8-9 years. Programs in training and education will occur to facilitate a working pool of employees to ensure stability of the operation support of the local workforce.

All activities will occur continuously during the operation phase in order to explore, develop, extract, concentrate and sell minerals from the project. As the project nears final completion, activities will stop sequentially.

Exploration will continue during the operation phase of the project with the intent to define additional reserves for mining and processing through the operation. Activities included in exploration are as follows:

- Diamond Drilling
- Exploration Geology, Geophysics, Mapping, Soil Sampling, Trenching
- Drilling, Core Logging

- Geotechnical Drilling and Logging
- Geological Modelling and Reserve Estimation

Development activities will occur to provide access and service drifts (tunnels) from surface to the deposit. If deeper extensions of the ore deposit are discovered during the mining process, a shaft from surface may be necessary to access and haul ore from these deeper areas. Various types of underground workings include:

- A portal (opening at surface) for the commencement of a ramp (decline) will be used from surface to access the underground workings and act as a haulage route for manpower, materials, rock and ventilation.
- Lateral drifts on each working level connect the ramp to the deposit underground.
- Ventilation raises are near vertical tunnels that are used to provide clean air or exhaust to and from all of the drifts and ramps in order to provide workers with a clean air environment.
- Auxiliary raises/drifts are tunnels used to carry services such as compressed air, process water, dewatering, electrical, secondary and escape routes for the mine.
- Underground infrastructure with short termination (dead-end drifts) include, refuge stations, water collection sumps and pumping stations, electrical distribution substations, material storage areas, remucks (Rock storage areas), explosives storages, and washroom facilities.

Activities used for development will include:

- Horizontal development drilling is typically completed using a hydraulic jumbo drill (carrier mounted drills) and an operator in the larger drifts. Small drifts may be mined by jackleg.
- Vertical or inclined openings may be mined by a jackleg, stoper or wagon drill.
- Blasting is performed using hand-held pneumatic loaders or by hand loading emulsions sticks into the drilled holes. Blasting occurs, typically two to three times per day once everyone is confirmed out of the mine.
- Mucking is a term to describe the removal of the rock (ore or waste) from a development heading typically with a scoop tram (Low profile front end loader). The rock is placed into a low profile truck for haulage to surface or remuck location for further handling.
- Haulage is completed using underground low profile haul-trucks that are loaded by the scoop trams. The trucks are used for hauling rock (ore and waste) out of the mine as well as hauling waste rock and cement back into the mine during the backfilling phase.
- Ground support such bolts, screen/mesh and rebar are typically used as required to ensure rock stability of the walls and roof of the underground workings in order to ensure safety for all workers throughout the project life. This is completed according to an engineering procedure and planning and varies based on type of rock, locations, duration of opening, etc. The tasks included in ground support are drilling holes, installing a steel mesh screen over the rock face and securing it in place using various tendons or "rock bolts".
- In addition to ground support, other underground construction may include cement work, timber work, steel work, plumbing, electrical work, in order to provide necessary services and improve safety.

Extraction/production activities will be continuous and repetitive compared to other activities that take place in the mine. Once various production areas in the mine are prepared, production miners will take over and accomplish the following activities in order to provide ~1000 tonnes per day of ore mill feed material to surface:

- Production drilling at Pickett Mountain will comprise near vertical holes on rings within a production area or panel (stope). These rings are drilled in a distributed grid to effectively distribute explosives throughout the panel for optimized fragmentation of the rocks.
- Blasting practices are similar in process to development but on a larger scale and in vertical holes vs horizontal holes. These activities are typical performed by hand including the loading of explosives into the drilled blast holes.
- Mucking is similar to the development activity. However, mucking for production is sometimes done via remote control in order to reduce the risk of injury to the operator.
- Haulage of ore is similar to the haulage of development rock activity.
- Backfilling is complete after a production area has been completed and there is a significant void left behind to be filled. Backfilling can occur using a scoop tram dumping waste material back into the void. This material is typically waste rock that has been hauled to surface during the development phase.

Concentration of ore mill feed takes place on surface via the concentrator facilities and is described in detail in another section of this Petition. The activities that will occur within the concentrator to separate the valuable minerals from the non-valuable minerals will include the following:

- Comminution is the act of crushing and grinding the ore mill feed material to a fine powder. The grain size of the powder is specifically targeted to liberate or expose the valuable minerals within the rock with the least amount of grinding and energy.
- Flotation is a process that involves mixing several reagents with the ground rock in a series of baths then injecting air bubbles. The chemicals cause the valuable minerals to selectively attach to the bubbles. The bubbles then float to the top of the bath and overflow producing concentrate. The materials that are not selectively floated (sank in the bath) are collected, cleaned and sent to the TMF.
- Reagent mix is completed to ensure that various chemicals within the process are prepared and delivered when and where designed.
- Each of the products generated from the flotation process are thickened to a thick paste then dried to a predetermined specification. This is typically performed by a type of pressure filter.
- Tailings (waste byproduct) is the remaining ground rock that did not float into a valuable concentrate. This material is cleaned and thickened so that it can be stored on surface within an engineered facility in order to mitigate any potential impacts to the environment that could be caused by this material. The full management of tailings is discussed in detail in another chapter of this Petition.

The concentrator will generate three separate concentrates of copper, lead and zinc that will be transported and sold to a smelter for further refinement into metals that can be used by industry. Transportation from Pickett Mountain will be via truck and trailer designed to haul concentrates and hauled on the existing highways infrastructure. A description of this process is described in greater detail further below.

Phase 4 – Reclamation/Remediation

The overall design and operational strategy at Pickett Mountain is to limit and maintain a small environmental impact throughout all phases of the project (construction and operation). For example, as the project generates tailings from production, they will be stored in separate cells, such that a completed cell will be closed and reclaimed while the next cell is in use. A series of three tailings cells will be constructed throughout the project life. Closure of the first cell will be completed after it has been filled to design capacity. Cell 2 will be constructed in conjunction with this timeframe to ensure continued operation of the concentrator facility. Cell 3

will be developed prior to cell 2 closure. Closure of each cell will consist of a similar process described later in this report which will spread the closure and reclamation over the life of the project, rather than at the end. The ongoing closure can be monitored and adjusted to maximize efficiencies and effectiveness.

Upon completion of the project, final reclamation activities will take place. These activities will be based on a previously engineered and approved reclamation plan required by the mining application. A description of this process is described in greater detail in a subsequent section of this Petition.

The majority of the required reclamation work will be completed by a skilled workforce from the state and include

- Decommissioning, sale and salvage of steel and site buildings.
- Ground surface cleanup and contouring.
- Spreading overburden, soils and final capping material (vegetation and seeding) on the impacted sites and final tailings cell.
- Construction of underground opening blockages (plugs.)
- Removal of pond and storage pad infrastructure.
- Continued operation of water treatment facility and monitoring of water quality.

A high-level schedule of the 4 project phases is shown in the following chart.

Year	Years from Mining Permit Approval														
	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12
Permitting Phase															
Conceptual Plan															
Rezoning Petition Submission															
Dialogue with Commission															
Approval of Rezoning															
Mining Application Initiated															
Baseline Study Work Proposal															
Baseline Study Work Approval															
Baseline Study Work Execution															
Mining Application Final Submission															
Mining Permit Approval															
Construction Phase															
Removal of trees and grub the land.															
Construction of roadways and working areas															
Construction of mineralized and waste rock pads.															
Installation of Temporary Power Generation.															
Installation of temporary explosives magazines (Rental from supplier).															
Installation of ground and surface water monitoring locations.															
Installation of air monitoring systems.															
Construction of the water management ponds and discharge structures.															
Construction of the water treatment facility.															
Construction of temporary shop facility.															
Excavation of the mine portal and services															
Begin mining development.															
Excavation of ventilation raise to surface.															
Installation of potable water system.															
Installation of security infrastructure.															
Installation of mine offices and dry facility.															
Installation of warehouse and laydown area.															
Installation of electrical substation															
Tie in electrical infrastructure grid															
Construction of TMF stage 1															
Construction of TMF stage 2															
Construction of TMF stage 3															
Construction of Concentrator and supporting facilities.															
Construction of permanent shop facility.															
Operations Phase															
Mine Development															
Mine Production Ramp Up															
Commercial Production															
Production Ramp Down															
Mine Closure															
Reclamation Phase															
Decomissioning of site buildings															
Site final cleanup and contouring															
Capping and closure of tailings facility															
Spread stored overburden and capping material on impacted sites															
Construction of underground blockages (Plugs)															
Removal of Pond and storage pad infrastructure															
Operation of water treatment facility															
Removal of water treatment facility															
Ground and surface water monitoring program															

High Level Schedule of Mine Permitting, Construction, Operation and Reclamation

5. ACREAGE. Specify the acreage proposed for rezoning under "Acres to be Developed." If your petition to rezone is intended for subsequent subdivision, specify the acreage proposed to be retained by the petitioner under "Retained Acres." Specify the total amount of contiguous land area that is owned or leased by the petitioner within the township, town or plantation of the project area under "Total Contiguous Acres." "Total Contiguous Acres" should equal the sum of "Acres to be Developed" and "Retained Acres."

Acres to be Rezoned / Developed: **528.2**	Acres to retain current zoning: **6,616.8**	Total Contiguous Acres: **7,145** (by Deed)

11. PUBLIC AND COMMUNITY SERVICES.

Service / feature	Name of provider / facility	Distance (in miles) from site:
Ambulance	Island Falls Ambulance Service	23
Education	RSU 89, (Stacyville, ME)	30 / 18.5
Fire	Island Falls Volunteer Fire Department	23
Police	Penobscot County Sherriff Dept. (Bangor) / Aroostook County Sheriff	90 / 45
Solid waste disposal (during construction: construction debris, stumps, brush, asphalt and pavement products)	Casella Waste Management (Houlton ME)	44
Solid waste disposal (after construction, *if different*)	Same	
Public water supply *(if applicable)*	NA	
Public wastewater *(if applicable)*	NA	
Public road	State Highway Route 11	4.5
Service center	Houlton, ME	39
Electric utilities	Emera Maine (New power transmission line from Patten)	14.6
Phone/Internet utilities	Viasat Highspeed – Clearconnect (Satellite)	NA

Provide as **EXHIBIT L**, either: i) a letter from each service provider confirming the facility's availability and capacity to provide the necessary services to the proposed development; OR ii) only in cases where the rezoning is for legally existing development, provide notice of the rezoning proposal to each service provider and provide, as EXHIBIT L, proof of such notice. All zoning petitions intended for residential development must submit such exhibits for education services, regardless whether the dwelling units are anticipated to be seasonal or year-round dwellings. See page vi of the instructions for more detail regarding this exhibit.

Public services, such as those identified above, are commonly provided by a municipality, or in the case of much of the unorganized territories, these services are provided or contracted for, by the county. In some cases, service centers may provide some of these public services. Service centers are identified by the Department of Agriculture, Conservation and Forestry's Municipal Planning Assistance Program. A partial listing of those near the Commission's jurisdiction includes: Ashland, Augusta, Bethel, Bingham, Brewer, Bridgeton, Calais, Caribou, Dexter, Dover-Foxcroft, Eastport, Ellsworth, Farmington, Fort Kent, Greenville, Guilford, Houlton, Jackman, Limestone, Lincoln, Machias, Madawaska, Mars Hill, Mexico, Milbridge, Millinocket, Newport, Norway, Orono, Pittsfield, Presque Isle, Rangeley, Rumford, Van Buren. For a more complete listing, check with the Municipal Planning Assistance Program at www.maine.gov/dacf/municipalplanning/index.shtml.

12. ACCESS TO SITE.

a. Starting with the closest public road, then each successive road, provide the following information about each existing road that will be used to access the area proposed for rezoning.

Road name	Public or private? *(if private, complete the rest of this row)*	Owner name	Length and travel width of road	Right-of-way width	Type of wearing surface
See Appendix A Attachment J	Private	Wolden Mt. Chase LLC	5.1 mi /15 ft	NA	Gravel

If access to your site is limited as part of your deed, lease, easement or other covenants, be sure to include a copy of such restrictions or provisions as part of **EXHIBIT B**. See page iv of the instructions for more detail regarding this exhibit.

b. Water Only Access- Not Applicable

15. CONSISTENCY WITH COMPREHENSIVE PLAN.

Consistency with the LUPC's Comprehensive Land Use Plan

The Comprehensive Land Use Plan (CLUP) provides for sound planning practices in the public interest to encourage and manage multiple uses of land and resources within the LUPC's jurisdiction. The following subsections describe how the proposed rezoning fits within the CLUP, and how the planned Pickett Mountain Mine project would meet the CLUP's goals and policies.

BROAD GOALS

The Pickett Mountain deposit is a unique mineral resource that is ideally situated to allow mineral extraction in an environmentally responsible manner through underground mining while ensuring the following:

- Enhancing the living and working conditions of the people of Maine including property owners and residents by creating an economic benefit in terms of capital investment, training, jobs and enhanced tax base within host and adjacent communities and counties.
- The proposed rezoning will meet the goal of separating incompatible uses. The area that is proposed for rezoning is currently a general management subdistrict (M-GN) that has been used for timber, and outside the proposed activity the logging operations can continue. The proposed rezoning will not impact any great ponds.
- The proposed project is designed to have a small foot print (approximately 528.2 acres) with a comprehensive water management plan that will ensure protection of adjacent natural resources including groundwater and surface water quality, forest resources, wildlife and other natural resource values such as plant and animal habitat. The current information available indicates no known occurrences of endangered, threatened or special concern species within the project area. The IF&W also has not mapped any significant wildlife habitats within the project area. Based on current information from the MNAP, rare and exemplary botanical features are not present or not expected to be present in the area proposed for rezoning. The MNAP did identify a priority area for a botanical survey on the Wolfden property located between Pleasant and Mud Lakes. This area is a graminoid/shrub fen and is unlikely to be affected by the project. Additional studies of terrestrial flora and fauna and aquatic fauna inside and outside the area to be rezoned will be conducted as part of the baseline monitoring program under the MEDEP Chapter 200 rules
- The proposed project will allow continued use of forest resources related to logging for wood and fiber production on Wolfden's property.

DEVELOPMENT GOALS AND POLICIES

Location of Development

The Pickett Mountain Mine project location is dictated by the unique geologic conditions that resulted in the formation of a mineral deposit of economic value. As such there are no alternatives to the project location and the project is exempt from the policy of adjacency. The location and physical relationship of the mineralized zones to surrounding topography and water bodies allows the deposit to be developed by underground mining methods which when combined with carefully managed mine water collection and treatment systems will allow mine development, operation and closure without impacting water quality of these adjacent resources. The manner in which the project will be designed shall be subject to avoidance and mitigation, to the extent possible, of protected natural resources including but not limited to wetlands, vernal pools, rare and endangered species including plants and wildlife. Therefore, aside from adjacency, the project as proposed, meets the LUPC's development goals and polices with respect to project location.

The project is also unique in having a finite duration currently anticipated to be from 10 - 15 years. Therefore, unavoidable impacts to resources such as wetlands are ephemeral or short lived, and resource values and functions can and will be restored upon project completion. The reclamation of the proposed site will sequentially remove all buildings and structures including the water treatment systems when they are no longer required or needed. Once the access to underground workings are permanently sealed and the site is regraded and revegetated it will attain the natural character and values that existed prior to mining. An above ground sub-aerial TMF will remain at closure. The TMF will be designed with a liner in accordance with DEP Chapter 200 requirements. This area will contain tailings that have been stabilized and compacted and which could present some risk to the environment if not managed properly. These risks will however be managed by collection and treatment of water that comes in contact with these materials during operations and capping at closure. The above ground TMF will be constructed and graded to follow the original upland land surface at an elevation approximately 22 feet higher over approximately 78.4 acres. This approach will preserve the current appearance of the ridgeline post reclamation. This area will also be revegetated and designed to allow regrowth of natural ground cover as discussed in later sections of this Petition.

Thus while meeting many of the goals related to location of development, the project is also consistent with and meets CLUP polices including:

Policy 1 Development that is directed to a suitable area and retains the principal values including a working forest, and integrity of natural resources.

Policy 2 The project location is near existing towns (the nearest community being Hersey (4.5 miles) and Patton (9.5 miles) with proximity and connectivity by public roads to other organized town and economic centers, with adequate available public infrastructure and services.

Policy 7 Project allows for (a) planned development dependent on a particular natural feature which is the presence of a metallic mineral resource.

Economic Development

One of the CLUP's goals is to encourage economic development that is connected to local economies, is efficient in its use of existing services and infrastructure and is compatible with existing natural resources and surrounding land uses.

The project will provide direct and substantial economic benefit to the local communities (see **Appendix A-Attachment N**). This benefit is in the form of job skills training, primary wages to local employees, wages that are spent in the local economy, an increase in property tax revenue, and indirect wages at secondary jobs that help support the mining operations (mechanical equipment repair, vehicle maintenance, road maintenance, solid waste management, and other specialized services).

The site is in vegetative regrowth from past logging efforts that are estimated to have occurred from 7 to 10 years ago. Wolfden actively leases its timber rights to a local logging company, preserving productive use of its working forests. The proposed development will be largely self-sufficient and not impose an undue burden on local community services or resources (see **Appendix A-Attachment O**). The project will require importation of approximately 6 megawatts of electrical supply which is larger than is currently available locally. This will require construction of approximately 14.6 miles of new transmission line along Route 11 and the existing private gravel access road.

The project occupies a largely upland area removed from adjacent lakes and ponds and would not impact water quality of such water bodies or affect related fish and wildlife resources during the active period of the project. Plants and natural communities that are located outside of the proposed area of land disturbance would not be impacted. If rare and exemplary botanical features are identified on-site in subsequent surveys impacts will be avoided to the extent possible, and such plant communities would be relocated or protected pending concurrence with the MNAP. The planned grading of the TMF will limit ridgeline impacts which will help mitigate scenic impacts. The presence of cultural resources, including historic logging camps and related structures are not known to be present on the site. A Phase 0 archeological survey will be conducted in the spring of 2020 to assess the presence of cultural features. The Phase 0 survey will also evaluate the potential for prehistoric archeological resources. A known prehistoric archeological site is in close proximity to the east end of Pickett

Pond. Since the extent of the site is limited in size, other mountain areas and other geologic resources would not be impacted.

The site is not in a remote area of the jurisdiction, being located approximately five miles from state highway SR-11 and is accessed by well developed, existing gravel roads on private property. The planned development of the site will occur along a portion of a ridgeline and at project completion the final profile of the ridgeline would be elevated approximately 22 feet from existing ground surface and parallel to the original profile. This slight alteration should not diminish overall character of the area and regrowth of vegetation common to the area is expected as part of the reclamation.

In addition to these goals the project also meets many elements of the CLUP's policies including the following items:

Policy 1 Encourage other resource-based industries and enterprises which further the jurisdiction's tradition of multiple use without diminishing its principal values.

Policy 4 Allow new technologies (sub-aerial tailings) which will provide the LUPC the opportunity to evaluate the technology and its effectiveness.

Site Review

A goal of the CLUP is to assure that development fits harmoniously into the existing communities, neighborhoods and the natural environment.

The nature of the proposed project, its location and the proposed reclamation, as discussed in following sections, would ensure a harmonious relationship to the natural environment and local communities.

In addition the project will meet established noise and lighting requirements of the CLUP as specified under section10.25.F

Noise. The maximum permissible continuous sound pressure level allowable in a D-PD district is determined by the LUPC. Specified maximum sound levels range from 70 dB(A) in daytime (7 am, to 7 pm) to 65dB(A) at night (7 pm to 7 am) for certain subdistricts (commercial-industrial for example) to 55dB(A) and 45dB(A) for all unspecified subdistricts. Construction activities conducted between 7 am and 7 pm are exempt from 10.25F. Other exempt activities include but are not limited to safety and warning signals, traffic on roadways, etc.

During the mine construction phase, noise will be created from construction equipment operating above ground, including drilling and minor blasting. Once the underground development has progressed, blasting will be occurring below ground and will no longer be a source of noise above ground.

During mine operations, the noise source with the largest pressure levels will be the fans used to ventilate the underground workings. Rock crushing is also a source of noise but less so than the ventilation fans. Once crushed, the final milling of the mineralized rock is conducted within a building and is not a large source of noise. The 2 ventilation fans will typically produce 110 decibels (dB) and can be dampened up to 20% to operate at approximately 88 dB. Adding in additional noise sources, a combined noise source estimate is as follows:

$\sum$ dB = 10*Log10 (10^ $^{(L1/10)}$ + 10 ^$^{(L2/10)}$+10^ $^{(Ln/10)}$)
where L1, L2 ….Ln are the separate source sound levels in dB

		L1	L2	L3	L4	L5
		Fan	Fan	Truck	Truck	Loader
Dampening	20%	110	110			
Source dB	L	88	88	88	88	85

$\sum$ dB = 94.533

		L1	L2	L3	L4	L5
		Fan	Fan	Truck	Truck	Loader
Dampening	0%	110	110			
Source dB	L	110	110	88	88	85

$\sum$ dB = 113.044

Reduction in pressure levels with increasing distance from a source is described by an inverse square law. The most conservative assumption would a free field where sound is traveling over an unobstructed plane with no barriers between the source and receptor. Barriers that would exist at the site include buildings and tree lines. Sound is also dampened (absorbed) by the ground and vegetation.

Assuming a free field condition (unobstructed path) reduction in sound would be described as:

$dL = Lp2 - Lp1$

$= 10 \log (R2 / R1)^2$

$= 20 \log (R2 / R1)$

where

dL = difference in sound pressure level (dB)

Lp1 = sound pressure level at location 1 (dB)

Lp2 = sound pressure level at location 2 (dB)

R1 = distance from source to location 1 (ft, m)

R2 = distance from source to location 2 (ft, m)

A "free field" is defined as a flat surface without obstructions.

Assume L1 is 1 foot from the source at measured decibels

The nearest property boundary from the preliminary location of the ventilation fans is approximately 3,000 feet to the south, near Fire Road C. The nearest residence is approximately 8,850 feet to the northeast, on the south side of Pleasant Lake. Applying this equation yields the following reduction with distance from the source.

