

A photograph of a forest access road. The road is a narrow, unpaved path that winds through a dense forest of tall, thin evergreen trees. In the distance, a person is visible on a small vehicle, possibly a snowmobile or a small truck, traveling along the road. The ground is covered with green grass and some dry, brownish vegetation. The sky is clear and blue.

Wuskwatim Power Limited Partnership

Access Road

**Environmental Protection Plan
(Aski Ketapahchikewe Othaschikekwin)
& Field Guide**

Wuskwatim Power Limited Partnership

Wuskwatim Generation Project

Access Road

Environmental Protection Plan (*Aski Ketapahchikewe Othaschikekwin*) & Field Guide

August 2006

Note to Readers

The following EnvPPs have been designed for the Wuskwatim Generation Project:

- **Wuskwatim Generation Project Access Road Environmental Protection Plan & Field Guide.**
- Wuskwatim Generation Project Construction Camp Environmental Protection Plan & Field Guide.
- Wuskwatim Generation Project Generating Station Environmental Protection Plan & Field Guide.
- Wuskwatim Generation Project Heritage Resources Protection Plan

The EnvPPs do not include site specific environmental protection measures. These measures will be incorporated into the engineering design and construction practices as specified in regulatory work permits.

EnvPPs have also been developed for the Wuskwatim Transmission Project.

Preface

Wuskwatim Power Limited Partnership

Wuskwatim Power Limited Partnership (the “Partnership”) is a limited partnership of which 5022649 Manitoba Ltd., a wholly owned subsidiary of Manitoba Hydro, is the general partner and Manitoba Hydro and Taskinigahp Power Corporation, wholly owned by Nisichawayasihk Cree Nation (“NCN”), are limited partners. The Partnership has entered in contracts with Manitoba Hydro for the management, construction and operation of the Wuskwatim generating station (the “Wuskwatim Project”) in accordance with the provisions of the applicable agreements. Manitoba Hydro, as Project Manager, in turn will sub-contract much of the construction work to other contractors, including NCN Qualified Businesses.

During the planning phase of the Wuskwatim Project, extensive work was undertaken collaboratively by Manitoba Hydro and NCN. The Wuskwatim Project will be built on land owned by the Partnership, which land is located within Nisichawayasihk N’tuskenan (“our land” to Nisichawayasihk Nehethowuk, the people from where the three rivers meet and who speak the language of the four winds) and within the Nelson House Resource Management Area.. The planning phase included environmental assessment and environmental approval processes. During the assessment process *Ethinesewin* (**traditional knowledge**, including the collective wisdom of *Nisichawayasihk Nehethowuk*) and western scientific knowledge were treated equally and meaningfully in the development of the studies and processes which formed the basis for the joint environmental impact statement. The Environmental Protection Plans for the Wuskwatim Project have been developed in a similar collaborative manner, including an equal and meaningful respect for *Ethinesewin* and western scientific knowledge.

The Partnership and Manitoba Hydro, as the Project Manager, are committed to implementing this Environmental Protection Plan. Companies which sub-contract with Manitoba Hydro to do work on the Wuskwatim Project will also be required to follow the terms of this and other applicable plans.

Nisichawayasihk Cree Nation and Kihche’othasowewin (the Great Law of the Creator)

The *Nisichawayasihk Nehethowuk* traditionally live by reference to *Kihche’othasowewin* (the Great Law of the Creator), which is underpinned by spiritual and philosophical beliefs, values, principles and goals. *Nisichawayasihk Nehethowuk* customary law is the sum total of these beliefs, values and norms. All combined to guide and direct the conduct of *ithiniwuk* (individuals), *ka’esi minisichek* (the family), *ka’esi anisko’wakometochek* (the extended family), *mamawe’minisichek* (the clan) and *ka’esi’pisketuskan’nesichik* (the nation). In this way social order was maintained by doctrines that reflect *Kihche’othasowewin*.

Ceremonies are an important part of *Nisichawayasihk Nehethowuk* customary law and are performed primarily to seek guidance, reconciliation, restore harmony, reverse the

potential of misfortune and achieve balance with one's surroundings. The principles of *Nisichawayasihk Nehethowuk* customary law are as follows:

1. ***Kwayaskonikiwin***, which means that the conduct of a person must be reconciled with ***Kihche'othasowewin*** (the Great Law of the Creator);
2. ***Kistethichekewin***, which means that the conduct of a person must be based on the sacred responsibility to treat all things with respect and honour. In the context of road access management, ***Kistethichekewin*** means that a person must show respect by requesting access.
3. ***Tawinamakewin***, which means that a person is welcome. In the context of road access management, ***Tawinamakewin*** means that a person granting access has a duty to consider a request for access, including consideration of the well-being of the person requesting access.
4. ***Aski Kanache Pumenikiwin***, which means that the conduct of a person must be in accordance with the sacred duty to protect ***N'tuskenan*** [the land, life, home and spiritual shelter entrusted to us by ***Kihche'manitou*** (the Creator) for our children ***michimahch'ohchi*** (since time immemorial)].
5. ***Ethinesewin***, which means traditional knowledge, including the influence of moons and seasons on climate, weather, animals, plants and ***Ithiniwuk*** (individuals) as well as seasonal harvesting cycles and practices. There is a duty to respect and seek ***Ethinesewin***.
6. ***N'totumakewin***, which means that a person must seek not to be understood but to first understand. ***N'totumakewin*** establishes a duty to teach as well as to understand and to share as well as to seek ***Ethinesewin***;
7. ***Ayakwamisiwin***, which means that a person must be cautious of his/her actions where there is uncertainty;
8. ***O'chenewin***, which means that what a person does to nature will come back to that person;
9. ***Aniskowatesewe kanache pumenikiwin***, which means that a person must act in accordance with the sacred responsibility to protect heritage resources;
10. ***Kanatethechikewin***, which means that the conduct of a person must be in accordance with the sacred responsibility to ensure that ***Ithiniwikuna*** (human remains) and ***Aniskowe Apuchetawina*** (artifacts; the things we use while here on Earth) must not be disturbed;
11. ***Asehewewin***, which means that what a person does to ***Ithiniwikuna*** (human remains) and ***Aniskowe Apuchetawina*** (artifacts; the things we use while here on Earth) will affect that person's whole being.

12. *Nehetho Tipithimisowin*, which means the exercise of sovereignty. The conduct of all persons must be consistent with ***Kihche’othasowewin*** (the Great Law of the Creator) and must reflect decision-making roles in accord with ***Nehetho Tipithimisowin***.

To *Nisichawayasihk Nehethowuk* (the people from where the three rivers meet and who speak the language of the four winds), n’tuskenan (our land) has been entrusted to them by *Kihche’manitou* (the Creator) for their children *michimahch’ohchi* (since time immemorial).

NCN has based its collaboration with Manitoba Hydro on the development of the Wuswatim Project on *Aski Kanache Pumenikiwin* (the sacred duty and responsibility to protect n’tuskenan) and *Asehewewin* (what you do to *ithiniwikuna* [human remains] and *aniskowe apuchetawina* [artifacts] will affect your whole being). Project planning by Nisichawayasihk Cree Nation incorporated *Kihche’othasowewin* (the Great Law of the Creator) and reflected the principle of *Kwayaskonikiwin* (reconciliation). In considering the specific terms, conditions, protocols, guidelines, recommendations and best practices incorporated into this *Aski Ketapahchikewe Othaschikekwin* (environmental protection plan), NCN has applied its belief in O’chenewin (what you do to nature comes back to you).

Through NCN’s participation in the planning for the Wuskwatim Project and in the development of this *Aski Ketapahchikewe Othaschikekwin* (environmental protection plan), *Kihche’othasowewin* (the Great Law of the Creator) and *Ethinesewin* (traditional knowledge, including the collective wisdom of *Nisichawayasihk Nehethowuk*)) have been integrated into this *Aski Ketapahchikewe Othaschikekwin* (environmental protection plan).

Manitoba Hydro and Commitment to Environmental Protection

Manitoba Hydro supports the need to protect and preserve natural environments and heritage resources affected by its projects and facilities. This goal can only be achieved with the full commitment of Manitoba Hydro employees and consultants at all stages of projects from planning and design through implementation and the full commitment of contractors during the implementation phase.

As stated in the Corporate Environmental Management Policy:

Manitoba Hydro is committed to protecting the environment. In full recognition of the fact that corporate facilities and activities affect the environment, Manitoba Hydro integrates environmentally responsible practices into its businesses, thereby:

- Preserving or minimizing any adverse impacts, including pollution on the environment, and enhancing positive impacts,
- Meeting or surpassing regulatory requirements and other commitments;

- Considering the interests and utilizing the knowledge of our customers, employees, communities and stakeholders who may be affected by our actions;
- Reviewing our environmental objectives and targets annually to ensure improvements in our environmental performance;
- Continually improving our Environmental Management System; and
- Documenting and reporting our activities and environmental performance.

Manitoba Hydro's environmental management policy has been incorporated in the plans for the construction and operation of the Wuskwatim Project. The use of environmental protection plans is a practical and direct implementation of Manitoba Hydro's commitment to responsible environmental stewardship.

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1.0 INTRODUCTION

1.1 Concept and Purpose of the Environmental Protection Plans (*Aski Ketapahchikewe Othaschikekwin*)

Environmental protection plans (“EnvPP’s”) are environmental protection *guidelines* that supplement project design, construction and operating specifications to prevent or minimize adverse environmental effects arising from the construction and operation of the Wuskwatim Project. They are designed as “user friendly” documents for use as reference documents by field construction and operating personnel. EnvPP’s prescribe practical responses to legislation, regulations, licences, permits, standards, conditions, contracts, agreements, designs and specifications for specific situations at specific work locations. They identify and describe environmental protection measures for sites or features of importance to local communities or individuals.

The Wuskwatim Project is being developed on land owned by the Partnership. Because that land is located within N’tuskenan (“our land” to Nisichawayasihk Nehethowuk, the people from where the three rivers meet and who speak the language of the four winds) and the Nelson House Resource Management Area, *Kihche’othasowewin* (the Great Law of the Creator) and *Ethinesewin* (traditional knowledge, including the collective wisdom of *Nisichawayasihk Nehethowuk*) have been integrated into this EnvPP for the Wuskwatim Project.

EnvPPs also provide guidelines for site specific mitigation **monitoring** and reporting on environmental effects of specific activities during construction, operation and **decommissioning** of construction related infrastructure.

1.2 How to Use the Environmental Protection Plan

This EnvPP (*aski ketapahchekewe othaschikekwin*) is presented in a format that provides the user with quick reference and instruction regarding anticipated environmental concerns. It also describes procedures for dealing with unanticipated situations. The plan is organized into the following sections:

- **Preface:** Information about the Wuskwatim Power Limited Partnership. NCN and Manitoba Hydro.
- **Section 1:** Introduction, purpose and how to use the EnvPP.
- **Section 2:** Project Description (description of work to construct and operate the project).
- **Section 3:** Environmental Setting (features of local importance).
- **Section 4:** General practices used to prevent or minimize environmental impacts.
- **Section 5:** Site specific environmental protection measures, detailed description of impacted sites including present land use, terrain sensitivity to activities and mitigation measures.
- **Section 6:** Monitoring programs, follow up and project records.

- **Section 7:** Project management system including the responsibilities for management and staff.
- **Section 8:** References and Glossary.
- **Section 9:** Copies of available licenses, permits and special approvals.
- **Section 10:** Maps.

This EnvPP is subdivided into sections that are applicable to project construction, operation and decommissioning. Some words in the text are in **bold font** the first time they occur in the document and these words are defined in the glossary in section 8.2.

It is intended that all contractor staff and Manitoba Hydro project employees will be familiar with the contents of this EnvPP. This document and copies of all documents contained in the reference section of the EnvPP shall be available at the project work site. This EnvPP will be thoroughly reviewed with Contractors at pre-job meetings and copies of this EnvPP will be made available for relevant members of the Contractor's staff. Questions regarding the implementation of environmental protection measures shall be directed to the Manitoba Hydro Resident Manager or his/her delegate. This EnvPP will be a regular agenda item for project progress meetings.

1.3 Concept of the Environmental Protection Program

This EnvPP is one part of an environmental protection program that includes environmental protection plans and field guides, environmental management plans, and environmental monitoring plans:

- Access Road Environmental Protection Plan and Field Guide (*Aski Ketapahchikewe Othaschikekwin*).
- Construction Camp Environmental Protection Plan and Field Guide (*Aski Ketapahchikewe Othaschikekwin*).
- Generating Station Environmental Protection Plan and Field Guide (*Aski Ketapahchikewe Othaschikekwin*).
- Heritage Resources Protection Plan (*Aniskowatesewe Ketapahchikewe Othaschikekwin*)
- Access Management Plan.
- No Net Loss (Management) Plan.
- Sediment Management Plan.
- Physical Effects Management Plan.
- Aquatic Effects Monitoring Plan.
- Terrestrial Effects Monitoring Plan.
- Resource Use Monitoring Plan.

These plans are part of an environmental management program that includes such other elements as:

- Employment and training of Environmental Inspectors (*Aski Kihche O'nanakachechikeo* or "AKO's").
- Ongoing on-site inspection.
- Regular documentation of field inspection activities.
- Regulatory liaison
 - Work permits
 - Adaptive monitoring and management plans
- General and site specific environmental protection guidelines
- Monitoring requirements review
- Specialist consultant management program review
- *Ethinesewin* (traditional knowledge, including the collective wisdom of *Nisichawayasihk Nehethowuk*) as well as western scientific knowledge and community reporting
- **Follow-up** and adaptive research, monitoring and environmental protection programs
- Annual reporting

A summary of the EnvPP components, human resources and objectives is provided in Table 1-1 (page 4). Section 6.0 contains more information regarding the monitoring and follow-up components of the Environmental Protection Program.

Table 1-1: Summary of the Environmental Protection Program

Program Components	Environmental Protection Plan	Monitoring	Follow-up	Training
Purpose	<ul style="list-style-type: none"> Guidelines for protection of the environment 	<ul style="list-style-type: none"> Compliance 	<ul style="list-style-type: none"> Verify EIS Predictions Determine Effectiveness of Monitoring, Training and Environmental Protection Plans 	<ul style="list-style-type: none"> Ensure Environmental Protection Program is carried out effectively
Geographic Area	Worksite	Project Wide	Site Specific	N/A
Program Elements	<ul style="list-style-type: none"> General Environmental Guidelines Project Specific Environmental Guidelines Site Specific Biophysical Land Classification Permits and Licenses 	<ul style="list-style-type: none"> Aquatic Terrestrial Physical Environment Resource Use Access Management Facilities 	<ul style="list-style-type: none"> Auditing, Rescoping and Adaptive Management of the Environmental Protection Plan, Monitoring and Training 	<ul style="list-style-type: none"> AKO Course (Modular) Environmental Protection Plan Monitoring docs Training
Resources	<ul style="list-style-type: none"> Senior Environmental Specialist AKO NCN Resident Manager Construction Inspectors 	<ul style="list-style-type: none"> Consultant Specialists AKO Senior Environmental Specialist Construction Inspectors NCN 	<ul style="list-style-type: none"> Senior Environmental Specialist Resident Manager NCN Consultant Specialists AKO Construction Inspectors 	<ul style="list-style-type: none"> Consultant Specialists Manitoba Hydro Staff Senior Environmental Specialist NCN

2.0 PROJECT DESCRIPTION

Construction of an all weather road is necessary to provide access for the construction of the Wuskwatim Project at Taskinigup Falls. A detailed project description is contained in Volume 3 of the **Environmental Impact Statement (EIS)**, with an overview provided in Volume 1. Figure 2-1 shows the route of the main access road.

In addition, there will be a number of temporary access routes constructed. The locations will be determined as temporary access is required. Routing will be assessed and appropriate environmental protection measures applied.

The road will begin at PR 391, approximately 32 kilometres west of Thompson and will extend 48 kilometres southwest to the Wuskwatim Project site. It has been designed to current Manitoba Transportation and Government Services Provincial road design standards and Manitoba Stream Crossing Guidelines as published by the Department of Fisheries and Oceans.

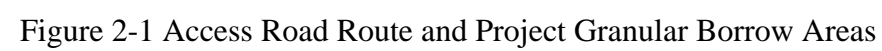
The road right-of-way will be 100 metres. Construction of the road will require a cleared width varying from 60 to 100 metres, depending on the road curvature and terrain. In addition to the actual roadway, clearing will be required to obtain borrow material to construct the road. It is expected that two temporary camps of 50 and 200 people will be required for the road workers.

The road traverses eight streams, which are crossed with either single or double corrugated metal pipe culverts. No bridge structures are required. The diameter of the culverts will range from a minimum of 0.9 metres to a maximum of 1.8 metres. A ninth stream is located at the construction camp. This stream crossing will be addressed in the Camp EnvPP.

In general, road construction methods will follow Manitoba Transportation and Government Services' "Grading and Surfacing Specifications".

The land on which the Wuskwatim access road will be built is owned by the Partnership. An Access Management Plan for the Wuskwatim Project has been written. During the construction phase of the generating station project and associated infrastructure, the access road will be closed to the general public for safety reasons. A 24 hour supervised security gate located near the intersection of PR 391 will control access to the road. The gate will be located at least 30 metres south of PR 391 to allow large trucks to pull off the highway and be clear of the intersection. Surface grading, dust control and snow clearing measures will be implemented along the road route, as required. Table 1 in Appendix A contains section references to the EIS that pertain to project activities which may impact the environment.

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3.0 ENVIRONMENTAL SETTING

Information on the Project area environment is detailed in the project EIS, organized into the following volumes:

- Volume 1 Summary EIS
- Volume 4 Physical Environment
- Volume 5 Aquatic Environment
- Volume 6 Terrestrial Environment
- Volume 9 Heritage Resources

The EIS for this project assessed impacts as being not significant and/or mitigable for most components. However, this was due, in part, to adherence to the EnvPPs. This section provides an overview of the various sensitivities along the access road that require careful management through adherence to this EnvPP.

Section 5 of this EnvPP describes the terrain features along the access road which is located in Boreal forest. The Boreal forest region contains a mix of upland forest and very open vegetation on bogs. Black spruce is the dominant tree species in these **ecosystem** types. Jack pine, white spruce, balsam fir, aspen, white birch, balsam poplar and tamarack can also be found in suitable locations.

The northern portion of the route is located on a sand and gravel ridge. Areas on this ridge supporting jack pine forest are considered uncommon. White spruce and balsam fir, which are regionally uncommon, occur along the access road.

No plant or bird species listed as Endangered, Threatened or Special Concern under Schedule 1 of the Federal Species at Risk Act or the Manitoba Endangered Species Act were found in the road project area during field studies. Additional rare plant surveys will be completed prior to clearing.

Most of the streams crossed by the road have intermittent flow and/or have few fish species present at the crossing site. Fish species are susceptible to habitat loss if exposed to excessive sedimentation and are protected by the Federal Fisheries Act.

Woodland caribou have been listed as “threatened” under Schedule 1 of the Species at Risk Act and “threatened” under the Manitoba Endangered Species Act. Approximately 200 woodland caribou of the Wapisi herd live in the region.

While no cultural/heritage artifacts were found along the access road, the area could have been used by people in the past; particularly along the sand and gravel ridge. Furthermore, most artifacts are found buried below the surface and this will require care and monitoring during construction.

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4.0 GENERAL ENVIRONMENTAL PROTECTION MEASURES FOR CONSTRUCTION, OPERATION AND DECOMMISSIONING

General Environmental Protection Measures have been organized by the following project phases:

- **G** *General (applies to all phases of the project)*
- **C** *Construction*
- **O** *Operation*
- **D** *Decommissioning*

4.1 General Management

- 1(G). Project specifications, guidelines, licenses and permits must be obtained prior to commencement of construction. All relevant Manitoba Hydro employees and contractors working onsite for this project will be made aware of these documents and their contents. These documents are presented in Section 9 of this EnvPP if available at the time of publication. Copies are also available from the Resident Manager's office or the Manitoba Hydro Senior Environmental Specialist in Winnipeg at [REDACTED]
- 2(G). One of the functions of this EnvPP is to demonstrate and document due diligence. In this context, due diligence involves taking all reasonable, practical steps to protect the environment during construction, operation and decommissioning phases of the Wuskwatim Project.
- 3(G). The Partnership supports the need to preserve and protect natural environments and heritage resources affected or which may be affected, directly or indirectly, by the Wuskwatim Project. In recognition of this objective, all Project participants will be required to undertake all necessary activities, steps, procedures and measures required to ensure work is done in strict compliance with contractual obligations and environmental and heritage regulations.

4.2 Regulatory Requirements

- 1(G). Manitoba Hydro requires that its employees and contractors comply with all Federal and Provincial **Regulatory** requirements relating to the construction, operations and decommissioning of its projects and facilities, including the Wuskwatim Project for which Manitoba Hydro is the Project Manager. General regulatory information is contained in the document:

“Guide to Environmental Legislation Applicable to Manitoba Hydro’s Projects and Operations” Environmental Land Use and Planning. January 2004.

and other applicable Guidelines, Standards and Codes of Practice referenced in Section 8.1 *“List of References”*. Site specific regulatory requirements for this project will be listed in the Manitoba Conservation work permit(s).

Section 9.0 “Licences, Regulatory Approvals and Permits” in this EnvPP references specific licences, approvals and permits required for the Project.

- 2(G). Environmental management and **monitoring** programs will be conducted in full cooperation with local authorities such as Natural Resource Officers (NRO).

4.3 Access and Access Roads

A 48 km all weather access road is required to transport workers, materials and equipment from existing roads to Wuskwatim project work sites. In addition, temporary access routes will be constructed to gain access to **borrow areas** for construction materials.

Potential environmental impacts associated with construction and operation of access roads include: soil **erosion** and compaction, sedimentation of streams, contamination of soil and **groundwater**, disruption of surface and sub-surface drainage patterns, changes to soil moisture and fertility, soil warming and permafrost melting in peatlands, edge effects on plants adjacent to cleared areas, deposition of airborne road dust and airborne emissions from vehicles and construction equipment, accidental fires, loss and/or conversion of fish and wildlife habitat, proliferation of invasive plants, disturbance to heritage resources, salvage and disposal of timber, noise and aesthetics.

The following section describes practices that will be followed to minimize potential environmental impacts during access road construction, operation and decommissioning.

- 1(G). Permission for access onto Crown Land will be obtained from the appropriate regulatory authority prior to the commencement of project related activities.
- 2(G). For safety reasons access to certain areas will be restricted.
- 3(G). Vehicle, machinery and pedestrian traffic will be restricted to project related access routes and cleared project sites.
- 4(G). Existing all weather or winter roads/trails shall be utilized, whenever possible.
- 5(G). Vehicles and machinery shall cross waterways at pre-constructed temporary and permanent culverts and will only travel on cleared access roads and project sites. All stream crossings shall conform to the "*Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat*" published by Manitoba Conservation and Department of Fisheries and Oceans (DFO).
- 6(G). Temporary access routes designated for specific uses or seasonal use may only be used outside of these constraints during emergency conditions (e.g. safety issue such as forest fires etc.).
- 7(G). Clearing and habitat disturbance outside of the project area shall be minimized or avoided. Ensure that **right of way** boundaries, buffers and **sensitive areas** (see section 5.3) are clearly marked prior to clearing. Access to certain facilities and sites may be restricted due to the location of environmentally sensitive sites, (rare and endangered species), heritage sites, seasonal wildlife migration, staging, calving, spawning or nesting habitats.

- 8(G). Water quality at stream crossings will be monitored and appropriate environmental protection measures will be taken to minimize negative impacts to aquatic ecosystems. See the Aquatic Effects Monitoring Plan for more details.
- 9(G). Approach gradients to waterways shall be minimized to prevent degradation of shoreline soils during periods of runoff.
- 10(G). Stream crossings shall be designed to not impede natural water flow or create a barrier to fish passage at sites where creation of such a barrier would negatively affect fish populations.
- 11(G). **Aggregate** material shall not be removed from any stream or waterway.
- 12(G). **Permafrost** soils and landforms will be protected during access road construction by: Minimizing disturbance to the vegetative and organic cover which acts as insulation; Minimizing removal of vegetative cover, compaction or disturbance to the surface organic layer; and minimizing alterations to drainage patterns and rutting and scouring of the topsoil.
- 13(G). Contractors will wash equipment, machinery and tires at their point of origin prior to transport to the project areas to minimize the risk of invasive plant introduction or spread. (i.e. purple loosestrife from the southern part of the Province.)
- 14(G). Ditches shall be seeded with a grass mixture that will only contain native and/or non-invasive introduced grasses (i.e., will not contain sweet clover or other herbs).
- 15(C). Temporarily cleared areas shall be graded and stock-piled organic material spread to encourage re-growth of native vegetation and reduce the risk of invasive plant spread.
- 16(C). Construction of temporary access routes shall be minimized. Where temporary access routes must be constructed, habitat disruption will be minimized by limiting their number and length and locating them outside of shallow water table wetlands and at least 100 m from any sensitive area (see section 5.3).
- 17(C). Surplus construction materials shall be removed from construction sites.
- 18(C). There are two research stations located near the Mile 17 access road junction of PR #391. They will not be disturbed during the project.
- 19(O). Snow storage areas, if required shall be located at least 100 m (110 yds) from any stream, waterway or source of drinking water. Following the spring melt debris at snow disposal sites including domestic and construction wastes shall be collected and removed to a proved landfill site.