							Nearest Property Boundary			**Nearest Residence**
Source dB (Undampened Fan)	113	113	113	113	113	113	113.04	113	113	113.04
L1 (ft)	1	1	1	1	1	1	1	1	1	1
L2 (ft)	1	10	100	500	1000	2000	**3000**	4000	5000	**8550**
dl=	0.0	20.0	40.0	54.0	60.0	66.0	69.5	72.0	74.0	78.6
Receptor dB	113.0	93.0	73.0	59.1	53.0	47.0	43.5	41.0	39.1	34.4
With 20% Dampening	20%									
Combined Source (dB)	94.5									
Receptor dB	94.5	74.5	54.5	40.6	34.5	28.5	**25.0**	22.5	20.6	**15.9**

As noise sources can be sometimes unpredictable, confirmatory work for noise in the surrounding area are scheduled to be completed in the summer of 2020. This study will be performed through several avenues and will justify the table above. This study will include a review of similar projects sites related to noise generation and carry as well as a desktop model of noise generation and projection using dampening impacts from trees and hills, etc. The proposed noise prediction model will be developed using the Candna/A software published by DataKustik GmbH or equivalent software configured to implement ISO 9613-2 environmental noise propagation algorithms.

Calculated Sound Pressure Levels from Source (unobstructed path)

1. Ventilation Fans - With dampening the underground ventilation fans, the expected sound levels at the property boundary and nearest residence are below sound levels for "all unspecified subdistricts". Wolfden intends to use enclosures and other means to dampen the source noise levels. Given the presence of other dampening factors (buildings, vegetation and tree lines), a conservative estimate of noise levels at the property line and the nearest seasonal residence (1.1 miles) indicates that expected noise levels will be very low at approximately 25 dB. It will be considerably lower at 3 miles, perhaps even undiscernible unless there is a wind from that direction. A value of 16 dB..

2. Blasting **-** Involves the drilling holes into rock then charging or loading the holes with a designed amount of explosives that are numbered with a firing sequence. When detonated, the firing sequence controls which holes "fire" or detonate in order to distribute the energy throughout the rock in a balanced controlled manner. The overall blasting process during the construction and development phase at Pickett Mountain is as follows:

    - Excavation of overburden and loose rocks from the footprint of the portal.
    - Drill a blasting pattern (Typically 3 feet x 3 feet square pattern) with 4.5 inch drill holes for desired blast. Typically larger excavations such as portal can take two to three blasts to complete in a very controlled manner.
    - Clean all of the holes and measure for accuracy.
    - Load explosives and detonators into the holes at design levels and quantities.
    - Clear property with sign outs and guards.
    - Sound appropriate warnings and alarms
    - Detonate the blast.
    - Check over the blast to ensure proper detonation and fracturing
    - Excavate fractured rock to waste rock storage pad.

    It is worth noting that open-air blasting to commence the access (portal) for the underground workings is only expected to last two or three weeks. Once underground, (after two to three more weeks) sound from the underground blasting will no longer be heard at the property boundary.

Lighting. Within the plant operations area, all above ground exterior lights greater than 60 watts or incandescent lights greater than 160 watts will be housed in downward facing full cut-off fixtures as specified in CLUP Standards under 10.25F. Other sources of light will include vehicle headlights and building interior lighting.

In addition, the project would meet other CLUP policies including the following items:

Policy 1(a) A buffer would be established around the proposed area of rezoning and would be far removed from other land use activities. At closure of the project the ridgeline where the TMF is located would be elevated approximately 22 feet above its current topographic profile. Once reclaimed and vegetated this will be a minimal change to the natural appearance of the landforms at the site.

Policy 1(b) The project will provide for parking at the mine operations site and the transportation routes, described in **Appendix J** would not adversely affect traffic circulation.

Policy 1(c) The only signage visible to the public associated with the project would be for transportation safety at the location where vehicles egress and exit from SR-11 to private roads.

Policy 2 The project final design will be permitted through the DEP and efforts will be made to minimize impacts to the principal values of the jurisdiction including avoidance and mitigation of impacts to protected natural resources.

Infrastructure

The project meets the CLUP's goal of ensuring that infrastructure improvements are well planned and do not have an adverse impact on the jurisdiction's principal values. These improvements will include upgrading existing gravel access roads located on private lands and the intersection of the private road with State Highway 11 for public safety purposes. The project will also, separate from this Petition, establish a new power transmission service line to supply additional needed electrical power for the project.

The power transmission route has been discussed with Emera Maine and would run from their substation located on Route 11, located approximately 0.6 miles south of downtown Patten, Maine. The transmission line would run north and northeast along Route 11 for approximately 9.5 miles then follow the same gravel access road proposed for the mine for approximately 5.1 miles. The access road upgrades to be considered in the design for the permit application submittal will be developed concurrently with the transmission line design.

The project also meets other CLUP policies including the following items:

Policy 1 To consider the capacity of existing infrastructure and services to accommodate proposed development. It is Wolfden's objective that primary workforce be employed locally from residents. This will require training for that work force since many unique skills are required of miners working underground. The mine will employee approximately 60 workers, composed of 30 workers per shift with two shifts per day. With a local workforce, the imposition on existing infrastructure and services (housing, schools, roads, medical facilities, fire, police, solid waste, and municipal) is minimized since this population is already using these services. An analysis of the capacity of these services in the local communities is provided in **Appendix A- Attachment O**.

Policy 2 The project will not require construction or establishment of any new public roads that would degrade the natural character of remote areas.

Policy 3 The new utility lines, principally electric power transmission, will be located or co-located within or adjacent to existing utility or public road rights of way to the extent practicable. Where new utilities cannot be established along existing utility corridors, they will be designed to minimize visual and physical impacts that would degrade natural values of the area. The areas contemplated would not be considered remote and would be near or adjacent to existing private roads.

Policy 5 Although not highly visible, infrastructure at the Site (buildings, water collection and treatment ponds, soil stockpile areas or pens) would be decommissioned, dismantled and removed at the end of the project as part site reclamation. The land surface once occupied by these buildings would be regraded and returned as close to original grades as possible.

Development Rate, Density and Type

The project will be constructed in accordance with plans approved by the DEP with input from LUPC. Since the project will be constructed in one phase the density and type of structures will be known and with input from the LUPC, will be consistent with the jurisdiction's principal values and policies concerning development.

Affordable Housing

The project does not involve construction of housing but as described in **Appendix A – Attachment O** the local employment anticipated by the project will provide employee wages sufficient for those employees to afford available housing in the local market.

Land Conservation

The project will support the long-term conservation of select areas of working forests in the project area as well as protecting high-value natural resources such as surface water bodies, streams, wetlands, vernal pools, flora and fauna. The manner in which these natural resources shall be protected is discussed in **Section B (3)(d)**. Wolfden will continue to work with local logging companies to manage and allow harvesting of forest resources on its property.

The project would meet the CLUP's land conservation policy:

Policy 1 Wolfden has developed cooperative working relationships with local landowners and local timber companies, to ensure continued use of its working forest resources and help maintain public access on private roads to access lakes within its property.

Natural and Cultural Resources and Policies

Air and Climate Resources

The project will not adversely affect air quality since dust will be controlled and processes that utilize chemicals that would be considered air pollutants are not used. On-site emission sources will be limited to motorized heavy machinery and vehicles for above ground and underground mining related activities.

Rock crushing operations are a potential source of dust, but adequate provisions will be provided for dust management and control. Dust suppression is an important operational safety concern below ground in the mine. Blasted rock is mucked out wet to eliminate dust underground. Rock placed into the crusher is therefore wet and that moisture greatly reduces dust during crushing operations. If dust becomes an issue, dust collection equipment can and would be installed above the crusher and removed via a bag house filter.

Cultural, Architectural and Historical Resources

The Maine Historic Preservation Commission (MHPC) has been consulted and due to the presence of archaeological site 147.001 (MHPC Archeological Survey report 2719- E.C. Jordan 1984) at the headwaters of Pickett Mountain Pond a Phase 0 Archeological survey will be conducted in Spring 2020 as discussed in **Exhibit M.** The scope for the Phase 0 survey has been developed in consultation with the MHPC and is presented the Exhibit M. By working cooperatively with MHPC, the project will meet the CLUP's goal of protecting archaeological and historical resources of cultural significance.

These activities will meet the following CLUP policies:

Policy 1 Identify and protect unique, rare and representative cultural resources to preserve their educational, scientific and social values.

Policy 2. Collaborate with other agencies in efforts aimed at the protection of cultural resources.

Policy 3. Complete an archaeological survey as part of this development proposal.

Energy

The project will further the CLUP's energy goals through designs that favor and incorporate energy efficiency and utilization of technologies such as heat pumps to assist heating and cooling at above ground facilities, when possible. The project will require a new transmission line to provide the needed energy requirements. The project will of course require emergency back-up power in the form of generators, but these would be used only when needed. Any new energy generation will be used exclusively for the project.

Forest Resources

As discussed in **Section B (3)(d)** and **Appendix A-Attachment Q** the project footprint will require only 106 acres of actual development. Only the area occupied by the dry stack tailings facility (approximately 78.4 acres) will be excluded as a future forest resource for lumber and fiber production. Upon final reclamation, all other areas (approximately 7 acres excluding roads) will be returned to current conditions. The balance of Wolfden's property will be accessible for timber harvest, thus meeting the CLUP's goal to conserve, protect and enhance the forest.

The specific policies items that are supported by the proposed project include:

Policy 1 Encourage active forest management.

Policy 2 Support uses that are compatible with continued timber and wood fiber production, as well as biodiversity.

Policy 3 Protect areas identified as environmentally sensitive.

Policy 5 Support efforts by landowners to manage vehicular access to private roads when necessary to reduce land use conflicts.

Policy 9. Encourage the use of Maine's best management practices for forestry on its land.

Geologic Resources

The LUPC has established goals of conserving soil and geologic resources by controlling erosion and protecting areas of significance. The CLUP's goal with respect to mineral resources is to allow environmentally responsible exploration and mining of metallic and non-metallic mineral resources where there are not overriding, conflicting public values which require protection.

The Pickett Mountain Site is under extensive exploration for mineral resources and there are no identified important natural geological formations, or geologic hazards such as seismically active faults, high elevations or steep slopes subject to instability or erosion. Based on visual

inspection the area proposed for the project features nearly level to gentle slopes with high percentage of vegetative cover and organic matter, and moderate to deeply rooted vegetation in glacially derived soils with a shallow water table. Fragile soils, most subject to erosion, are not known to be present.

As discussed in **Attachment J**, site access is by existing gravel roads that are currently used for logging operations and which are in good condition. Any modification or improvement of these roads will be completed in accordance with a sedimentation and erosion control plan that will be developed during the mine design and permitting phase under DEP rules. Based on current information, soil types are suitable for proposed development (construction of buildings, having a stable foundation for the TMF, though more retailed detailed studies including soil mapping and geotechnical investigations will be required prior to preliminary and subsequently final design of buildings and the TMF. Soil and groundwater studies will be conducted under the baseline characterization for the MEDEP Chapter 200 permit applications. These studies will quantify the infiltration capacity of soils and groundwater hydraulic conditions including gradients and saturated hydraulic conductivities and physical properties of site soils. Such studies will be needed to site, design, and size the PDPs as well as a site septic system. Such studies will also assist in determining engineering approaches that may be warranted to design improvements to the performance of such recharge/ infiltration systems. The current proposed PDP locations are away from wetlands where the hydrology conditions would be unfavorable. These larger upland locations for the PDPs are likely situated over thicker unsaturated zones with greater depth to the water table which would be better suited for these purposes.

Any modification of roads or the one existing stream crossing (outlet from Pickett Mountain Pond) would be completed in conformance with Land Use Standards enumerated in Chapter 10.27,D.

The proposed metallic mineral mining would occur only within the area rezoned for planned development and would not adversely impact competing uses and public values. The proposed facility would minimize water, air, land, noise and visual pollution through operations described in **Section B (3)(d)** and **Appendix A-Attachment Q,** These operations will not affect public safety and health, and will avoid undue adverse impacts on fisheries, wildlife, botanical, natural, historic, archaeological, socioeconomic and other values. The proposed mining operation provides distinct economic and social benefits and would not pose undue burden on existing services as described in **Attachments M, N and O.**

The project will be subject to a long-term post closure monitoring and maintenance program subject to the requirements of DEP Chapter 200 rules and including reclamation of the mine site to restore natural values and protect public health and safety and allow beneficial reuse of the majority of the property.

Specifically, the project would support the following policy items pertaining mineral resources:

Policy 6 Exploration for mineral resources with minimal disturbance to natural and cultural resources.

Policy 9. Permit a major metallic mining development in an area zoned for planned development, which broadly considers impacts and benefits, competing uses and public values.

Policy 10. Regulate the mining operation to minimize water, air, land, noise and visual pollution, to ensure public safety and health, and to avoid undue adverse impacts on fisheries, wildlife, botanical, natural, historic, archaeological, socioeconomic and other values.

Policy 11. Complete effective monitoring and reclamation of the mining site to protect public health and safety and to promote beneficial reuse where feasible.

Plant and Animal Habitat Resources

The proposed mining activity is not within areas known to contain unique, threatened or endangered plant or wildlife resources and will be able to meet the CLUP goals and policies to preserve and protect aesthetic, ecological, cultural and economic values of plant and wildlife resources. The area proposed for development is primarily upland forested habitat, co-dominated by deciduous trees (i.e., beech, birch, and red maple trees) and coniferous trees (i.e., spruce, fir, cedar and hemlock). The area has been logged in the past and is currently in vegetative re-growth. The proposed mining activities are within an area that is actively logged and would have a lesser short- and long-term effect on habitats than current logging practices. Since the area is relatively small compared to the surrounding woodland habitat it should not have a negative effect on connectivity of habitats in the area. Wolfden has received preliminary correspondence from the Maine Department of Inland Fisheries and Wildlife concerning potential habitats supporting Rare, Threatened or Endangered (RTE) species. Based on work completed to date habitat supporting rare, threatened, or endangered species are not known to be present in the area. Also, unique habitats such as deer wintering areas, great blue heron nesting sites or habitat for bats, were not observed. Wolfden has conducted delineation of wetlands and vernal pools in spring 2020. Addition studies of terrestrial fauna will be conducted under the baseline characterization work under the MEDEP Chapter 200 regulations and will at that time conduct a final assessment for potential RTE species.

Wolfden has also met with staff of the MNAP. There is one area, a fen, between Pleasant and Mud Lakes that MNAP has identified as a priority site for a botanical survey. This area is far removed from the proposed site and would not be adversely affected by proposed activities and is outside the area proposed to be re-zoned. The MNAP environmental review for the project is presented in Exhibit N. Based on current information RTE plants are unlikely to be present in the upland areas proposed for rezoning. Wolfden plans on conducting additional

evaluations of terrestrial flora in consultation with the MNAP under the MEDEP Chapter 200 baseline characterization program and if plant resources requiring protection are identified, Wolfden will make appropriate accommodations to avoid impacts where possible.

Specifically, the policy items that would be met by the project include:

Policy 1. Coordinating with and supporting agencies in the identification and protection of a variety of high-value wildlife habitats, including but not limited to: habitat for rare, threatened or endangered species; rare or exemplary natural community and ecosystem types; native salmonid fish species; riparian areas; deer wintering areas; seabird nesting islands; waterfowl and wading bird habitats; and significant vernal pools.

Policy 2. Conduct land use activities that are protective of sensitive habitats, including but not limited to habitats for fish spawning, nursery, feeding and other life requirements for fish species.

Policy 3. Develop the site in a manner that retains connectivity of habitats and minimize road mortality of wildlife by promoting road building practices that facilitate wildlife movement and by directing development to appropriate areas.

Policy 5. Protect wildlife habitat in a fashion that is balanced and reasonably considers the management needs and economic constraints of project owner (landowner).

Policy 7. Encouraging sustainable land use (forestry management) over much of the Wolfden parcel which will contribute to maintaining a large tract of undeveloped land, with ecological significance that is important locally to healthy plant and animal populations.

Recreational Resources

See Section 19 of this Petition for a discussion of recreational resources.

The specific recreational resource policies of the CLUP that would be met or supported by the proposed project include:

Policy 6. Cooperative efforts that assure continued public access across any rights of way on Wolfden's property (excepting reasonable restrictions on certain roads that lead to the mine site, if needed for public safety).

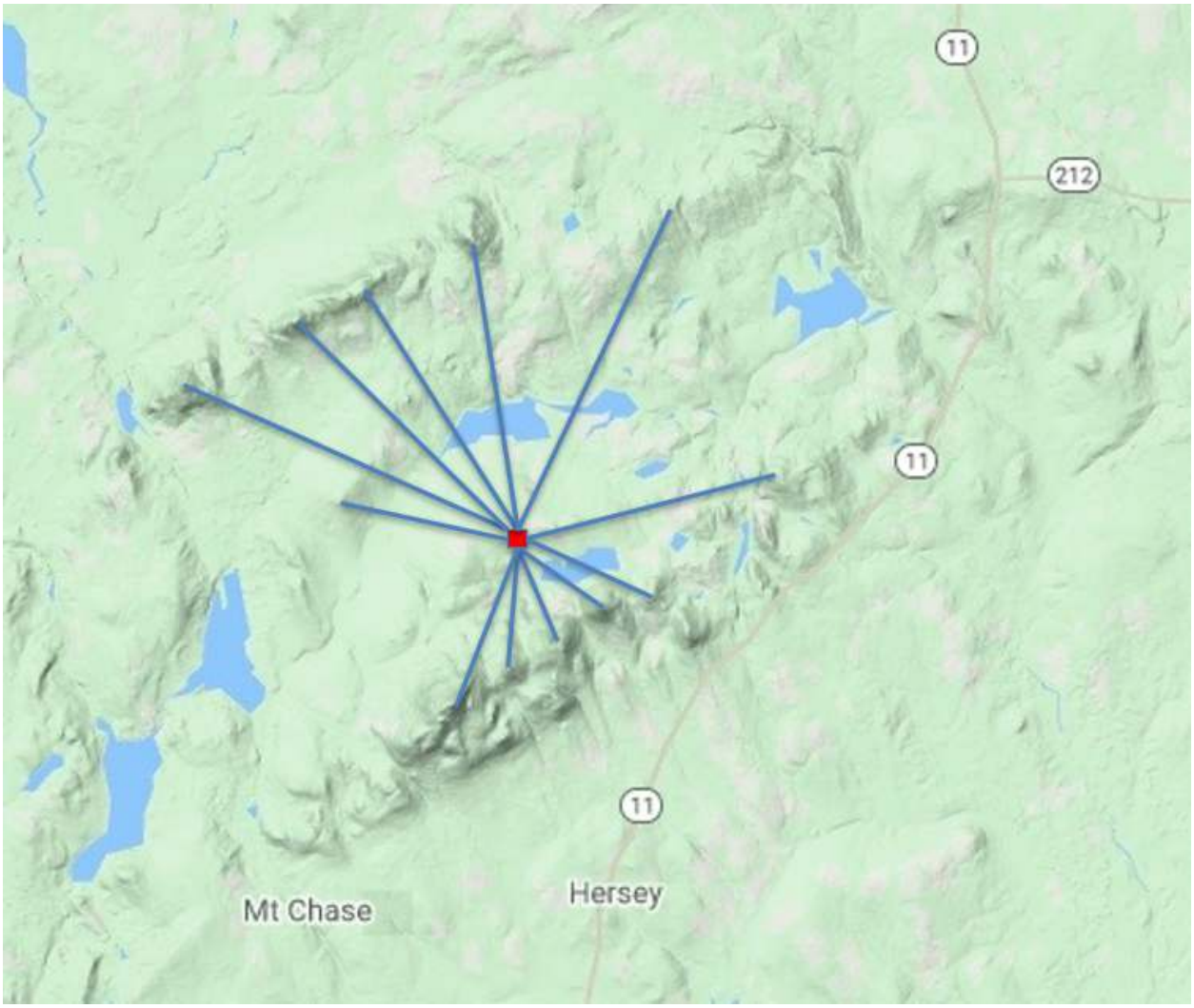
Policy 7. Efforts on the part of Wolfden that ensure continued public access to public waters .

Policy 8. Responsible use of Wolfden's property.

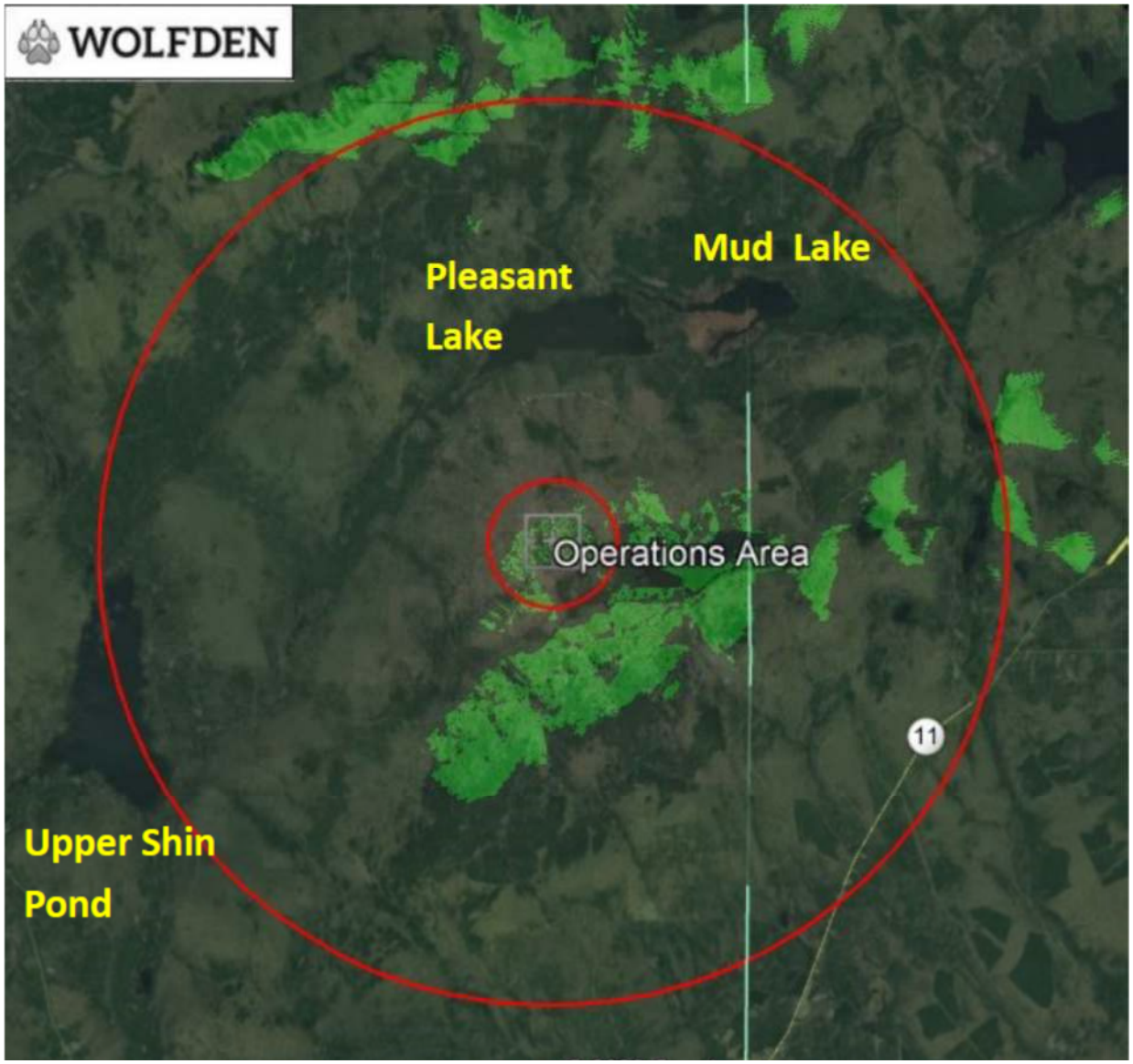
Scenic Resources

The topography surrounding the site provides the area proposed for rezoning a high degree of visual screening from public roads (Route 11 and Route 159) and the established high use recreation areas located to the west of the site. The area proposed for rezoning has a prominent ridgetop immediately west of the areas where proposed buildings would be constructed screening those buildings from view from that direction. A ring of higher elevation peaks is present south of Picket Mountain Pond and north and west of Pleasant Lake. While an unobstructed line of site exists from Pickett Mountain Pond, Pleasant Lake, Mud Lake and Grass Pond, the visibility of the site would likely be obscured by tree lines that would be left in place around the developed areas. The most visible portion of the site would be the northern and northeastern corners of the dry stacked tailings area.

The landforms surrounding the site are complex rolling hills and moderate elevation mountain peaks with mixed forests, that would be more tolerant to visual impacts from the site. Based on the topography, landforms and forested nature of the area, the proposed site is a reasonably harmonious fit with the surrounding environment and generally meets the CLUP's goal of protecting the high-value scenic resources of the surrounding area.



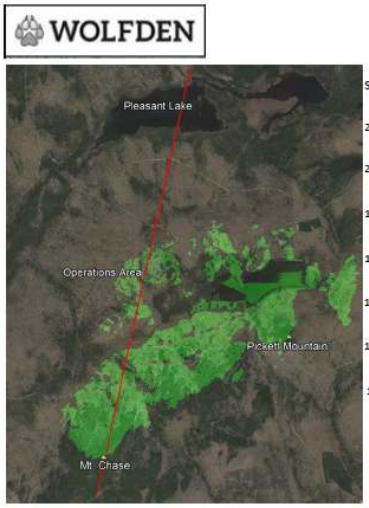
Peaks Surrounding Pickett Mountain Project Site

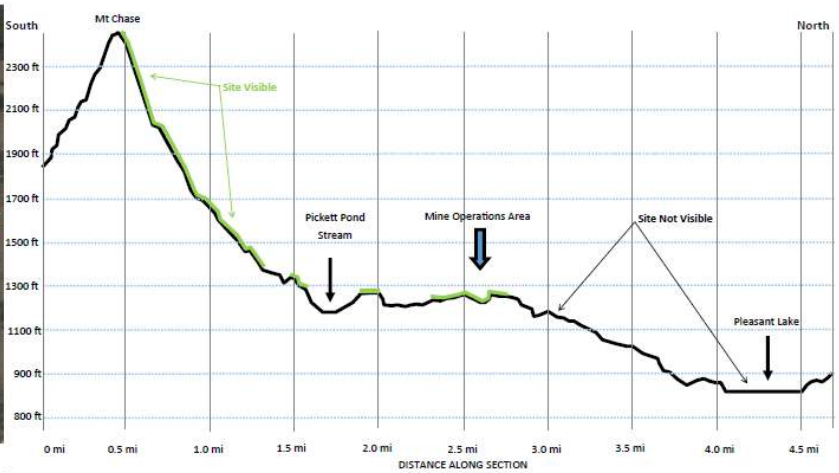


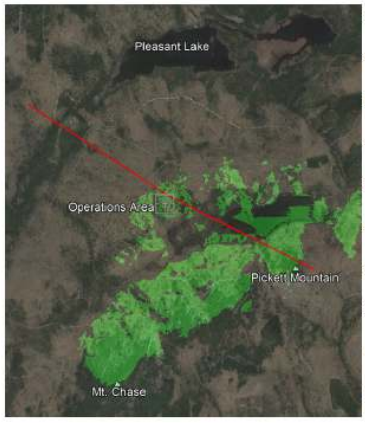
Three Mile Radius Analysis

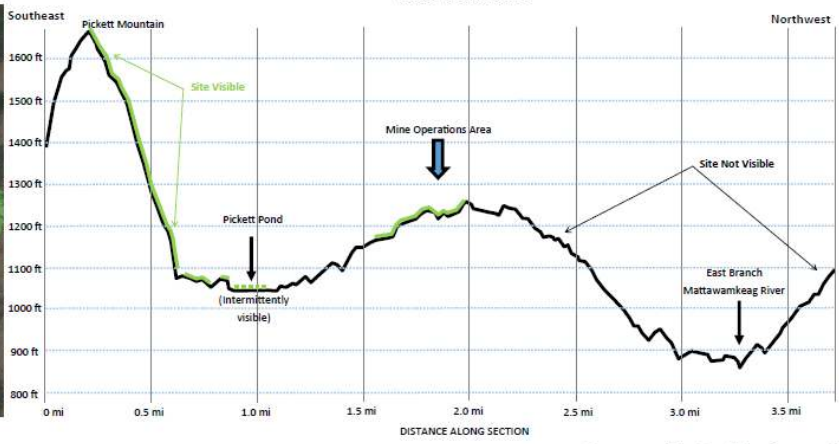
The inner circle of the image above represents a 0.5 mile radius which encompasses the proposed site boundary. The outer circle is a 3.5 mile radius to show a net 3 mile radius from the boundary of the property. Th analysis was conducted using a Google Earth Viewshed model (ground surface digital elevation model), which uses ground surface elevations to construct line of sight analysis. The view height is 10 meters above ground level to simulate a building 10 meters above average tree height. The highlighted areas (and those highlighted on surrounding peaks) are potential areas with a line of site to the property. The 10 meters or 33 feet above the tree line was selected assuming the trees in the area are ~27 feet tall for a total building height of 60 feet. It should be noted, that to obtain a line of site to the property from the surrounding areas, one has to be above the tree line to have an unobstructed view. The property will not be visible from anywhere along Route 11 nor from any State park or State

managed trail. There are no official trails within the proposed area, however, within a 3.0 mile radius of the site boundary, there are several ATV, snowmobile and hiking trails as shown in attachment L. Hiking trails are along the south face of the mountain belt and a snowmobile/ATV trail travels along the north face of the mountain belt. Based on the sections below, trails that are travelled along the north face of Mount Chase are likely to have visual line of site to the property if standing on a cleared area. The tallest building on the property is estimated at 60 feet tall and would rise above the tree line approximately 10 meters and therefore would be the most visible point. Additional site specific studies (such as the LUPC weather balloon test protocol for communications towers) could be conducted to obtain a better understanding of actual visibility.









Viewshed of Operations Area (Green)

Topographic Profiles Across Site

Viewshed Sections

Water Resources

Appendix A Section B(3)(d) provides a discussion of Potential Impacts to Existing Uses and Natural Resources and provides an overview of mine water management, involving the collection and treatment of precipitation that contacts mined rock materials and tailings. The project description in Section 4 of this Petition describes the operations and reclamation phases of the project. Collectively these environmentally responsible mine-management practices would prevent degradation or impacts to groundwater and surface water and protect water quality in adjacent aquatic habitats including wetlands, vernal pools, streams, lakes and ponds. These actions would meet the CLUP's goal of protecting the quality and quantity of surface waters and groundwater.

The project will have no direct impact on shorelands since the project location is removed from such features.

The specific CLUP policies that will be advanced through the planned development and regulatory framework include the following:

Policy 1 Regulate uses of land and water in order to prevent degradation of the jurisdiction's excellent water quality and undue harm to aquatic habitat.

Policy 2 Protect the recreational and aesthetic values associated with water resources.

Policy 4 Conserve and protect lakes, ponds, rivers, streams and their shorelands, which provide significant public recreational opportunities.

Policy 8 Control land uses on identified aquifers and their recharge areas in order to prevent adverse effects on water quality or quantity

Policy 10 Protect ground water quality throughout the jurisdiction through proper controls on potentially polluting activities.

Policy 12 Conserve the quality and quantity of public and certain private water supplies by managing land use in source protection areas.

Wetland Resources

See Appendix A Section B(3)(d) of this Petition for a discussion of wetland resources.

The specific wetlands resource policies of the CLUP that would be met or supported by the proposed project include:

Policy1 Support the nationwide goal of no net loss of wetland functions and values by avoidance or minimization of impacts.

Policy 2 Provide compensation to offset loss or degradation of wetland functions, while recognizing that such losses may not be avoidable in every instance.

Policy 3 Plan development to avoid alteration of wetland areas. If avoidance is not feasible, ensure that development minimizes alteration. If loss of wetland functions is unavoidable, require actions to restore, reduce or gradually eliminate lost or degraded wetland functions. If necessary, require compensation for lost or degraded wetland functions through protection of wetlands of equal or greater value.

Exhibit D-2

Preliminary Site Plan

The following plan provides a conceptual layout of the facilities and buildings associated with the project. The building designation, structure type and size are summarized below. In addition to buildings and other structures, it is anticipated that a 0.5 acre parking area will be required for employees with an additional 2.5 acres dedicated to parking for trucks and other equipment. Therefore, the total area to be cleared is 137.5 acres. The water collection and treatment systems will not collect precipitation around buried structures or office buildings but will collect run-off around other buildings, the tailings storage area, storage pads etc.

Name	SQ FT	Structure Type	Acreage	Notes
1	1,077	Building	0.02	Temporary Explosives Magazine
2	1,077	Building	0.02	Temporary Explosives Magazine
3	1,077	Vent Raise	0.02	Ventilation Exhaust Raise
4	1,077	Vent Raise	0.02	Ventilation Exhaust Raise
5	97	Buried Structure	0.00	Concrete Water Diffuser
Parking Facility	21,780	Impervious area	0.50	
Equipment Parking	108,900	Impervious area	2.50	
Site Road Infrastructure	157,252	Impervious area	3.61	
Conc Handling	29,874	Building	0.69	
Concentrator	64,619	Building	1.48	
Dry Stacked Tailings Facility	3,415,104	Lined Pad	78.40	
Fuel	2,126	Building	0.05	
Electrical Substation	10,000	Building	0.23	Electrical Substation
Laydown Area	70,000	Impervious area	1.61	
Laydown Area A	4,000	Impervious area	0.09	
Mill Feed Storage Pad	43,080	Lined Pad	0.99	
Office	2,423	Building	0.06	
Office A	485	Building	0.01	
Office B	97	Building	0.00	
PDP 1	148,104	Buried Structure	3.40	Septic Type System
PDP 2	104,544	Buried Structure	2.40	Septic Type System
PDP 3	200,376	Buried Structure	4.60	Septic Type System
PDP 4	100,188	Buried Structure	2.30	Septic Type System
Solid Waste Septic System	10,000	Buried Structure	0.23	Solid Waste Septic Bed and tank
Portal East	11,821	Excavation	0.27	
Shop	6,462	Building	0.15	
Warehouse	8,000	Building	0.07	
Waste Rock Storage Facility	69,143	Impervious area	1.59	
Waste Water Storage	16,155	Impervious area	0.37	
WTP	1,615	Building	0.04	
Total Buildings Area	**127,855**	**SQ FT**	**2.83**	**Acres**
Total Lined Pads Area	**3,458,184**	**SQ FT**	**79.39**	**Acres**
Total Impervious Area	**447,229**	**SQ FT**	**10.27**	**Acres**
Total Impacted Area	**4,610,551**	**SQ FT**	**105.73**	**Acres**
Total Cleared Area	**5,993,717**	**SQ FT**	**137.45**	**Acres**

REVISED JUNE 30, 2020


WOLFDEN
Access Barrier
Access Gate
PDP 1
PDP 2
PDP 3
PDP 4
4 Acre Pond
Dry Stacked Tailings Facility
WTP
Waste Water Storage
Employee Parking
Truck Parking
Fuel Storage
Laydown Area / Area A
Waste Rock Storage Facility
Mill Feed Storage Pad
Conc Handling
Warehouse and Shop
Office
Concentrator
Elec Subst
Septic System
Portal
Image Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Prepared/Date: BRP 07-01-20
Checked/Date: PHT 07-01-20
Exhibit D-2
Preliminary Site Plan
LEGEND
Area Proposed for Rezoning
400 Foot Setback Buffer
P-SL2 75' Setback
Infrastructure
Roads
5 Foot Ground Elevation Contour
Vernal Pool Point
Vernal Pool Polygon
Drainage
Stream
Stream-Tentative
Wetland
Wetland-Tentative
Wetland Area

Wood Environment & Infrastructure Solutions, Inc.
511 Congress Street
Ste. 200
Portland, ME 04101
USA
T: 207-775-5401
www.woodplc.com

June 30, 2020

Mr. Jeremy Ouellette, P. Eng.
Wolfden Resources Corporation
Office Address:
1100 Russell Street,
Thunder Bay, ON P7B 5N2

Subject: Wetland Delineation Survey
Pickett Mountain Site, Maine

Dear Mr. Ouellette:

This letter report summarizes the wetland delineation survey that was conducted in response to the wetland, stream, and vernal pool survey requested by LUPC for the re-zoning petition for the Pickett Mountain Site in Maine.

Scope of Work

The 528 acre area proposed for re-zoning (the Site) was surveyed to identify and delineate wetlands, vernal pools and streams. Figure 1 shows an overview of the proposed rezoning boundary and the area surveyed. Figures 2-7 are provided at a scale of 1 inch = 100 feet, as requested by LUPC. The survey was conducted by certified wetland scientists (NH) from Wood Environment and Infrastructure Solutions, Inc. (Charles Lyman), and Broadwater Environmental, LLC (Ian Broadwater) and under the direction of professional wetland scientist from Atlantic Resources Consultants, LLC (Roger St. Amand).

Wetlands Delineation

Wetlands were delineated over two field events. The first event was May 18, 2020 through May 22, 2020. The second event was June 15, 2020 through June 19, 2020. Wetlands were delineated based on the presence of wetland hydrology, hydrophytic vegetation and hydric soils, following U.S. Army Corps of Engineers Wetland Delineation Manual (Wetlands Technical Report Y-87-1) and the Northcentral and Northeast Regional Supplement (ERDC/EL TR-12-1). In addition to delineating wetlands, streams and drainage features were also delineated. The streams on site were delineated following the Natural Resource Protection Act (NRPA) Identification Guide for Rivers, Streams, and Brooks (Danielson, 2018). Streams and drainages delineated are

shown on Figures 1-7. A summary of the wetlands delineated and pertinent information is included in Table 1. Representative plots and photographs of the wetlands delineated on Site are found in Attachment A.

Vernal Pool Survey

A vernal pool survey was conducted as the first step in the wetland delineation work. The initial vernal pool survey work, which included a survey of the entire Site, was done over a three-day period between May 17, 2020 and May 20, 2020 and was completed within the timeframe window for wood frog egg masses in Northern Maine. Vernal pools (VPs) were identified based on physical characteristics of the features including isolated water bodies, water stained leaves, water lines, sphagnum moss and the presence of hydrophytic vegetation. Egg mass counts of spotted salamanders and wood frogs were collected. A total of eight vernal pools were identified and surveyed during this initial survey. A second, follow up visit, to the vernal pools identified during the initial site visit, was conducted on May 28, 2020 and May 29, 2020. Egg mass counts of spotted salamanders and wood frogs were collected. The vernal pools identified on Site are shown on Figures 1-7. A summary of the vernal pools identified and pertinent information is included in Table 2.

Other Observations

As part of the initial zoning petition Wolfden sought input from Maine Natural Areas Program (MNAP) and Maine Department of Inland Fisheries and Wildlife (MDIFW) on the presence of significant wildlife habitats and/or plant communities in the area. Both agencies provided documentation back on species and habitats in the general area. Information provided indicated there were no known significant wildlife habitats or S1/S2 plant communities within the area proposed for rezoning. This information was reviewed by the wetland scientists conducting the survey and no significant wildlife habitats or S1/S2 plant communities within the area proposed for rezoning were observed during the field survey. A detailed survey of flora and fauna was not part of this survey.

References:

Danielson, T.J. 2018 Natural Resource Protection Act (NRPA) Streams, Rivers and Brooks, Maine Department of Environmental Protection, Augusta, Maine.

Sincerely,

Wood Environment & Infrastructure Solutions, Inc.

Peter Baker, C.G.
Project Manager

Charles Lyman, CWS, LSE
Certified Wetland Scientist (NH)'

FIGURES

WOLFDEN

Zone 1

Zone 2

Zone 3

Zone 4

Zone 5

Zone 6

S-1 S-2 S-3 S-4 S-5 S-6 S-7 S-8 S-9 S-10 S-11 S-12 S-13 S-14 S-15 S-16 S-17 S-18 S-19 S-20

D-1 D-2 D-3 D-4 D-7 D-8 D-9 D-10

W-1 W-2 W-3 W-4 W-5 W-6 W-7 W-8 W-9 W-10 W-11 W-12 W-13 W-14 W-15 W-16 W-17 W-18 W-19 W-20 W-21 W-22 W-23 W-24 W-25 W-26 W-27 W-28 W-29 W-30 W-31 W-32 W-33 W-34 W-35

VP-A VP-B VP-C VP-D VP-E VP-F VP-G VP-H

Image Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Figure 1
Wetland Delineation Overview

LEGEND

- Vernal Pool Point
- Vernal Pool Polygon
- Drainage
- Stream
- Stream-Tentative
- Wetland
- Wetland-Tentative
- Wetland Area
- Area Proposed for Rezoning
- 5 Foot Ground Elevation Contour
- Roads


WOLFDEN
Figure 2
Wetland Delineation Zone 1
LEGEND
Vernal Pool Point
Vernal Pool Polygon
Drainage
Stream
Stream-Tentative
Wetland
Wetland-Tentative
Wetland Area
Area Proposed for Rezoning
5 Foot Ground Elevation Contour
Roads
S-7
S-6
S-5
S-4
S-3
S-2
D-1
D-2
D-3
D-4
W-2
W-3
W-4
W-5
W-6
W-7
W-8
W-9
W-10
W-11
Image Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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WOLFDEN

W-2

S-1

W-1

VP-A

W-34

W-12

S-8

W-13

Figure 3
Wetland Delineation Zone 2

LEGEND

- Vernal Pool Point
- Vernal Pool Polygon
- Drainage
- Stream
- Stream-Tentative
- Wetland
- Wetland-Tentative
- Wetland Area
- Area Proposed for Rezoning
- 5 Foot Ground Elevation Contour
- Roads

Image Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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WOLFDEN

D-4
W-20
W-19
VP-C
VP-B
VP-F
D-8
W-26
S-15
W-23
D-7
W-25
S-15
W-24
S-14
W-19

Image Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Prepared/Date: BRP 06-30-20	Checked/Date: PSB 06-30-20

Figure 4
Wetland Delineation Zone 3

LEGEND

- Vernal Pool Point
- Vernal Pool Polygon
- Drainage
- Stream
- Stream-Tentative
- Wetland
- Wetland-Tentative
- Wetland Area
- Area Proposed for Rezoning
- 5 Foot Ground Elevation Contour
- Roads

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WOLFDEN

W-12
S-8
S-9
W-15
S-8
W-14
W-13
W-17
W-16
W-18
S-11
S-10
S-9
W-23
S-12
W-21
VP-E
W-21
S-15
S-14
W-21
S-13
VP-G
W-21
W-21
VP-H
W-35
W-22

Image Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Figure 5
Wetland Delineation Zone 4

LEGEND

- Vernal Pool Point
- Vernal Pool Polygon
- Drainage
- Stream
- Stream-Tentative
- Wetland
- Wetland-Tentative
- Wetland Area
- Area Proposed for Rezoning
- 5 Foot Ground Elevation Contour
- Roads

WOLFDEN

W-24
W-19
S-15
S-14
W-21
VP-H
W-35
W-27
D-10
D-9
S-18
W-29
VP-D
S-17
W-28
W-31
W-30
W-32
W-32
W-33
S-20

Figure 6
Wetland Delineation Zone 5

LEGEND

- Vernal Pool Point
- Vernal Pool Polygon
- Drainage
- Stream
- Stream-Tentative
- Wetland
- Wetland-Tentative
- Wetland Area
- Area Proposed for Rezoning
- 5 Foot Ground Elevation Contour
- Roads

Image Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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WOLFDEN

S-15
S-14
W-21
VP-H
W-35
W-21
VP-G
S-13
W-21
W-22
W-27
S-16
W-32
W-32
S-19

Image Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Figure 7
Wetland Delineation Zone 6

LEGEND

- Vernal Pool Point
- Vernal Pool Polygon
- Drainage
- Stream
- Stream-Tentative
- Wetland
- Wetland-Tentative
- Wetland Area
- Area Proposed for Rezoning
- 5 Foot Ground Elevation Contour
- Roads