- 20(O). Only approved melting agents for snow/ice covered roads will be used. Chemical melting agents shall not be used at stream crossings or near sensitive habitats (see section 5.3). Clean abrasives such as sand and gravel may be used as alternatives to chemical melting agents.
- 21(O). Road salts should be pre-moistened prior to application as this allows the salts to stick to the road instead of bouncing onto non-target areas.
- 22(O). Oil or petroleum products shall not be used to control dust. Water or approved dust suppression products will be used to control dust on the access road.
- 23(O). Each stream crossing will be monitored by the AKO bi-annually during early spring and late summer for blockage and alignment to ensure fish passage. Additionally, ongoing inspections for structural condition will include observations of factors that may affect fish passage (e.g., perched culvert, ice damaged culvert invert, obstruction to fish passage within the culvert). Refer to the DFO document “*Manitoba Operational Statement Habitat Management Program for Culvert Maintenance*” found at http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/prov-terr/mb/index_e.htm.
- 24(O). Appropriate measures will be taken to eliminate all types of refuse from work sites. Garbage will be removed as required from work sites.
- 25(O). To reduce the possibility of vehicle and wildlife collisions, vehicle speeds shall not exceed posted speed limits and wildlife warning signs shall be installed where appropriate.
- 26(D). Road segments shall be inspected prior to decommissioning to document areas of staining, stressed vegetation, debris, etc. Soil and groundwater samples will be taken by qualified personnel at suspect areas to delineate the extent of any potentially contaminated sites.
- 27(D). Temporary access routes and associated stream crossings may be decommissioned at the completion of the construction phase according to specification requirements and shall be signed off by an NRO.
- 28(D). Decommissioned roadbeds will be reclaimed. If required a terrestrial ecologist will provide specification requirements and will provide advice as required during reclamations.
- 29(D). Ongoing visual inspection of the worksites will be conducted by the Project AKO to ensure adequate restoration and minimal environmental degradation.
- 30(D). Temporarily cleared access routes areas that supported jack pine forest prior to construction (as identified in the EIS) shall be regenerated to jack pine forest. A terrestrial ecologist shall provide regeneration prescriptions and inspect

regeneration efforts immediately after completion of work, at three years and again at seven years. (See the Terrestrial Effects Monitoring Plan.)

4.4 Borrow Pits and Quarries

Borrow pits are sites where stone, sand, gravel, till, clay, or other granular soils are extracted for the construction of access roads, transmission lines, and stations. The term ‘pit’ is used when granular material is extracted. The term ‘quarry’ is used where consolidated rock is removed. Some guidelines regarding design, operation and restoration of borrow pits apply to quarries.

Environmental impacts of pit and quarry development can include the loss, reduction or disturbance of wildlife and habitat, erosion runoff, dust, soil/groundwater contamination, damage to historic resources, waste disposal, noise, and aesthetics.

The following section describes practices that will be followed to minimize potential environmental impacts associated with pits and quarries.

- 1(G). Regarding activities related to pits and quarries, reference will be made to the following:

The provincial “*Mines and Minerals Act*”

“*Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters.*” Department of Fisheries and Oceans.
1998.

- 2(G). Where pit and quarry operations are located close to public view, including access routes and all weather roads, a form of visual screening will be left in place if possible. A visual screen generally consists of a vegetated buffer area between a public use area and a work-site.
- 3(G). New borrow pits and quarries shall be located as close to existing access routes as possible while maintaining an adequate visual screening.
- 4(G). The work face of the quarry should be oriented away from sensitive wildlife habitats, recreation areas and temporary and permanent settlements. This practice will direct noise away from environmentally sensitive areas (see section 5.3) and minimize potentially negative aesthetic impacts.

- 5(G). Quarry blasting operations will be scheduled to minimize disturbance to wildlife and to ensure the safety of workers. Spring (first open water to the end of July) is the most important season for wildlife as it is the critical reproductive period for most **species**.
- 6(G). A deep quarry excavation is preferable to a shallow excavation since a deep site minimizes the amount of surface disturbance relative to the amount of material excavated.
- 7(G). Before excavation starts in pits or quarries, **runoff** control measures shall be designed to redirect surface runoff away from access routes and pit and quarry walls.
- 8(G). Borrow pits shall not be located within 100 m (110 yds) of stream banks or steep slopes unless a specific exemption is provided by Manitoba Conservation.
- 9(G). Borrow pits shall be monitored for the presence of historic or heritage material by all project employees. If found, work shall cease and the Manitoba Hydro Resident Manager shall be contacted immediately. The Resident Manager or their delegate shall contact the project archeologist.
- 10(G). **Organic** material, topsoil, and subsoil shall be stripped and piled separately for future site **rehabilitation**.
- 11(G). To encourage revegetation, the organic layer will be segregated from other overburden soils and will be replaced on pit slopes and bottoms after borrow material has been removed from sites designated for decommissioning. Pit walls shall be left at maximum slope of 4:1 (horizontal: vertical).
- 12(G). Site clearing shall be minimized within the context of permitting the safe and efficient movement of personnel, material and equipment, during the excavation of materials.
- 13(G). The contractor shall implement erosion and dust control measures on site. Washing and maintenance of vehicles and equipment in the excavated area shall not be permitted.
- 14(G). Signs will be posted to warn unauthorized personnel of safety hazards.
- 15(G). Appropriate site drainage and erosion control measures shall be implemented for borrow sites which are no longer needed.

- 16(G). Oil and grease changes on any vehicles will be prohibited in pits and should only occur in designated areas.
- 17(G). Erosion and dust from the site shall be controlled.
- 18(C). Garbage, debris or refuse shall not be discarded into the excavated areas.
- 19(O). The number of borrow pits opened will be minimized. Existing borrow areas shall be used whenever reasonably possible.
- 20(D). All waste, refuse, structures, material and equipment shall be removed by the contractor at the end of construction.
- 21(D). Depending on the planned future use for the site and the size of the excavation, pits and quarries should be backfilled with clean mineral soil or granular material, leveled or sloped and if necessary revegetated. Reclamation plans shall be forwarded to Manitoba Industry, Economic Development and Mines and Manitoba Conservation.
- 22(D). Temporary haul roads from permanently abandoned borrow areas will be decommissioned as outlined in Section 4.3.
- 23(D). The restored pit will be monitored by Manitoba Hydro to determine if additional restoration activities are required. If appropriate for the site, revegetation will be allowed to re-occur naturally.
- 24(D). Decommissioned borrow areas and borrow area access roads that supported jack pine forest prior to construction (as identified in the EIS) will be regenerated to jack pine forest. A terrestrial ecologist shall provide regeneration prescriptions and inspect regeneration efforts immediately after planting, at three years and again at seven years. (See the Terrestrial Effects Monitoring Plan.)
- 25(D). Areas that are seeded with a grass mixture to assist rehabilitation will be seeded with a mixture that only contains native and/ or non-invasive introduced grasses (i.e., will not contain sweet clover or other herbs).

4.5 Clearing

To construct the access roads and associated facilities, it will be necessary to clear trees and other vegetation. Potential environmental impacts associated with clearing include: removal of **merchantable** timber and wildlife habitat, changes to soil, water, temperature and fertility in adjacent areas, erosion and fire hazards due to timber and slash stockpiling.

The following section describes practices that will be followed to minimize potential environmental impacts during clearing.

- 1(G). As much as possible restrict clearing activities outside the most sensitive breeding and brood-rearing months (i.e. May to late July) to reduce impacts to birds and other wildlife.
- 2(G). Where practical and viable merchantable timber will be salvaged and utilized. Where the project is located on crown land timber, harvesting activities will be conducted in accordance with the Manitoba Provincial “*The Forest Act*” and Manitoba Conservation “*Timber Harvesting Practices for Forestry Operation in Manitoba*” (1996). All Crown owned productive forest lands cleared will be subject to the Manitoba Conservation “*Forest Damage Appraisal and Valuation Policy*” (1995).
- 3(G). Right-of-way clearing will be limited to the area required for construction, operation and maintenance of the road.
- 4(G). Clearing and disturbance shall be limited to project areas and associated access routes. Whenever possible, existing access routes will be utilized and machinery shall not operate outside of the project areas and associated access routes. Storage areas shall be contained within the project areas and associated access routes.
- 5(G). Vegetation will be removed by mechanical means except where other selective clearing methods are stipulated.
- 6(G). Right-of-way boundaries and sensitive areas (see section 5.3) shall be clearly marked with flagging tape by Manitoba Hydro prior to clearing.
- 7(G). Areas requiring selective clearing (i.e., buffer zones, sensitive sites (see section 5.3)) shall be marked prior to clearing. The AKO will ensure these areas are noted by the contractors and not unduly disturbed by construction equipment and related activities. Buffer zones will be maintained as outlined in the document “*Consolidated Buffer Management Guidelines.*” *Manitoba Natural Resources. March, 1996.*
- 8(G). Trees will be felled towards the cleared area to avoid damage to standing trees.

- 9(G). Tolko Industries Ltd., Manitoba Conservation and NCN shall be consulted regarding best timber utilization options regarding merchantable timber prior to clearing in project area. If practical cleared vegetation could be used as firewood for local community members.
- 10(G). Cleared trees and/or vegetation shall not obstruct waterways and will be stored above the **ordinary high water mark** if close to waterbodies.
- 11(G). Specified clearing methods will be carried out in a manner that will minimize disturbance to existing organic cover.
- 12(G). Windrows and piles of slash shall be disposed of in accordance with Manitoba Conservation work permits. Long term storage of cleared vegetation is discouraged. Clearing the vegetation may prevent forest fires, provide unobstructed wildlife movement and promote natural drainage. Windrows of snow containing any organic matter pushed up along tree lines will be pulled back onto clearings or rights-of way. Refer to Manitoba Conservation Forest Practices Guidebook "*Brush Disposal*" 2005.
- 13(G). Clearing shall avoid where possible the marked white spruce and balsam fir sensitive sites.
- 14(C). Construction sites including road rights-of-way, pits and quarries and temporary access shall be stabilized to minimize erosion immediately after initial excavation exposure.
- 15(C). Where practical and feasible, timber clearing in known permafrost areas will be minimized but where required shall retain the top layer of organic soil and ground vegetation as an insulating cover to prevent or minimize disturbance.
- 16(C). Any requirements for additional clearing outside the originally designated project area shall be reported to Manitoba Conservation. Revisions to work permits may be required. Trees located at the edge of clearings or rights-of-way, that can potentially affect the function of a Manitoba Hydro facility (distributions lines, buildings etc.) or human safety, will be removed. These trees are referred to as "danger trees".
- 17(C). Vegetative buffer zones shall be maintained between construction areas and natural waterbodies. Any deviations to buffer zones identified in the work permits shall only be made with the approval of Manitoba Conservation i.e.:
- With the exception of specific construction sites under the Environment Act License approvals, heavy equipment is not allowed within a minimum of 30 m (33 yds) of the ordinary high water mark except to allow temporary access across a stream or other waterbody.
 - Buffer zones at stream crossings shall not be less than 100m (110yds) from the ordinary high water mark.

- Trees shall not be felled into streams.
- Removal of standing and fallen trees in riparian **ecosystems** will be determined on a site specific basis.
- Slash produced during clearing for construction will not be left in a buffer zone.
- Unless otherwise specified by Manitoba Conservation, only manual removal of woody debris will occur from stream beds.
- During the construction of linear facilities, a cleared center line through buffer zones may be required. The width of center line clearing will be determined during the planning phase. Selective clearing methods will be applied. Natural revegetation will be allowed to occur although active reclamation programs may be required at specific sites.

18(C). Trees containing large nests of sticks and areas where active dens or burrows occur will be identified, left undisturbed and reported to the NRO. Mitigation may be required to help preserve important wildlife species. Bear and wolf dens should be protected and avoided where possible when clearing. The AKO and a NCN member will identify these den sites prior to clearing and provide a list of sites to the contractor.

19(D). Soil that has been stockpiled during the course of construction may be used for the rehabilitation of cleared areas.

20(D). Soil/site preparation will be conducted if necessary to re-establish vegetation. These activities may consist of scarification, grading and fertilizing.

21(D). Revegetation may be required in disturbed areas to:

- stabilize erodible soils;
- create or restore wildlife habitat;
- prevent or delay the invasion of unwanted plant **species**; or
- enhance or restore the aesthetic appeal of an area.

These sites will be specifically identified by the Natural Resource Officer as requiring special treatment after construction and during decommissioning, otherwise natural revegetation will be allowed to reoccur.

22(D). Areas that are seeded with a grass mixture to assist rehabilitation will be seeded with a mixture that only contains native and/ or non-invasive introduced grasses (i.e., will not contain sweet clover or other herbs).

23(D). Cleared areas that supported jack pine forest prior to construction (as identified in the EIS) will be regenerated to jack pine forest. A terrestrial ecologist shall provide regeneration prescriptions and inspect regeneration efforts immediately after planting, at three years and again at seven years. (See the Terrestrial Effects Monitoring Plan)

4.6 Grubbing

Grubbing is the removal of the roots of vegetation and will occur during access road construction.

Potential environmental impacts associated with grubbing include erosion, rutting and sedimentation of waterways.

The following section describes practices that will be followed to minimize potential environmental impacts during grubbing activities:

- 1(G). Where possible grubbing will not occur within 2 m (2.5 yds) of standing timber in order to prevent damage to root systems of adjacent to standing trees and reduce the occurrence of **blow down**.
- 2(G). Slash windrows that will be disposed of by burning shall be piled the maximum distance possible from standing timber.
- 3(G). Where possible special care shall be taken when grubbing in areas of fine-grained soils (clays, silts, fine sands, etc.) to minimize erosion, particularly during wet weather, to prevent rutting and erosion.
- 4(G). When grubbing in areas susceptible to erosion into waterbodies, erosion control blankets and/or silt fences may need to be installed.
- 5(G). A minimum 100 metre (110 yds) non-grubbing zone will be maintained around streams and waterways.
- 6(G). Construction sites requiring extensive grubbing shall be stabilized (graded, seeded, etc.) as soon as practical, to minimize erosion.
- 7(G). Sediment released from grubbed material will be controlled to minimize entry into waterbodies.

4.7 Stripping and Grading

Stripping involves the removal of topsoil and low vegetation to mineral soil. Grading is the process of reshaping the land to design elevations such as the access road bed, drainage ditches and construction camp areas. Stripping and grading are required for both permanent and temporary facilities.

Potential environmental impacts associated with stripping and grading include erosion, disturbance of permafrost, and sedimentation of waterways.

The following section describes environmental practices that will be followed to minimize potential environmental impacts during stripping and grading.

- 1(G). Erosion control measures, if required, shall be in place prior to stripping.
- 2(G). Construction areas containing soil with high percentages of silt, artesian springs, or areas of previous erosion, shall require special design considerations, including erosion control techniques.
- 3(G). In areas of permafrost, stripping through organic vegetative layers shall be avoided, in order to prevent ground ice from melting.
- 4(G). Whenever possible, stripped material shall be segregated and stockpiled for later use in regrading and backfilling. The stripping stockpile shall be situated a minimum of 100 m from any waterbody.
- 5(G). Soil strippings shall be stockpiled in a manner that will not impede natural drainage and will remain available to rehabilitate disturbed sites. Depending on the condition of the soil at the time of rehabilitation and the planned future use of the site, the stockpiled soil will be replaced upon completion of project activities.
- 6(G). Excavated soil shall not be stockpiled at worksites adjacent to wetlands or waterways. This material shall be removed to an approved disposal area.
- 7(G). Stockpiled material shall not block drainage ditches, and will be prevented from washing into waterways.
- 8(G). **Fill** material placed adjacent to waterways shall be clean and well-graded granular material.
- 9(G). Natural vegetation near stream crossings will be retained to minimize erosion.
- 10(G). Use of heavy equipment in and near waterways will be restricted to activities described in regulatory work permits.

4.8 Blasting and Drilling/Boring

Blasting is used to loosen or break up rocks for removal. It is used during excavation of **bedrock**. Drilling and/or boring are used to collect soil and rock samples, to place charges for blasting, and to facilitate grouting. These activities will be employed during construction of the access road.

Potential environmental impacts include: dust (air quality), contaminant releases, sedimentation, safety, fly rock and debris, noise and explosive detonation effects on people, structures, fish and wildlife.

The following section describes practices that will be followed to minimize potential impacts during blasting, drilling and boring.

- 1(G). The blasting contractor must be in possession of all required permits/certificates. Notification will be given to affected parties including site employees and the local general public prior to each blasting event. The Contractor shall submit a Blasting Plan to Manitoba Hydro prior to each blast.
- 2(G). Reference will be made to Department of Fisheries and Oceans document *"Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters"* 1998. Blasting plans will be submitted to DFO and Manitoba Conservation prior to commencement of blasting in areas that could affect fish habitat.
- 3(G). Blasting plans will comply with blasting regulations and reflect the appropriate timing of events as they relate to critical life functions of fish and wildlife species i.e. spawning, nesting, calving and migration. Therefore, to reduce impacts to birds and other wildlife, blasting activities should be restricted to outside the most sensitive breeding and brood rearing months (i.e. May to late-July) as much as possible.
- 4(G). Storage facilities and personnel handling explosives shall be in accordance with regulations in the provincial Workplace Safety and Health Act. Also refer to Manitoba Hydro Safety Publication 0016/05 "Transportation, Storage and Handling of Explosives".
- 5(G). Whenever possible, drilling/blasting and supporting activities shall be scheduled during winter months to minimize permafrost degradation.
- 6(G). Whenever possible, large charges shall be divided into smaller multiple time-delayed charges.
- 7(G). Drilling sites will be clearly marked with flagging tape and the flagging tape will be removed at the completion of the work.
- 8(G). Blast rock shall be stockpiled for subsequent use or disposal on site.

- 9(G). Vehicles, machinery, and equipment shall be kept in good working condition and free of fluid leaks. Motorized equipment will be equipped with spark-retarders.
- 10(G). No blasting is permitted within 5 km of identified caribou calving area along the access road from late-May to early-July. See Figures 2 to 7 for restricted areas.
- 11(G). Transportation of explosives shall comply with the federal Explosives Act.
- 12(G). Directional drilling may occur at water crossings. Refer to the DFO document "*Manitoba Operational Statement Habitat Management Program for High Pressure Directional Drilling*" describing fish and fish habitat protection measures found at http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/prov-terr/mb/os-eo07_e.htm. The measures may be used as a general guideline for Horizontal Bores, Horizontal Punches and Directional Drilling at Manitoba Hydro projects and worksites.
- 13(D). Waste (e.g., empty fuel or lubricant containers) and debris shall be removed from the site upon completion of the work.
- 14(D). In accordance with the blasting plans, site remediation will occur as soon as possible after the blast and where appropriate, surplus excavated soils will be disposed of at an approved site.
- 15(D). Excessive volumes of debris that enters a waterway as a result of blasting shall be removed prior to the completion of the blasting program.

4.9 Drainage, Erosion and Sedimentation Control

Protection of natural drainage is an important issue during all phases of the project. Erosion protection methods will be used for all construction activities and sedimentation control measures will be applied at eroding sites. Reference will be made to the detailed Sediment Management Plan for the project.

Potential environmental impacts associated with drainage and erosion include bank slumping and sediment loading into waterways, entry of debris, fuels or chemicals into waterways, loss of fish or wildlife habitat, interference with navigable waterways and aesthetics.

The following section describes environmental practices that will be followed to minimize impacts associated with drainage, erosion and sedimentation. Note: Other sections make reference to erosion and sedimentation control specific to construction activities.

- 1(G). Natural drainage shall be maintained where possible. Measures will be taken to maintain flows as well as, to prevent erosion and ponding.
- 2(G). Drainage water from construction areas shall be diverted through vegetated areas prior to entering a waterbody.
- 3(G). Soil stripped from a work site, will be stockpiled in a location where natural drainage will not be impeded. If appropriate to the particular facility design it will be replaced upon completion of construction activities.
- 4(G). If necessary to prevent erosion, ditches will be stabilized with bioengineering methods involving vegetation, erosion control blankets or granular materials.
- 5(G). Vegetation shall be retained as much as possible along ditches to reduce potential erosion.
- 6(G). Silt fences will be checked regularly by the contractor to ensure they are installed and functioning correctly. Accumulated sediment shall be cleared out of silt fences at regular intervals. Sediment shall be disposed of in an area where it can not enter any fish bearing waterbodies.
- 7(G). Silt containment methods shall remain in place until all work has been completed, disturbed areas have been protected from erosion and accumulated sediment has been removed.
- 8(G). Where necessary to minimize erosion, exposed slopes shall be revegetated as soon as possible.
- 9(G). Divert run-off away from erosion susceptible slopes to prevent further site degradation.

- 10(G). Discharge water from dewatering of excavations and depressions shall be directed away from waterbodies.
- 11(G). Where required, culverts will be installed to prevent ponding or infilling.
- 12(G). Sedimentation control shall be provided in sloped work areas and work areas adjacent to waterbodies. Methods of sedimentation control include:
- straw mulching and seeding;
 - erosion control blanket and seeding;
 - straw bale containment dam;
 - silt fence; and
 - sandbags, logs, planks, etc.
- 13(G). Where such erosion and sedimentation control measures are employed, sites shall be monitored and maintained by the contractor who installs them and the AKO and the effectiveness of the measures shall be documented.
- 14(G). Silt contaminated water shall not be discharged directly into a waterway.
- 15(G). Wastewater resulting from washing vehicles or equipment shall not be discharged directly into waterways. Vehicles and equipment shall be cleaned at a location dedicated for that purpose.
- 16(G). Materials used for culvert erosion control shall be clean, erosion resistant and completely cover any erodible materials.
- 17(G). Whenever possible, ditches and culverts shall be constructed and installed during periods with minimal or no stream flows.
- 18(C). Ditches shall be constructed from lower to higher elevations to avoid water ponding.
- 19(C). Surplus excavated soil shall not be stockpiled near wetlands or adjacent to streams. Surplus soil shall be removed to an approved disposal area.
- 20(C). Appropriate erosion control methods shall be applied at culverts.

4.10 Stream Crossings

The main access road will cross 8 streams. Streams SC-2, SC-5, SC-6 and SC-9 were deemed navigable by Transport Canada.

Potential environmental impacts associated with crossing streams include erosion, sedimentation, foreign material releases, slumping, disturbance to drainage and removal of vegetation.

The following section describes practices that will be followed to minimize environmental impacts at stream crossings.

- 1(G). During route access planning, routes shall be selected in a manner which minimizes the number of crossings of waterways, waterbodies & wetlands to the extent practicable.
- 2(G). Streams should be crossed at right angles to minimize shoreline disturbance to the extent practicable.
- 3(G). Construction of all stream crossings shall be in accordance with the "*Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat*" published by Manitoba Conservation and DFO.
- 4(G). Back-fill installed adjacent to waterbodies shall consist of clean and well-graded granular material.
- 5(G). No burning shall be permitted within 100 m (110 yds) of a stream crossing/waterbody.
- 6(G). Temporary and permanent access across waterbodies, shorelines, riverbanks and wetlands shall be constructed and if applicable, decommissioned in consideration with the following Manitoba Conservation guidelines:

"Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat."

"Recommended Buffer Zones for Protecting Fish Resources in Lakes and Streams in Forest Cutting Areas."

"Timber Harvesting Practices for Forestry Operations in Manitoba."
Manitoba Natural Resources, Forestry Branch. January, 1996.

"Consolidated Buffer Management Guidelines." *Manitoba Natural Resources. March, 1996.*

The following publication is recommended as a technical reference:

“Shorelines, Shorelands & Wetlands. A Guide to Riparian Ecosystem Protection at Manitoba Hydro Facilities.”