TABLES

TABLE 1 - Wetlands in Proposed Re-Zoning Area

Resource ID	Cowardin Classification[1]	Dominant Vegetation[2]	Hydric Soil Indicator[3]	Hydrology Indicators[3]	Preliminary MDEP Classification[4]
Wetland 1	PFO4	Balsam fir (Abies balsamea), red maple (Acer rubrum), sensetive fern (Onoclea sensibilis), dwarf raspberry (Rubus pubescens)	Depleted matrix Redox (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WNSS
Wetland 2	PFO1/4	Red spruce (Picea rubens), yellow birch (Betula alleghaniensis), balsam fir (Abies balsamea), nodding sedge (Carex gynandra), interrupted fern (Osmunda claytoniana)	Depleted Below Dark Surface (A11), Depleted Matrix (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WNSS
Wetland 3	PSS1	Yellow birch (Betula alleghaniensis), speckled alder (Alnus incana), red maple (Acer rubrum), green ash (Fraxinus pennsylvanica), sensitive fern (Onoclea sensibilis), field horsetail (equisetum arvense)	Depleted matrix Redox (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WNSS
Wetland 4	PSS1	Yellow birch (Betula alleghaniensis), red maple (Acer rubrum), beaked hazelnut (Corylus cornuta), bluejoint (Calamagrostis canadensis), greater bladder sedge (Carex intumescens)	Depleted matrix Redox (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WOSS (stream)
Wetland 5	PSS1	Yellow birch (Betula alleghaniensis), green ash (Fraxinus pennsylvanica), Bebb's willow (Salix bebbiana), red maple (Acer rubrum), sensitive fern (Onoclea sensibilis), white edge sedge (Carex debilis), field horsetail (Equisetum arvense)	Depleted matrix Redox (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WNSS
Wetland 6	PFO1	Red maple (Acer rubrum), green ash (Fraxinus pennsylvanica), black ash (Fraxinus nigra), balsam fir (Abies balsamea), speckeled alder (Alnus incana), Bebb's willow (Salix bebbiana), steeplebush (Spiraea tomentosa), sensitive fern (Onoclea sensibilis), cinnamon fern (Osmunda cinnamomea), interrupted fern (Osmunda claytoniana)	Depleted matrix Redox (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WNSS
Wetland 7	PEM1	Sensitive fern (Onoclea sensibilis), drooping woodland sedge (Carex arctata), jewelweed (Impatiens capensis), nodding sedge (Carex gynandra)	Depleted matrix Redox (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WOSS (stream)
Wetland 8	PSS1	Bebb's willow (Salix bebbiana), steeplebush (Spiraea tomentosa), sensitive fern (Onoclea sensibilis), jewelweed (Impatiens capensis), field horsetail (Equisetum arvense)	Depleted matrix Redox (F3)	Surface Water (A1), High Water Table (A2), Saturation (A3)	WNSS
Wetland 9	PEM1	Sensitive fern (Onoclea sensibilis), drooping woodland sedge (Carex arctata), jewelweed (Impatiens capensis), nodding sedge (Carex gynandra)	Depleted matrix Redox (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WOSS (stream)
Wetland 10	PFO1	Ostrich Fern (Matteuccia struthiopteris), Field Horsetail (Equisetum arvense), sensetive fern (Onoclea sensibilis), Carex sp.			WNSS
Wetland 11	PFO1	Ostrich Fern (Matteuccia struthiopteris), Fringed Sedge (Carex Crinita), Jewel Weed (Impatiens capensis), Sensitive fern (Onoclea sensibilis)			WNSS

TABLE 1 - Wetlands in Proposed Re-Zoning Area

Resource ID	Cowardin Classification[1]	Dominant Vegetation[2]	Hydric Soil Indicator[3]	Hydrology Indicators[3]	Preliminary MDEP Classification[4]
Wetland 12	PEM	Cinnamon fern (Osmunda cinnamomea), Interrupted fern (Osmunda claytoniana), Nodding sedge (Carex gynandra	Loamy mucky mineral (F1)	High Water Table (A2), Saturation (A3)	WNSS
Wetland 13	PEM	Nodding sedge (Carex gynandra), Wild mint (Mentha arvensis), Sensitive fern (Onoclea sensibilis)	Depleted matrix Redox (F3)	Saturation (A3), Waterstained leaves (B9)	WNSS
Wetland 14	PFO	Balsam fir (Abies balsamea), Gray birch (Betula populifolia), Yellow birch (Betula alleghaniensis), Hobblebush (Viburnum lantanoides), Red maple (Acer rubrum), Sensitive fern (Onoclea sensibilis), Cinnamon fern (Osmunda cinnamomea), Interrupted fern (Osmunda claytoniana)	Depleted matrix Redox (F3), Loamy mucky mineral (F1)	Saturation (A3), Waterstained leaves (B9), Microtopographic Relief (D4)	WOSS within 25' of stream
Wetland 15	PEM	Sensitive fern (Onoclea sensibilis), Jewelweed (Impatiens capensis)	Loamy mucky mineral (F1)	Saturation (A3), Geomorphic Position (D2), Microtopographic Relief (D4)	WOSS within 25' of stream
Wetland 16	PEM	Balsam fir (Abies balsamea), Sphagnum (Sphagnum capillifolium), Sensitive fern (Onoclea sensibilis), Cinnamon fern (Osmunda cinnamomea)	Depleted matrix Redox (F3)	Saturation (A3), Geomorphic Position (D2), Microtopographic Relief (D4)	WNSS
Wetland 17	PFO/PEM	Balsam fir (Abies balsamea), Yellow birch (Betula alleghaniensis), Gray birch (Betula populifolia), Hobblebush (Viburnum lantanoides), Sphagnum (Sphagnum capillifolium), Sensitive fern (Onoclea sensibilis), Cinnamon fern (Osmunda cinnamomea), Nodding sedge (Carex gynandra)	Depleted matrix Redox (F3), Loamy mucky mineral (F1)	Saturation (A3), Geomorphic Position (D2), Microtopographic Relief (D4)	WNSS
Wetland 18	PEM	Sphagnum (Sphagnum capillifolium), Sensitive fern (Onoclea sensibilis), Cinnamon fern (Osmunda cinnamomea)	Depleted matrix Redox (F3), Loamy mucky mineral (F1)	Saturation (A3)	WOSS within 25' of stream
Wetland 19	PEM	Balsam fir (Abies balsamea), Sphagnum (Sphagnum capillifolium), Sensitive fern (Onoclea sensibilis), Cinnamon fern (Osmunda cinnamomea)	Depleted matrix Redox (F3)	Saturation (A3), Geomorphic Position (D2), Microtopographic Relief (D4)	WNSS
Wetland 20	PEM1/PSS1/4	Red maple (Acer rubrum), balsam fir (Abies balsamea), yellow birch (Betula alleghaniensis), green ash (Fraxinus pennsylvanica), red raspberry (Rubus idaeus), jewelweed (Impatiens capensis), sensitive fern (Onoclea sensibilis)	Depleted matrix Redox (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WNSS
Wetland 21	PFO	Balsam fir (Abies balsamea), Gray birch (Betula populifolia), Yellow birch (Betula alleghaniensis), Hobblebush (Viburnum lantanoides), Red maple (Acer rubrum), Sensitive fern (Onoclea sensibilis), Cinnamon fern (Osmunda cinnamomea), Interrupted fern (Osmunda claytoniana)	Depleted matrix Redox (F3), Loamy mucky mineral (F1), Histic epipedon (A2)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WOSS within 25' of stream
Wetland 22	PEM	Sensitive fern (Onoclea sensibilis), Jewelweed (Impatiens capensis)	Loamy mucky mineral (F1)	Saturation (A3), Geomorphic Position (D2), Microtopographic Relief (D4)	WNSS
Wetland 23	PSS1	Green ash (Fraxinus pennsylvanica), New York fern (Thelypteris noveboracensis), jewelweed (Impatiens capensis), sensitive fern (Onoclea sensibilis), nodding sedge (Carex gynandra)	Redox Dark Surface (F6)	Saturation (A3), Waterstained Leaves (B9)	WNSS

TABLE 1 - Wetlands in Proposed Re-Zoning Area

Resource ID	Cowardin Classification[1]	Dominant Vegetation[2]	Hydric Soil Indicator[3]	Hydrology Indicators[3]	Preliminary MDEP Classification[4]
Wetland 24	PSS1	Yellow birch (Betula alleghaniensis), wrinkleleaf goldenrod (Solidago rugosa), jewelweed (Impatiens capensis)	Depleted Below Dark Surface (A11), Depleted Matrix (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WNSS
Wetland 25		Fringed Sedge (Carex Crinita), Sensitive fern (Onoclea sensibilis), Speckeled Alder (Alnus Incana), Red raspberry (Rubus idaeus), dwarf raspberry (Rubus pubescens)	Depleted matrix Redox (F3)		WNSS
Wetland 26	PFO1/4	Balsam fir (Abies balsamea), red maple (Acer rubrum), green ash (Fraxinus pennsylvanica), red spruce (Picea rubens), speckeled alder (Alnus incana), New York fern (Thelypteris noveboracensis), Jack in the pulpit (Artisaema triphyllum), greater bladder sedge (Carex intumescens)	Histic Epipedon (A2),	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WOSS (stream)
Wetland 27	PEM1	New York fern (Thelypteris noveboracensis), jewelweed (Impatiens capensis), Jack in the pulpit (Arisaema triphyllum), field horsetail (Equisetum arvense), interrupted fern (Osmunda claytoniana)	Depleted Below Dark Surface (A11), Depleted Matrix (F3)	Saturation (A3), Microtopographic Relief (D4	WNSS
Wetland 28	PFO1/4	Red maple (Acer rubrum), green ash (Fraxinus pennsylvanica), black ash (Fraxinus nigra), balsam fir (Abies balsamea), sensitive fern (Onoclea sensibilis), cinnamon fern (Osmunda cinnamomea), fringed sedge (Carex crinita), red raspberry (Rubus idaeus)	Depleted matrix Redox (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WOSS (stream)
Wetland 29	PEM1	Reed canarygrass (Phalaris arundinacea), sensitive fern (Onoclea sensibilis), jewelweed (Impatiens capensis),interrupted fern (Osmunda clatoniana), field horsetail (Equisetum arvense)	Redox Dark Surface (F6)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WNSS
Wetland 30	PEM1	Fox sedge (Carex vulpinoidea), fringed sedge (Carex crinita), jewelweed (Impatiens capensis), field horsetail (Equisetum arvense)	Depleted matrix Redox (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WNSS
Wetland 31	PEM2	Fox sedge (Carex vulpinoidea), fringed sedge (Carex crinita), jewelweed (Impatiens capensis), field horsetail (Equisetum arvense)	Depleted matrix Redox (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WNSS
Wetland 32	PFO1/4	Yellow birch (Betula allegheniensis), green ash (Fraxinus pennsylvanica), balsam fir (Abies balsamea), northern white cedar (Thuja occidentalis), red spruce (Picea rubens), cinnamon fern (Osmunda cinnamomea), interrupted fern (Osmunda claytoniana), sensitive fern (Onoclea sensibilis), royal fern (Osmunda regalis)	Histic Epipedon (A2), Black Histic (A3), Depleted Matrix (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WOSS (stream)
Wetland 33	PEM1/PSS1/4	Green ash (Fraxinus pennsylvanica), red maple (Acer rubrum), balsam fir (Abies balsamea), New York fern (Thelypteris noveboracensis), jewelweed (Impatiens capensis), sensitive fern (Onoclea sensibilis), nodding sedge (Carex gynandra)	Depleted matrix Redox (F3)	High Water Table (A2), Saturation (A3), Waterstained leaves (B9)	WNSS

TABLE 1 - Wetlands in Proposed Re-Zoning Area

Resource ID	Cowardin Classification[1]	Dominant Vegetation[2]	Hydric Soil Indicator[3]	Hydrology Indicators[3]	Preliminary MDEP Classification[4]
Wetland 34	PEM1/PSS1/4	Sensitive fern (Onoclea sensibilis), three-seeded sedge (Carex trisperma), fox sedge (Carex vulpinoidea), drooping wood sedge (Carex debilis)	Depleted Below Dark Surface (A11), Depleted Matrix (F3)	Water-Stained Leave (B9), Shallow Aquitard (D3), Microtopographic Relief (D4), FAC-Neutral Test (D5)	WNSS (mapped as wetland T1U (not yet assigned number)

1 - Cowardin, et al. 1979. United States, Fish and Wildlife Service, evaluated during winter conditions

2 - Representative species in

3 - U.S. Army Corps of Engineers. 2011. Regional Supplement to the Corps of Engineers Wetland Delineation Manual:Northcentral and Northeast Region (Version 2

4 - State of Maine, Department of Environmental Protection, Natural Resources Protection Act Statute - **Preliminary Classification**

Table 2. Vernal Pools in Proposed Re-Zoning Area

Resource ID	First Visit Date	Second Visit Date	Pool Origin	# Spotted Salamander Egg Masses	# Wood Frog Egg Masses	Length (ft)	Width (ft)	Pool Hydroperiod (Estimated)	Soils	Notes	Corps Jurisdictional	MDEP Jurisdictional
VP-A	5/18/2020	5/28/2020	Nat-Mod	1	1	1	1	Ephemeral -	Organic	Skid ruts	Yes	Yes
VP-B	5/18/2020	5/28/2020	Nat-Mod	0	2	20	40	Ephemeral -	Organic	Edge of PVP bordered by woods road	Yes	Yes
VP-C	5/18/2020	5/28/2020	Nat-Mod	3	35	10	20	Ephemeral -	Organic	Edge of PVP bordered by woods road	Yes	Yes
VP-D	5/18/2020	5/28/2020	Nat-Mod	20	26	20	20	Semi-Permanent	Organic	Appears to be old cellar hole	Yes	Yes
VP-E	5/17/2020	5/28/2020	Natural	0	0	12	7	Ephemeral	Organic/ mineral	Edge of skidder road	Yes	Yes
VP-F	5/19/2020	5/28/2020	Nat-Mod	15	10	40	60	Semi-Permanent	Organic	skidder trails and old test pit observed	Yes	Yes
VP-G	5/17/2020	5/28/2020	Natural	0	0	12	12	Ephemeral	Organic		Yes	Yes
VP-H	5/18/2020	5/28/2020	Natural	0	0	10	10	Ephemeral	Organic		Yes	Yes

ATTACHMENT A

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Wolfden Pickett Mountain City/County: Aroostook Sampling Date: 6/17/2020

Applicant/Owner: Wolfden State: ME Sampling Point: Plot 1 up

Investigator(s): Ian Broadwater Section, Township, Range: Moro Plantation

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No x (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes _____ No x

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No x	**Is the Sampled Area within a Wetland?**	**Yes _____ No x**
Hydric Soil Present?	Yes _____	No x	If yes, optional Wetland Site ID: _____	
Wetland Hydrology Present?	Yes _____	No x		

Remarks: (Explain alternative procedures here or in a separate report.)

Lack of rain over the past few weeks has resulted in abnormally dry conditions. Area has been forested and there is evidence of disturbance from this activity. Old skidder roads are present that appear to have been bulldozed as they have oil piles along the road edges. Sometimes they contain wetlands in an otherwise upland setting.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No x	Depth (inches):
Water Table Present?	Yes _____	No x	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes _____	No x	Depth (inches):

Wetland Hydrology Present? Yes _____ No x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: T2 Plot 1 up

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Red spruce *(Picea rubens)*	30	Y	FACU
2. American beech *(Fagus grandifolia)*	20	N	FACU
3. Balsam fir (*Abies balsamea*)	*15*	*N*	*FAC*
4. *Paper birch (Betula papyrifera)*	*5*	*N*	*FACU*
5.			
6.			
7.			
	70 = Total Cover		
Sapling/Shrub Stratum (Plot size: *15'*)			
1. Red spruce *(Picea rubens)*	15	Y	FACU
2. American beech (*Fagus grandifolia*)	5	N	FACU
3. Sugar maple (A*cer saccharum*)	5	N	FACU
4. Hobblebush *(Viburnum lantanoides)*	5	N	FAC
5.			
6.			
7.			
	30 = Total Cover		
Herb Stratum (Plot size: 5')			
1. White trillium *(Trillium grandiflorum)*	30	Y	NA
2. Sugar maple seedlings (*Acer saccharum*)	3	N	FACU
3. *Hobblebush seedlings (Viburnum lantanoides)*	3	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	36 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** x

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: T2 Plot 1 up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	various						organic	Oe horizon; dry
3-5	10YR 4/4	99					Fine sandy loam	no redox features
5"	Refusal on cobbles							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: very stony layer at 5"

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** x

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Wolfden Pickett Mountain City/County: Aroostook Sampling Date: 6/17/2020

Applicant/Owner: Wolfden State: ME Sampling Point: T2 Plot 1 wet

Investigator(s): Ian Broadwater Section, Township, Range: Moro Plantation

Landform (hillslope, terrace, etc.): Gentle slope Local relief (concave, convex, none): 1.5' deep skidder ruts Slope (%): 1

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No x (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes _____ No x

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No	**Is the Sampled Area within a Wetland?** **Yes x** **No**
Hydric Soil Present?	Yes x	No	
Wetland Hydrology Present?	Yes x	No	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

Lack of rain over the past few weeks has resulted in abnormally dry conditions. Area has been forested and there is evidence of disturbance from this activity. Old skidder roads are present that appear to have been bulldozed as they have oil piles along the road edges. Sometimes they contain wetlands in an otherwise upland setting.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- x Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- x Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- x Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No x	Depth (inches):	
Water Table Present?	Yes _____	No x	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes x	No _____	Depth (inches):	4

Wetland Hydrology Present? Yes x No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: T2 Plot 1 wet

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Red spruce (*Picea rubens*)	20	Y	FACU
2. Gray birch *(Betula populifolia)*	15	Y	FAC
3. Balsam fir (*Abies balsamea*)	10	N	FAC
4. Hobblebush *(Viburnum lantanoides)*	10	N	FAC
5.			
6.			
7.			
	55	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. *Balsam fir (Abies balsamea)*	15	Y	FAC
2. Red spruce *(Picea rubens)*	15	Y	FACU
3. Hobblebush *(Viburnum lantanoides)*	10	N	FAC
4.			
5.			
6.			
7.			
	40	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Cinnamon fern (*Osmunda cinnamomea*)	30	Y	FACW
2. Lady fern *(Athyrium angustum)*	15	N	FAC
3. Hobblebush seedlings *(Viburnum lantanoides)*	5	N	FAC
4. *Unidentified carex (no fruit)*	5	N	NA
5. Unidentified grass (no fruit)	5	N	NA
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	60	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. None			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: T2 Plot 1 wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/1						organic	saturated
5-8	10YR5/1	95	7.5YR 6/8	5	c	m	Loamy sand	10% gravel; saturated
8+	Refusal on cobbles							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- x Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: very stony layer at 8"

Depth (inches): _____

Hydric Soil Present? **Yes** x **No** _____

Remarks:

Area disturbed by past logging operations.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Wolfden Pickett Mountain City/County: Aroostook Sampling Date: 6/19/2020

Applicant/Owner: Wolfden State: ME Sampling Point: T2 Plot 2 up

Investigator(s): Ian Broadwater Section, Township, Range: Moro Plantation

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): convex Slope (%): 5

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No x (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes _____ No x

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No x	**Is the Sampled Area within a Wetland?**	**Yes _____ No** x
Hydric Soil Present?	Yes _____	No x		
Wetland Hydrology Present?	Yes _____	No x	If yes, optional Wetland Site ID: _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Lack of rain over the past few weeks has resulted in abnormally dry conditions. Area has been forested and there is evidence of disturbance from this activity. Old skidder roads are present that appear to have been bulldozed as they have oil piles along the road edges. Sometimes they contain wetlands in an otherwise upland setting.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No x	Depth (inches):
Water Table Present?	Yes _____	No x	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes _____	No x	Depth (inches):

Wetland Hydrology Present? Yes _____ No x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: T2 Plot 2 up

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. American beech *(Fagus grandifolia)*	40	Y	FACU
2. Sugar maple *(Acer saccharum)*	25	N	FACU
3. Balsam fir (*Abies balsamea*)	*15*	*N*	*FAC*
4. Gray birch *(Betula populifolia)*	*10*	*N*	*FAC*
5.			
6.			
7.			
	90 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Red spruce *(Picea rubens)*	10	Y	FACU
2. American beech (*Fagus grandifolia*)	10	N	FACU
3. Sugar maple (A*cer saccharum*)	10	N	FACU
4. Stripped maple (*Acer pensylvanicum)*	10	N	FACU
5. Hobblebush *(Viburnum lantanoides)*	5	N	FAC
6.			
7.			
	45 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Lady fern *(Athyrium angustum)*	3	Y	FAC
2. *American beech seedlings*	3	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	6 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1. None			
2.			
3.			
4.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** x

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: T2 Plot 2 up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	various						organic	Oe horizon; dry
3-4	7.5YR 6/2	99					Fine sandy loam	
4-7	7.5YR 4/6	99					Sandy loam	no redox features
7+	Refusal on cobbles							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: very stony layer at 7"

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** x

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Wolfden Pickett Mountain City/County: Aroostook Sampling Date: 6/19/2020

Applicant/Owner: Wolfden State: ME Sampling Point: T2 Plot 2 wet

Investigator(s): Ian Broadwater Section, Township, Range: Moro Plantation

Landform (hillslope, terrace, etc.): Gentle slope Local relief (concave, convex, none): 1.5' deep skidder ruts Slope (%): 1

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No x (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes _____ No x

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No	**Is the Sampled Area within a Wetland?** **Yes x** **No**
Hydric Soil Present?	Yes x	No	
Wetland Hydrology Present?	Yes x	No	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

Lack of rain over the past few weeks has resulted in abnormally dry conditions. Area has been forested and there is evidence of disturbance from this activity. Old skidder roads are present that appear to have been bulldozed as they have oil piles along the road edges. Sometimes they contain wetlands in an otherwise upland setting.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- x Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- x Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- x Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No x Depth (inches):

Water Table Present? Yes _____ No x Depth (inches):

Saturation Present? (includes capillary fringe) Yes x No _____ Depth (inches): 2

Wetland Hydrology Present? **Yes x** **No**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of sphagnum sp. in wetland area.

VEGETATION – Use scientific names of plants.

Sampling Point: T2 Plot 2 wet

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Gray birch *(Betula populifolia)*	15	Y	FAC
2. Balsam fir (*Abies balsamea*)	5	N	FAC
3. Sugar maple (Acer saccharum)	5	N	FACU
4.			
5. Note: Sugar maple located outside of wetland.			
6.			
7.			
	25	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Red cedar *(Juniperus virginiana)*	20	Y	FACU
2. Gray birch (*Betula populifolia*)	10	Y	FAC
3. *Balsam fir (Abies balsamea)*	10	N	FAC
4. *Sugar maple (Acer saccharum)*	5	N	FACU
5.			
6.			
7.			
	45	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Sphagnum (Sphagnum capillifolium)	60	N	NA
2. Nodding sedge (Carex gynandra)	30	Y	FACW
3. Interrupted fern (*Osmunda claytoniana*)	10	N	FAC
4. Wild mint *(Mentha arvensis)*	5	N	FACW
5. Dwarf raspberry (*Rubus pubescens*)	5	N	FACW
6. Unidentified grass (no fruit)	5	N	NA
7.			
8. Sphagnum not counted on cover % as other plants were growing through it.			
9.			
10.			
11.			
12.			
	55	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. None			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: T2 Plot 2 wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2		7.5 YR 6/8	5	c	m	Loam	10% gravel; saturated
6+	Refusal on cobbles							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- x Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: very stony layer at 6"

Depth (inches): _____

Hydric Soil Present? **Yes** x **No** _____

Remarks:

Area disturbed by past logging operations.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Wolfden Pickett Mountain City/County: Aroostook Sampling Date: 6/19/2020

Applicant/Owner: Wolfden State: ME Sampling Point: T2 Plot 3 up

Investigator(s): Ian Broadwater Section, Township, Range: Moro Plantation

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): convex Slope (%): 3

Subregion (LRR or MLRA): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No x (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes _____ No x

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No x	**Is the Sampled Area within a Wetland?**	**Yes _____ No x**
Hydric Soil Present?	Yes _____	No x	If yes, optional Wetland Site ID: _____	
Wetland Hydrology Present?	Yes _____	No x		

Remarks: (Explain alternative procedures here or in a separate report.)

Lack of rain over the past few weeks has resulted in abnormally dry conditions. Area has been forested and there is evidence of disturbance from this activity. Old skidder roads are present that appear to have been bulldozed as they have oil piles along the road edges. Sometimes they contain wetlands in an otherwise upland setting.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No x	Depth (inches):
Water Table Present?	Yes _____	No x	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes _____	No x	Depth (inches):

Wetland Hydrology Present? Yes _____ No x

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: T2 Plot 3 up

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. American beech *(Fagus grandifolia)*	50	Y	FACU
2. Gray birch *(Betula populifolia)*	20	N	FAC
3. Balsam fir (*Abies balsamea*)	*15*	N	FAC
4. Eastern cottonwood (*Populus deltoides*)	*10*	N	FAC
5.			
6.			
7.			
	95	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Stripped maple (*Acer pensylvanicum)*	20	Y	FACU
2. Sugar maple (A*cer saccharum*)	10	N	FACU
3. Balsam fir (*Abies balsamea*)	5	N	FAC
4.			
5.			
6.			
7.			
	35	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Lady fern *(Athyrium angustum)*	2	N	FAC
2. *American beech seedlings*	2	Y	FACU
3. Sugar maple (Acer saccharum)	2	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	6	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. None			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** x

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: T2 Plot 3 up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	various						organic	Oe horizon; dry
3-4	7.5YR 6/2	99					Fine sandy loam	
4-7	7.5YR 4/6	99					Sandy loam	no redox features
7+	Refusal on cobbles							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: very stony layer at 5"

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** x

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Wolfden Pickett Mountain City/County: Aroostook Sampling Date: 6/19/2020

Applicant/Owner: Wolfden State: ME Sampling Point: T2 Plot 3 wet

Investigator(s): Ian Broadwater Section, Township, Range: Moro Plantation

Landform (hillslope, terrace, etc.): Gentle slope Local relief (concave, convex, none): 1.5' deep skidder ruts Slope (%): 1

Subregion (LRR or MLRA): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No x (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology x significantly disturbed? Are "Normal Circumstances" present? Yes ____ No x

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No	**Is the Sampled Area within a Wetland?** **Yes x** **No**
Hydric Soil Present?	Yes x	No	
Wetland Hydrology Present?	Yes x	No	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

Lack of rain over the past few weeks has resulted in abnormally dry conditions. Area has been forested and there is evidence of disturbance from this activity. Old skidder roads are present that appear to have been bulldozed as they have oil piles along the road edges. Sometimes they contain wetlands in an otherwise upland setting.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- x Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- x Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- x Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No x Depth (inches):

Water Table Present? Yes ____ No x Depth (inches):

Saturation Present? (includes capillary fringe) Yes x No ____ Depth (inches): 3

Wetland Hydrology Present? Yes x No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: T2 Plot 3 wet

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Balsam fir (*Abies balsamea*)	25	Y	FAC
2. Gray birch *(Betula populifolia)*	10	N	FAC
3.			
4. American beech *(Fagus grandifolia)*	20	N	FACU
5. Note: Beech located outside of wetland so not counted in total cover.			
6.			
7.			
	35	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Gray birch (*Betula populifolia*)	20	Y	FAC
2. American beech (*Fagus grandifolia*)	15	N	FACU
3.			
4. *Note: Beech located outside of wetland so not counted in total cover.*			
5.			
6.			
7.			
	20	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Nodding sedge (Carex gynandra)	25	Y	OBL
2. Wild mint *(Mentha arvensis)*	25	Y	FACW
3. Dwarf raspberry (*Rubus pubescens*)	5	N	FACW
4. Cinnamon fern *(Osmunda cinnamomea)*	2	N	FACW
5. Sensitive fern (Onoclea sensibilis	2	N	FACW
6. Unidentified grass (no fruit)	2	N	NA
7.			
8.			
9.			
10.			
11.			
12.			
	59	= Total Cover	

Woody Vine Stratum (Plot size: 30')			
1. None			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** x **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: T2 Plot 3 wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/2						Sandy loam	
3-7	10YR 4/6	97	7.5YR 6/8	2	c	m	Fine sandy loam	very moist
7+	Refusal on cobbles							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- x Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L, M**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: very stony layer at 7"

Depth (inches): ___

Hydric Soil Present? **Yes** x **No** ___

Remarks:

Area disturbed by past logging operations.

Site Photographs

Client:	Wolfden	***Project Number:***	**3617197478.4.1**
Site Name:	Pickett Mountain	***Site Location:***	Patten, Maine

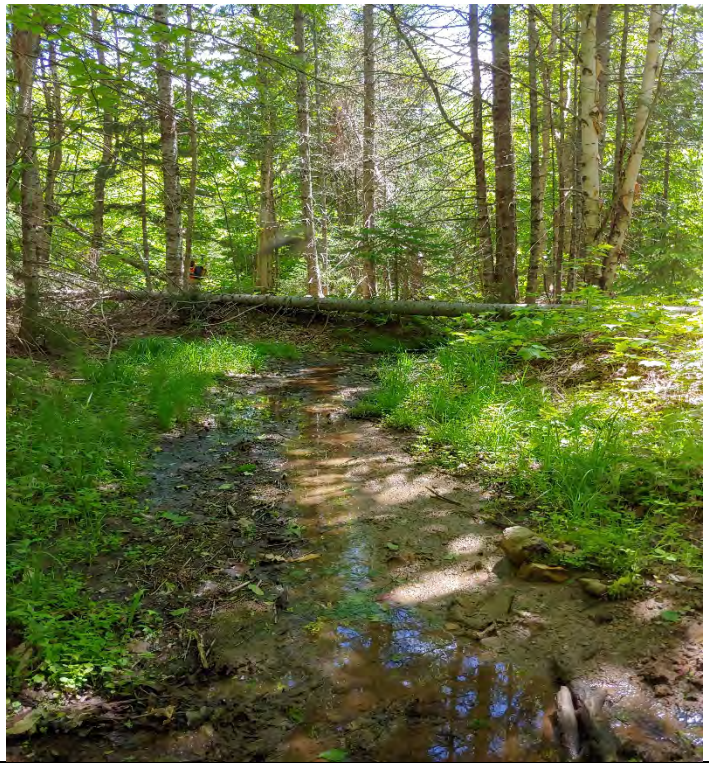
Photographer:
Ian Broadwater

Date:
05/18/2020

Photograph: 1

Direction:
Northwest

Description:
Branch of Stream 14 that developed in a skidder road



Photographer:
Ian Broadwater

Date:
05/18/2020

Photograph: 2

Direction:
South

Description:
Branch of Stream 14

Site Photographs

Client:	Wolfden	***Project Number:***	**3617197478.4.1**
Site Name:	Pickett Mountain	***Site Location:***	Patten, Maine

Photographer:
Ian Broadwater

Date:
June 2020

Photograph: 3

Direction:
West

Description:
Natural portion of Stream 14 uninterrupted by skidder trails.

Photographer:
Ian Broadwater

Date:
June 2020

Photograph: 4

Direction:
South

Description:
Emergent wetland that formed in an old logging road. Notice banks of soil on the left possibly from a dozer.

Site Photographs			
Client:	Wolfden	***Project Number:***	**3617197478.4.1**
Site Name:	Pickett Mountain	***Site Location:***	Patten, Maine

Photographer:
Ian Broadwater

Date:
June 22020

Photograph: 5

Direction:
Southeast

Description:
T2 Plot 1 upland

Photographer:
Ian Broadwater

Date:
June 2020

Photograph: 6

Direction:
South

Description:
T2 Plot 1 wetland

Site Photographs

Client:	Wolfden	***Project Number:***	**3617197478.4.1**
Site Name:	Pickett Mountain	***Site Location:***	Patten, Maine

Photographer:
Ian Broadwater

Date:
05/18/2020

Photograph: 7

Direction:
Southeast

Description:
T2 Plot 2 upland

Photographer:
Ian Broadwater

Date:
June 2020

Photograph: 8

Direction:
South

Description:
T2 Plot 2 wetland

Site Photographs

Client:	Wolfden	***Project Number:***	**3617197478.4.1**
Site Name:	Pickett Mountain	***Site Location:***	Patten, Maine

Photographer:
Ian Broadwater

Date:
June 2020

Photograph: 9

Direction:
Southeast

Description:
T2 Plot 3 upland

Photographer:
Ian Broadwater

Date:
June 2020

Photograph: 10

Direction:
South

Description:
T2 Plot 3 wetland

Exhibit H

Financial Capacity

Financial Capacity

Funding for the Pickett Mountain Mine project to date has been a combination of small equity raises and timber sales from the property. Wolfden's market capitalization will be an important factor for its ability to fully finance the construction of the project. Wolfden, like other base metal focused mining companies trades at a discount due to lower investor interest in the base metal commodity sector. In addition, Wolfden is the first company in years to attempt to build a metallic mine in Maine and as a result, investors may be more cautious to invest in the project until the principle regulatory requirements (such as rezoning, baseline studies, feasibility studies, and a mining permit) have been successfully completed. We anticipate that this trend will continue for the project until milestones like the rezoning have been achieved and the project is proceeding well through its baseline studies.

Typically, mining projects are funded through a combination of project debt and equity whether the company is large or small. For small mining companies, the equity portion of the project financing is usually raised through several share issuances as the project completes the principle milestones as those listed above, such as the 1) Full Feasibilty Study with a positive outcome; 2) Mine permitting approvals; 3) Approval of a project debt facility with a lead financial arranger; and 4) Positive results from any ongoing exploration that indicate the potential for additional resources.

Currently, Wolfden is actively exploring while in parallel pursuing a rezoning petition. Success on both of these fronts will significantly de-risk the project and thereby improve investor comfort in the project and in the future of metallic mining in Maine. Wolfden's two largest shareholders (Kinross and Altius) are larger mining companies with the financial capacity to finance the construction of the project. Similar to small investors, these larger investors could be interested in a partnership to develop the project or even a take over of Wolfden so that they can develop the project themselves. There are other larger mining companies that continue to follow Wolfden's efforts and success in Maine who may also be interested in either approach as the project receives approvals on the milestones listed above.

The project financing will be based on a financial model (as included in the Costs and Revenues section and an attachement) that will evolve further with more detailed drilling, baseline studies and feasibility work. The current financial model shows the project to be positive. Wolfden estimates that additional resources can be further defined at depth and within close proximity to the deposit that can further improve the financial returns and life of the project. The Company plans to continue with exploration and delineation drilling in parallel with all study work over the next two to three years. In addition, Wolfden has commissioned a third party engineering firm to produce a Preliminary Economic Assessment (PEA) which is typically completed before a Prefeasibility Study and Full Feasibility Study. The PEA, with a financial accuracy of 30%, will be filed as an independently approved form of a public disclosure document required by those financial regulatory markets to which Wolfden reports. The PEA will include amongst other things, much of the similar technical information included in this

rezoning petition, in addition to a more detailed (estimated) mine plan, schedule and estimated costs and revenues that support the positive practicality of building an operation at Pickett Mountain and in continuing with further exploration, technical studies and ultimately mine permitting.

Wolfden is committed to demonstrating to the mining community, its investors and all relevant stakeholders that Maine is "open for business" when it comes to employing proven safe and modern mining techniques. Rezoning, Mine Permitting and implementation of the project also would demonstrate that the LUPC and DEP rules governing metallic mineral mines are not preclusive of mining in the State of Maine.

Wolfden benefits from established strategic relationships with larger companies such as Kinross and Altius, which have the experience and capability to build a modern base metal mine in Maine. Wolfden's management also has a track record of success in building modern mines, including the financing of the largest producing mine in Burkina Faso, West Africa (Essakane Mine) that even more than ten years later is still the single largest contributor to the GDP of the country. Wolfden urges that the Commission not focus on its balance sheet of today and a project financing to build the project will not be pursued by any mining company, large or small, until the completion of a full feasibility study and a successful mine permitting process.

Exhibit J
Soil Suitability and Mapping

Attachment G provides available low intensity soil maps. The soils present are derived from glacial till deposited over bedrock. On-site mapping of soils has not been conducted but based on available information soils are generally suitable for the proposed project for construction of facilities and the TMF. Geotechnical investigations are scheduled in the summer of 2020 for determination of geotechnical characteristics of soils for design of building foundations, the TMF, and completing stability analyses required by DEP's Chapter 200 rules. Hydrogeologic characterization will also be required to design monitoring systems, determine an appropriate location for a domestic wastewater septic field, and to design and size the infiltration galleries for re-injection of treated water back to groundwater. These studies will be detailed in nature and implemented as part of the baseline and background studies to support detailed design of the above ground mine facilities.

WOLFDEN

Map Symbol	Map Unit Name
BnC	Bangor very stony silt loam, 8 to 15 percent slopes
BnD	Bangor very stony silt loam, 15 to 25 percent slopes
BrA	Burnham silt loam, frequently ponded, 0 to 3 percent slopes
DyB	Dixmont very stony silt loam, 2 to 8 percent slopes
DyC	Dixmont very stony silt loam, 8 to 15 percent slopes
HvB	Howland loam, 0 to 8 percent slopes, very stony
HvC	Howland silt loam, 8 to 15 percent slopes, very stony
MrB	Monarda-Burnham complex, 0 to 3 percent slopes, very stony
PrC	Plaisted loam, 8 to 15 percent slopes, very stony
RmD	Rock outcrop-Thorndike association, 15 to 25 percent slopes, very stony
ThB	Thorndike channery silt loam, 0 to 8 percent slopes, rocky
ThC	Thorndike channery silt loam, 8 to 15 percent slopes, rocky
ThD	Thorndike channery silt loam, 15 to 25 percent slopes, very rocky
TvB	Thorndike-Winnecook complex, 3 to 8 percent slopes, rocky
TvC	Thorndike-Winnecook complex, 8 to 15 percent slopes, rocky
TvD	Thorndike-Winnecook complex, 15 to 35 percent slopes, very rocky

N

0 200 400 Feet

Prepared/Date: BRP 06-30-20 | Checked/Date: PHT 06-30-20

Attachment G

LEGEND

Area Proposed for Rezoning

NRCS Soils

A new power transmission line will be installed by Emera Maine from their substation located south of Patten Maine on Route 11. The new power line will follow Route 11 for 9.5 miles then the existing gravel access road for another 5.1 miles. Wolfden will contract with Emera directly for this service.

B(3)(d) Potential Impacts to Existing Uses and Natural Resources

Introduction

The following subsections present an assessment of potential for impacts to natural resources including forest resources; historic sites; wildlife and plant habitats; scenic resources; water resources; and recreation resources.

A significant component of this discussion is dedicated to surface waters (ponds and streams) and groundwater since these are the resources most vulnerable during the development, operation and closure of the Pickett Mountain mineral deposit. This evaluation discusses the nature of the water resources including the relationships between topography, location of groundwater divides, areas of groundwater recharge and groundwater discharge. An initial estimate of an overall hydrologic water balance for the site is also provided.

The mine development, operation and closure strategy is predicated on protecting these water related resources. Therefore, a discussion of this overarching strategy is presented after discussion of the resources and addresses how these resources will be protected.

This information is followed by a general discussion of the Pickett Mountain mine development, operation and closure strategy and the management of mine-related waters. Those approaches, as well as the physical setting of the mineral deposit provide the means for mitigation of potential impacts to water resources.

Surface Water Resources and Groundwater

The following sections describe the physical setting, surface water, groundwater hydrogeology and groundwater resources.

Physical Setting and Surface Water Resources

The Pickett Mountain Deposit is situated beneath a portion of an approximate 2.7 mile long ridge with moderate elevations ranging from 1,360 to 1,140 feet (west to east). The ridge is bordered to the south by Pickett Mountain Pond, to the east by Tote Road Pond and Grass Pond, and to the north by Pleasant Lake and Mud Lake. Pickett Mountain Pond flows through an unnamed stream to Grass Pond and hence north to Mud Lake and the West Branch of the

Mattawamkeag River. Pleasant Pond flows easterly to Mud Lake. Tote Road Pond outlets to a stream that flows easterly to Hale Pond and hence northerly through Green Pond to an unnamed stream that also joins the West Branch of the Mattawamkeag River.

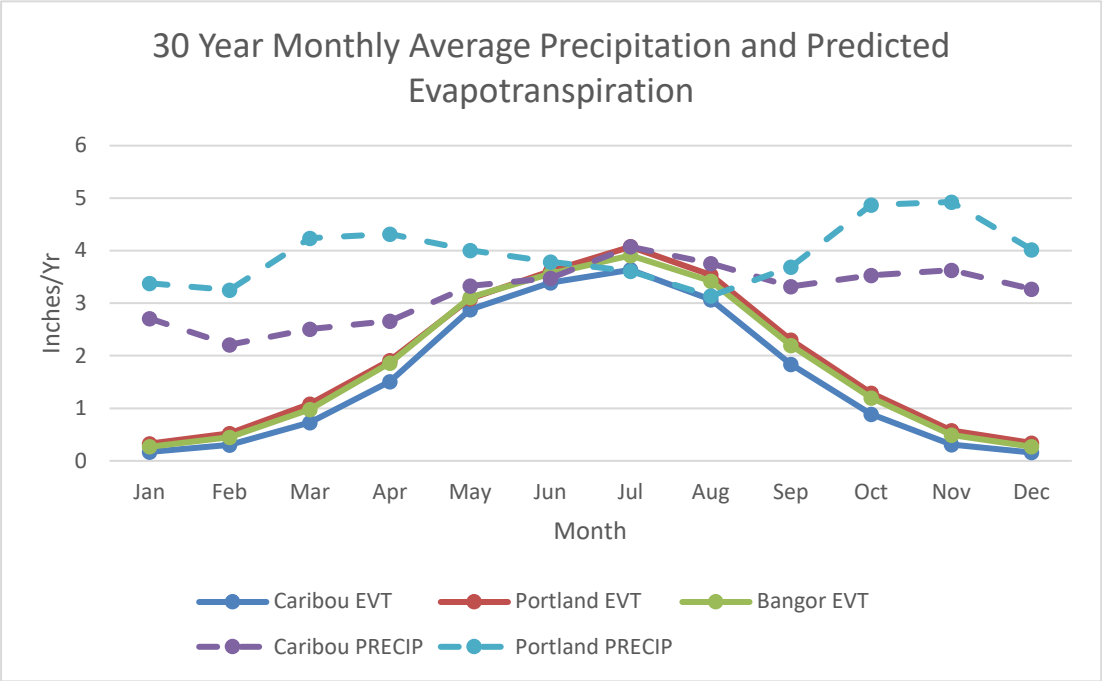
The various lakes and ponds have the approximate following acreages:

Pickett Pond	173 acres
Grass Pond	42 acres
Pleasant Lake	310 acres
Mud Lake	188 acres
Tote Road Pond	28 acres.

The ridge occupying the Pickett Mountain Deposit is bordered by higher elevations to the south including Mount Chase, Long Mountain and Pickett Mountain and to the north by Hay Brook Mountain, Roberts Mountain and Green Mountain. Another intervening ridge of similar elevation is present north of the West Branch of the Mattawamkeag River, where it enters the west side of Pleasant Lake. Surface water drainage and shallow groundwater discharge from the southern slope of this intervening ridge and Green Mountain contribute groundwater and surface water flows along the north side of both Pleasant and Mud Lakes. Prior field observations including surface water temperature measurements indicate the presence of groundwater seeps that flow into Pickett Mountain Pond and the stream flowing from it. Long and Pickett Mountain to the south, also contribute to groundwater and surface water inflows to Pickett Mountain Pond.

Groundwater Hydrogeology

Based on subsurface drilling conducted during mineral exploration activities, the site is characterized by relatively thin glacial deposits which mantle bedrock with moderate to steep slopes. Within margins of intervening valleys stratified glacial deposits are potentially present. Groundwater and surface water divides are expected to be controlled by topography and groundwater flow direction should mimic topography. **Attachment I** provides a depiction of the anticipated groundwater and surface water divides, and indicates anticipated groundwater flow directions. Based on studies of similar geologic and geographic settings (Gerber and Hebson, 1996) and historically averaged precipitation data (http://www.nrcc.cornell.edu/wxstation/pet/pet.html), the site is anticipated to receive approximately 45 inches of total annual precipitation (see figure below). Recharge to groundwater (Net precipitation minus evapotranspiration) will result in overburden groundwater and shallow bedrock groundwater recharge and groundwater flow toward surface water bodies including lakes, ponds and streams.



Average Precipitation and Evapotranspiration Rates Across Maine

The majority of shallow groundwater recharge is in spring and fall when temperatures are above freezing and evapotranspiration rates are lowest, and precipitation highest as depicted in Exhibit 1. The majority of recharge will be too shallow (possibly perched) and deeper overburden groundwater with a smaller amount of recharge to bedrock groundwater, typically in the range of 2-10% (Gerber and Hebson, 1996). The amount of recharge typically increases toward the top of the topographic highs due to increased vertical gradients, with lower recharge rates down slope toward groundwater discharge areas. This shallow groundwater will form the base flow of groundwater recharge to surface water.

The hydraulic conductivity of silty glacial tills is typically low (< 1 feet/day). Therefore, the movement of overburden groundwater at the site is expected to be slow (< 0.2 feet/day) given anticipated hydraulic gradients, which should approximate the slope of the hill slope from the site to Pickett Mountain Pond (0.05 feet/ feet). The slow groundwater migration rates and large distances to surface water bodies from the site (3,500 feet to Pickett Pond and 6,500 feet to Pleasant Lake afford a high degree of protection to surface water resources.