- 7(G). Instream work will be managed to minimize activity and total suspended sediment inputs to the extent practicable during periods when spawning/incubation of key fish species is occurring. In their Manitoba Operational Statement Habitat Management Program DFO has identified Provincial timing windows during which no instream work is to occur except under site specific review and with the implementation of protection measures. The timing windows depend on the presence of spawning fish. Where spring spawning species are present (northern pike and white sucker), activity will be minimized from April 15 to June 30. The summer spawning timing window is May 15 to July 15. No fall spawners are present in the stream crossings.
- 8(G) Each stream crossing will be monitored by the AKO bi-annually during early spring and late summer for blockage and alignment to ensure fish passage. Additionally, ongoing inspections for structural condition will include observations of factors that may affect fish passage (e.g., perched culvert, ice damaged culvert invert, obstruction to fish passage within the culvert). Refer to the DFO document *“Manitoba Operational Statement Habitat Management Program for Culvert Maintenance”* found at http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/prov-terr/mb/index_e.htm.
- 9(C). Slopes at water crossings will be managed for erosion control and sedimentation. Bioengineering methods will be implemented whenever practical to provide erosion and sedimentation control measures on susceptible slopes at stream crossings.
- 10(C). Construction materials and other debris (lime, cement and fresh concrete, etc.) shall be prevented from entering waterways.
- 11(C). Vehicles, machinery, and equipment working near stream crossings shall be kept in good working condition and free of fluid leaks.
- 12(C). If instream methods are used to isolate stream flow during the installation of culverts at stream crossings, salvage fisheries will be conducted prior to dewatering and screens will be used on the intake pipes if flows are diverted.
- 13(D). After removal of any temporary stream crossings, the banks will be protected from erosion and flows in the waterway will be returned to pre-construction flow.

4.11 Marshalling Yards

Marshalling yards are used for the temporary storage of materials, equipment and building structures. They are also used for staging materials for delivery to work sites, equipment assembly, and servicing of vehicles and machinery and for work support services such as carpentry and welding.

Potential environmental impacts associated with marshalling yards include: hazardous materials releases, habitat disruption, contamination of waterways, erosion, invasion of plant species and disturbance to **permafrost**. Marshalling areas shall be located to minimize potential environmental impacts.

The following section describes practices that will be followed to minimize potential environmental impacts at marshalling yards.

- 1(G). All sites will be included under Manitoba Conservation work permits and be located at least 100 m (110 yds) from any waterway unless otherwise authorized by Manitoba Conservation.
- 2(G). Marshalling areas shall be located to minimize potential negative environmental impacts. Minimizing the area cleared will potentially reduce mitigation or reclamation costs, minimize wildlife habitat loss and decrease the potential for erosion. Preferred locations are natural openings that will not require additional clearing and minimize surface soil disruption. Salvage timber should be limbed, bucked and stacked near the site.
- 3(G). The Contractor will provide, during tendering and as required, site preparation, operating and remediation procedures as well as emergency action plans. Regular inspection of the yards for compliance with these procedures and plans will be conducted during the construction period.
- 4(G). Topsoil and organic materials shall be removed during site preparation and stockpiled to be redistributed over the disturbed area during decommissioning.
- 5(G). Marshalling yards shall be located if possible where soils have high weight bearing capacity and low permeability. Permafrost soils shall be avoided as they are susceptible to thawing and subsidence.
- 6(G). Low permeability soils are preferred storage sites for fuels, lubricants and chemicals to minimize the possibility of migration into the water table.
- 7(G). Vehicles will only be refueled in designated areas. Heavy equipment may be refueled at construction sites. Oil changes will only be permitted in specified areas. Spill containment equipment must be available at all refueling sites. Refer to the *Manitoba Provincial Dangerous Goods Handling and Transportation Act*.

- 8(G). For fire safety considerations, marshalling yards shall be kept free of grass and vegetation.
- 9(G). Fuelling of vehicles will take place in a designated section of the marshalling yard.
- 10(D). Hazardous materials, fuel containers and other materials shall be removed from the site.
- 11(D). Once the yard is no longer required, structures and fences will be dismantled and salvaged. Equipment, supplies and other goods stored on site will be removed to a new location.
- 12(D). Garbage and debris shall be removed from the site and disposed of in a licensed landfill.
- 13(D). A terrestrial ecologist shall provide regeneration prescriptions. Revegetation may be required in disturbed areas to:
- Stabilize erodible soils;
 - Create or restore wildlife habitat;
 - Prevent or delay the invasion of unwanted plant species; or
 - Enhance or restore the aesthetic appeal of an area.

These sites will be specifically identified as requiring special treatment after construction and during decommissioning, otherwise natural revegetation will be allowed to reoccur.

4.12 Temporary Start-up Camps and Facilities

The access road will be constructed prior to construction of the main camp and ancillary facilities. Temporary “start-up” camps will be required to house workers constructing the roads. Temporary camps will consist of dormitories and washcars, kitchen/diner complexes, and offices, all consisting of modular buildings. Electrical power will be initially supplied to the road camps by a diesel generator and then by a power line.

Potential environmental impacts associated with the road camp include: clearing of vegetation, potential for introduction of contaminants, generation of wastes, interactions with wildlife and sewage disposal.

The following section describes practices that shall be followed to minimize potential environmental impacts at the road start-up camp.

- 1(G). The first choice for selecting a site for the road start-up camp shall be previously cleared sites or natural openings. This will minimize unnecessary clearing.
- 2(G). Fuel shall be stored in a secure dedicated area.
- 3(G). Sewage shall be collected in holding tanks and hauled from the site. Disposal will be at an approved facility. These tanks will be registered with Manitoba Conservation.
- 4(G). The use of pit privies is acceptable in remote areas where no plumbing is available. All privies must conform to the *Public Health Act*. Use of privies shall be subject to the approval of the local public health officer or NRO.
- 5(C). Firebreaks may be constructed around temporary campsites.
- 6(O). Garbage shall be collected and stored in covered containers and removed to a licensed landfill site.
- 7(O). Liquid and solid wastes shall be regularly removed by a licensed hauler to a approved disposal area.
- 8(D). All buildings, infrastructure, waste and debris shall be removed from the road start-up camp during **decommissioning**.

4.13 General Fish and Wildlife Protection

Many project activities can impact fish and wildlife. Habitat loss, disruption, introduction of exotic species and introduction of contaminants into the environment are potential environmental impacts.

General specifications in the various contract documents will include the following:

- 1(G). Wildlife shall not be fed or harassed. Project personnel are prohibited from hunting, fishing, harvesting, feeding or harassing wildlife (furbearers, big game, birds, fish), on the project site, designated access routes or borrow areas.

All measures related to monitoring and management of fish and wildlife species must be approved by the local NRO.

- 2(G). **Nuisance wildlife** will be immediately reported to the NRO.
- 3(G). Trees containing large nests of sticks and areas where active dens or burrows occur will be identified, left undisturbed and reported to the AKO. The AKO will contact the NRO who will determine appropriate **mitigation** for each case.
- 4(G). Beaver dams shall not be removed without consultation and approval by the NRO. Reference will be made to the DFO document “*Manitoba Operational Statement Habitat Management Program DFO Beaver Dam Removal*” found at http://www.dfo-mpo.gc.ca/regions/central/habitat/os-eo/prov-terr/mb/index_e.htm. The AKO will record it’s removal and any contact made by the NRO with the appropriate NCN trapline or permit holder..
- 5(G). Blasting plans will reflect the appropriate timing of events as they relate to critical life functions of fish and wildlife species i.e. spawning, nesting, calving and migration. Therefore, to reduce impacts to birds and other wildlife, blasting activities should be restricted to outside the most sensitive breeding and brood rearing months (i.e. May to Late-July) as much as possible.
- 6(G). To reduce the possibility of vehicle and wildlife collisions vehicle speed shall not exceed posted speed limits and wildlife warning signs shall be installed where appropriate.
- 7(G). The AKO will report any wildlife killed or injured in collisions with vehicles to the Resident Manager.
- 8(G). Periodic monitoring for birds killed in collisions with the communication tower and other tall structures or electrical conductors may be required. See the Terrestrial Monitoring Plan for more details.
- 9(G). Wildlife is attracted to untidy campsites. Cleanliness, proper storage of food and garbage and common sense are the best avoidance practices.

- 10(G). A training session for all site employees regarding wildlife encounters may be requested of the NRO by the Resident Manager during the employee orientation process.
- 11(G). No temporary roadbed borrow operations will occur within 2 km of known caribou calving areas along the access road from mid-May to early-July.
- 12(G) No blasting is permitted within 5 km of identified caribou calving area along the access road from late-May to early-July. See Figures 2-7 for restricted areas.
- 13(G). Instream work will be managed to minimize activity and total suspended sediment inputs to the extent practicable during periods when spawning/incubation of key fish species is occurring. In their Manitoba Operational Statement Habitat Management Program DFO has identified timing windows during which no instream work is to occur except under site specific review and with the implementation of protection measures. The timing windows depend on the presence of spawning fish. Where spring spawning species are present (northern pike and white sucker), activity will be minimized from April 15 to June 30. The summer spawning timing window is May 15 to July 15. No fall spawners are present in the stream crossings.

4.14 Heritage Resources

Heritage resources are indicators of past human activities. They provide valuable information about past lifeways, are a link between past and present generations, and are the surviving tangible products of past culture. Culture can be described as the fabric of human existence and is the source of one's identity.

Heritage resources were an important component of the environmental impact assessment. The assessment considered a number of sources of information, including previous heritage resource surveys, predictive modeling, and preparatory research including a literature review. Field research was undertaken specifically for the Wuskwatim Project. These are described in Volume 9 of the Environmental Impact Statement. The assessment concluded:

"It is expected that most of the heritage resources in the central area of the development, the section of river between Wuskwatim Falls and Taskinigup Falls, have been previously impacted by CRD. Archaeological sites not discovered during the various archaeological surveys, or by the archaeological study team HRIA field study, may be present within the footprint of the generating station."

General archaeological surveys have been conducted near the proposed Wuskwatim generating station site, at select borrow locations and along the right-of-way of the access road. However, additional heritage resources may only become evident during construction and operation of the Wuskwatim Project. Undiscovered sites may remain.

The Partnership has concluded that it is important to implement an *Aniskowatesewe Ketapahchikewe Othaschikekwin* (Heritage Resources Protection Plan) to achieve its commitment to protect heritage resources. Any human remains or heritage objects that may be found, discovered or disturbed during the development of the Wuskwatim Project will be treated in the manner set out in section 5.2 of the *Aniskowatesewe Ketapahchikewe Othaschikekwin* (Heritage Resources Protection Plan), which is consistent with the provisions and procedures outlined in Manitoba's "Policy Concerning the Reporting, Exhumation and Reburial of Found Human Remains" (1987) and with the *Heritage Resources Act*.

4.15 Non-Hazardous Waste Management and Recycling

Non-hazardous or conventional waste consists of either liquid or solid waste. Liquid waste includes gray water (wash water and kitchen water); or industrial wastewater from core drilling, concrete washing, wash water from aggregates, or other sediment loaded wash water streams. Solid waste includes inert inorganic materials such as rock, concrete, clay and granular materials; organic materials such as wood construction material and vegetation; or domestic garbage, such as paper, kitchen waste, packaging, etc.

Environmental concerns related to waste management practices arise from the storage, handling and disposal of waste associated with non-hazardous waste. This includes minimizing the amount of waste and proper disposal of waste.

The following sections describe practices that will be followed to minimize environmental impacts caused by non-hazardous waste.

- 1(G). Work sites shall be kept tidy at all times. Construction waste and sewage shall be collected for proper disposal. Domestic garbage shall be collected and disposed of regularly to minimize human/wildlife interaction. Domestic garbage shall be stored in containers with covers and shall be disposed of in a licensed landfill.
- 2(G). Procedures for burning waste materials will follow Manitoba Conservation work permits.
- 3(G). Recycling programs will be developed for paper, cardboard, glass and plastic where feasible.
- 4(G). Opportunities for waste reduction, material reuse or recycling shall be identified and a program developed and implemented.
- 5(G). Food wastes will be stored in closed containers to minimize wildlife interactions and will be removed from the campsite at regular intervals to a licensed landfill site.
- 6(G). Non-reusable demolition and construction debris will be disposed of at a landfill site operating under a permit from the *Waste Disposal Ground Regulation, MR 150/91*, or an Environment Act License pursuant to the Environment Act.
- 7(O). Waste materials remaining at snow disposal sites after melting shall be disposed of at an approved landfill.

4.16 Hazardous Materials Storage/Disposal and Workplace Hazardous Material Information System (WHMIS)

Hazardous materials are any products that may be a hazard to human health, property or the environment. Hazardous materials include a variety of substances such as antifreeze, propane, solvents, and battery acid. WHMIS shall be implemented to ensure proper procedures are followed regarding the safe use, handling, storage and disposal of hazardous materials as well as procedures for emergency response.

Hazardous materials may be used throughout all phases of the project. Potential environmental impacts from hazardous materials could include health and safety issues and contamination of land and water.

The following section describes practices that shall be followed to minimize or eliminate hazards to people, property and the environment associated with hazardous materials.

- 1(G). All applicable laws, regulations and standards for the safe use, handling, storage and disposal of chemical products including hazardous waste as well as procedures for emergency conditions will be followed (e.g. *“Dangerous Goods Handling and Transportation Act”*, etc.).
- 2(G). In accordance with the *“Workplace Health Hazard Regulation (MR 53/88)”* an inventory of controlled products including hazardous waste will be maintained on site and updated as required by MR 53/88. A copy of all Material Safety Data Sheets (MSDS) will be readily available to employees.
- 3(G). Adherence to WHMIS requires proper labeling and current Materials Safety Data Sheets (MSDS) for chemical products. This includes an inventory list of controlled product(s) used, stored, handled or disposed of at the workplace. For more information refer to the Manitoba Hydro document *“Workplace Hazardous Materials Information System (WHMIS) in Manitoba Hydro.”*
- 4(G). Contractors and relevant Manitoba Hydro employees must have WHMIS training in compliance with regulatory and Corporate policy requirements.
- 5(G). Hazardous materials will be stored within dedicated areas at work camps and marshalling yards in full compliance with regulatory requirements. Storage of hazardous materials must be located a minimum of 100 metres (110 yds) from a waterway.

- 6(G). Areas dedicated for hazardous material storage shall provide spill containment and facilitate clean up through measures such as:
- maximum separation from sensitive features (water bodies);
 - clear identification of the materials present;
 - access restricted to authorized personnel and vehicles only;
 - bermed storage areas;
 - dedicated spill response equipment.
- 7(G). Storage sites for petroleum products shall be secured and signs will be posted which include hazard warnings, who to contact in case of a release (spill), access restrictions and under whose authority the access is restricted will be posted.
- 8(G). If stored outside, containers shall be labeled and stored in weatherproof containers on spill containment pallets and under a weatherproof tarp. The contractor/spill response coordinator will monitor daily for leaks, and check to ensure that labels are still present and legible.
- 9(G). Indoor storage of flammable and combustible chemicals shall be in fire resistant and vented enclosed storage area or building in accordance with “*National Fire Code*” standards.
- 10(G). Containers shall be inspected for leaks and to ensure labels are still present and legible daily by the Contractors and weekly by Manitoba Hydro. A product inventory shall be maintained by the Contractor and retained for inspection upon request by Manitoba Hydro and Regulatory Authorities.
- 11(G). General clean-up in storage areas and sites will be undertaken in accordance with regulatory standards. If necessary soil will be remediated or disposed of in a manner approved by regulatory authorities.
- 12(G). Where possible, non-hazardous products will be used in place of hazardous products.
- 13(G). All hazardous materials will be transported according to the “*Dangerous Goods Handling and Transportation Act*”.
- 14(G). Hazardous wastes must be segregated by type.
- 15(G). Pesticide use shall be in accordance with *Manitoba Regulation 47/2004* and the Manitoba Hydro document “*Pesticide Application Requirements for Manitoba Hydro Employees and Contractors*”. This document contains information on both health and safety and environmental protection. Any chemical vegetation control onsite will require approval by a Provincial Environment Officer.

- 16(G). Prior to disposal, hazardous materials shall be stored in a bermed area with an impervious liner to contain any spill or release of material. Storage sites shall be secured, and signs that include hazard warnings, who to contact in case of a release (spill), access restrictions and under whose authority the access is restricted will be posted. Manitoba Hydro and the Contractors will provide protective equipment; first aid kits and spill response kits appropriate for the hazardous waste at the sites.
- 17(G). Hazardous wastes shall be disposed of in accordance with Manitoba Hydro's "*Hazardous Materials Management Handbook*." See Appendix B Figure 1 for a summary of Corporate Waste Streams & Disposition.
- 18(G). General clean-up in storage areas and sites where releases occurred will be undertaken in accordance with regulatory standards. If necessary, soil will be remediated or disposed of in a manner approved by regulatory authorities.

4.17 Petroleum Products Handling and Storage

Petroleum products include products such as gasoline, diesel, heating oil, aviation fuel, grease, hydraulic fluids and new or used lubricating oil. Potential environmental impacts may result from spills or leaks and can include soil or groundwater contamination, and surface water, fire, or workplace safety and health concerns.

The following section describes environmental practices that will be followed to minimize environmental impacts associated with petroleum products.

- 1(G). Petroleum products shall be transported in accordance with the “*Manitoba Dangerous Goods Handling and Transportation Act*”. A permit is required for handling and storage of fuel products and shall be obtained from Manitoba Conservation.
- 2(G). Petroleum products shall be labeled as to their contents and stored and handled within dedicated areas at marshalling yards in accordance with Manitoba Regulation 188/2001 respecting “*Storage and Handling of Petroleum Products and Allied Products*”. Petroleum products storage and equipment servicing areas shall be located a minimum of 100 metres (110 yds) from a water body.
- 3(G). All new and existing underground and all aboveground tanks with a capacity greater than 5000 L shall be registered with Manitoba Conservation. New tanks must be registered before installation. Tanks shall be designed, installed, and operated in accordance with the “*Dangerous Goods Handling and Transportation Act*” and “*Manitoba Hydro Code of Practice for Storage and Handling of Petroleum Products and Allied Products Storage Tank Systems*.”
- 4(G). Construction, installation or removal of petroleum product storage tank systems shall only occur under the supervision of a registered licensed petroleum technician.
- 5(G). Dedicated petroleum storage areas shall provide spill containment and facilitate clean up through measures such as:
 - maximum separation from environmentally sensitive features (water bodies, permafrost, important habitat);
 - clear identification of the materials present;
 - access restricted to authorized vehicles only;
 - impervious bermed storage areas;
 - dedicated spill response equipment.
- 6(G). Storage sites for petroleum products shall be secured and signs including hazard warnings, who to contact in case of a release, access restrictions and under whose authority the access is restricted will be posted.
- 7(G). All employees involved in the handling and storage of fuels and hazardous materials shall have WHMIS training.

- 8(G). Whenever possible, aboveground storage tanks shall be used for the storage of bulk petroleum products. The tanks shall be equipped with overfill protection and spill containment consisting of perimeter dykes or secondary containment in the tank design. If dykes are used, the containment areas shall be dewatered after a rainfall event and the containment water disposed of as specified by Manitoba Conservation. Product inventory shall be taken weekly by the owner/operator on all aboveground tanks greater than 5000 L and retained for inspection upon request.
- 9(G). All underground storage tanks shall be provided with overfill protection devices and secondary containment, with remote monitoring devices to detect for leakage in the secondary containment structure. Product inventory shall be taken daily on underground tanks and retained for inspection upon request.
- 10(G). Bulk waste oil shall be stored in aboveground oil tanks, which shall have secondary containment and a weatherproof cover. Waste oil may be recycled by Manitoba Hydro or a reputable recycling agency. Waste oil shall never be used as a dust suppressant.
- 11(G). Petroleum product containers shall be inspected daily by the Contractors and weekly by Manitoba Hydro. Product inventory shall be taken daily and retained for inspection upon request by Manitoba Hydro and Regulatory Authorities.
- 12(G). The Resident Manager shall designate on-site Emergency Spill Response Coordinators.
- 13(G). Contractors shall prevent fuel, lubricants or compounds from being released. All empty containers from equipment refueling and servicing shall be removed to a licensed disposal site.
- 14(G). Contractors shall be thoroughly familiar with provincial/federal spill response compliance procedures and Manitoba Hydro's spill response procedure outlined in the "*Manitoba Hydro Hazardous Materials Management Handbook*" and adherence thereto must be a condition of their contracts.
- 15(G). Materials required for spill containment and clean up shall be available at all sites where construction related activities occur. All vehicles hauling fuel shall carry materials and equipment for emergency spill containment.
- 16(G). At locations where stationary oil filled equipment is used, oil containment measures such as secondary containment shall be incorporated (i.e. berms).
- 17(G). Documentation describing Manitoba Hydro's process for recycling waste oils and other materials shall be made accessible to contractors.

- 18(G). Oil contaminated soils resulting from releases shall be remediated or disposed of in a manner approved by regulatory authorities.
- 19(G). Fuel barrels will be securely fastened to the vehicle during transport and if possible during refueling operations.
- 20(G). All petroleum product storage sites and mobile transportation units, will at all times be equipped with the appropriate categories of equipment and volumes of fire suppression products.

4.18 Release and Fire Response

Trained Manitoba Hydro employees will be assigned responsibility for environmental inspection and response team leadership, as described in the Hazardous Materials Release response plan developed for this project by the contractor. Basic and special emergency spill response equipment, as required, will be available on site and from standby sources. All equipment both mobile and stationary, requiring fuels and lubricants, is a potential source of low flow leakage of contaminants. In the event of a release, project management can obtain support and other equipment, if necessary, from the services of other Manitoba Hydro projects and facilities and external agencies such as the Manitoba Conservation, and the RCMP.

The following section describes practices that will be followed to minimize potential impacts to the environment and people at project facilities and work sites in the event of a release or fire.

- 1(G). The Manitoba Hydro document “*Hazardous Materials Management Handbook Part 1: Spill Response—General Guidelines*” outlines procedures for:

- Identifying Hazards;
- Protecting Yourself, Containing the Spill and Securing the site;
- Notifying Agencies and Appropriate People;
- Sampling and Analysis;
- Clean-up; and
- Shipping, Storage and Disposal

Contractors shall be aware of the above procedures and adherence thereto must be a condition of their contracts. See Appendix B Figure 2 for a summary flow chart of managing releases of dangerous goods and hazardous wastes.

- 2(G). Large volume releases of contaminants (oil, sewage, etc.) require mobilization of all available resources (equipment, trained workers, etc.). Internal reporting, appropriate regulatory agencies and affected public will be contacted immediately.
- 3(G). Emergency spill response kits (absorbents, fire extinguishers, etc.) will be conveniently located adjacent to petroleum and hazardous material storage facilities and at other project locations. Spill response equipment will be capable of containing and recovering a release from the largest containers, tanks, or equipment and be suitable for the site location (for example, spill containment booms adjacent to a waterbody).

4(G). **In the event of a release:**

- **the on-site Emergency Spill Response Coordinator shall be notified immediately and action will be taken to contain the fuel or chemical spill or remove ruptured containers in a manner described in the spill response plan by the most expedient means to a predetermined site.**
- **See Appendix B Figure 3 for Manitoba Hydro Release Reporting Protocol.**
- if releases occur as a result of circumstances outside of normal work practices or the practice of due diligence, inform the Hazardous Materials Officer of the Manitoba Hydro Employee Safety and Health Department (204) 474-3259 or after hours (204) 799-3304.

5(G). Manitoba Conservation's 24 Hour Emergency Response Line (Winnipeg (204)-944-4888), Environment Canada's 24 Hour Emergency Response Line (Winnipeg (204)-981-7111) and the NRO in Thompson (204) 677-6640 shall be notified if more than 100 litres (22 gals) of petroleum product are released or if any amount enters a waterway. Refer to the Manitoba Hydro document "*Hazardous Materials Management Handbook Part 1*" for complete notification procedures and incident report forms.

6(G). Selected other externally reportable releases include:

1. Oils & Lubricants: 100 litres/22 gals
2. Fuels: 100 litres/22 gals
3. Battery Acid: 5 litres/1 gal
4. Propane: any quantity that could pose a danger to public safety or a sustained 10 min release or 100 litres/22 gals

For a list of all reportable quantities for releases refer to MR 439/87 respecting Environmental Accident Reporting or Appendix B Figure 4 Reportable Quantities for Spills.

7(G). When reporting a release prepare a hazardous materials incident report. See Appendix B Figure 5 for an example.

8(G). Site clean-up and disposal of contaminated material shall be managed as directed by the Emergency Spill Response Coordinator in consultation with the NRO.

9(G). The Manitoba Hydro Resident Manager or appointed designate shall be the on-site Emergency Spill Response Coordinator.

10(G). Procedures for fire response are outlined in the Manitoba Hydro Document "*Fire Response Manual*". The procedures apply to all personnel who work for Manitoba Hydro including consultant and contract representatives.

- 11(G) It shall be the responsibility of the construction manager to see that proper fire fighting practices are established and that adequate fire fighting equipment is installed and maintained in all buildings, vehicles and work areas. It shall be the responsibility of the fire marshal to see that all requirements and instructions are carried out and crews are instructed and trained so that they are capable of taking the necessary precautions for the prevention of fire and for fire fighting if the need arises.
- 12(G) Temporary Camps, established for occupancy while a Permanent Camp is being assembled and small Permanent Camps, are to have a designated fire brigade established immediately when the camp is ready for occupancy. It is the responsibility of the Senior Manitoba Hydro Official on site to make certain that a brigade is formed and maintained during the life of the camp. The brigade will consist of four fire crews, each crew consisting of three to four members, depending on the size of the camp. The Senior Manitoba Hydro Official will appoint a person to be Fire Chief who, in turn, will appoint a Captain for each crew. The Fire Chief will be considered as a member of number one (1) crew or "A" crew. Each crew will service one "Duty Week" in each four-week period. The Captain of the "Duty Crew" will arrange for at least one, two hour instruction, drill or inspection session during the Duty Week.
- 13(G). Emergency response/evacuation procedures will be adhered to in case of forest fires.

4.19 Workplace Safety and Health

Workplace safety and health shall be the “first priority” and “most important goal” during the project. Employee health and safety and the protection of the general public from hazards are regulated and will be enforced.

The following guidelines will be used to ensure a safe work environment:

- 1(G). All workplace safety measures will be followed as per Government regulations, guidelines and codes of practice and Manitoba Hydro’s Employee Safety and Health publications including the “*Corporate Occupational Safety and Health Rule Book*” 2003.
- 2(G). All activities will be undertaken in compliance with prevailing Safety and Health requirements. Workplace Safety & Health Committees will be established as required and safety meetings will be held as required. Manitoba Hydro employees will be instructed by the Resident Manager in all necessary special conditions associated with this project. These conditions will apply to both Manitoba Hydro and Contractor staff.
- 3(G). All project workers will receive regular safety training as required under legislation.

5.0 SITE SPECIFIC ENVIRONMENTAL PROTECTION AND MONITORING, TERRAIN SENSITIVITY AND MITIGATIVE MEASURES

Section 5 contains *guidelines* for Contractors, Field Inspectors and Equipment Operators. The following information emphasizes that environmental protection measures must be considered and the appropriate degree of caution taken for every activity and for all three levels of terrain sensitivity. They do not imply that clearing and construction activities may not proceed on project sites with potentially high (red colour designation on aerial photographs) sensitivity ratings. Local environmental conditions will be variable and in many cases are unpredictable; therefore, final decisions regarding operating procedures will be made in the field.

Three broad categories of sensitivity have been assigned to the terrain components. In the project area there are no sites deemed high sensitivity. Sensitivity ratings are based on the potential environmental impacts to soils and landforms resulting from conventional clearing and construction methods. A colour code has been designated to illustrate the sensitivity ratings.



LOW :

Soil properties such as texture, structure, internal drainage and topographic expression can sustain mechanical clearing activities and repeated heavy machinery traffic. Vegetation communities associated with stable terrain types are resilient and will recover and maintain adequate ground cover. Permafrost is non-existent or at depths unlikely to be affected by clearing and traffic.



MODERATE :

Soil properties and vegetation communities are somewhat susceptible to disturbance and may require mitigative prescriptions that will avoid cumulative degradation over time. The ground cover associated with the less stable terrain types is moderately resilient and may require some form of prescribed rehabilitation. Permafrost is more widespread on the lower slopes and in depressions.



HIGH :

Terrain types such as permafrost areas, stream courses and unstable slopes are highly sensitive to the passage of heavy machinery and if subjected to the total removal of vegetative cover, they are considered to be highly sensitive. Where the necessary removal of ground cover is an unavoidable impact; selective clearing and retention of the shrub understory, if possible is required to limit the extent of disturbance.

5.1 Stream Crossings

Class 1

Streams are categorized as Class 1 where the combined upstream drainage area is in excess of 30 km² (12 mi²). Streams and rivers of this size most often exhibit perennial flow characteristics. Variability in seasonal flow and the maintenance of year-round flow are influenced by regional or local terrain and climatic conditions, depending on the size of the watershed. For example the Nelson River has a large watershed basin and year-round flow, in contrast some smaller water courses may cease to flow seasonally due to the influence of local terrain (retention in upstream **bogs**, drainage through porous soils) and climate (precipitation). Waterways of this size are likely to contain important feeding, **spawning** and **overwintering** habitat for resident fish populations.

Class 2

Streams are categorized as Class 2 at locations where the upstream drainage area is greater than 10 km² (4 mi²) but less than 30 km² (12 mi²). Depending on annual precipitation conditions, terrain type, and the presence and size of lakes, bogs and swamps which drain or interconnect these water courses may or may not flow throughout the open water period (May/June to November) at the crossing site. Streams of this size are frequently narrow (less than 5 m (16 ft) wide) but may be substantially wider at some sites. These streams are often capable of providing spawning habitat in spring, supporting summer populations of small fish species and providing suitable nursery habitat for juvenile fish, and possibly serving as migratory corridors for fish moving between or into lake or downstream river habitats during spring or fall.

Class 3

Streams are categorized as Class 3 at locations where the upstream drainage area is 10 km² (4 mi²) or less. Streams of this size are generally ephemeral in nature, but have a capacity to support fish on a seasonal basis and particularly in their lower reaches. Depending on species present in the watershed and the nature of the substrate and hydrology, some of these stream sites may provide spring and early summer spawning habitat for fish. Depending on local terrain and precipitation conditions, they may cease to flow by mid-summer.

Buffer Zones

Buffer zones are required along waterways to protect riparian habitats (shorelines and streambanks). This protection is particularly important during spring and other periods when high water levels and ice will scour disturbed, cleared shorelines and carry heavy silt loads into downstream spawning areas causing severe habitat degradation. The buffer zone should therefore extend out from the waterbody at least as far as the zone of influence of the waterbody on vegetation and terrain; ie. to include flood plains, bank slopes and associated vegetation growth. Refer to the document "*Shorelines, Shorelands and Wetlands: A Guide to Riparian Ecosystem Protection at Manitoba Hydro Facilities*" for more information on buffer zones and riparian areas.

5.2 Lakes/Ponds (Permanent Standing Water)

As with rivers and streams, the objective is not only to protect water quality and fish and **waterfowl** habitat in lakes and ponds but to maintain a buffer zone to guard against unnecessary disturbances to riparian ecosystems.

Environmental protection criteria for lakes and ponds include, but are not limited to:

- Non-degradation of surface and groundwater quality - this applies equally to lakes with flow through as well as confined catchments that don't appear to support fish.
- Prevention of erosion in riparian areas that could result in siltation and turbidity in waterbodies.
- Maintenance of waterfowl habitat and minimization of barriers to waterfowl use of a waterbody - minimal disturbance to natural vegetation will ensure continued cover for nesting and brood rearing.
- Maintenance of aesthetics - open water bodies offer broad sight lines and any change to the natural appearance should be minimized in areas of recreational importance and areas of traditional human use.

5.3 Ecologically Sensitive Sites

Ecologically sensitive sites are those that contain regionally uncommon to rare habitat types, habitat types with low resilience to disturbance, habitat types with low resilience to indirect effects (e.g., altered soil temperature or drainage) or high potential to support rare plant species.

Ecologically sensitive sites in the Project area include those containing:

- Jack pine forest on dry soils;
- White spruce concentrations;
- Balsam fir concentrations;
- **Excess ice** in organic soil horizons (permafrost);
- Provincially or regionally rare plant species;
- Plants with low competitive ability;
- Vegetation complexes or plant species maintained by natural environmental extremes (e.g., high or low fertility);
- Rich fen vegetation;

Environmental protection criteria for ecologically sensitive sites include, but are not limited to:

- Ensuring that qualified personnel clearly mark these sites well in advance of project activities;
- Avoiding these sites wherever feasible;
- Minimizing disturbance of these sites where avoidance is not feasible;
- Minimizing alterations to natural drainage, groundwater levels and sub-surface flows in these sites and adjacent areas;
- Minimizing alterations to soil temperature in these sites and adjacent areas;
- Minimizing the risk of accidental fire starts;
- Minimizing the risk of invasive or non-native plant introductions or expansions;

5.4 Site Specific Environmental Protection Plans

INTRODUCTION

An all weather road off PTH 391 at Mile 17 between Thompson and Nelson House is planned to access the proposed Wuskwatim Generating Station.

An environmental protection plan has been prepared to describe the terrain types along the pre-selected, preferred route, to identify environmentally sensitive ecosystems and to prescribe mitigating measures in order to minimize any harmful impacts of construction and traffic along the proposed route while constructing the access road.

METHODOLOGY

Aerial photos acquired by Manitoba Hydro in 1985, (scale 1:20 000) and Forest Inventory photos obtained in 1989, (scale 1:15,840), were interpreted to delineate recurring patterns of various mineral and organic terrain that occur along the proposed alignment. Terrestrial ecozone attributes such as upland and lowland soil types, textures, drainage, presence of permafrost, slope and relief classes were classified by applying an ecological land classification system.

Detailed terrain analysis highlights the ecosystems that may be impacted by access road clearing and construction activities. Portions of the aerial photos have been scanned, annotated and produced at a scale of 1:20 000, (1cm.=200 m. approx.) to display the access route. Orthophoto maps were also produced at a similar scale to provide an overview of the route. Detailed descriptions of the ecosite and ecozones are included in the report text, (pages 54-75) and general descriptions accompany the high resolution graphics section, (pages 78-94). Environmental sensitivity ratings for the ecozone polygons are displayed on the graphics. Sensitivities are categorized as:

High Sensitivity – Red Moderate Sensitivity – Yellow Low Sensitivity – Green

UPLAND MAP SYMBOL CATEGORIES & DEFINITIONS

The **upland ecosite** symbols annotated on the aerial photos are abbreviated as follows:

RELIEF (Meters)	SLOPE (Percent)	SOIL TEXTURE (Mineral Soils)	LANDFORM (Category)	TOPOGRAPHY (Surface Expression)
a - 0 to 2	1 - 0 to 5	c - clay	L - Lacustrine	b - blanket
b - 3 to 5	2 - 6 to 15	l - loamy	G - Glaciofluvial	a - apron
c - 6 to 20	3 - 16 to 30	s - sandy	R - Bedrock	r - ridged
d - 21 to 50	4 - 32 to 60	ss-skeletal	(sand and gravel)	h- hummocky

LOWLAND MAP SYMBOL CATEGORIES & DEFINITIONS

The **lowland ecosite** symbols annotated on the aerial photos are abbreviated as follows:

RELIEF (Meters)	SLOPE (Percent)	SOIL TEXTURE (Organic Soils)	LANDFORM (Category)	TOPOGRAPHY (Surface Expressions)
a – 0 to 2	1 – 0 to 5	fibric	B – Bog	v – veneer
b – 3 to 5	2 – 6 to 15	mesic	F – Fen	t – plateau
		humic		h – horizontal
				c – collapse
				s – stream

STREAM CROSSINGS

Eight minor streams will be encountered along the route and have been assigned an identifying number and stream class category, **SC 1 to SC 9 – Classes 2 and 3. (There is no SC 7 stream crossing).** Distances from Mile 17 starting point appear in Table 1 found on pages 95-98, in order to assist the construction crew in locating the approximate locations.

The environmental protection plan objectives and mitigative measures are designed to minimize the disturbance at the stream crossings, in order to avoid disrupting the ground and shrub cover within the riparian habitat corridor and to avoid exposing the underlying organic and mineral soils within a 30 meter buffer zone along both banks of the stream.

GENERAL DESCRIPTION

The route has been separated into two sections. Section “A” extends south from Mile 17 southwest to where a temporary, winter construction camp was situated near an esker ridge in 2000. Section “B” which continues east and southwesterly to the proposed generating station, and proposed construction campsite near the Burntwood River, north of Taskinigup Falls.

SECTION “A”

UPLAND COMPONENT

The upland terrain encountered along Section “A” consists of gently undulating, moderately well to imperfectly drained lacustrine clay and silt sediments and moderately sloping, rapidly to very well drained, stratified sandy glaciofluvial deposits. There appears to be no occurrence of exposed bedrock protrusion occurring along Section “A”.

LOWLAND COMPONENT

The lowlands are comprised of imperfectly to poorly drained shallow bog veneers; moderately deep, poorly drained peat plateaus and very deep horizontal fens and collapse fens. Permafrost occurs in the perennially frozen peat plateaus and adjacent to the runnels draining the bog veneers. The permafrost is 0.5 meters below the peat surface.

GENERAL DESCRIPTION (cont'd.)

SECTION “B”

UPLAND COMPONENT

The upland terrain is dominated by moderately hilly and hummocky, very well to rapidly drained, sandy glaciofluvial ridges and gently sloping, imperfectly drained heavy lacustrine clay sediments. Exposed bedrock outcrops occur frequently at the far end of Section “B”.

LOWLAND COMPONENT

The lowlands encountered along Section “B” also consist of imperfectly to poorly drained shallow bog veneers; moderately deep, poorly drained peat drained peat plateaus and very deep horizontal fens and collapse fens. Permafrost occurs in the perennially frozen peat plateaus and adjacent to the runnels draining the bog veneers. The permafrost table is approximately 0.5 meters below the peat surface.

ECOSECTION OCCURRENCE & DISTANCE SUMMARY

Clay lacustrine sediments with minor components of stratified sandy and gravelly glaciofluvial deposits and exposed bedrock occupy about half, (24.85 km.), of the approximate 50 kilometer route. Pure sandy glaciofluvial deposits are encountered along 16.3 kilometers of the predominantly upland route. The organic components occupy the remaining distance of about 8 kilometers. The portions of the route that traverse the moderately deep to very deep organic landforms cover distances varying from 50 to 700 meters in length. A concise summary can be examined in Table 2 on page 99-102.

NOTE: The ecosection distances shown on the enhanced photo graphics figures were derived from Manitoba Hydro orthophoto maps. The orthophotos were geometrically corrected to show relatively accurate distances. Because of the radial distortion factor inherent with vertical aerial cameras, any horizontal measurements taken on the photo reproductions that are annotated on the graphics will approximate the real distances obtained from the orthomaps.

UPLAND MINERAL SOIL ECOSYSTEM-ECOSITE DEFINITIONS / DESCRIPTIONS

4

ECOSECTION: b c.2 cLb 8 Bv 2

Environmental Sensitivity: Low

Relief Classes: b - 3 to 5 meters **Slope Class: 2** - 6 to 15% gently to moderately sloping.

Relief Classes: c - 6 to 20 meters **Slope Class: 2** - 6 to 15% gently to moderately sloping.

Ecosite: cLb 8 - Clay Lacustrine blanket 80% (located on the apex and upper slopes).

Clay: Particles less than .002 mm. Contains up to 60% clay and 40% silt and fine sand.

Lacustrine: Sediments generally consisting of moderately well drained clay, silt and fine sand, deposited on a glacial lake bed thousands of years before the present time.

Blanket: A mantle of clay and silt varves (layers), thick enough to mask the underlying soils or bedrock but still conforming to the general underlying topography.

Ecosite: Bv 2 – Bog veneer 20% (located on the mid and lower slopes)

Bog: Poorly drained sphagnum or forest peat materials accumulated over thousands of years in a wet, nutrient deficient, (**ombrotrophic**) environment. Near the surface, the organic materials are usually undecomposed (fibric); the middle layers are partially decomposed, (mesic), and the bottom layers are well decomposed, (humic), peat. Localized permafrost may occur bordering the runnels (intermittent drainage channels) where tree growth is denser.

Veneer : An extensive area of thin, (>0.25 to <1 m.), organic material overlying, clay lacustrine sediments. Minor runnels, form a dendritic pattern draining the organic terrain.

Ecosection Description: This recurring pattern of landforms, soils and vegetation consisting of clay Lacustrine blanket and Bog veneer is characterized by moderately well and imperfectly to poorly drained, gently undulating to moderately sloping topography. The upland forest cover usually comprises black spruce, white spruce and trembling aspen in pure or mixed stands. The shrub cover may be alder, wild rose and twin flower and the ground cover is usually a continuous carpet of feathermosses. The lowland forest cover is predominantly stunted black spruce and scattered tamarack associated with a dense shrub layer of ericaceous shrubs including Labrador tea, bog rosemary, bog laurel and leatherleaf and a heavy ground carpet of sphagnum and feathermosses.

Mitigative Measures: Machine clearing is allowed through the clay Lacustrine blanket and bog veneer components. However, since the minor drainage channels (runnels) may possess permafrost, it is advisable to hand clear the tree cover along the edges of the runnels and leave the moss layer undisturbed by raising the dozer blade to avoid scouring the peat surface. Culverts should be installed to avoid impeding sub-surface lateral flow. In the Bog veneer component during summer construction, where possible heavy machinery should operate from dry stable ground or brush mats to avoid excess sedimentation. A geotextile cloth shall be installed prior to placement of fill.

ECOSECTION: b c.2 cLb 7 Bv 3

Environment Sensitivity: Low 5

Relief Class: b – 3 to 5 meters **Slope Class: 2** - 6 to 15% gently to moderate sloping.

Relief Class: c – 6 to 20 meters **Slope Class: 2** - 6 to 15% gently to moderate sloping.

Ecosite: cLb 7 –Clay Lacustrine blanket 70% (located on the apex and upper slopes).

Clay: Particles less than .002 mm. contain up to 60% clay and 40% silt and fine sand.

Lacustrine: Sediments generally consisting of moderately well drained clay, silt and fine sand, deposited in glacial lake beds thousands of years before the present time.

Blanket: A mantle of clay and silt varves (layers), thick enough to mask the underlying soils or bedrock but still conforming to the general underlying topography.

Ecosite: Bv 3- Bog veneer 30% (located on the mid and lower slopes)

Bog: Poorly drained sphagnum or forest peat materials accumulated over thousands of years in a wet, nutrient deficient, (ombrotrophic) environment. Near the surface, the organic materials are usually undecomposed (fibric); the middle layers are partially decomposed, (mesic) and the bottom layers are well decomposed, (humic) peat. Localized permafrost may occur bordering the runnels (intermittent drainage channels) where tree growth is denser.

Veneer: An extensive area of thin, (>0.25 to <1 m.), organic material overlying, clay lacustrine sediments. Minor runnels, form a dendritic pattern draining the organic terrain.

Ecosection Description: The recurring pattern of landforms, soils and vegetation consisting of clay Lacustrine blanket and Bog veneer is characterized by moderately well and imperfectly to poorly drained, gently undulating to moderately sloping topography. The upland forest cover usually comprises black spruce, white spruce and trembling aspen in pure or mixed stands. The shrub cover may be alder, wild rose and twin flower and the ground cover is usually a continuous carpet of feathermosses. The lowland forest cover is predominantly stunted black spruce and scattered tamarack associated with a dense shrub layer of ericaceous shrubs including Labrador tea, bog rosemary, bog laurel and leatherleaf and a heavy ground carpet of sphagnum and feathermosses.

Mitigative Measures: Machine clearing is permissible through the seasonally frozen clay Lacustrine blanket and Bog veneer components. However, since the minor drainage channels (runnels) may possess permafrost, it is advisable to hand clear the tree cover along the edges of the runnels and leave the moss layer undisturbed by raising the dozer blade to avoid scouring the peat surface. Culverts should be installed to avoid impeding subsurface lateral flow. In the Bog veneer component during summer construction, where possible heavy machinery should operate from dry stable ground or brush mats to avoid excess sedimentation. A geotextile cloth shall be installed prior to placement of fill in the Bog veneer.

ECOSECTION: b.2 cLb 6 Bv 4

Environmental Sensitivity: Low



Relief Class: b – 3 to 5 meters Slope Class: 2 – 6 to 15% gently to moderately sloping

Ecosite: cLb 6 – Clay Lacustrine blanket 60% (located on the apex and upper slopes).

Clay: Particles less than .002 mm. Contains up to 60% clay and 40% silt and fine sand.

Lacustrine: Sediments generally consisting of moderately well drained clay, silt and fine sand, deposited in glacial lake beds thousands of years before the present time.

Blanket: A mantle of clay and silt varves (layers), thick enough to mask the underlying soils or bedrock but still conforming to the general underlying topography.

Ecosite: Bv 4- Bog veneer 40% (located on the mid and lower slopes)

Bog: Poorly drained sphagnum or forest peat materials accumulated over thousands of years in a wet, nutrient deficient, (ombrotrophic) environment. Near the surface, the organic materials are usually undecomposed (fibric); the middle layers are partially decomposed, (mesic), and the bottom layers are well decomposed, (humic) peat. Localized permafrost may occur bordering the runnels (intermittent drainage to channels) where tree growth is denser.

Veneer: An extensive area of thin (>0.25 to <1 m.), organic material overlying, clay lacustrine sediments. Minor runnels, form a dendritic pattern draining the organic terrain.

Ecosection Description: This recurring pattern of landforms, soils and vegetation consisting of clay Lacustrine blanket and Bog veneer is characterized by moderately well and imperfectly to poorly drained, gently undulating to moderately sloping topography. The upland forest cover usually comprises black spruce, white spruce and trembling aspen in pure or mixed stands. The shrub cover may be alder, wild rose and twin flower and the ground cover is usually a continuous carpet of feathermosses. The lowland forest cover is predominantly stunted black spruce and scattered tamarack associated with a dense shrub layer of ericaceous shrubs including Labrador tea, bog rosemary, bog laurel and leatherleaf and a heavy ground carpet of sphagnum and feathermosses.

Mitigative Measures: Machine clearing is permissible through the seasonally frozen clay Lacustrine blanket and Bog veneer components. However, since the minor drainage channels (runnels) may possess permafrost, it is advisable to hand clear the tree cover along the edges of the runnels and leave the moss layer undisturbed by raising the dozer blade to avoid scouring the peat surface. Culverts should be installed to avoid impending subsurface lateral flow. In the Bog veneer component during summer construction, where possible heavy machinery should operate from dry stable ground or brush mats to avoid excess sedimentation. A geotextile cloth shall be installed prior to placement of fill in the Bog Veneer.

ECOSECTION: b c.2 cLb 7 sGa 3 Environmental Sensitivity: Low

7

Relief Class: c – 6 to 20 meters **Slope Class:** 2 – 6 to 15% gently to moderate sloping

Ecosite: cLb 7 – Clay Lacustrine blanket 70% (located on the mid and lower slopes).

Clay: Particles less than .002 mm. Contain up to 60% clay and 40% silt and fine sand.

Lacustrine: Sediments generally consisting of imperfectly drained clay, silt and fine sand, deposited in glacial lake beds thousands of years before the present time.

Blanket: A mantle of varved clay and silt, thick enough to mask the underlying soils or bedrock but still conforming to the general underlying topography.

Ecosite: sGa 3 – Sandy Glaciofluvial apron 30% (located on the upper plateau).

Sandy: Soil particles less than 2 mm. in size. The sandy deposits contain less than 30% silt and clay combined and more than 70% sand.

Glaciofluvial: Pertains to the outwash deposits and landforms produced by melt water streams associated with and flowing from wasting glacial ice. The excessively to very well drained stratified sands may contain minor lenses of gravel.

Apron: An extensive, continuous, nearly level to gently sloping, blanket-like deposit of stratified sand and occasionally gravel.

Ecosection Description: This recurring pattern of landforms, soils and vegetation consisting of clay Lacustrine blanket and sandy Glaciofluvial apron is characterized by excessive, very well and imperfectly to poorly drained, gently undulating to moderately sloping topography. The sandy upland forest cover is usually comprised of mature and immature jack pine and white spruce and occasionally trembling aspen regeneration in pure or mixed stands. Shrub cover frequently consists of alder and bearberry while the ground cover is mainly lichens and mixed mosses. The heavier clay sediments on the mid and lower slopes support healthy stands of pure black spruce, white spruce and trembling aspen in pure or mixed stands. The shrub cover may be alder, wild rose and twinflower and the ground cover is usually a continuous carpet of feathermosses.

Mitigative Measures: Machine clearing is permissible throughout the seasonally frozen clay Lacustrine blanket and sandy glaciofluvial components. The ground vegetation on the glaciofluvial deposits is more fragile and less resilient and needs to be protected by lifting the dozer blade to avoid completely scalping the lichens and mosses. Culverts should be installed to avoid impeding any surface flow along the lower slopes of the clay sediments.

ECOSECTION: c.3 cLb 8 aRh 2 Environmental Sensitivity: Low

8

Relief Class: c - 6 to 20 meters **Slope Class:** 3 16 - 30% strongly sloping to hummocky

Ecosite: cLb 8—clay Lacustrine blanket 80% (located on the upper, mid & lower slopes).

Clay: Particles less than .002 mm. Contains up to 60% clay and 40% silt and fine sand.

Lacustrine: Sediments generally consisting of imperfectly drained clay, silt and fine sand, deposited in glacial lake beds thousands of years before the present time.

Blanket: A mantle of clay and silt varves (layers), thick enough to mask the underlying soils or bedrock but still conforming to the general underlying topography.

Ecosite: aRh 2 – Acidic (Precambrian) Bedrock hummocky 20% (located on the apexes).