Significant Sand and Gravel Deposits

A surficial deposit with good to moderate potential yields is mapped along the northern side of portions of Pleasant and Mud Lakes (**Attachment I**). Based on topography and subsurface drainage basin boundaries indicated on the Significant Sand and Gravel Aquifers Map of the Green Mountain Quadrangle (MGS Open File No. 01-75 2001) surface water divides are generally coincident with groundwater divides. This significant sand and gravel deposit therefore does not receive recharge or run-off from site (i.e., the north facing portion of the ridge that contains the Pickett Mountain Deposit) and would not be affected by the proposed project.

Hydrologic Water Budget - Overburden and Bedrock Groundwater Resources (

A divide in surface water and groundwater occurs along the ridge separating surface water and groundwater flow to Picket Mountain Pond and Pleasant Lake (Attachment I). The drainage sub-basin occupied by this portion of the ridge occupies approximately 3,330 acres (830 acres south of the divide and 2500 acres north of the divide). On average it is expected that 42% of precipitation is lost to evapotranspiration and run-off, with the remaining water budget resulting in recharge to overburden and bedrock groundwater (Gerber and Hebson, 1996). Approximately 5% of precipitation is assumed be to bedrock. This results in the following estimated water balance for the sub-basin provided in the following table. Most of the overburden groundwater would be expected to discharge locally within the local drainage basin (>95%), with the exclusion of recharge to bedrock. Some shallow bedrock groundwater would also be expected to discharge locally to streams in upland mountain areas and deeper sections of ponds, where present.

Estimated Hydrologic Budget

Area	Size (acres)	Net Precipitation (acre/feet/yr)	Evapotranspiration (acre/feet/yr)	Overburden Recharge (acre/feet/yr)	Bedrock Recharge (acre/feet/yr)	Overburden Recharge gallons/year	Bedrock Recharge gallons/year
Total Sub-Basin	3330	12488	5245	6881	362	2,242,201,434	118,010,602
North of Divide	2500	9375	3938	5166	272	1,683,334,410	88,596,548
South of Divide	830	3113	1307	1715	90	558,867,024	29,414,054
Developed Mine Area	20	75	0	-37	-3	(11,975,809)	(1,099,819)
Percent Excluded During Mine Operation	0.6%	0%	0%	1%	1%	1%	1%

Total Annual Precipitation	45		
Interception	2		4%
Net Annual Precipitation	43	inches	
Bedrock Net Recharge	5	%	5%
EVT Rate & Run-off	0.42	%	42%

Developed Mine Area = area where precipitation/ runoff is collected for treatment.
Assumes 15 Acres of the Total Tailngs Area open at at given time

The total area of land disturbance for mine development (excluding roads) is approximately 106 acres and includes the footprint of buildings, mine portal, a surface water management facility and a dry TMF (approximately 78 acres). Precipitation over much of this area (approximately 92 acres) will be managed to control run-off of non-contact waters, and water that potentially contact waste materials including waste rock and exposed tailings in the TMF (approximately 20 acres at any given time). Collected waters will be treated as discussed later in this section.

The area of mine development during operations is intentionally limited in size. When the water budget within this area is compared to the drainage basin, it becomes clear that impacts to recharge of groundwater (overburden and bedrock) and run-off of surface water to surface water bodies is negligible, and as a percentage (<1%) is within the range of annual variations in precipitation. Even if average annual precipitation varied by as much as 10% (+/- 5 inches), the percent reduction in recharge remains essentially the same. The immediate reduction in recharge is replaced by re-infiltration of clear treated effluent from the water management system (which is reflected in the table above).

Forest Resources

Wolfden currently owns 7,148 acres located in the southeastern corner of Township 6, Range 6 (T6R6). The property is entirely undeveloped and forested, except for six privately owned camps (seasonal residences) and logging/woods roads. The property has generated approximately $300,000 in revenue annually from timber revenue. The Company entered into a timber harvest agreement in January 2020 to sell $5 million of its timber over the next five years to a local timber company. Much of these proceeds will be used to advance the project. The timber industry is the primary industry in the area and is the driver of the local economy. The area proposed for rezoning is approximately 528.2 acres which includes approximately 106 acres of land that would be constructed upon or disturbed by construction. The mine is planned to operate for 10 years after which the impacted area would be restored. The mine operations area would be restored as forest and would eventually again be logged/harvested. The dry stacked tailings pile would be capped and restored/revegetated. The cap concepts will be developed during the final design. The cap is required to achieve the same permeability as the liner system. Several concepts will be evaluated from a dry cap that promotes run-off in a course armored infiltration layer that would discourage large tree growth and protect the underlying low permeability barrier from root damage and wind throw, to a wet cap that mimics local hydrology and is able to sustain a wetland like condition where large tree growth is naturally discouraged. Other alternatives include long term management of vegetative growth on the cap, similar to a conventional landfill cap. There would be no restrictions on current and future timber operations on the remaining 6616.8 acres of the property while the mine is in operation and being restored. The development associated with the proposed mine would affect less than 1.3% of the property currently in forest production. Therefore, impacts to the forest resources and timber industry would be negligible.

Wetland Resources

The U.S. Fish and Wildlife Service has mapped wetlands in T6R6 as a part of the National Wetland Inventory (NWI). The NWI mapped wetlands have been promulgated into LUPC Land Use Guidance Maps. There are NWI mapped wetlands on the property. The mapped wetlands are primarily palustrine forested and palustrine scrub/shrub wetlands, associated with Pleasant Lake and Pickett Mountain Pond. In addition, the West Branch of the Mattawamkeag River flows across the south part of the property. There are no NWI mapped wetlands in the area of the proposed mine development, however due to the scale of NWI mapping, it can't be concluded that there are no wetlands on the site.

A reconnaissance of the area proposed for development was conducted in October 2019. The purpose of this reconnaissance was to preliminarily identify wetland resources including wetlands and potential vernal pools, and the possible presence of small or intermittent streams. During the reconnaissance wetlands, potential vernal pools, and intermittent streams were observed. The results of the reconnaissance suggest that a detailed wetland and vernal pool survey of the proposed development area during the growing season was warranted.

In spring of 2020 a detailed delineation and reconnaissance level evaluation of wetlands and vernal pools was conducted. The report on these wetland and stream features is appended to Exhibit D-1, existing site plan and conditions Exhibit D-2 presents the proposed site plan and shows how the proposed development can occur with no impacts to vernal pools, wetlands and streams and observing a 75 foot buffer on all such natural resources.

It is Wolfden's aim to conserve and protect the wetlands and their ecological functions by avoiding impacts to the extent practical, minimizing impacts where they cannot be avoided, and compensating impacts that are not avoidable. The current development plan achieves these goals with no impact.

At the completion of the mining project, the site will be reclaimed removing all buildings and structures except the TMF. The final grading plan for this final phase of the project can be designed in a manner to enhance and create forested wetlands and associated vernal pool habitats in areas with appropriate hydrology within the footprint of the mine operational area.

Based on our current understanding of wetlands present at the site, the project will meet the goal of protecting the ecological functions of wetland resources, including vernal pools.

Correspondence with the Maine Department of Inland Fisheries and Wildlife is presented in Exhibit N.

Other Water Resources (surface water, streams, shallow groundwater)

The property includes lakes, ponds, and streams, including Pleasant Lake, Pickett Mountain Pond, Mud Pond, west branch of the Mattawamkeag River. The area proposed for development however does not include any mapped streams or surface water bodies based on the USGS topographic map (i.e., Green Mountain, Maine). Although there are no USGS mapped streams within the area proposed for development, the area may include intermittent streams, too small to be picked up at the scale of the USGS maps. As noted in the Wetlands section, intermittent streams and shallow groundwater were observed during the October 2019 and have been delineated. Impacts to water resources would be avoided to the extent practicable and any impacts would be mitigated through restoration activities. In general impacts to water resources would be negligible based on the proposed treatment and discharge of water generated during mine operations, as discussed in the preceding sections. The water generated by mine operations will be treated and released back into the environment following all rules and best management practices and achieving requirements specific by the MEDEP Chapter 200 regulations.

Wildlife Resources and Habitats

The property contains a mix of terrestrial and aquatic habitats, including forested uplands, forested and scrub shrub wetlands, rivers, streams, ponds and lakes. The majority of the property is forested composed of a mix of deciduous and evergreen trees. Wildlife common to the Northwoods include deer, moose, bobcats, fishers, as well as a number of small mammal species. Avian species including passerine birds, accipiters and buteos, and piscivorous birds such as kingfishers and herons are also common, as are waterfowl including ducks, geese, and loons. The area proposed for development is primarily upland forested habitat, co-dominated by deciduous trees (i.e., beech, birch, and red maple trees) and coniferous trees (i.e., spruce, fir, cedar and hemlock). The area has been logged in the past and is currently in re-growth. Evidence of past logging operations in the form of skidder trails and logging roads are common throughout the area proposed for rezoning and development. The forest understory is relatively open and lacks dense growth commonly found in recently cut forest. Wildlife are accustomed to logging activities in the Northwoods and based on the current mine plan the mine operation would have less impacts to wildlife than common logging operations.

Correspondence was sent to the Inland Fish and Wildlife Service (November 6, 2019) to obtain a list of Rare, Threatened, or Endangered species that could potentially be found in the area. The IF&W provided a preliminary response to this request on November 25, 2019 which indicated there were no known occurrences of endangered, threatened of special concern

species within the project area (Exhibit N). The IF&W also has not mapped any significant wildlife habitats within the project area. The IF&W did identify Great Blue Heron colonies as species of concern and noted the special protection afforded to eight species of bats and concern for habitat protection. The preliminary screening survey conducted to date did not identify habitat that would support Great Blue Heron colonies or bats, the latter due principally to very limited and small exposures of bedrock outcrop and lack of talus slopes. A detailed assessment of terrestrial fauna will be completed under baseline studies required by MEDEP Chapter 200 regulations. encompassing a survey of the area proposed for development individual species and or suitable habitat for the species identified. Impacts to rare, threatened or endangered wildlife are not known or expected and if identified will be avoided and minimized.

Plant Habitats

The area proposed for development includes upland forested habitat and as noted has been logged in the past. The forest habitat includes a relatively open understory dominated by saplings of the dominant tree species. Shrubs are also present in the forested. The herbaceous growth in the forest habitat includes moss, ferns, grasses, and sedges.

Correspondence with the MNAP was submitted to request a list of known or suspect rare, threatened or endangered plants occurring in the area. Exhibit N contains the MNAP response which indicates that there are no rare botanical features documented specifically within the project area. Impacts to rare, threatened or endangered plants are therefore unlikely but if such botanical features are identified they will be avoided and minimized. Unavoidable impacts will be mitigated through moving/transplanting rare, threatened or endangered species when impacts are unavoidable. A detailed assessment of terrestrial flora will be completed under baseline studies required by MEDEP Chapter 200 regulations. Based on discussions on MNAP correspondence lakeside graminoid/shrub fen is located between Pleasant and Mud Lakes. These would not be affected by proposed activities and are outside the area to be re-zoned.

Historical Sites

The Maine State Historic Preservation Office has been consulted to identify any known or suspected historical sites on the property. A stone tool archeological habitation site is known near the headwater of Pickett Pond. The Phase 0 Assessment included background research and a field inspection. Background research considered various 19th and 20th century maps of the area, contemporary topographic and bedrock/ surficial geological maps, and review of MHPC site files associated with previously identified site 147.001. These resources confirmed the potential presence of toolstone geological resources within the project area, possibly including chert and fine-grained volcanics. The field inspection was conducted by NE ARC Assistant Director Dr. Gemma Hudgell

Background research and field inspection indicates that the project area contains three areas of outcropping "cherty rhyolite", which is a knappable lithic material of a type known to have been used by Native Americans to make stone tools. The artifacts from the nearby previously identified Native American site, 147.001, may be of this material, or a very similar type. The project also possesses archaeological sensitivity for Native American archaeological habitation sites based on the presence of a fairly level till bench terrace located above Pickett Mountain Pond in the southeastern portion of the project, and given the identification of site 147.001 within 250 m of the southern boundary of the project on a similar landform near the head of the same pond. The project area is not considered sensitive for the presence of historic period archaeological resources and a Phase 1 survey could be recommended if Wolfden continues to the next phase of background study testwork and permitting for the DEP. A memo is included with this petition and a formal detailed report is available.

Scenic Resources

The project has been designed to limit impacts to scenic resources. The "below ground" mine operation limits the footprint of mine requiring a relatively small area for mine operations - approximately 7 acres ,dry stack tailings pile -approximately 78 acres and total clearing approximately 137 acres. In addition, the dry stacked tailings will match base line contours, to not protrude from the surrounding topography. The overall elevation increase in the footprint of the tailings facility is expected to be be maximum of 22 feet higher than the original ground surface. Once the mine operations end the impacted area will be restored and will be allowed to reestablish as forest.

Recreational Resources

The area proposed for development does not include any snowmobile trails, hiking trails, or camping areas nor does it include any aquatic resources suitable for fishing. The area proposed for rezoning makes up only 1.3% of the total property. It is unlikely that the proposed mine would impact recreation resources. Once the mine is closed there would be no impacts to recreational resources.

Mine Development, Operation and Closure Strategy

The following section provides a general overview of how mine and process waters will be managed. The strategy for mine development, processing of mineralized rock, and management of tailings is discussed. Each of these processes have a water management component. Additional Information is provided in **Appendix M**

Overview - Management of Mine Waters, Process Waters and Septic Waters

Proper planning, management and treatment of site impacted waters can avert impacts to natural water resources including groundwater, run-off, and surface water. Elements of water management designed to alleviate the potential for adverse impacts are described in the following subsections.

Development of the Pickett Mountain mineral deposit will require collection of groundwater seepage for subsurface dewatering during underground mining operations and collection of surface water runoff from within the footprint of the developed property. These waters will be used in the beneficiation of the economically valuable minerals which includes milling and flotation to separate valuable from non-valuable minerals and create a concentrate that will be shipped off-site for further refinement (smelting) as well as tailings that will be stored on a lined tailings facility located onsite. Waters impacted by these processes will be treated and re-used to the maximum extent possible. It will be the intention of the concentrator/tailings design to have a net negative water balance that will require makeup water.

Water from the mine (seepage and process water) will be collected and treated to within water discharge guidelines and rules that include at or better than background quality. A portion of the treated water will be reused at mining process water and concentrator process water make up. Sewage from the mine will be contained to Portable Toilets (Porta Potties). These will be on contract basis and managed through replacement of filled facilities with clean facilities by the supplier. Sewage from all surface structures will drain to a septic system located on the site down gradient of the building infrastructure and potable water supply. Any excess treated water will be returned to the environment as recharge via system of underground diffusers, similar to a septic system leach field. Water from the tailings facility will be managed

separately. As a result of the water management strategy and the water balance required to sustainably operate the mine, impacts to water resources are expected to be negligible.

The estimated water balance from the milling/tailings facility is as follows resulting in a process water make up requirement of 68.4 cubic meters per day or 12.3 USGPM.

Overall Water Balance				
Water Product	Solids		Water t/d or m^3/d	Comments
	%	t/d		
Plant Feed (flotation feed)	30	1000	2333.3	Need per day
Cu Conc.	80	15.5	3.87	Lost in concentrate
Pb Conc.	80	10.6	2.65	Lost in concentrate
Zn Conc.	80	49.5	12.4	Lost in concentrate
Tailing	80	807.4	49.5	Lost in concentrate
Process Water Recycle	-	-	2264.88	Amount recovered
Need Process water	-	-	68.42	

Mine Development Strategy

The strategy for mine development is to conduct underground mining using a long hole stoping method with a decline, to allow underground haulage trucks to carry mineralize rock (mill feed) to a surface staging pad, where waste rock will be segregated from Mineralize Rock. Waste rock would be staged until it can be returned underground for backfill. Waste rock that is placed underground as backfill is not treated or neutralized, rather is simply placed as broken rock. Typically, waste rock outside of the Pickett Mountain deposit is non acid generating and in fact carries significant neutralizing potential. In addition, after waste rock is deposited undergound, it is in a low oxygen environment and therefore will not react with ground water if portions of the rock do contain acid generating potential. Seepage of bedrock water as well as injection of mine process water into the underground workings, necessitates a program of mine dewatering. Although engineering/hydrologic studies have not been conducted to quantify flow rates required to keep the working areas of the mine in a dewatered state, it is currently estimated based on similar site experience and the likelihood of low transmissivity bedrock at depth, that these "seepage" flows are likely to be on the order of 30 gallons per minute (gpm) long term.

Initial dewatering is usually conducted through use of bedrock extraction wells (dewatering wells) to reduce the bedrock potentiometric surface prior to and during development of the decline. This water will be used for storage and recycled for underground diamond drilling for blastholes. As underground workings are advanced, and seepage into these openings will occur, and that seepage will be pumped out eventually replacing the dewatering wells and establishing a network of water conveyance pipes within the developing mine infrastructure During mine operation, seepage waters will continue to be collected underground through a series of temporary sumps and pumps and treated at the water management facility prior to being re-used for underground process water with excess discharged to the environment. Waters used underground for drilling and wetting down rock surfaces to eliminate dust when mucking rock outwill be pumped through a connected network of pipes that can be modified and extended as the underground workings are developed.

When sulfide mineralized rock is mined and processed, the surface area of exposed sulfides increases along with the potential for acid generation. Exposure of these sulfide minerals to oxygen and water results in weathering and oxidation producing acidity (hydrogen ions), dissolved sulfate, dissolved metals and soluble acid-sulfate minerals. Undisturbed sulfide mineral deposits have limited exposed surfaces, and therefore pose little threat to groundwater under natural, oxygen-limited conditions. Since this weathering process requires presence of both oxygen and water, as well as time, effective strategies to prevent acid generation are incorporated into the design and operation of the mine. In the short term, these strategies rely on limiting exposure of these materials to water in the presence of oxygen as well as water collection and treatment. In the long term, strategies rely on isolating materials from water (infiltration), intrusion of atmospheric oxygen.

The waste rock will be mined separately and segregated from the mill feed, temporarily staged and then returned underground as backfill on an on-going basis. This manages and mitigates potential leaching and environmental release of metals from this waste rock material.

Mineralized Rock Milling and Flotation Strategy

Mineralized Rock (mill feed) will be crushed on-site and finely ground to a powder utilizing a comminution (Grinding) circuit. The finely ground rock is the feed stock for the flotation circuits, where the valuable sulfide minerals (Zn, Cu, Pb, and associated precious metals Au and Ag) are sequentially segregated from gangue minerals of no economic value and into a series of Copper, Lead and Zinc concentrates. This flotation process is done with a series of chemicals and reagents that are used to treat the minerals to optimize recoveries. Chemicals that are used within the process typically remain in the process water and are broken down over time. However, since majority of the water is reclaimed into the process, this material is reused. Any potential waste chemicals or spills are collected and pumped to the tailings facility. These are then broken down over time or gathered through precipitation and ultimately gathered back into the process. Any stored chemicals that are expired or unusable for other reasons are repackaged and shipped back to the supplier or to a qualified management facility for appropriate disposal during operations and mine closure. The non-valuable or gangue minerals which will constitute approximately 80% of the mill feed result in the production of tailings requiring management. A conceptual flow diagram of the milling process is shown below.

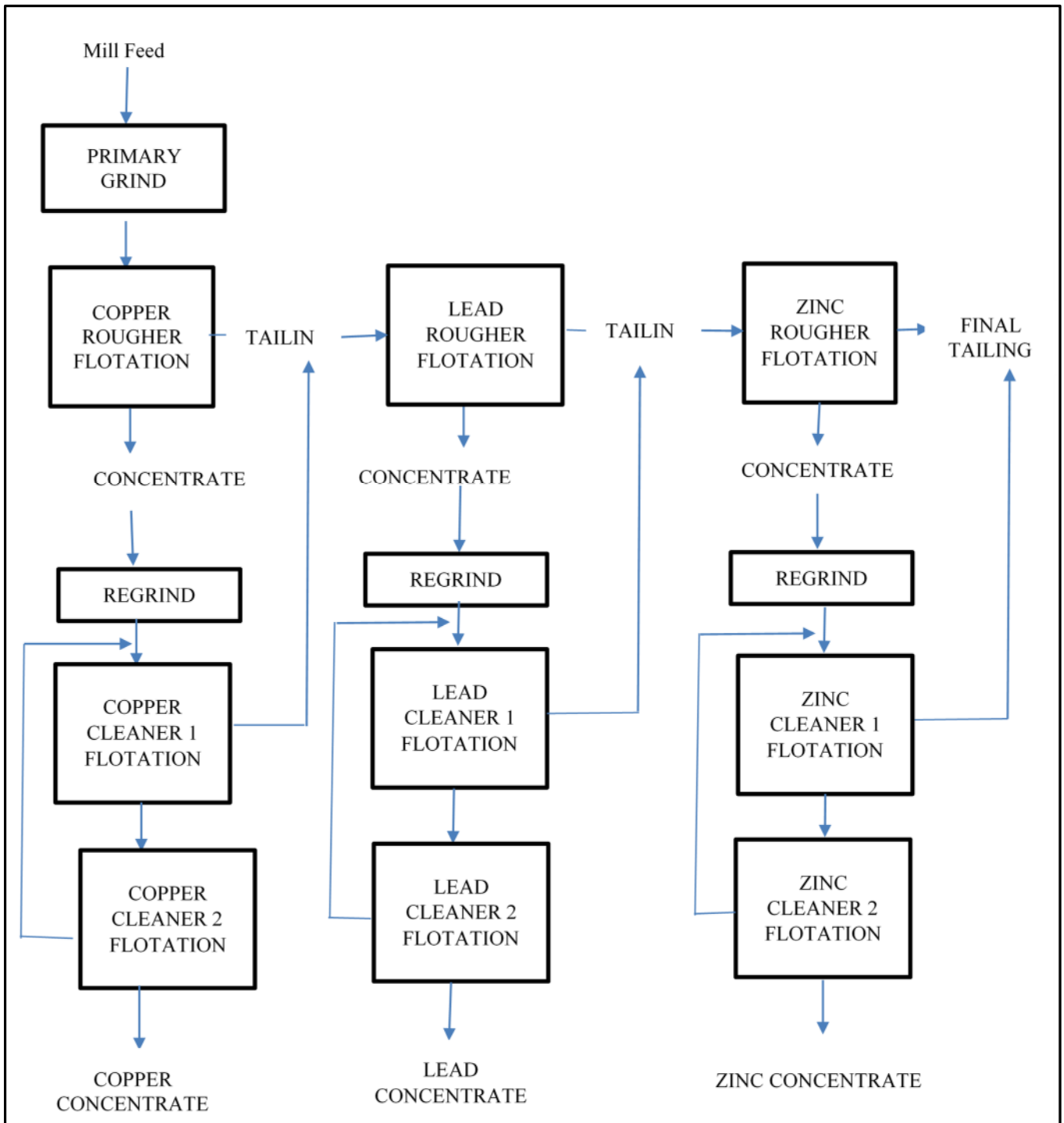


FIGURE: CONCEPTUAL PROCESS FLOWSHEET

Tailings Treatment and Management Strategy

Tailings, also contain iron sulfides as well as other metallic sulfide minerals and are managed accordingly to mitigate acid generation and leaching. When tailings are first produced, they are oversaturated with respect to water content and are pumped in a slurry.