Acidic: Igneous intrusive or extrusive bedrock having more than 66% silicon oxide.

Bedrock: A general term for the rock, usually solid, that is exposed or underlies surficial mineral or organic soil material.

Hummocky: Terrain having a broken, irregular surface with distinct knobs or mounds and depressions.

Ecosection Description: This recurring pattern of landforms, soils and vegetation consisting of clay Lacustrine blanket and acidic bedrock hummocks is characterized by very well and imperfectly to poorly drained, gently undulating to moderately sloping topography. The upland protection forest cover on the exposed bedrock is usually comprised of scattered, mature and immature jack pine and white birch. Shrub cover consists of clumps of alder and clusters of bearberry while the ground cover is mainly patches of lichens and mixed mosses. The heavier clay sediments on the mid and lower slopes support healthy stands of pure black spruce, white spruce and trembling aspen in pure or mixed stands. The shrub cover may be alder, wild rose and twinflower and the ground cover is usually a continuous carpet of feathermosses.

Mitigative Measures: Machine clearing is permissible throughout the seasonally frozen clay Lacustrine blanket and sandy Glaciofluvial components. The ground vegetation on the exposed bedrock is more fragile and less resilient where there are thin pockets of loamy soil and needs to be protected by lifting the dozer blade to avoid completely scalping the lichens and mosses. Culverts should be installed to avoid impeding any surface flow along the lower slopes of the clay sediments.

ECOSECTION; c.3 cLb 7 aRh 3

Environmental Sensitivity: Low 9

Relief Class: c – 6 to 20 meters **Slope class:** 3 16 – 30% strongly sloping to hummocky

Ecosite: cLb 7–Clay Lacustrine blanket 70% (located on the upper, mid & lower slopes).

Clay: Soil particles less than .002mm. Contains up to 60% clay and 40% silt and fine sand.

Lacustrine: Sediments generally consisting of imperfectly drain clay, silt and fine sand, deposited in glacial lake beds thousands of years before the present time.

Blanket: A mantle of clay and silt varves (layers), thick enough to mask the underlying soils or bedrock but still conforming to the general underlying topography.

Ecosite: aRh 3 - acidic (Precambrian) Bedrock hummocky 30% (located in the apexes).

Acidic: Igneous intrusive or extrusive bedrock having more than 66% silicon oxide.

Bedrock: A general term for the rock, usually solid, that is exposed or underlies surficial mineral or organic soil material.

Hummocky: Terrain having a broken, irregular surface with distinct knobs or mounds and depressions.

Ecosection Description: This recurring pattern of landforms, soils and vegetation consisting of clay Lacustrine blanket and acidic bedrock hummocks is characterized by very well and imperfectly to poorly drained, gently undulating to moderately sloping topography. The upland protection forest cover on the exposed bedrock is usually comprised of scattered, mature and immature jack pine and white birch. Shrub cover consists of clumps of alder and clusters of bearberry while the ground cover is mainly patches of lichens and mixed mosses. The heavier clay sediments on the mid and lower slopes support healthy stands of pure black spruce, white spruce and trembling aspen in pure or mixed stands. The shrub cover may be alder, wild rose and twinflower and the ground cover is usually a continuous carpet of feathermosses.

Mitigative Measures: Machine clearing is permissible throughout the seasonally frozen clay Lacustrine blanket and sandy Glaciofluvial components. The ground vegetation on the exposed bedrock is more fragile and less resilient where there are thin pockets of loamy soil and needs to be protected by lifting the dozer blade to avoid completely scalping the lichens and mosses. Culverts should be installed to avoid impeding any surface flow along the lower slopes of the clay sediments.

ECOSECTION: b c.3 cLb 5 aRh 3 Bv 2

Environmental Sensitivity: Low 

Relief Class: c-6 to 20 meters **Slope Class: 3** 16-30% strongly sloping to hummocky

Ecosite: cLb 5 - Clay Lacustrine blanket 50% (located on the upper, mid & lower slopes).

Clay: Particles less than .002 mm. Contains up to 60% clay and 40% silt and fine sand.

Lacustrine: Sediments generally consisting of imperfectly drained clay, silt and fine sand, deposited in glacial lake beds thousands of years before the present time.

Blanket: A mantle of clay and silt varves (layers), thick enough to mask the underlying soils or bedrock but still conforming to the general underlying topography.

Ecosite: aRh 3 – Acidic (Precambrian) Bedrock hummocky 30% (located on the apexes).

Acidic: Igneous intrusive or extrusive bedrock having more than 66% silicon oxide.

Bedrock: A general term for the rock, usually solid, which is exposed or underlies surficial mineral or organic soil material.

Hummocky: Terrain having a broken, irregular surface with distinct knobs or mounds and depressions.

Ecosite: Bv 2 – Bog veneer 20 % (located on the mid and lower slopes).

Ecosection Description: This recurring pattern of landforms, soils and vegetation consisting of clay Lacustrine blanket, acidic bedrock hummocks and bog veneer is characterized by very well and imperfectly to poorly drained, strongly to moderately and gently sloping topography. The upland protection forest cover on the exposed bedrock is usually comprised of scattered, mature and immature jack pine and white birch. Shrub cover consists of clumps of alder and clusters of bearberry while the ground cover is mainly patches of lichens and mixed mosses. The heavier clay sediments on the mid and lower slopes support healthy stands of pure black spruce, white spruce and trembling aspen in pure or mixed stands. The shrub cover may be alder, wild rose and twinflower and the ground cover is usually a continuous carpet of feathermosses.

Mitigative Measures: Machine clearing is permissible throughout the seasonally frozen clay Lacustrine blanket, sandy Glaciofluvial and Bog veneer components. The ground vegetation on the exposed bedrock is more fragile and needs to be protected by lifting the dozer blade where thin loamy soils exist to avoid completely scalping the low shrubs and lichen. Culverts should be installed to avoid impeding any surface flow along the lower of the clay sediments and where runnels occur in the minor sections of bog veneer.

ECOSECTION: c.3 sGh 10

Environmental Sensitivity: Low



Relief Class: c-6 to 20 meters **Slope Class: 3** 16-30% strongly sloping to hummocky

Ecosite: sGh 10 – Sandy Glaciofluvial hummocky 100% (located on the upper plateau).

Sandy: Soil particles less than 2 mm. The sandy deposits contain less than 30% silt and clay combine and more than 70% sand. Pockets of gravel may be present.

Glaciofluvial: Pertains to the outwash deposits and landforms by melt water streams associated with and flowing from wasting glacial ice. The excessively to very well drained stratified sands may contain minor lenses of gravel.

Hummocky: Terrain having a broken, irregular surface with distinct knobs or mounds and depressions.

Ecosite Description: This recurring pattern of landforms, soils and vegetation consisting of sandy Glaciofluvial hummocky terrain is characterized by excessive to very well drained, strongly to moderately sloping topography. The sandy upland forest cover is usually comprised of mature and immature jack pine and white spruce and occasionally trembling aspen regeneration in pure or mixed stands. Shrub cover frequently consists of alder and bearberry while the ground cover is mainly lichens and mixed mosses.

Mitigative Measures: Machine clearing is permissible throughout the seasonally frozen sandy glaciofluvial component. The ground vegetation on the stratified deposits is more fragile and less resilient and needs to be protected by lifting the dozer blade to avoid completely scalping the lichens and mosses. The sandy material may provide a sufficiently good source for coarse fill material.

ECOSECTION: c.2 sGa 10

Environmental Sensitivity: Low

12

Relief Class: c-6 to 20 meters **Slope Class: 2** 6-15% strongly sloping to hummocky

Ecosite: sGa 10 – Sandy Glaciofluvial apron 100% (located on the upper plateau).

Sandy: Soil particles less than 2 mm. The sandy deposits contain less than 30% silt and clay combine and more than 70% sand. Pockets of gravel may be present.

Glaciofluvial: Pertains to the outwash deposits and landforms produced by melt water streams associated with and flowing from wasting glacial ice. The excessively to very well drained stratified sands may contain minor lenses of gravel.

Apron: An extensive, continuous, nearly level to gently sloping, blanket-like deposit of stratified sand and occasionally gravel.

Ecosite Description: This recurring pattern of landforms, soils and vegetation consisting of sandy Glaciofluvial apron is characterized by excessive to very well drained, strongly to moderately sloping topography. The sandy upland forest cover is usually comprised of mature and immature jack pine and white spruce and occasionally trembling aspen regeneration in pure or mixed stands. Shrub cover frequently consists of alder and bearberry while the ground cover is mainly lichens and mixed mosses.

Mitigative Measures: Machine clearing is permissible throughout the seasonally frozen sandy glaciofluvial component. The ground vegetation on the stratified deposits is more fragile and less resilient and needs to be protected by lifting the dozer blade to avoid completely scalping the lichens and mosses. The sandy material may provide a sufficiently good source for coarse fill material.

ECOSECTION: c.3 ssGr 10

Environmental Sensitivity: Low

13

Relief Class: c-6 to 20 meters **Slope Class: 3** 16-20% ridged to strongly sloping.

Ecosite: ssGr 10-Sandy skeletal Glaciofluvial ridge 100% (located on the upper plateau).

Sandy skeletal: Soil particles less than 2 mm. The sandy deposits contain less than 30% silt and clay combined and more than 70% sand. Large pockets of gravel are present.

Glaciofluvial: Pertains to the outwash deposits and landforms produced by melt water streams associated with and flowing from wasting glacial ice. The excessively to very well drained stratified sands and gravels contain thick lenses of aggregate material.

Ridged: Terrain characterized by long, narrow elevations which may occur independently or in parallel or intersecting patterns. Ridges usually have sharp crests and steep sides.

Ecosite Description: This recurring pattern of landforms, soils and vegetation consisting of sandy skeletal Glaciofluvial ridged terrain is characterized by excessive to very well drained, strongly to moderately sloping topography. The sandy upland forest cover is usually comprised of mature and immature jack pine and white spruce and occasionally trembling aspen regeneration in pure or mixed stands. Shrub cover frequently consists of alder and bearberry while the ground cover is mainly lichens and mixed mosses.

Mitigative Measures: Machine clearing is permissible throughout the seasonally frozen sandy skeletal glaciofluvial component. The ground vegetation on the stratified deposits is more fragile and less resilient and needs to be protected by lifting the dozer blade to avoid completely scalping the lichens and mosses. The sandy material may provide a sufficiently good source for coarse fill material.

ECOSECTION: c.2 3 ssGr 7 cLb 3

Environmental Sensitivity: Low

14

Relief Class: c – 6 to 20 meters

Slope Class: 2 6-15% ridged to strongly sloping

Relief Class: c – 6 to 20 meters

Slope Class: 3 16-30% ridged to strongly sloping

Ecosite: ssGr7 – Sandy skeletal Glaciofluvial ridge 70% (located on the upper plateau)

Sandy skeletal: Soil particles less than 2 mm. in size. The sandy deposits contain less than 30% silt and clay combined and more than 70% sand. Large pockets of gravel are present.

Glaciofluvial: Pertains to the outwash deposits and landforms produced by melt water streams associated with and flowing from wasting glacial ice. The excessively to very well drained stratified sands and gravels contain thick lenses of aggregate material.

Ridged: Terrain characterized by long, narrow elevations which may occur independently or in parallel or intersecting patterns. Ridges usually have sharp crests and steep sides.

Ecosite: cLb 3 – Slay Lacustrine blanket 80% (located on the apex and upper slopes).

Clay: Particles less than .002 mm. Contains up to 60% clay and 40% silt and fine sand.

Lacustrine: Sediments generally consisting of moderately well drained clay, silt and fine sand, deposited on a glacial lake bed thousands of years before the present time.

Blanket: A mantle of clay and silt varves (layers), thick enough to mask the underlying soils or bedrock but still conforming to the general underlying topography.

Ecosite Description: This recurring pattern of landforms, soils and vegetation consisting of sandy Glaciofluvial apron and clay Lacustrine blanket is characterized by excessive, very well and imperfectly to poorly drained, gently undulating to moderately sloping topography. The sandy upland forest cover is usually comprised of mature and immature jack pine and white spruce and occasionally trembling aspen regeneration in pure or mixed stands. Shrub cover frequently consists of alder and bearberry while the ground cover is mainly lichens and mixed mosses. The heavier clay sediments on the mid and lower slopes support healthy stands of pure black spruce, white spruce and trembling aspen in pure or mixed stands. The shrub cover may be alder, wild rose and twinflower and the ground cover is usually a continuous carpet of feathermosses.

Mitigative Measures: Machine clearing is permissible throughout the seasonally frozen sandy Glaciofluvial and clay Lacustrine blanket components. The ground vegetation on the glaciofluvial deposits is more fragile and less resilient and needs to be protected by lifting the dozer blade to avoid completely scalping the lichens and mosses. Culverts should be installed to avoid impeding any surface flow along the lower slopes of the clay sediments.

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LOWLAND ORGANIC SOIL ECOSECTIONS-ECOSITE DEFINITIONS/ DESCRIPTIONS

ECOSECTION: a. 1 Bt 6 Bv 4

Environmental Sensitivity: Mod 15

Relief Class: a - 0 to 2 meters **Slope Class: 1** 1- 5% nearly level to very gently sloping.

Ecosite: Bt 6 – Peat plateau 60% (located in level, poorly drained depressions).

Peat plateau: Peat plateaus are associated with permafrost and their elevated height (approx. 1 m.) above the surrounding wetlands is primarily due to ice lens formation in the frozen core. Their sizes vary from several hectares to tens of hectares. Sphagnum and forest peat materials are formed over thousands of years in a wet, ombrotrophic (nutrient deficient) environment. The dense tree, shrub and ground cover maintains the permafrost table, found 0.5 m. below the surface, by providing ample seasonal insulation.

Ecosite: Bv 4 – Bog veneer 40% (located on the mid and lower slopes)

Bog: Poorly drained sphagnum or forest peat materials accumulated over thousands of years in a wet, nutrient deficient, (ombrotrophic) environment. Near the surface, the organic materials are usually undecomposed (fibric); the middle layers are partially decomposed, (mesic), and the bottom layers are well decomposed, (humic), peat. Localized permafrost may occur bordering the runnels (intermittent drainage channels) where tree growth is denser.

Veneer: An extensive area of thin (>0.25 to <1 m.), organic material overlying, clay lacustrine sediments. Minor runnels, form a dendritic pattern draining the organic terrain.

Ecosection Description: The elevated, nearly level peat plateaus have a frozen permafrost core and are slightly raised above the adjoining saturated wetlands. The protective forest is dense black spruce with shrub cover consisting of Labrador tea, ericaceous shrubs including appleberry and the ground cover is dominantly sphagnum moss and bog cranberry. The bog veneer forest cover is predominantly stunted black spruce and scattered tamarack associated with a dense shrub layer of ericaceous shrubs including Labrador tea, bog rosemary, bog laurel and leatherleaf and a heavy ground carpet of sphagnum and feathermosses.

Mitigative Measures: Selective clearing is obligatory in the Peat plateau to protect and maintain the permafrost table. Leave the shrub and ground cover relatively undisturbed by raising the dozer blade when clearing the route. Machine clearing is allowed through the bog veneer component. However, since the minor drainage channels (runnels) may possess permafrost, it is advisable to hand clear the tree cover along the edges of the runnels and leave the moss layer undisturbed by raising the dozer blade to avoid scouring the peat surface. Culverts should be installed to avoid impeding sub-surface lateral flow. During summer construction, where possible heavy machinery should operate from dry stable ground or brush mats to avoid excess sedimentation. A geotextile cloth shall be installed prior to placement of fill.

ECOSECTION: a. 1 Bt 7 Bv 3

Environmental Sensitivity: Mod 16

Relief Class: a - 0 to 2 meters **Slope Class: 1** 1- 5% nearly level to very gently sloping.

Ecosite: Bt 7 – Peat plateau 70% (located in level, poorly drained depressions).

Peat plateau: Peat plateaus are associated with permafrost and their elevated height (approx. 1 m.) above the surrounding wetlands is primarily due to ice lens formation in the frozen core. Their sizes vary from several hectares to tens of hectares. Sphagnum and forest peat materials are formed over thousands of years in a wet, ombrotrophic (nutrient deficient) environment. The dense tree, shrub and ground cover maintains the permafrost table, found 0.5 m. below the surface, by providing ample seasonal insulation.

Ecosite: Bv 3 – Bog veneer 30% (located on the mid and lower slopes)

Bog: Poorly drained sphagnum or forest peat materials accumulated over thousands of years in a wet, nutrient deficient, (ombrotrophic) environment. Near the surface, the organic materials are usually undecomposed (fibric) the middle layers are partially decomposed, (mesic) and the bottom layers are well decomposed, (humic) peat. Localized permafrost may occur bordering the runnels (intermittent drainage channels) where tree growth is denser.

Veneer: An extensive area of thin (>0.25 to <1 m.), organic material overlying, clay lacustrine sediments. Minor runnels, form a dendritic pattern draining the organic terrain.

Ecosection Description: The elevated, nearly level peat plateaus have a frozen permafrost core and are slightly raised above the adjoining saturated wetlands. The protective forest cover is dense black spruce with shrub cover consisting of Labrador tea, ericaceous shrubs including appleberry and the ground cover is dominantly sphagnum moss and bog cranberry. The bog veneer forest cover is predominantly stunted black spruce and scattered tamarack associated with a dense shrub layer of ericaceous shrubs including Labrador tea, bog rosemary, bog laurel and leatherleaf and a heavy ground carpet of sphagnum and feathermosses.

Mitigative Measures: Selective clearing is obligatory in the Peat plateau to protect and maintain the permafrost table. Leave the shrub and ground cover relatively undisturbed by raising the dozer blade when clearing the route. Machine clearing is allowed through the bog veneer component. However, since the minor drainage channels (runnels) may possess permafrost, it is advisable to hand clear the tree cover along the edges of the runnels and leave the moss layer undisturbed by raising the dozer blade to avoid scouring the peat surface. Culverts should be installed to avoid impeding sub-surface lateral flow. During summer construction, heavy machinery should operate from dry stable ground or brush mats to avoid excess sedimentation. A geotextile cloth shall be installed prior to placement of fill.

ECOSECTION: a. 1 Bt 5 Bv 3 Fh 2

Environmental Sensitivity: Mod 17

Relief Class: a - 0 to 2 meters **Slope Class: 1** 1- 5% nearly level to very gently sloping.

Ecosite: Bt 5 – Peat plateau 50% (located in level, poorly drained depressions).

Peat plateau: Peat plateaus are associated with permafrost and their elevated height (approx. 1 m.) above the surrounding wetlands is primarily due to ice lens formation in the frozen core. Their sizes vary from several hectares to tens of hectares. Sphagnum and forest peat materials are formed over thousands of years in a wet, ombrotrophic (nutrient deficient) environment. The dense tree, shrub and ground cover maintains the permafrost table, found 0.5 m. below the surface, by providing ample seasonal insulation.

Ecosite: Bv 3 – Bog veneer 30% (located on the mid and lower slopes)

Ecosite: Fh 2 – Fen horizontal 20% (located in the level, saturated depression)

Fen horizontal: A fen is a peat-filled, flat, low lying, extensive area with a high water table. The organic materials are deep (2 to 3 meters), well (humic), to moderately decomposed (mesic), sedge peat. Fens are mainly rich in nutrients (minerotrophic) that are derived from the surrounding upland mineral soils.

Ecosection Description: The elevated, nearly level peat plateaus have a frozen permafrost core and are slightly raised above the adjoining saturated wetlands. The protective forest is dense black spruce with shrub cover consisting of Labrador tea, ericaceous shrubs including appleberry and ground cover consisting of sphagnum mosses and bog cranberry. The bog veneer forest cover is predominantly stunted black spruce and scattered tamarack associated with a dense shrub layer of ericaceous shrubs including Labrador tea, bog rosemary, bog laurel and leatherleaf and a heavy ground carpet of sphagnum and feathermosses. The treeless fens are saturated, sedge filled depressions.

Mitigative Measures: Selective clearing is obligatory in the Peat plateau to protect and maintain the permafrost table. Leave the shrub and ground cover relatively undisturbed by raising the dozer blade when clearing the route. Machine clearing is allowed through the bog veneer component. However, since the minor drainage channels (runnels) may possess permafrost, it is advisable to hand clear the tree cover along the edges of the runnels and leave the moss layer undisturbed by raising the dozer blade to avoid scouring the peat surface. Culverts should be installed both in the veneers at the runnel locations and frequently in the fens to avoid impeding sub-surface lateral flow. During summer construction, heavy machinery should operate from dry stable ground or brush mats to avoid excess sedimentation. A geotextile cloth shall be installed prior to placement of fill.

ECOSECTION: a.1 Bt 4 Bv 4 Fh 2

Environmental Sensitivity: Mod 18

Relief Class: a - 0 to 2 meters **Slope Class: 1** 1- 5% nearly level to very gently sloping.

Ecosite: Bt 4 – Peat plateau 40% (located in level, poorly drained depressions).

Peat plateau: Peat plateaus are associated with permafrost and their elevated height (approx. 1 m.) above the surrounding wetlands is primarily due to ice lens formation in the frozen core. Their sizes vary from several hectares to tens of hectares. Sphagnum and forest peat materials are formed over thousands of years in a wet, ombrotrophic (nutrient deficient) environment. The dense tree, shrub and ground cover maintains the permafrost table, found 0.5 m. below the surface, by providing ample seasonal insulation.

Ecosite: Bv 4 – Bog veneer 40% (located on the mid and lower slopes)

Ecosite: Fh 2 – Fen horizontal 20% (located in the level, saturated depression).

Fen horizontal: A fen is a peat-filled, flat, low lying, extensive area with a high water table. The organic materials are deep (2 to 3 meters), well (humic), to moderately decomposed (mesic), sedge peat. Fens are mainly rich in nutrients (minerotrophic), which are derived from the surrounding upland mineral soils.

Ecosection Description: The elevated, nearly level peat plateaus have a frozen permafrost core and are slightly raised above the adjoining saturated wetlands. The protective forest cover is dense black spruce with shrub cover consisting of Labrador tea, ericaceous shrubs including appleberry and ground cover consisting of sphagnum mosses and bog cranberry. The bog veneer forest cover is predominantly stunted black spruce and scattered tamarack associated with a dense shrub layer of ericaceous shrubs including Labrador tea, bog rosemary, bog laurel and leatherleaf and a heavy ground carpet of sphagnum and feathermosses. The treeless fens are saturated, sedge filled depressions.

Mitigative Measures: Selective clearing is obligatory in the Peat plateau to protect and maintain the permafrost table. Leave the shrub and ground cover relatively undisturbed by raising the dozer blade when clearing the route. Machine clearing is allowed through the bog veneer component. However, since the minor drainage channels (runnels) may possess permafrost, it is advisable to hand clear the tree cover along the edges of the runnels and leave the moss layer undisturbed by raising the dozer blade to avoid scouring the peat surface. Shrub growth should be retained by lifting the dozer blade to avoid sheering off the sparse cover. Culverts should be installed both in the veneers at the runnel locations and frequently in the fens to avoid impeding sub-surface lateral flow. During summer construction, heavy machinery should operate from dry stable ground or brush mats to avoid excess sedimentation. A geotextile cloth shall be installed prior to placement of fill.

ECOSECTION: a.1 Bt 4 Fh 4 Fc 2

Environmental Sensitivity: Mod 19

Relief Class: a - 0 to 2 meters **Slope Class: 1** 1- 5% nearly level to very gently sloping.

Ecosite: BT5-Peat plateau 50% (located in level, poorly drained depressions).

Peat plateau: Peat plateaus are associated with permafrost and their elevated height (approx. 1 m.) above the surrounding wetlands is primarily due to ice lens formation in the frozen core. Their sizes vary from several hectares to tens of hectares. Sphagnum and forest peat materials are formed over thousands of years in a wet, ombrotrophic (nutrient deficient) environment. The dense tree, shrub and ground cover maintains the permafrost table, found 0.5 m. below the surface, by providing ample seasonal insulation.

Ecosite: Fh 3-Fen collapse 20% (located in the level saturated depressions).

Fen horizontal: A fen is a peat-filled, flat, low lying, extensive area with a high water table. The organic materials are deep (2 to 3 meters), well (humic), to moderately decomposed (mesic), sedge peat. Fens are mainly rich in nutrients (minerotrophic) that are derived from the surrounding upland mineral soils.

Ecosite: Fc 2-Fen collapse 20% (located in the level, saturated depressions).

Fen collapse: These collapse scars have developed as a result of melting permafrost in or along the perimeter of peat plateaus. The collapse portion of the organic landform has a high water table and the collapsing edge may form a steep bank. It is speculated that the weight of the biomass causes the permafrost to deteriorate and commence melting.

Ecosection Description: The elevated peat plateaus have a frozen permafrost core and are slightly raised above the adjoining saturated wetlands. The protective forest cover is dense black spruce with shrub cover consisting of Labrador tea, ericaceous shrubs including appleberry and ground cover consisting of sphagnum mosses and bog cranberry. The treeless horizontal fens are saturated, sedge filled depressions that may support a sparse shrub cover of leatherleaf, bog rosemary and bog laurel and dense ground cover of sedges, grasses and reeds. The collapse scars are occupied by scattered black spruce regeneration, ericaceous shrubs, sphagnum mosses and cotton grass.

Mitigative Measures: Selective clearing is obligatory in the Peat plateau to protect and maintain the permafrost table. Leave the shrub and ground cover relatively undisturbed by raising the dozer blade when clearing the route. Shrub growth should be retained by lifting the dozer blade to avoid sheering off the sparse cover. Collapse scar surfaces should also be protected by lifting the dozer blade while clearing the route. Culverts should be installed frequently in the fens to avoid impeding sub-surface lateral flow. During summer construction, heavy machinery should operate from dry stable ground or brush mats to avoid excess sedimentation. A geotextile cloth shall be installed prior to placement of fill.

ECOSECTION: a.1 Bt 4 Fh 4 Fc 2

Environmental Sensitivity: Mod 20

Relief Class: a - 0 to 2 meters **Slope Class: 1** 1- 5% nearly level to very gently sloping.

Ecosite: Bt 4 – Peat plateau 40% (located in level, poorly drained depressions).

Peat plateau: Peat plateaus are associated with permafrost and their elevated height (approx. 1 m.) above the surrounding wetlands is primarily due to ice lens formation in the frozen core. Their sizes vary from several hectares to tens of hectares. Sphagnum and forest peat materials are formed over thousands of years in a wet, ombrotrophic (nutrient deficient) environment. The dense tree, shrub and ground cover maintains the permafrost table, found 0.5 m. below the surface, by providing ample seasonal insulation.

Ecosite: Fh 4 – Fen horizontal 40% (located in the level, saturated depression)

Fen horizontal: A fen is a peat-filled, flat, low lying, extensive area with a high water table. The organic materials are deep (2 to 3 m.) well, (humic) to moderately decomposed (mesic), sedge peat. Fens are mainly rich in nutrients (minerotrophic), which are derived from the surrounding upland mineral soils.

Ecosite: Fc 2 - Fen collapse 20% (located in the level, saturated depressions).

Fen collapse: These collapse scars have developed as a result of melting permafrost in or along the perimeter of peat plateaus. The collapse portion of the organic landform has a high water table and the collapsing edge may form a steep bank. It is speculated that the weight of the biomass causes the permafrost to deteriorate and commence melting.

Ecosection Description: The elevated peat plateaus have a frozen permafrost core and are slightly raised above the adjoining saturated wetlands. The protective forest cover is dense black spruce with shrub cover consisting of Labrador tea, ericaceous shrubs including appleberry and ground cover consisting of sphagnum mosses and bog cranberry. The treeless horizontal fens are saturated, sedge filled depressions that may support a sparse shrub cover of leatherleaf, bog rosemary and bog laurel and dense ground cover of sedges, grasses and reeds. The collapse scars are occupied by scattered black spruce regeneration, ericaceous shrubs, sphagnum mosses and cotton grass.

Mitigative Measures: Selective clearing is obligatory in the Peat plateau to protect and maintain the permafrost table. Leave the shrub and ground cover relatively undisturbed by raising the dozer blade when clearing the route. Collapse scar surfaces should be protected by lifting the dozer blade while clearing the route. Culverts should be installed frequently in the fens to avoid impeding sub-surface lateral flow. During summer construction, heavy machinery should operate from dry stable ground or brush mats to avoid excess sedimentation. A geotextile cloth shall be installed prior to placement of fill.

ECOSECTION: b. 1 Bv 10

Environmental Sensitivity: Mod 21

Relief Class: b - 3 to 6 meters **Slope Class: 1** 1- 5% nearly level to very gently sloping.

Ecosite: Bv 10 – Bog veneer 100% (located in on the mid and lower slopes).

Bog: Poorly drained sphagnum or forest peat materials accumulated over thousands of years in a wet, nutrient deficient, (ombrotrophic) environment. Near the surface, the organic materials are usually undecomposed (fibric); the middle layers are partially decomposed, (mesic) and the bottom layers are well decomposed, (humic) peat. Localized permafrost may occur bordering the runnels (intermittent drainage channels) where tree growth is denser.

Veneer: An extensive area of thin (>0.25 to <1 m.), organic material overlying, clay lacustrine sediments. Minor runnels, form a dendritic pattern draining the organic terrain.

Ecosection Description: The bog veneer forest cover is predominantly stunted black spruce and scattered tamarack associated with a dense shrub layer of ericaceous shrubs including Labrador tea, bog rosemary, bog laurel and leatherleaf and a heavy ground carpet of sphagnum and feathermosses.

Mitigative Measures: Machine clearing is allowed through the bog veneer component. However, since the minor drainage channels (runnels) may possess permafrost, it is advisable to hand clear the tree cover along the edges of the runnels and leave the moss layer undisturbed by raising the dozer blade to avoid scouring the peat surface. During summer construction, heavy machinery should operate from dry stable ground or brush mats to avoid excess sedimentation. A geotextile cloth shall be installed prior to placement of fill.

ECOSECTION: b. 1 Bv 7 Bt 3

Environmental Sensitivity: Mod (22)

Relief Class: b - 3 to 6 meters **Slope Class: 1** 1- 5% nearly level to very gently sloping.

Ecosite: Bv 7 – Bog veneer 70% (located on the mid and lower slopes)

Bog: Poorly drained sphagnum or forest peat materials accumulated over thousands of years in a wet, nutrient deficient, (ombrotrophic) environment. Near the surface, the organic materials are usually undecomposed (fibric); the middle layers are partially decomposed, (mesic), and the bottom layers are well decomposed, (humic), peat. Localized permafrost may occur bordering the runnels (intermittent drainage channels) where tree growth is denser.

Veneer: An extensive area of thin (>0.25 to <1 m.), organic material overlying, clay lacustrine sediments. Minor runnels, form a dendritic pattern draining the organic terrain.

Ecosite: Bt 3 – Peat plateau 30% (located in level, poorly drained depressions).

Peat plateau: Peat plateaus are associated with permafrost and their elevated height (approx. 1 m.) above the surrounding wetlands is primarily due to ice lens formation in the frozen core. Their sizes vary from several hectares to tens of hectares. Sphagnum and forest peat materials are formed over thousands of years in a wet, ombrotrophic (nutrient deficient) environment. The dense tree, shrub and ground cover maintains the permafrost table, found 0.5 m. below the surface, by providing ample seasonal insulation.

Ecosection Description: The bog veneer forest cover is predominantly stunted black spruce and scattered tamarack associated with a dense shrub layer of ericaceous shrubs including Labrador tea, bog rosemary, bog laurel and leatherleaf and a heavy ground carpet of sphagnum and feathermosses. The elevated, nearly level peat plateaus have a frozen permafrost core and occupy the depressions. The protective forest cover is dense black spruce with shrub cover consisting of Labrador tea, ericaceous shrubs including appleberry and the ground cover is dominantly sphagnum moss and bog cranberry.

Mitigative Measures: Machine clearing is allowed through the bog veneer component. However, since the minor drainage channels (runnels) may possess permafrost, it is advisable to hand clear the tree cover along the edges of the runnels and leave the moss layer undisturbed by raising the dozer blade to avoid scouring the peat surface. Selective clearing is obligatory in the Peat plateaus to protect and maintain the permafrost table. Leave the shrub and ground cover relatively undisturbed by raising the dozer blade when clearing the route. Culverts should be installed at the runnel locations to avoid impeding sub-surface lateral flow. During summer construction, heavy machinery should operate from dry stable ground or brush mats to avoid excess sedimentation. A geotextile cloth shall be installed prior to placement of fill.

ECOSECTION: a.1 Fs 10

Environmental Sensitivity: Mod 23

Relief Class: a - 0 to 2 meters **Slope Class: 1** 1 - 5% nearly level to very gently sloping.

Ecosite: Fs 10 – Fen stream 100% (located adjacent to intermittently flowing streams).

Fen stream: A fen stream is a flat, low lying, ribbon of peat bordering a stream with a high water table. The organic materials are moderately deep (1 to 2 meters), well (humic), to moderately decomposed (mesic) peat derived from sedges, grasses and reeds. The stream fens are mainly rich in nutrients (minerotrophic) that have percolated down from the surrounding upland mineral soils.

Ecosite Description: The fen streams are narrow bands of moderately deep, poorly drained peat that support clumps of willow and alder, ericaceous shrubs, sedges, grasses and reeds.

Mitigative Measures: The shoreline vegetation along the fen streams should be retained by lifting the dozer blade while clearing this segment. A large culvert or small bridge should be installed at the stream crossing to avoid impeding normal seasonal flows. During summer construction, heavy machinery should operate from dry stable ground or brush mats to avoid excess sedimentation. A geotextile cloth shall be installed prior to placement of fill.

STREAM CROSSINGS

There are eight stream crossings that cross the Mile 17 preferred upland access route to Wuskwatim Lake. The widths of the streams vary from 5 to 15 meters and meander through deep, very poorly drained organic deposits of fen peat comprised of sedges, reeds, rushes with patches of willow and alder. The flows vary seasonally and may inundate the riparian zone during spring runoff. It is important to minimize the disturbance of vegetation by leaving a buffer zone of ground vegetation and shrub cover.

CLASS: 1 The combined upstream drainage area is in excess of 30 km² (12 mi.²).

There are no Class 1 streams along the Mile 17 to Wuskwatim Lake access route, although some streams may qualify by draining large organic formations. However, there does not appear to be any well defined outlet into larger streams and the likelihood of supporting fish populations are remote.

CLASS: 2 The combined upstream drainage is in excess of 10 km² (4 mi.²).

There are six Class 2 streams that intersect the Mile 17 access route.

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Stream Crossing 2-2	Location: Ecosection A- 2	15.0 km. from Hwy 391
Stream Crossing 4-2	Location: Ecosection B- 4	27.1 km. from Hwy 391
Stream Crossing 5-2	Location: Ecosection B-12	31.4 km. from Hwy 391
Stream Crossing 6-2	Location: Ecosection B-17	32.9 km. from Hwy 391
Stream Crossing 8-2	Location: Ecosection B-35	41.9 km. from Hwy 391
Stream Crossing 9-2	Location: Ecosection B-44	44.2 km. from Hwy 391

CLASS 3 The combined upstream drainage area is less than 10 km² (4mi.²).

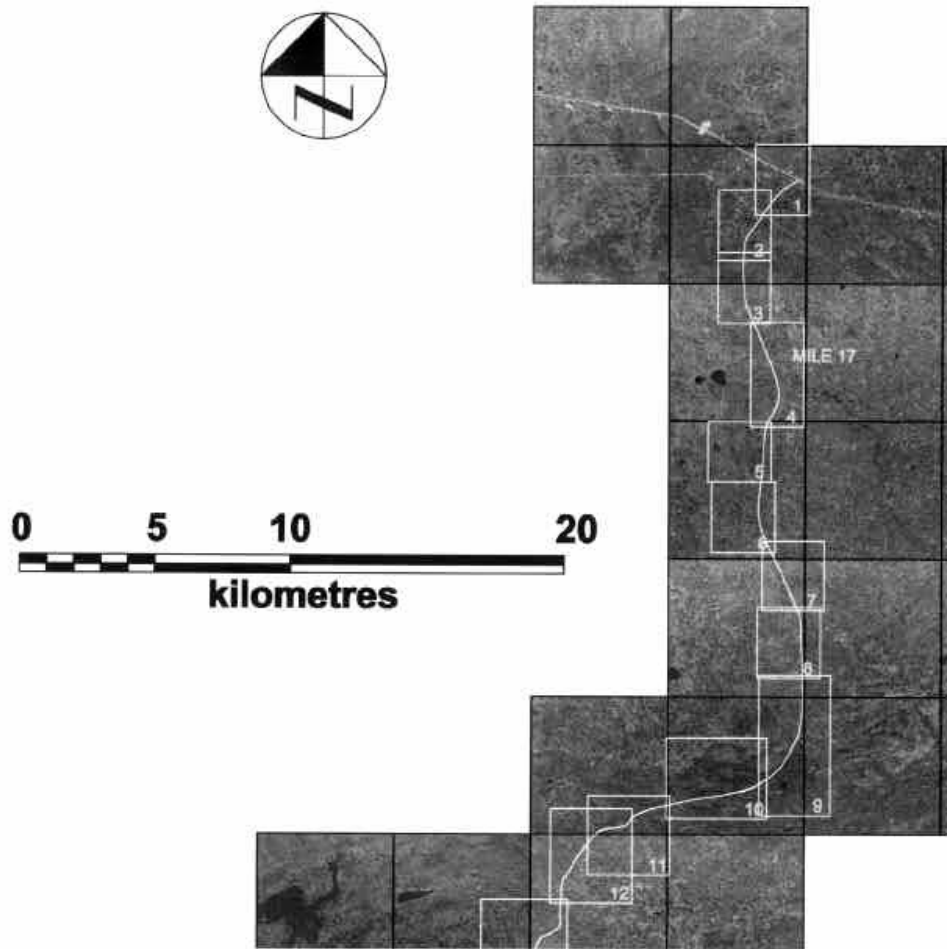
There are two Class 3 streams that intersect the Mile 17 access route

24

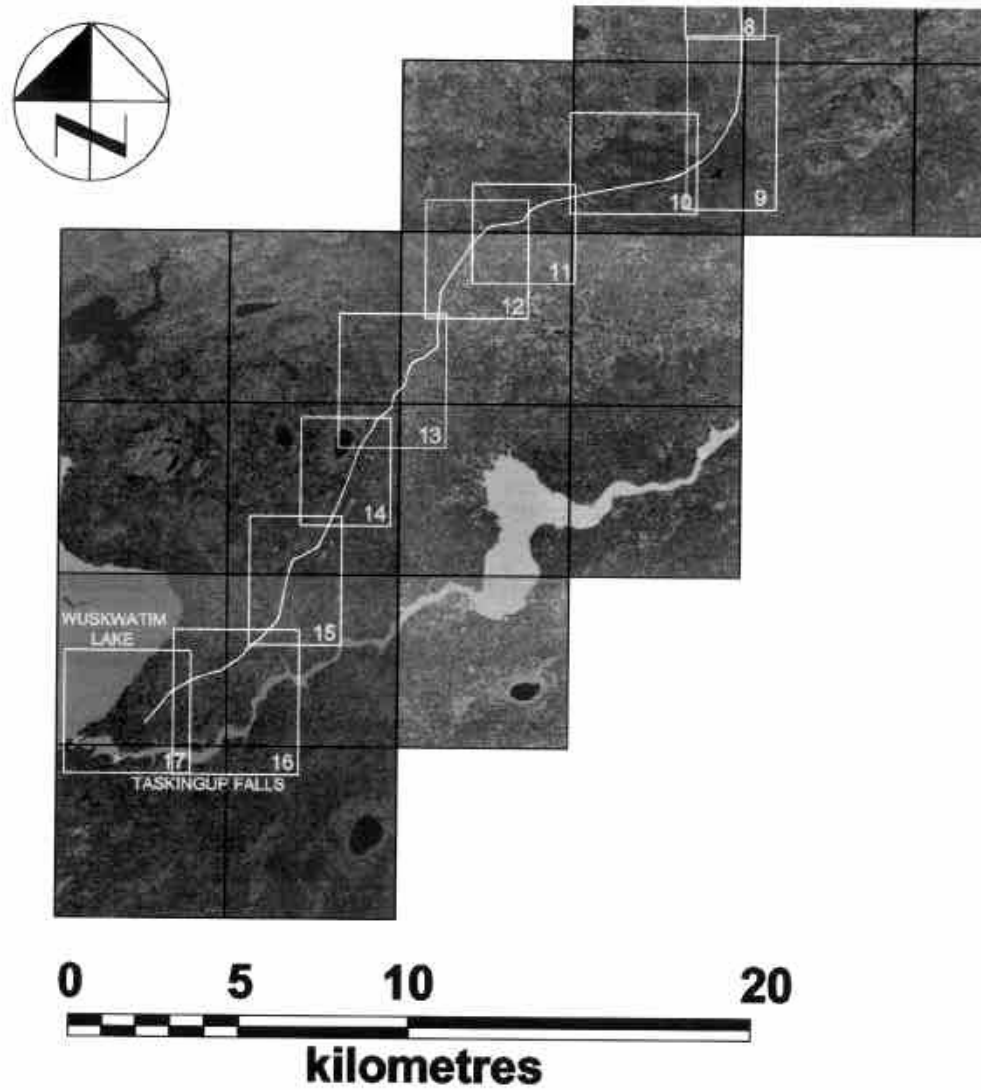
Stream Crossing 1-3	Location: Ecosection A-10	6.2 km. from Hwy 391
Stream Crossing 3-3	Location: Ecosection A-37	25.2 km. from Hwy 391

MITIGATION MEASURES

All of the Class 2 and 3 streams are only moderately sensitive to minor disturbance caused by winter road construction. The approaches are gradually sloping to level and the possibility of shoreline erosion is minimal. Leave the ground and shrub cover intact while clearing the route by lifting the dozer blade and retaining the snow cover.



SECTION A
MAP INDEX
Figures 1-10



SECTION B
MAP INDEX
Figures 10-17

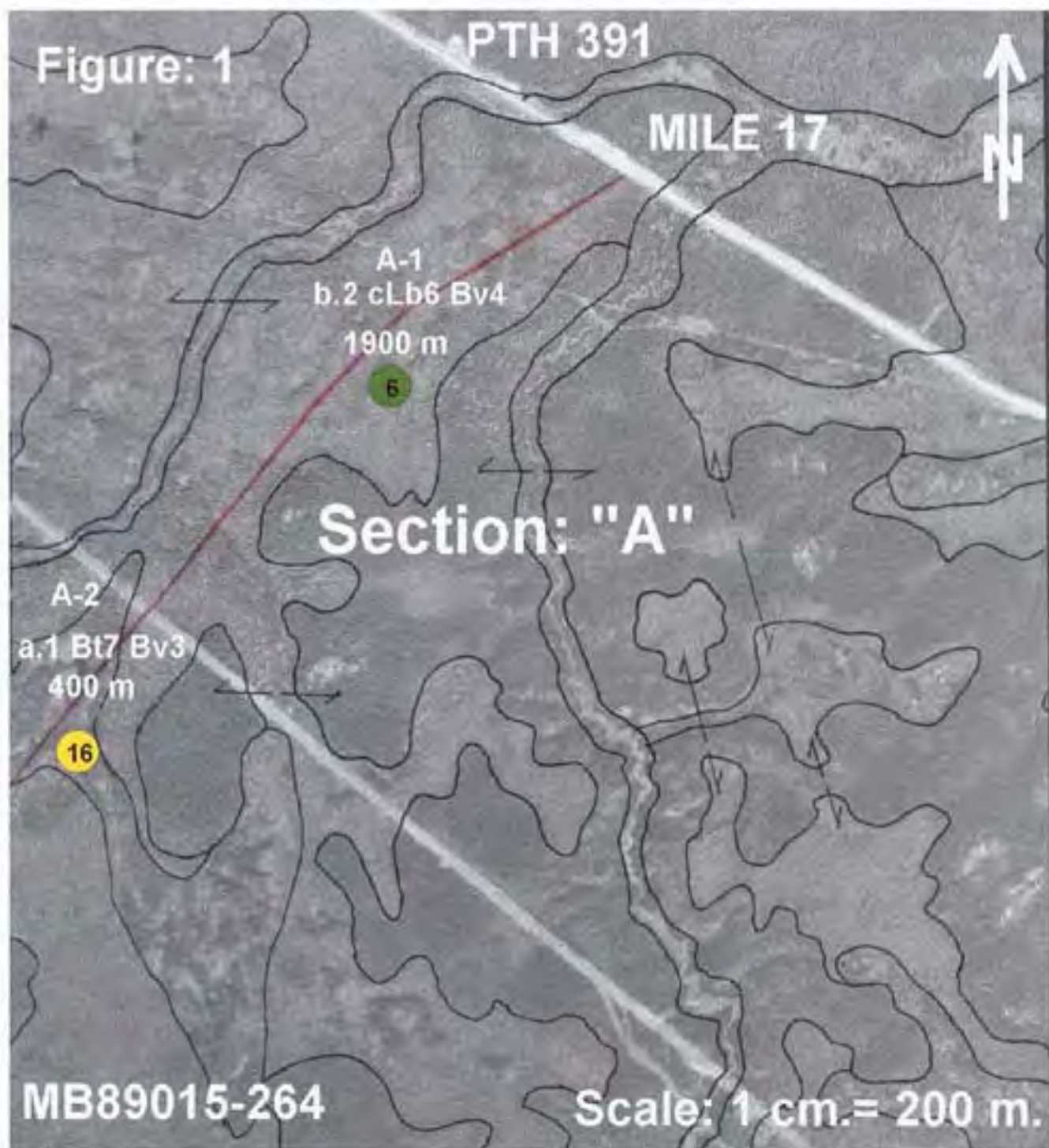


Figure 1: Mile 17 Upland Access Route to Wuskwatim G. S.

Ecosection: A - 1 Imperfectly drained, moderately sloping clay Lacustrine blanket (60%) and poorly drained, gently sloping Bog veneer, (40%), (less than 1 m. peat) overlying clay sediments. **Environmental Sensitivity: LOW**

Ecosection: A - 2 Poorly drained, nearly level, deep Peat plateau, (>2 m. forest peat), overlying clay Lacustrine sediments, (70%) and poorly drained, gently sloping Bog veneer, (30%), (less than 1 m. peat) overlying clay Lacustrine sediments. **Environmental Sensitivity: MODERATE.** Permafrost is present in the peat plateaus and along the runnels, (minor drainage), in the Bog veneers.

Refer to text pages 56 & 67 for detailed Ecosection Descriptions and Environmental Sensitivity.

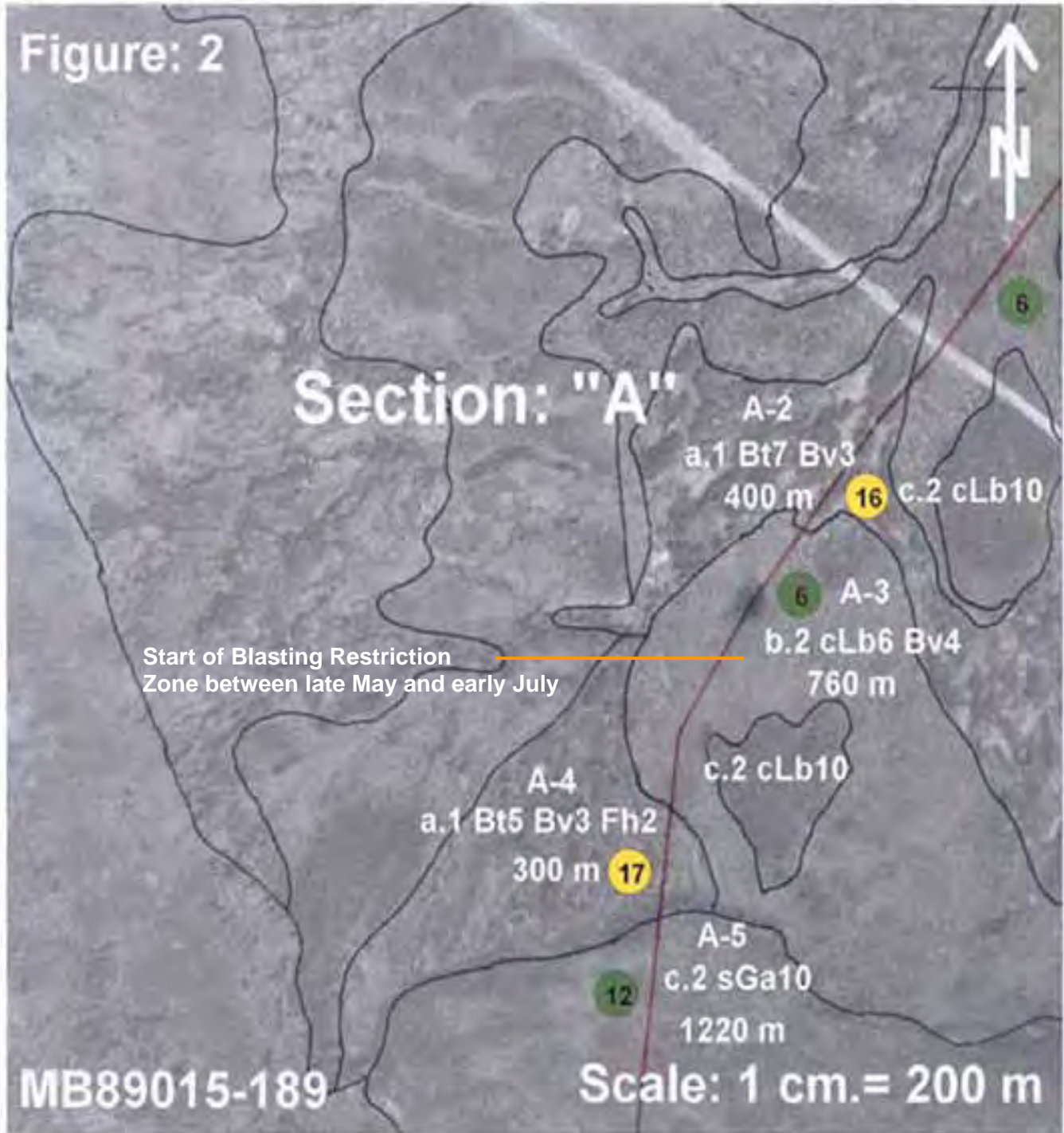


Figure: 2 Mile 17 Upland Access Route to Wuskwatim G. S

Ecosection: A - 3 Imperfectly drained, moderately sloping clay Lacustrine blanket (60%) and poorly drained, gently sloping Bog veneer, (40%), (less than 1 m. peat) overlying clay sediments. **Environmental Sensitivity: LOW.**

Ecosection: A - 4 Poorly drained, nearly level, deep Peat plateau, (>2 m. forest peat), overlying clay Lacustrine sediments, (40%) and poorly drained, gently sloping Bog veneer, (40%), (less than 1 m. peat) overlying clay sediments and very poorly drained Fen, (20%). **Environmental Sensitivity: MODERATE.**

Ecosection: A - 5 Well drained sandy, gently sloping Glaciofluvial apron. **Environmental Sensitivity: LOW.**

Permafrost is present in the peat plateaus and along the runnels, (minor drainage), in the Bog veneers.