All tailings will be deposited on a dry stack tailings management facility (TMF). The cleaned and filtered tailings will be dewatered and transported by truck or conveyor belt to the TMF where they are spread, stacked and compacted by a dozer. All water generated by the dewatering process is recycled and pumped back to the concentrator for reuse in the process circuit. The dewatered tailings have a low moisture content and is expected that no supernatant pond will form as they are compacted in the TMF. Rainfall on the TMF is expected and run-off collection is required. All water will be collected from the TMF in a lined collection pond at the south edge of the TMF. Water from the lined TMF collection pond will be pumped back to the concentrator for reuse in the processing circuit. The dewatered tailings will exit the concentrator plant via conveyor onto a storage pad with 24 hours of capacity. The tailings will be loaded and hauled via 35 or 40 tonne articulated trucks to the TMF. With an expected 800 tonnes per day of tailings, this will result in 1.5 or 1.0 trucks per hour depending on the size of the truck. Once or twice per shift, the truck operator will spend up to one hour with a dozer and roller compactor to grade and compact the tailings. The expected cycle time to the farthest area of the TMF is under 7 hours while the closest will be 4 hours. This allows more than sufficient time for haulage, grading and compacting in a 10-hour work shift.

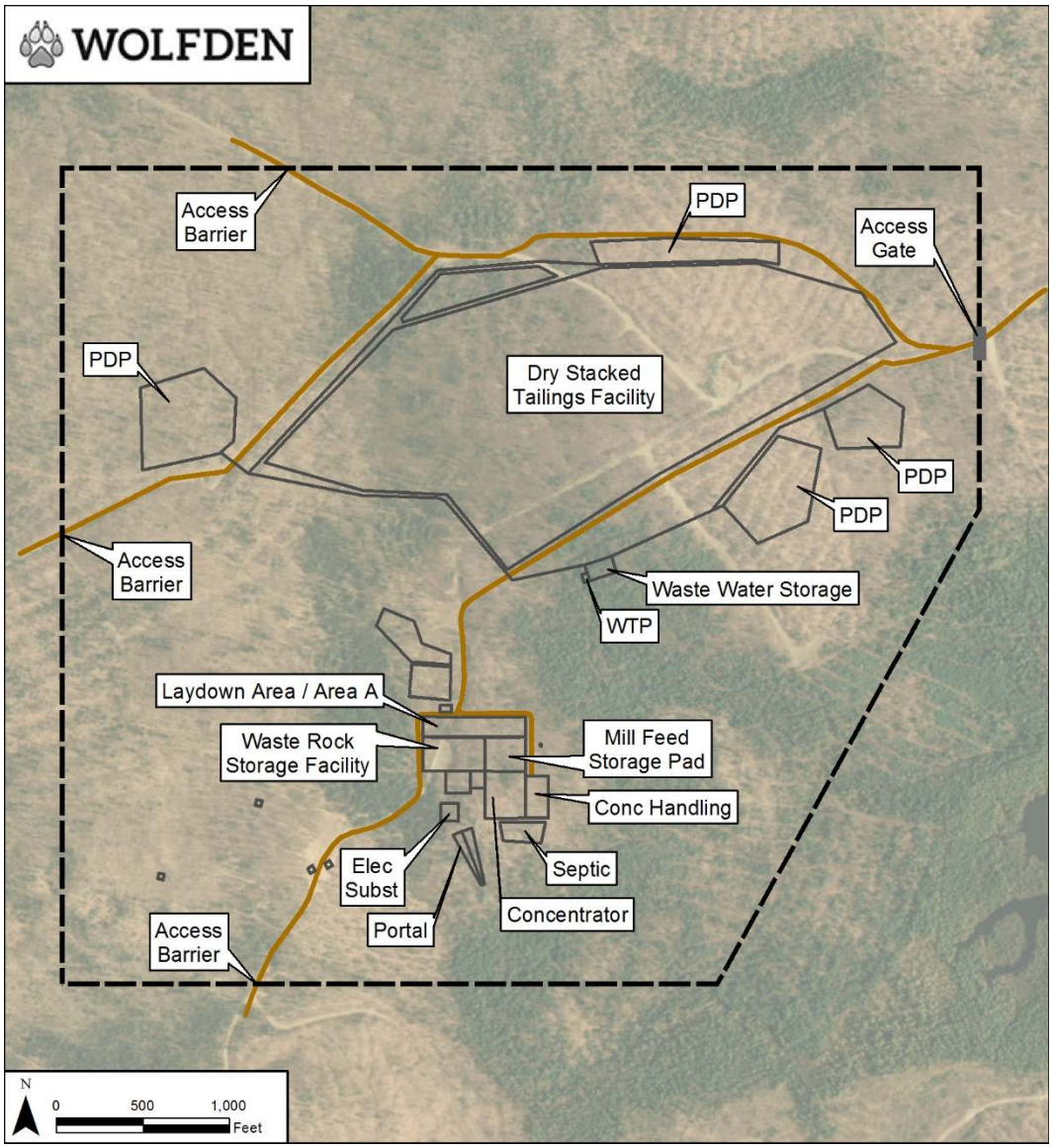
Sub-aerial (dry stacked) tailings are the only above ground tailings management method allowed under the DEP Chapter 200 rules for Group A and Group B mine waste. The sub-aerial TMF will be designed in accordance with requirements (including a composite liner and leachate collection) of Chapter 200 Subchapter 5 Section 21 Mine Waste Unit Design Standards. Leachate ponds that collect water that encounters tailings are also governed by these standards. TMF ground slopes of 20% to 30% may be used for dry stack tailings. The maximum height of the TMF cells when completed at Pickett Mt. are not expected to exceed 22 feet and may average less than 15 feet.

Once compacted, these tailings will not be subject to infiltration of water and intrusion of atmospheric oxygen which will mitigate the oxidation of sulfide minerals. Management of dry stacked tailings placed within a lined containment facility, that is progressively closed during mine operation will control leaching of metals and provide long-term protection to water resources (groundwater and surface water). The TMF would be designed with run-on controls to prevent contact with surface water run-off. During the operating period of the dry stacked tailings facility, contact water (precipitation) is actively managed.

An example of similar tailings deposition is Cerro Lindo (Peru) show in the following collection of images. Although the climate in Peru is drier than in Maine, the concept is the same. Sub-aerial tailings are currently used in other cold regions including Alaska, Minnesota and Canada.

In most cases in cold weather climates, the tailings are progressively covered to optimize water treatment and reduce the remaining area requiring closure during final reclamation. The DEP regulations require a cover system of permeability equal to the liner system which has specific maximum permeability requirements.

Cerro Lindo Moist Cake Disposal (1:2 Slope)



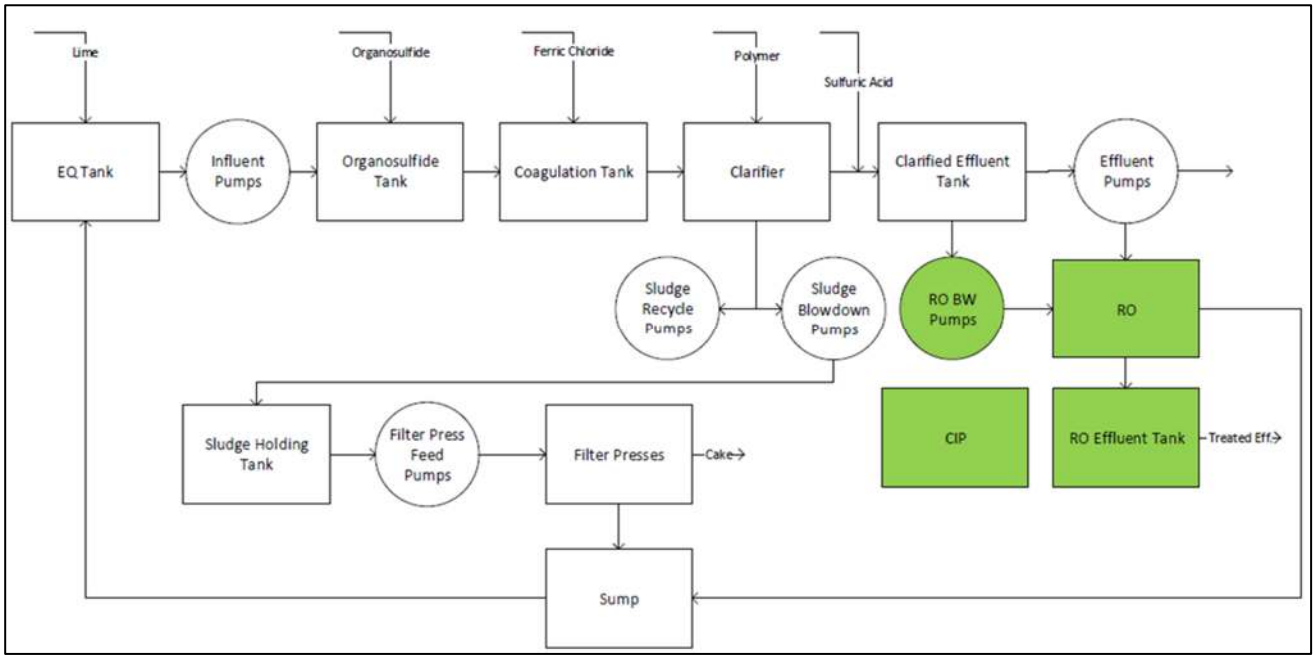
Conceptual Tailings Facility at Pickett Mountain

The figure above illustrates a dry stack tailings facility. The tailings stack features an outer side slope of 20% raised to a maximum height of about 22 feet (7 metres). The volume of tailings in this model is approximately (1,400,000 m3), equivalent to about 2.6 Mtonnes when fully consolidated or compacted to 88 wt% solids.

Mine Water Management and Treatment

All process and seepage water into the mine as well as precipitation landing outside of the tailings facility footprint are collected via run off ditching and routed to the south eastern (down gradient) corner of the project site into a lined raw water pond in order to contain all water collected on the project site. Seepage water from tailings as well as precipitation water

onto the tailings facility are collected separately and pumped into the mill as recycled water. A series of berms will be designed to re-route precipitation water outside of project footprint in order to reduce contact with site and minimize potential impact. Once the water is collected in the raw water pond, it is pumped to the water treatment facility. The technological state of mine water treatment is very advanced as a form of waste water treatment with processes designed to adjust pH, remove sulfates and metals producing a high quality effluent and a high density solids waste stream (sludge) the latter of which is thickened by a conventional filter press to produce a sulfate filter cake. The solid filter cake will be placed underground in the mine. Excess water from the filter press is returned to the influent equalization tank for treatment. The conceptual treatment train is show in the following figure. The treated effluent may then be recharged to groundwater with no chemical impacts via underground infiltration structures. A Clean In Place (CIP) system is designed within the plant which is used for cleaning the interior of pipes and vessels as well as reverse osmosis and micro/nano filtration systems without having to remove them and clean them manually. This system is not a water treatment function but rather a maintenance function to the rest of the plant. Recharge of treated water to groundwater is also protective of surface water that eventually receives groundwater.



Mine Water Treatment Process Flow Diagram

Notes:

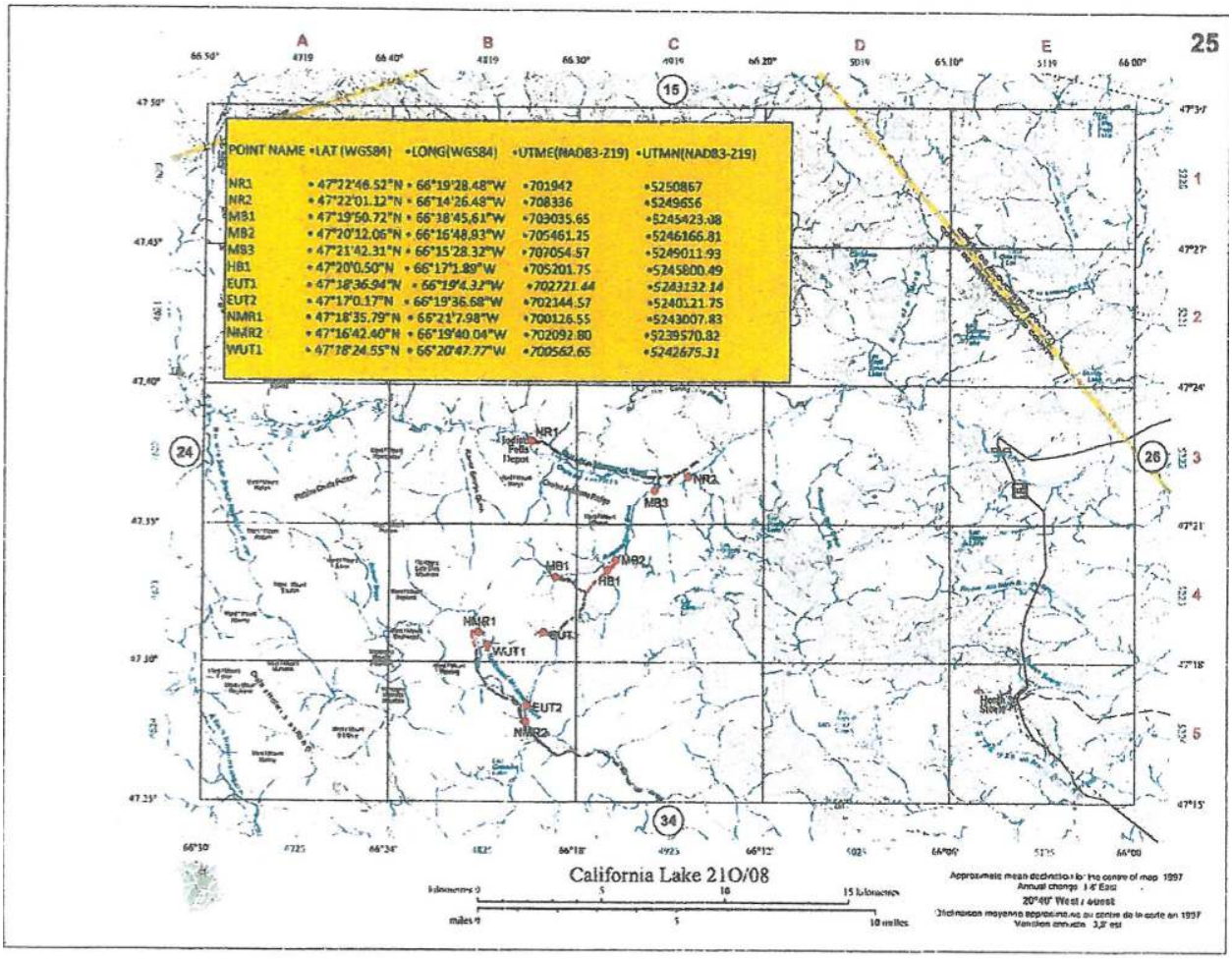
EQ= Equalization (Tank); RO= Reverse Osmosis, BW= Backwash, CIP=Clean in Place (Tank)

The treatment plant will be operated in accordance with an operations and maintenance plan that will specify storage and management of chemical reagents and actions to be taken to

prevent spills and accidental releases and to address spill clean-up and reporting should an accidental spill occur.

The groundwater quality will be monitored quarterly during the life of the mine and for a period of time post-closure that is specified in the mining permit issued by the DEP. Monitoring will occur at locations where mining activities have a reasonable potential for impact to groundwater and surface water. In general, these parameters will be based on baseline background water quality data and consideration of parameters related to mining operations (metals, pH, specific conductance and inorganic parameters such as sulfate). Surface water and sediment quality will also be monitored under an approved program during mine operations and for a post-closure period specified in the mining permit. The Department may require additional sampling of aquatic biological resources and monitoring of specific parameters at certain structures including water storage ponds, leachate collection systems and underdrains.

The following tables summarize of ground water variances for a full list of elements and characteristics in ground water surrounding the Halfmile Mine owned by Trevali Mining Corporation located West of Miramichi, NB. Sampling for Halfmile was completed by the environmental team; typically a senior level environmental engineer or environmental engineering student. Samples were collected by lab standards then packed and sent to a laboratory for analysis by RPC Science and Engineering (Research and Productivity Council), a certified laboratory based in Fredericton, New Brunswick. It can be noted that certain non-targeted and non-harmful minerals that may be higher than background levels can be rectified with the addition of a reverse osmosis system downstream of the chemical treatment facility proposed for Pickett Mountain. The mechanical type of filtration is able to draw these final minerals from the water and ensure the final treated quality is equal to or better than the background (baseline approved) quality level. Confirmation of this by the a water treatment plant provider is attached to this petition.



Halfmile Mine Water Sampling Locations Map

REVISED JUNE 30, 2020

Halfmile Mine Analysis of Metals in Water		Ground Water Well											
Sample Identification		327776-1	327776-2	327776-3	327776-4	125083-1	125083-3	125083-4	125083-2	Variance	Variance	Variance	Variance
Well Identification		MB-1	MB-3	HB-1	MB-2	MB1	MB3	HB1	MB2	MB1	MB3	HB1	MB2
Date Sampled:		28-Aug-19	28-Aug-19	28-Aug-19	28-Aug-19	7-Sep-11	7-Sep-11	7-Sep-11	7-Sep-11	NA	NA	NA	NA
Analytes	**Units**												
Aluminum	µg/L	3	17	24	27	8	43	56	44	-5	-26	-32	-17
Antimony	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Arsenic	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Barium	µg/L	2	3	3	3	2	2	3	2	0	1	0	1
Beryllium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Bismuth	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Boron	µg/L	2	0	0	1	1	1	2	1	1	-1	-2	0
Cadmium	µg/L	0.02	0	0	0	0	0	0	0	0.02	0	0	0
Calcium	µg/L	6250	8620	8230	8490	4910	6900	6770	6780	1340	1720	1460	1710
Chromium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Cobalt	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Copper	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Iron	µg/L	0	20	30	30	0	60	90	60	0	-40	-60	-30
Lead	µg/L	0	0	0	0	0	0.1	0.1	0	0	-0.1	-0.1	0
Lithium	µg/L	0.1	0	0	0	0	0	0	0	0.1	0	0	0
Magnesium	µg/L	840	900	1040	900	630	790	910	780	210	110	130	120
Manganese	µg/L	0	4	10	9	0	5	9	6	0	-1	1	3
Mercury	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Molybdenum	µg/L	0	0.2	0.1	0.1	0.1	0	0	0.1	-0.1	0.2	0.1	0
Nickel	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Potassium	µg/L	430	380	430	380	370	320	350	320	60	60	80	60
Rubidium	µg/L	0.2	0.5	0.4	0.5	0.2	0.3	0.3	0.3	0	0.2	0.1	0.2
Selenium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Silver	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	µg/L	2190	1610	1750	1680	1730	1400	1380	1400	460	210	370	280
Strontium	µg/L	22	25	24	25	15	18	18	18	7	7	6	7
Tellurium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Thallium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Tin	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Uranium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Vanadium	µg/L	0	0	0	0	0	0	0	0	0	0	0	0
Zinc	µg/L	3	1	2	1	0	2	0	2	3	-1	2	-1

Halfmile Mine Groundwater Metals Variance September 2011 – August 2019

Halfmile Mine Water Chemistry Analysis		Ground Water Well											
Sample Identification		327776-1	327776-2	327776-3	327776-4	125083-1	125083-3	125083-4	125083-2	na	na	na	na
Well Identification		MB-1	MB-3	HB-1	MB-2	MB1	MB3	HB1	MB2	MB-1	MB-3	HB-1	MB-2
Date Sampled:		28-Aug-19	28-Aug-19	28-Aug-19	28-Aug-19	7-Sep-11	7-Sep-11	7-Sep-11	7-Sep-11	NA	NA	NA	NA
Analytes	**Units**												
Ammonia (as N)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0
pH	units	7.5	7.5	7.5	7.5	7	7.1	7.1	7.1	0.5	0.4	0.4	0.4
Acidity (as $CaCO_3$)	mg/L	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	mg/L	4	0	0	0	0	0	0	0	4	0	0	0
Solids - Total Suspended	mg/L	0	0	0	0	0	0	0	0	0	0	0	0
Conductivity	µS/cm	54	62	60	60					54	62	60	60
Hardness (as $CaCO_3$)	mg/L	19.1	25.2	24.8	24.9	14.9	20.5	20.6	20.2	4.2	4.7	4.2	4.7

Halfmile Mine Groundwater Chemistry Variance September 2011 – August 2019

The mine water balance will be carefully managed to take advantage of recycling of mine waste contact waters including precipitation run-off and seepage water. These anticipated water streams volumes are evaluated to determine the design capacity of the water treatment system. These water sources will be used in the beneficiation of the mineralize rock (milling and flotation) are compared to those design flows to determine the extent of water recycling and excess treated water requiring recharge back to groundwater.

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A preliminary mine water balance has been developed. This preliminary estimate assumes all infiltration /run-off within the footprint of the developed facility will be collected and treated in addition to approximately 30 gpm of seepage water. The annual average precipitation over the facility footprint is equivalent to an average flow of 175 gpm. This results in an average flow of approximately 205 gpm for use by the treatment facility.

The concentrator water balance indicates, after recycle, approximately 68.4 tonnes of make water (or approximately 13 gpm) such that the daily water balance of available water is greater than the water required. Therefore, net recharge of treated effluent back to ground, will be close to the natural recharge that is excluded within the developed facility footprint. Operation of the envisioned facility will therefore not require additional sources of water supply (groundwater or surface water) and the operation of the facility is sustainable with respect to water needs, water use and management.