Refer to text pages 56, 62, 67 and 68 for detailed Ecosection Description and Environmental Sensitivity.

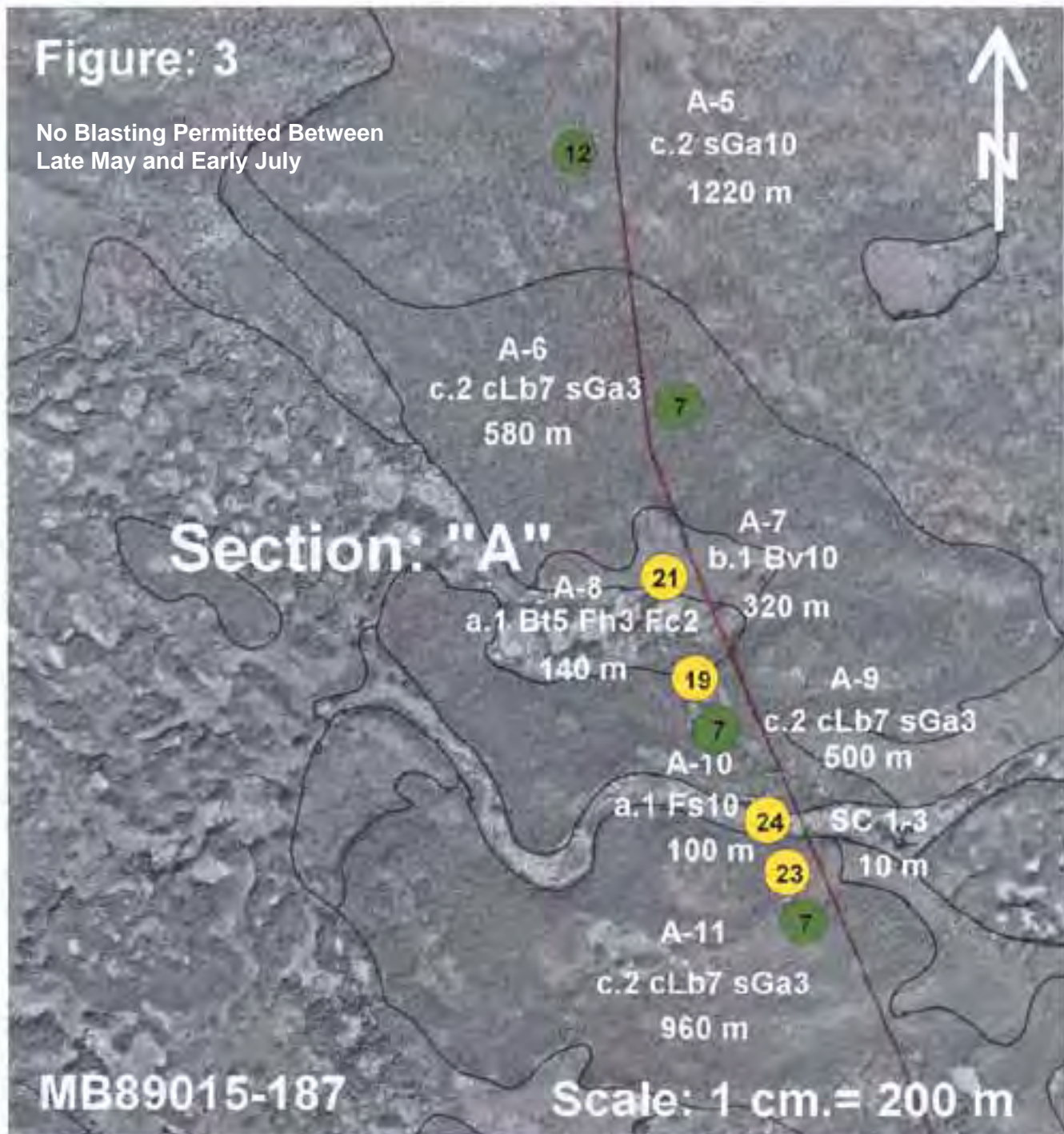


Figure: 3 Mile 17 Upland Access Route to Wuskwatim G. S.

Ecosection: A-5 Well drained, gently sloping sandy Glaciofluvial apron, (100%). **Environmental sensitivity: LOW.**

Ecosection: A-6, 9 and 11 Moderately well drained, undulating clay Lacustrine blanket (70%) and well drained, gently sloping, stratified, sandy Glaciofluvial apron, (30%). **Environmental Sensitivity: LOW.**

Ecosection: A-7 Poorly drained, gently sloping Bog veneer overlying clay. **Environmental Sensitivity: MODERATE**

Ecosection: A-8 Poorly drained Peat plateau and saturated horizontal fen and fen collapse **Environmental Sensitivity: MOD**

Ecosection: A-10 Poorly drained Fen stream and **Stream Crossing: 1-3 (R1) (432+60)** **Environmental Sensitivity: MODERATE**

Permafrost is present in the peat plateau and along the runnels, (minor drainages), in the Bog veneers.

Refer to text pages 57, 62, 70, 72, 74 and 75 for detailed Ecosection Description and Environmental Sensitivity.

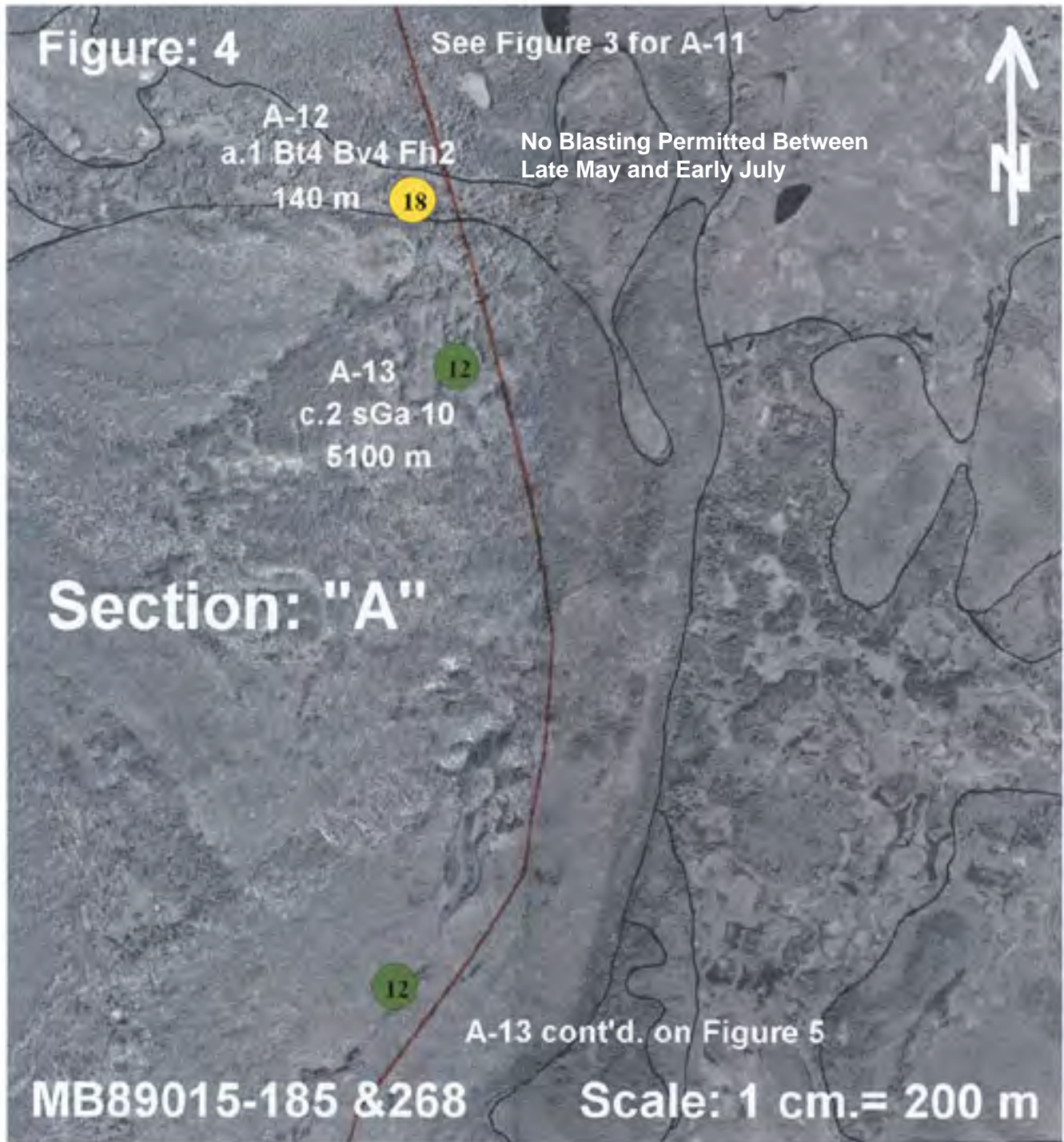


Figure: 4 Mile 17 Upland Access Route to Wuskwatim G. S

Ecosection: A-12 Poorly drained, nearly level, deep Peat plateau, (>2 m. forest peat), overlying clay Lacustrine sediments, (40%) and poorly drained, gently sloping Bog veneer, (40%), (less than 1 m. peat) overlying clay sediments and very poorly drained Fen, (20%). **Environmental Sensitivity: MODERATE.**

Ecosection: A-13 Well to excessively drained, gently sloping stratified sandy Glaciofluvial apron (100%) Limited quantities of gravel may be found at depths below 1 meter. **Environmental Sensitivity: Low**

Permafrost is present in the peat plateaus and along the runnels, (minor drainages), in the Bog veneers.

Refer to text pages 62 and 69 for detailed Ecosection Descriptions and Environmental Sensitivity.

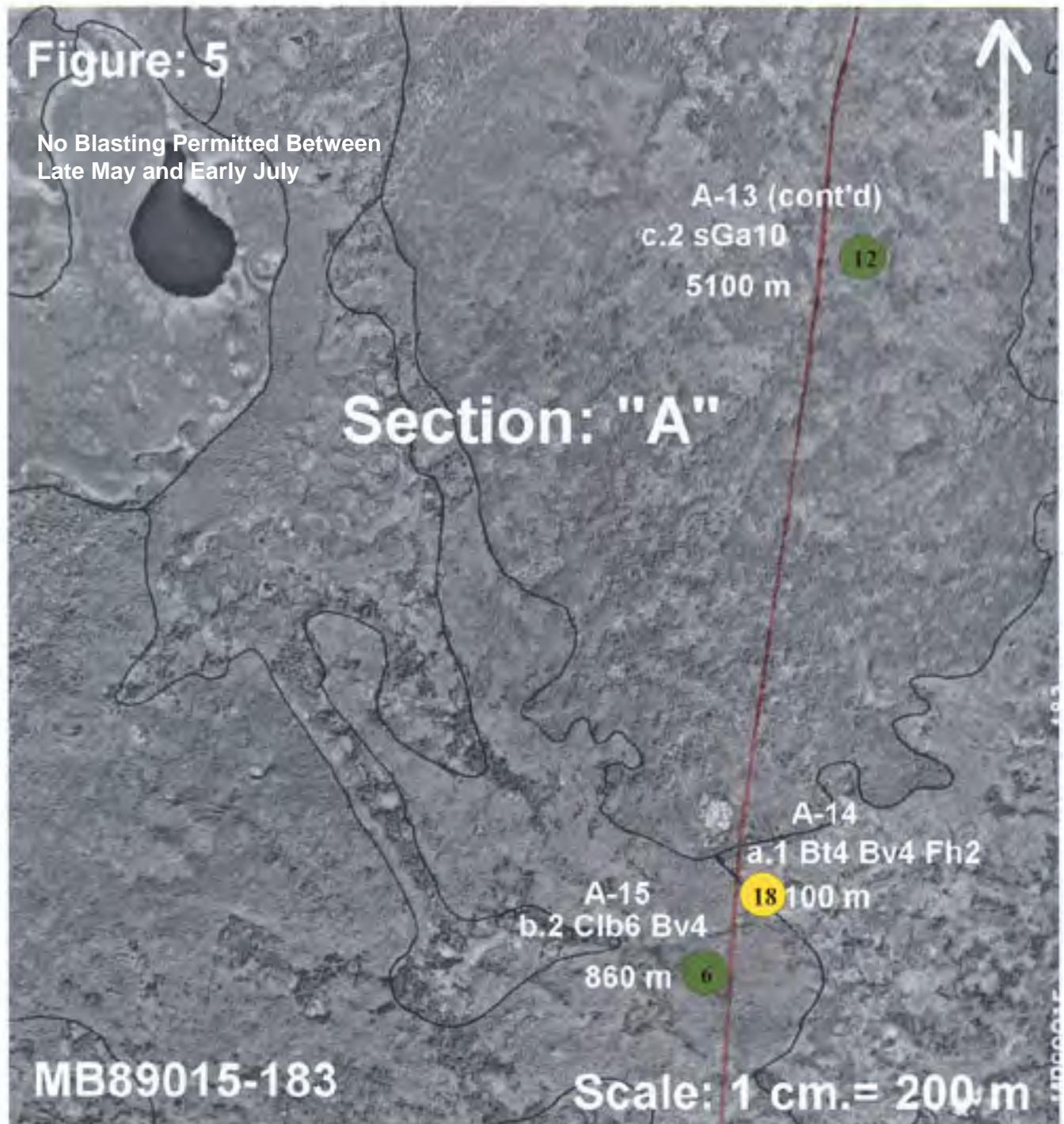


Figure: 5 Mile 17 Upland Access Route to Wuskwatim G. S

Ecosection: A-13 Well to excessively drained, gently sloping stratified sandy Glaciofluvial apron (100%) Limited quantities of gravel may be found at depths below 1 meter. **Environmental Sensitivity: LOW.**

Ecosection: A-14 Poorly drained, nearly level, deep Peat plateau, (>2 m. forest peat), overlying clay Lacustrine sediments, (40%) and poorly drained, gently sloping Bog veneer, (40%), (less than 1 m. peat) overlying clay sediments and very poorly drained Fen, (20%). **Environmental Sensitivity: MODERATE.**

Ecosection: A-15 Imperfectly drained, moderately sloping clay Lacustrine blanket (60%) and poorly drained, gently sloping Bog veneer, (40%), (less than 1 m. peat) overlying clay sediments. **Environmental Sensitivity: LOW.** Permafrost is present in the peat plateaus and along the runnels, (minor drainages), in the Bog veneers.

Refer to text pages 56, 62 and 69 for detailed Ecosection Descriptions and Environmental Sensitivity.

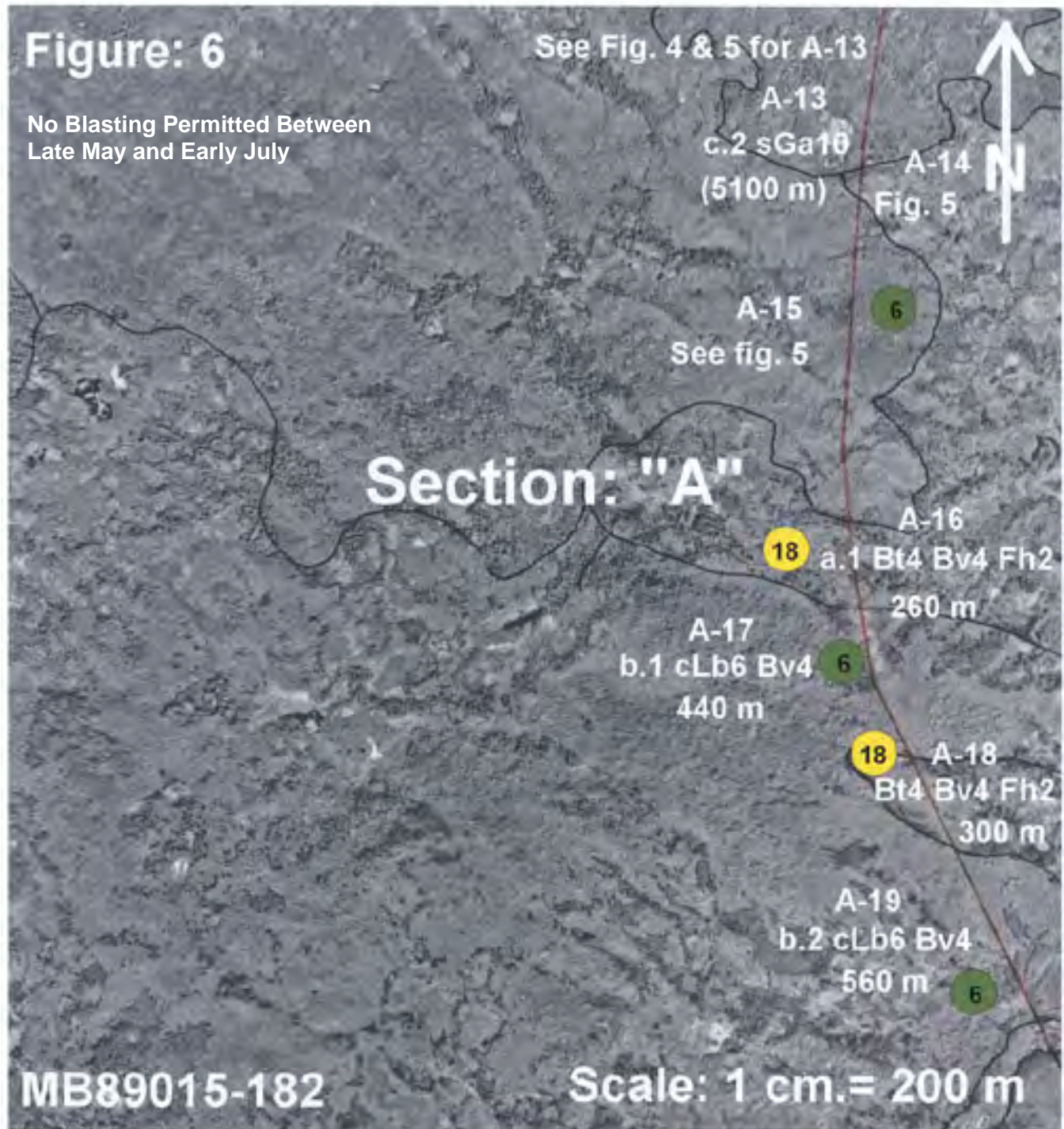


Figure: 6 Mile17 Upland Access Route to Wuskwatim G. S.

Ecosection: A-13 Well to excessively drained, gently sloping stratified sandy Glaciofluvial apron (100%) Limited quantities of gravel may be found at depths below 1 meter. **Environmental Sensitivity: LOW**

Ecosection: A-14, 16 and 18 Poorly drained, nearly level, deep Peat plateau, (>2 m. forest peat), overlying clay Lacustrine sediments, (40%) and poorly drained, gently sloping Bog veneer, (40%), (less than 1 m. peat) overlying clay sediments and very poorly drained Fen, (20%). **Environmental Sensitivity: MOD**

Ecosection: A-15, 17 and 19 Imperfectly drained, moderately sloping clay Lacustrine blanket (60%) and poorly drained, gently sloping Bog veneer, (40%), (1< m. peat) overlying clay sediments.

Environmental Sensitivity: LOW

Permafrost is present in the peat plateau and along the runnels, (minor drainages), in the Bog veneers.

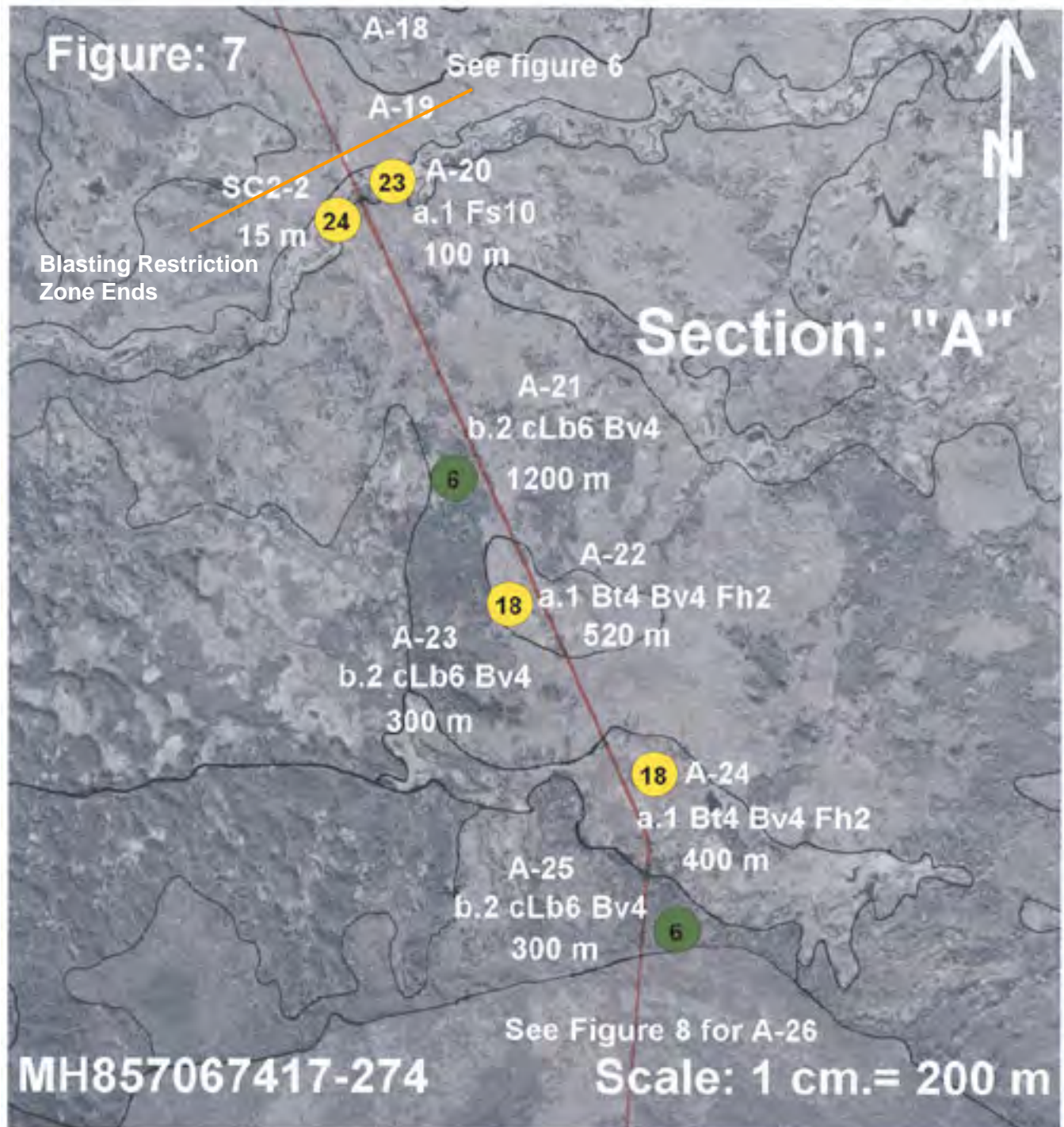


Figure: 7 Mile 17 Upland Access Route to Wuskwatim G. S.