Attachment J
Map and Description of Existing Transportation Infrastructure Routes, Impacts and Improvements

Description of Proposed Transportation Infrastructure Routes, Impacts and Improvements

The following transportation evaluation describes the proposed route to be used by trucks carrying mineral concentrate from the proposed Pickett Mountain site to the US – Canadian border, the level of additional traffic, potential impacts and potential improvements to promote safety. The proposed route is dependent on the final locations where mineral concentrate will be shipped for further processing (smelting) in Canada. The processing locations have not been finalized and therefore the proposed route could be subject to change.

Transportation Need

The proposed mining activity has an anticipated mill feed rate of 1,000 tonnes/day with anticipated metal recoveries, total concentrate yields will be approximately 160tonnes/day of concentrate for shipment (352,740 lbs). Typical tractor trailer tare weights (empty weight including driver and fuel) vary and range from 26,000 to 37,000 lbs. Using an average of 32,000 lbs tare weight allows 48,000 lbs for cargo; requiring approximately 7 shipments/day.

Roads within the area will also be used for employee travel to and from the mine and discussed later in this section.

Route Description

The proposed truck route consists of gravel roads on private property from the Pickett Mountain site to public roads that include three rural state highways, and one US Interstate Highway (See **Figure Attachment J** for locations and sections). From the site, trucks will travel on private gravel roads to Maine (ME) State Route 11 (ME SR-11), hence northeast to the intersection of ME SR-212. Trucks will travel southeast along ME SR-212 to Oakfield, (where it turns into Smyrna – Oakfield Road) and enter Interstate 95 (I-95) traveling east to Houlton and the Canadian-US border and proceed to the Canadian National Highway in Woodstock New Brunswick. These roads are more specifically described below:

- 5.1 miles of gravel roads (consisting of an unnamed road, Pleasant Lane Road, and Bear Mountain Road). Elevations from the Pickett Mountain site to Maine (ME) state route (SR)-11 drop from approximately 1200 to 850 feet mean sea level (MSL) from west to east.
    - Existing gravel roads are currently in good condition, and well maintained for logging operations conducted on and around the property. An agreement is in place with land owning neighbors to allow right of way using this set of gravel roads outside of the Wolfden property boundary. Confirmation of the right of way is in the form of a letter within this report. Confirmation of right to upgrade

and maintain is established in the original agreement between both companies registered on April 2, 2020 in book 6000 on page 29.

  - The gravel roads are single lane varying in width from 10 to 15 feet with drainage ditches where elevated. One bridge crossing is present.
  - The permanent bridge crossing at Pickett Pond outlet, consists of concrete abutments with two layers of wood decking and steel beams for support. The bridge deck is approximately 15 feet wide with a 20 feet span. The bridge appears to be in good structural condition.
  - Intersection of the gravel road with ME SR-11 has a good turning radius. The gravel road width at the shoulder of SR-11 is approximately 55 feet.
  - There is no available traffic data for the gravel roads mostly used for logging traffic in addition to access to a seasonal camp on the south side of Pleasant Pond.
  - The gravel roads are also used for recreational purposes by the public including all-terrain vehicles (ATVs) and snowmobiles.

- 19 miles of 2-lane rural state highway from the intersection of Bear Mountain Road with ME SR-11 to the intersection of Smyrna – Oakfield Road with I-95 (including 7.3 miles along ME SR-11 and 10.3 miles along ME SR-212, and 1.4 miles along the Smyrna – Oakfield Road). ME SR-11 and ME SR-212 are characterized by rolling hills ranging in elevation from approximately 550 to 1150 feet MSL. Posted speed limits are 50 MPH on ME SR-11 and 45 MPH on ME SR-212, and 35 MPH on the Smyrna-Oakfield Road. Each road has an approximate 11 feet wide travel lane with 3-foot shoulder in both directions.
  - Roads are in good to fair condition and include bridge crossings over West Branch of Mattawamkeag River on ME SR-11 and over East Hastings Brook on MR SR-212.
  - Average Annual Daily Traffic (AADT) presented on Maine Department of Transportation (Maine DOT) website ranged from 470-1270 along ME SR-11 and ME SR-212 in 2015. Ten crashes were reported from 2017-2019 at intersection of Clark Road and SR-212 in town of Merrill according to Maine DOT Crash Portal. The Level of Service is A (light & free flowing) on all state roads within the route.
  - Intersections along state routes have good turning radiuses.

- 9.1 miles of US Interstate Highway (I-95) from SR-212 to US-Canada border, with a posted speed of 75 MPH, 10-foot right shoulder both directions.
  - Road is in good condition.
  - AADT data from Maine DOT website ranged from 1480-2470 in 2015, 78 crashes along I-95 section from 2017-2019 according to Maine DOT Crash Portal with most assumed as animal collisions, with a Level of Service of C (stable).

- On-ramps to be used along proposed route have good turning radiuses.

Traffic Increases

- Proposed traffic to the Pickett Mountain site includes a peak 30 workers per shift with two shifts per day offset by one hour. This results in a maximum of 60 peak hour trip/ hour during shift changes on ME SR-11. It is expected that the majority of workers employed at the mine will be from local work force, many of whom may currently use portions of this route for current employment.
- Maine DOT requires a traffic permit to be obtained if traffic to be added to a route is greater than or equal to 100/hour. Proposed traffic increase will not require a traffic permit.
- The daily traffic to and from the site (assuming 30 workers and two shifts/day plus 7 shipments of concentrate) results in 134 additional trips/day on ME SR-11 (an average of 5.6 vehicles/hour. The road has an hourly capacity of 1800 vehicles and its use is currently well under that capacity.
- Shipping of concentrate via trucks will only occur during daytime hours.

Impacts

The proposed route for hauling concentrate consists of state and federal highways. The weight limit will be restricted by the Federal Interstate which allows a maximum of 80,000 pounds (lbs) for both five and six axel tractor trailer configurations. State roads allow up to 88,000 lbs for 5 axel configurations for certain commodities including unconsolidated rock material. Planned weight load will be 80,000 lbs. The private gravel roads are constructed for logging trucks with the similar weight constraints.

As identified previously, on average seven truck shipments of concentrate will occur daily. This small level of increased traffic will not burden or impact proposed traffic route.

As discussed in previous sections, the additional volume of traffic will not require a traffic permit nor represent a burden or impact on the existing traffic capacity of the proposed route.

Anticipated Improvements

Unimproved Gravel Roads

Improvements on existing gravel roads will be conducted to improve year-round use, safe passage of vehicles on a single lane road and public safety.

- Maintenance of spring thaw impacts along the gravel roads will be undertaken by Wolfden. Wolfden will evaluate the scope of maintenance and improvements during the design analysis for the mine under the mining application (mine design and permitting phase).

- During the mine design analysis widening of the gravel roads will be evaluated for safe passage of logging trucks, concentrate trucks, and workers. A maximum width between 22 and 25 feet to the road shoulder should be sufficient for safe passage of large vehicles and recreational traffic (ATVs and snowmobiles in winter).
- During that analysis, consideration will also be given to providing a separate lane for safe passage of recreational vehicular traffic (ATVs and snowmobiles).
- Maintenance of bridge decking at Pickett Pond outlet crossing, may include improvement or replacement of the wood decking as dictated by normal wear and tear of truck traffic. During the mine design analysis, widening of the bridge will also be evaluated for safety considerations. If widening of the bridge is proposed during mine design and permitting phase the replacement will be a similar structure with concrete abutment and footings allowing the natural streambed to be maintained. A replacement structure would be designed to accommodate a 25-year frequency storm event with arches located landward 1.2 times the channel width at normal high water. Work in the stream would be minimized allowing the streams natural structure and integrity to remain intact.
- A cooperative road maintenance agreement, in general, will be established between Wolfden and commercial loggers whom access their own private property as well the Wolfden property.

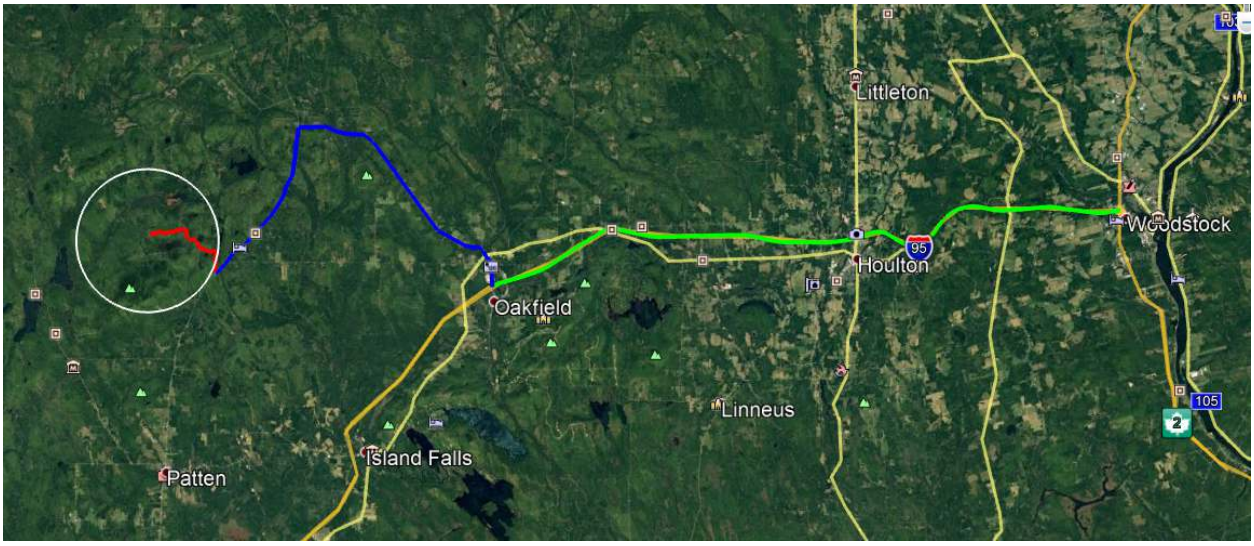
Rural State Highways

Potential Improvements to state highways will be for traffic safety. Wolfden will hire an MEDOT approved transportation engineer familiar with the area to consider, evaluate and design improvements, as needed, during the mine design and permitting phase. These improvements may include:

- Signage and lighting at intersection of Bear Mountain Road and ME SR-11 indicating truck entering and leaving Bear Mountain Road (i.e. "Trucks Entering").
- Addition of deceleration and acceleration lanes at the intersection of Bear Mountain Road and ME SR-11 for trucks to avoid obstruction of traffic during acceleration and deceleration periods.
- Widening right shoulder at intersection of ME SR-11 and ME SR-212 in Moro Plantation to facilitate right turning truck traffic.

Summary

The proposed traffic route (Appendix J and below) and additional traffic levels do not constitute an impact on the existing road infrastructure. Wolfden will work with stakeholders (LUPC, the public, commercial loggers, and MEDOT) to accommodate modifications to ensure public safety and recreational access along the proposed private and state highway routes.



Proposed Truck Route from Pickett Mountain Site with unimproved gravel roads in red, 2-lane rural state highways in blue, and US Interstate Highway in Green. An approximate three-mile radius is drawn around the site (white)

WOLFDEN

Route 212

Route 11

Rural State Highways

Private Gravel Road

Smyrna-Oakfield Road

US Interstate Highway

I-95

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0 3,000 6,000 Feet

Prepared/Date: BRP 06-30-20 | Checked/Date: PHT 06-30-20

Attachment J

LEGEND

- Transportation Route
- Major Road
- Minor Road
- Area Proposed for Rezoning
- Approximate Property Line

Attachment J
Map and Description of Existing Transportation Infrastructure Routes, Impacts and Improvements

Description of Proposed Transportation Infrastructure Routes, Impacts and Improvements

The following transportation evaluation describes the proposed route to be used by trucks carrying mineral concentrate from the proposed Pickett Mountain site to the US – Canadian border, the level of additional traffic, potential impacts and potential improvements to promote safety. The proposed route is dependent on the final locations where mineral concentrate will be shipped for further processing (smelting) in Canada. The processing locations have not been finalized and therefore the proposed route could be subject to change.

Transportation Need

The proposed mining activity has an anticipated mill feed rate of 1,000 tonnes/day with anticipated metal recoveries, total concentrate yields will be approximately 160tonnes/day of concentrate for shipment (352,740 lbs). Typical tractor trailer tare weights (empty weight including driver and fuel) vary and range from 26,000 to 37,000 lbs. Using an average of 32,000 lbs tare weight allows 48,000 lbs for cargo; requiring approximately 7 shipments/day.

Roads within the area will also be used for employee travel to and from the mine and discussed later in this section.

Route Description

The proposed truck route consists of gravel roads on private property from the Pickett Mountain site to public roads that include three rural state highways, and one US Interstate Highway (See **Figure Attachment J** for locations and sections). From the site, trucks will travel on private gravel roads to Maine (ME) State Route 11 (ME SR-11), hence northeast to the intersection of ME SR-212. Trucks will travel southeast along ME SR-212 to Oakfield, (where it turns into Smyrna – Oakfield Road) and enter Interstate 95 (I-95) traveling east to Houlton and the Canadian-US border and proceed to the Canadian National Highway in Woodstock New Brunswick. These roads are more specifically described below:

- 5.1 miles of gravel roads (consisting of an unnamed road, Pleasant Lane Road, and Bear Mountain Road). Elevations from the Pickett Mountain site to Maine (ME) state route (SR)-11 drop from approximately 1200 to 850 feet mean sea level (MSL) from west to east.
    - Existing gravel roads are currently in good condition, and well maintained for logging operations conducted on and around the property. An agreement is in place with land owning neighbors to allow right of way using this set of gravel roads outside of the Wolfden property boundary. Confirmation of the right of way is in the form of a letter within this report. Confirmation of right to upgrade

and maintain is established in the original agreement between both companies registered on April 2, 2020 in book 6000 on page 29.

  - The gravel roads are single lane varying in width from 10 to 15 feet with drainage ditches where elevated. One bridge crossing is present.
  - The permanent bridge crossing at Pickett Pond outlet, consists of concrete abutments with two layers of wood decking and steel beams for support. The bridge deck is approximately 15 feet wide with a 20 feet span. The bridge appears to be in good structural condition.
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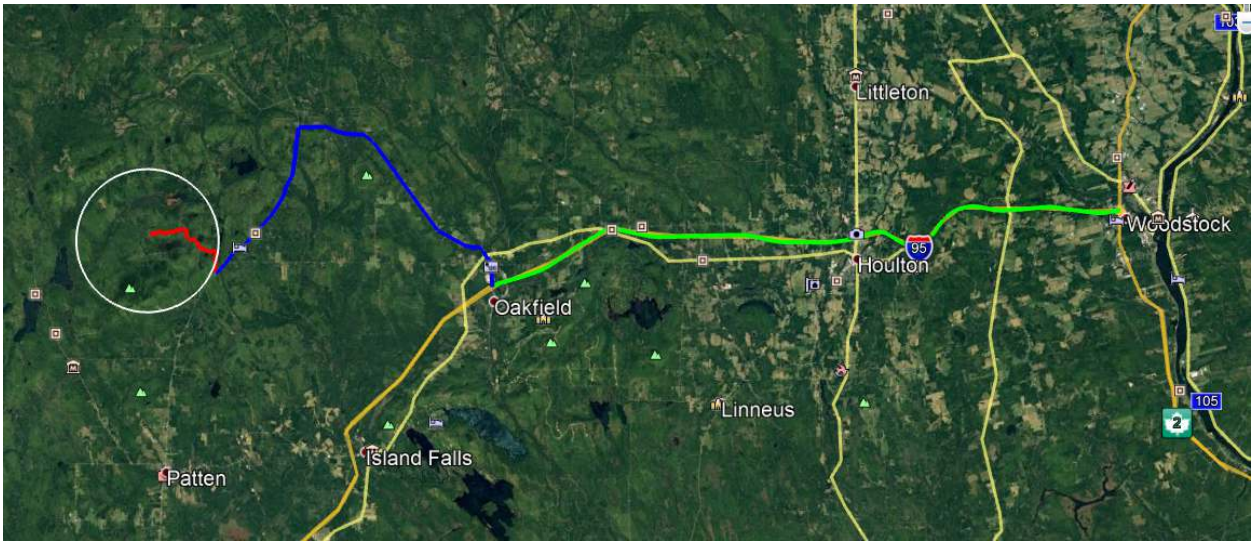

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WOLFDEN

Route 212

Route 11

Rural State Highways

Private Gravel Road

Smyrna-Oakfield Road

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Prepared/Date: BRP 06-30-20 | Checked/Date: PHT 06-30-20

Attachment J

LEGEND

- Transportation Route
- Major Road
- Minor Road
- Area Proposed for Rezoning
- Approximate Property Line

Attachment R
Proposed Land Use Activities and Structure Allowed in the Picket Mountain (D-PD) Planned Development Subdistrict

This Petition contains preliminary locations and dimensions of new buildings and structures required for the project. During detailed engineering analysis and planning in support of the mine permit application to the DEP, these preliminary locations and dimensions may change. Changes may reflect improvements in the efficiency of the project, environmental management of the site, and comments by the DEP.

The following land use activities and structures are anticipated for the Pickett Mountain (D-PD) Planned Development Subdistrict, including:

A. Uses and activities allowed without a permit;

B. Uses allowed without a permit subject to standards

C. Uses and activities allowed with a permit or by special exemption.

A. Land use activities and structures allowed in the Pickett Mountain (D-PD) Planned Development Subdistrict without a permit

1. Motorized vehicular traffic on roads and trails.
2. Snowmobile traffic on-and off roads.
3. Electrical Services Construction, installation, servicing, maintenance, including electrical Service drops. and High/Medium/Low Voltage service
4. Mineral exploration activities, including geophysical investigations.
5. Surveying and other natural resource analysis.
6. Signs listed as exempt in Section 10.27,J,1of the LUPC's Land Use Districts and Standards.
7. Temporary lighting equipment.
8. Emergency operations conducted for the public health, safety or general welfare, such as emergency medical response, law enforcement, resource protection and other rescue operations.
9. The general management, operations and maintenance of roads, structures, above ground and subsurface utilities
10. Shipping and receipt of materials
11. On-site and Off-site management of solid waste generated on-site.

12. Forest management activities
13. The operation of vehicles, vehicular equipment on existing roads, service roadways and associated areas.
14. The repair, and maintenance of vehicles, vehicular equipment, and other equipment in on-site maintenance buildings and areas and emergency repairs in on-site maintenance building and other facilities including roads, service roadway, and associated areas.
15. Hunting and trapping of wild animals, provided such hunting and trapping is conducted at least 500 feet away from existing development including structures.
16. Decommissioning of all installed infrastructure
17. Environmental work
18. Security Services

B. Land use activities and structures allowed in the Pickett Mountain (D-PD) Planned Development Subdistrict without a permit subject to standards

1. Expansion of a building approved as part of the mining permit issued by DEP, so long as it does not add or change uses to the building.
2. Construction, operation and maintenance of all subsurface facilities and assets related to mineral extraction, backfilling and closure of such facilities, including but not limited to additional surface facilities not envisioned at this time but could be needed in the future to support subsurface operations including ventilation shafts, raises, surface shafts and attendant headworks to facilitate deeper ore removal.
3. Importation of electrical power via a new utility line constructed by others
4. Road maintenance activities, including grading, replacement of gravel travel surface, widening, maintaining shoulders, drainage and trimming vegetation.
5. Increase in the amount of cleared area within the subdistrict.
6. Minor modifications of the location or design of buildings and other structures approved pursuant to a permit, which are made necessary or preferable to unforeseen conditions. Minor changes to be allowed under this section may include:
    a. Relocation of exterior lighting within 50 feet of the location(s) shown on the approved plans;
    b. Relocation or realignment of roadways or alignment(s) shown on the approved plans, provided that required erosion control systems are adjusted accordingly;
    d. Relocation of culvert(s) within 50 feet of the location(s) shown on the approved plans;

e. Relocation of water treatment and management facilities, including subsurface piping, including those for domestic wastewater

c.. Fuel storage tanks for operation of heating and backup power generation;

7. Constructed ponds: Creation, alteration or maintenance of constructed ponds of less than 4,300 square feet in size which are not fed or drained by flowing waters, provided they are constructed and maintained in conformance with the vegetative buffer strip requirements of Section 10.27,C,2,a.

8. Filling and grading.

9. Clearing and grubbing and maintenance of topsoil pens for later use in site restoration/ reclamation.

10. Mineral exploration activities: Level A and B mineral exploration activities, excluding associated access ways.

11. Road projects: Level A road projects.

12. Maintenance of employee parking areas within the mine operations area

13. Service drops.

14. Signs.

15. Exterior lighting

16. Storing and utilizing explosives assigned for underground.

C. Land uses and activities allowed in the Pickett Mountain (D-PD) Planned Development Subdistrict requiring a permit.

1. Mineral (natural) resource extraction, crushing and processing including all related metallic mineral mining activities and Tier one advanced exploration and all related support activities required for the safe and environmentally secure execution of the mining, crushing and processing activities.

2. Construction, operation and maintenance of buildings, pads, office facilities and attendant structures for the sorting, milling, processing of the mineral resource and shipping off-site of mineral concentrates

3. Construction, operation and maintenance of water treatment facilities and attendant structures for the collection, conveyance of waters, and re-infiltration of treated waters.

4. Construction, operation and maintenance of lined facilities for eventual and permanent management of dry stacked tailings.

5. Constructed ponds: Creation, alteration or maintenance of constructed ponds 4,300 square feet or greater in size which are not fed or drained by flowing waters, or of such ponds less

than 4,300 square feet in size which are not in conformance with the vegetative buffer strip requirements of Section 10.27,C,2,a.

6. Draining or altering the water table or water level for other than mineral extraction.
7. Filling and grading, which is not in conformance with the standards of Section 10.27,F.
8. Road projects: Level B and C road projects, except for water crossings as provided for in Section 10.21,A,3,b.
9. Signs which are not in conformance with the standards of Section 10.27,J.
10. Utility facilities, above ground and underground electric utility lines excluding service drops, and wire and pipe line extensions which do not meet the definition of service drops;
11. Water impoundments and ponds for water storage, treatment or detention.
12. All potential electrical work including High/Medium/Low Voltage service installation, operation and maintenance, including installation of cables, and associated infrastructure
13. Other structures, uses, or services which the LUPC determines are consistent with the purposes of this subdistrict and of the Comprehensive Land Use Plan and are not detrimental to the resources and uses they protect, and are of similar type, scale and intensity as other uses under this permit.

Wolfden will continue developing the list of rules, definitions, and standards with the LUPC and DEP staff.