Ecosection: 20 Poorly drained fen stream and **Stream Crossing 2-2 (R2), (345+04).** **Environmental Sensitivity: MODERATE**

Ecosection: A-22 and 24 Poorly drained, nearly level, deep Peat plateau, (>2 m. forest peat), overlying clay Lacustrine sediments, (40%), and poorly drained gently sloping Bog veneer, (40%) (less than 1 m. peat) overlying clay sediments and very poorly drained Fen, (20%). **Environmental Sensitivity: MODERATE**

Ecosection: A-21, 23 and 25 Imperfectly drained, moderately sloping clay Lacustrine blanket (60%) and poorly drained, gently sloping Bog veneer, (40 %), (<1 m peat overlying clay sediments).

Environmental Sensitivity: LOW.

Permafrost is present in the peat plateaus and along the runnels, (minor drainages), in the Bog veneers.

Refer to text pages 56, 69, 74 and 75 for detailed **Eco**section descriptions and **Environmental Sensitivity**.

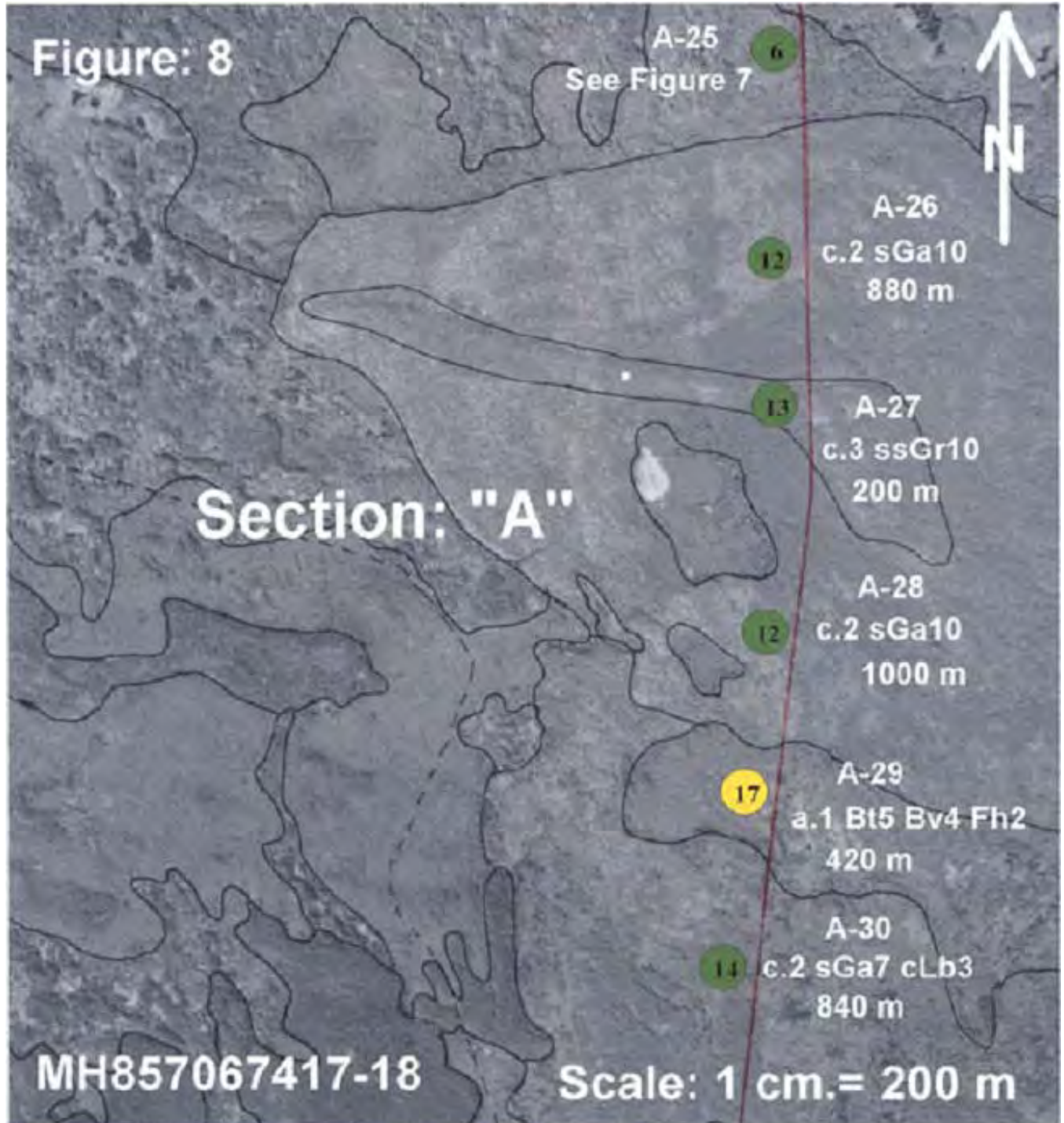


Figure: 8 Mile 17 Upland Access Route to Wuskwatim G. S.

Ecosection: A-26 and 28 Well to excessively drained, gently sloping, sandy Glaciofluvial apron (100%) Limited quantities of gravel may be found at depths below 1 meter. **Environmental Sensitivity: LOW.**

Ecosection: A-27 Rapidly drained, strongly sloping stratified sandy Glaciofluvial ridged (100%). Abundant quantities of gravel may be found along the esker ridge. **Environmental Sensitivity: LOW**

Ecosection: A-29 Poorly drained, nearly level, deep Peat plateau, (>2 m. forest peat), overlying clay Lacustrine sediments (50%) and poorly drained, nearly level, deep Peat Plateau, (.2m. forest peat), overlying clay Lacustrine sediments and very poorly drained Fen, (20%). **Environmental Sensitivity: MOD.**

Ecosection: A-30 Well drained, gently sloping, stratified, sandy Glaciofluvial apron, (70%) and moderately well drained, undulating clay Lacustrine blanket (30%) **Environmental Sensitivity: LOW.**

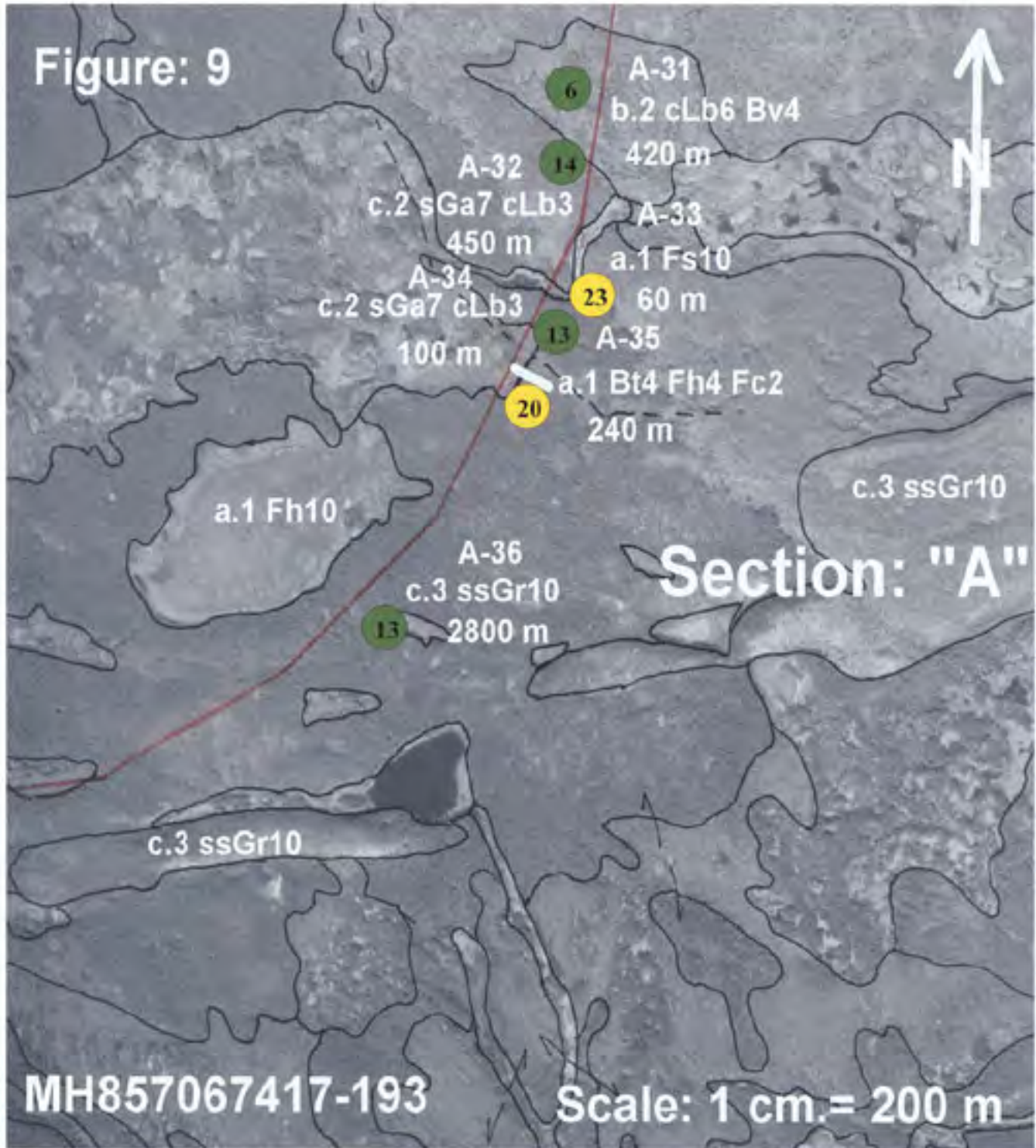


Figure: 9 Mile 17 Upland Access Route to Wuskwatim G. S.

Ecosection: A-31 Imperfectly drained, moderately sloping clay Lacustrine blanket (60%) and poorly drained, gently sloping Bog veneer, (40%), (<1m. peat) overlying sloping clay sediments. **Environmental Sensitivity: LOW.**

Ecosections: A-32 Well drained, gently sloping, stratified, sandy Glaciofluvial apron, (70%) and moderately well drained, undulating clay Lacustrine blanket (30%). **Environmental Sensitivity: LOW.**

Ecosection: A-33 Poorly drained, Fen stream and seasonal runnel. **Environmental Sensitivity: MODERATE.**

Ecosection: A-34 and 36 Rapidly drained, strongly sloping stratified sandy Glaciofluvial ridged (100%). Sufficient quantities of gravel may be found along the esker ridge. **Environmental Sensitivity: LOW.**

Ecosection A-35 Poorly drained, nearly level, deep Peat plateau, (>2 m. forest peat), overlying clay Lacustrine sediments, (40%), and very poorly drained Fen, (20%). **Environmental Sensitivity: MODERATE.**

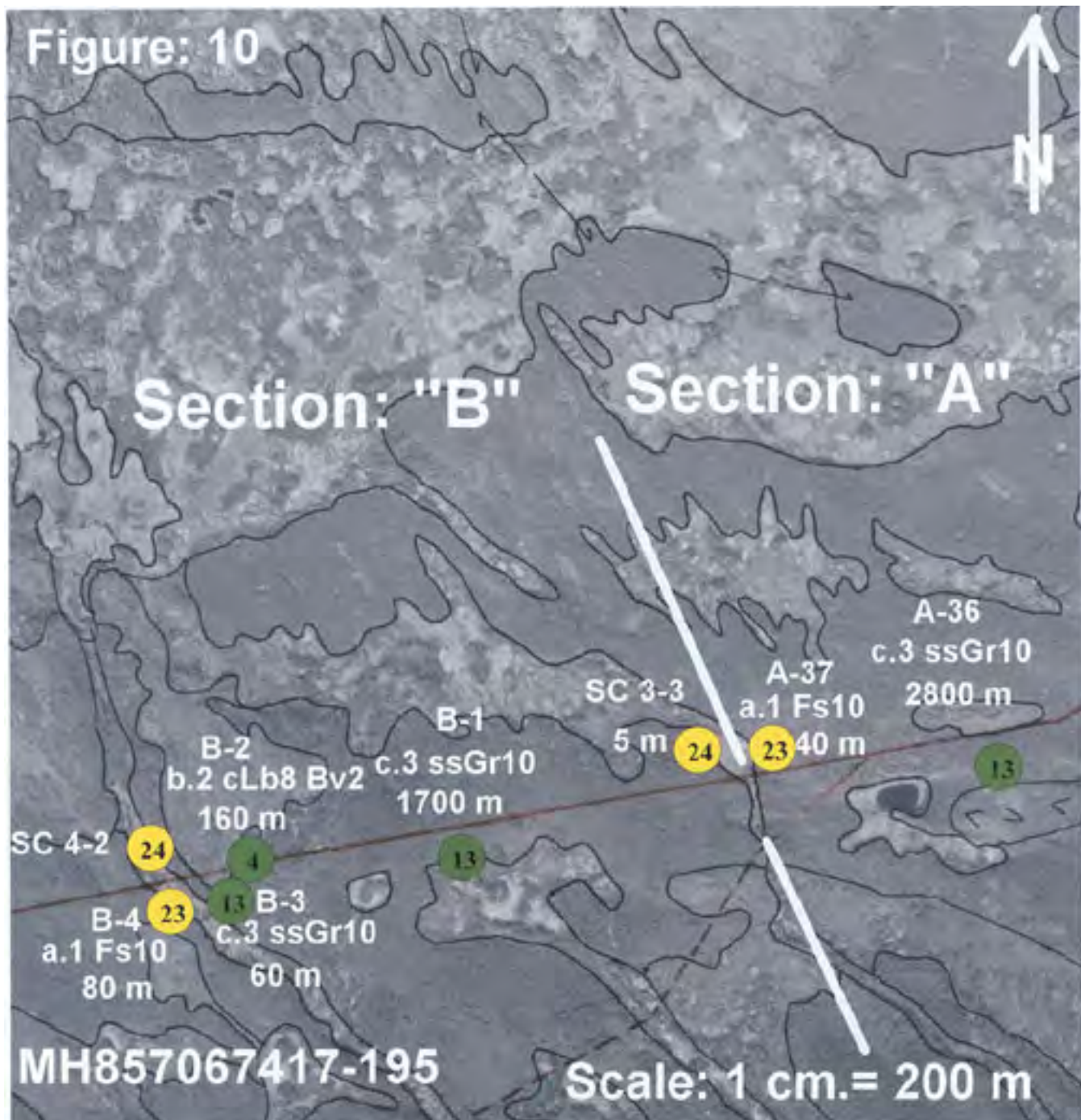


Figure: 10 Mile 17 Upland Access Route to Wuskwatim G. S.

Ecosection: A36 and B-1 Rapidly drained, strongly stratified sandy Glaciofluvial ridged (100%). Ample quantities of gravel may be found along the esker ridge. **Environmental Sensitivity: LOW**

Ecosection: A-37 and B-4 Poorly drained Fen stream and seasonal runnel. **Stream Crossings SC 3-3 (R3) (243+16) and SC 4-2 (R4) (223+60).** **Environmental Sensitivity: MODERATE.**

Ecosection: B-2 Imperfectly drained, moderately sloping clay Lacustrine blanket (80%) and poorly drained, gently sloping Bog veneer, (20%), (<1 m. peat) overlying clay sediments. **Environmental Sensitivity: LOW.**

Ecosection: B-3 Well drained, gently sloping, stratified, sandy Glaciofluvial apron, (70%) and moderately well drained, undulating clay Lacustrine blanket (30%). **Environmental Sensitivity: LOW**

Permafrost is present in the peat plateau and along the runnels, (minor drainage), in the Bog veneers.

Refer to text pages 54, 63, 74 and 75 for detailed Ecosection Description and Environmental Sensitivity.

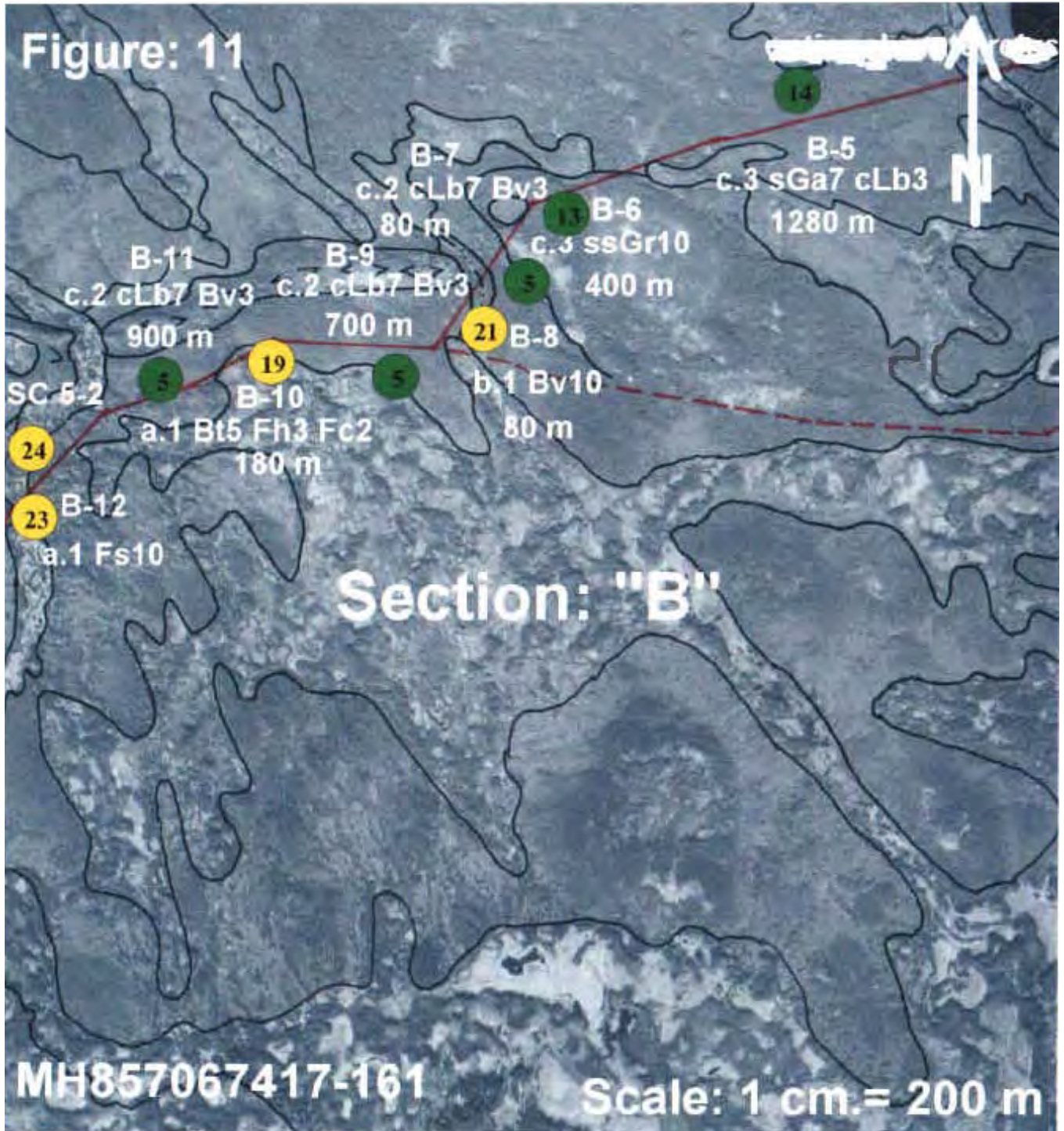


Figure: 11 Mile 17 Upland Access Route to Wuskwatim G. S.

Ecosection: B-5 Well drained, gently sloping, stratified, sandy Glaciofluvial apron, (70%) and moderately well drained, undulating clay Lacustrine blanket (30%). **Environmental Sensitivity: LOW.**

Ecosection: B-6 Rapidly drained, strongly sloping stratified sandy Glaciofluvial ridged (100%). Ample quantities of gravel may be found along the esker ridge. **Environmental Sensitivity: LOW.**

Ecosection: B-7, 9, and 11 Imperfectly drained, moderately sloping clay Lacustrine blanket (70%) and poorly drained, gently sloping Bog veneer, (30%), (<1 m. peat) overlying clay. **Environmental Sensitivity: LOW.**

Ecosection: B-10 Poorly drained, nearly level, deep Peat plateau, (>2 m. forest peat), overlying clay Lacustrine sediments, (50%), very poorly drained deep horizontal fen, (30%), (>2.5 m. peat) overlying clay sediments and saturated, very deep Fen collapse, (20%). **Environmental Sensitivity: MODERATE.**

Ecosection: B-12 Poorly drained Fen stream and **Stream Crossing 5-2 (R5)(187+20).** **Environmental Sensitivity: MODERATE.**

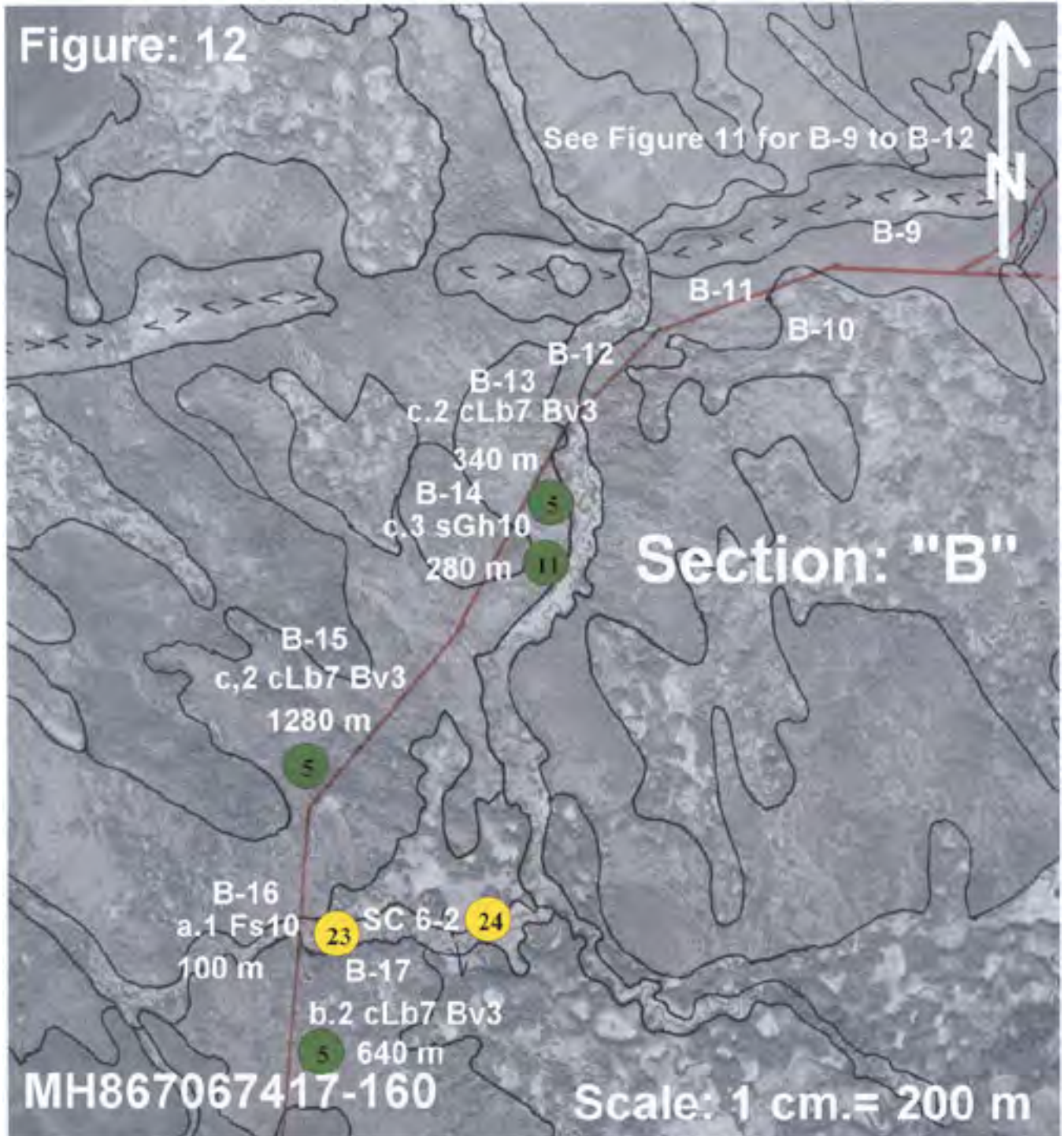


Figure: 12 Mile 17 Upland Access Route to Wuskwatim G. S.

Ecosection: B-13, 15, and 17 Imperfectly drained, moderately sloping clay Lacustrine blanket (70%) and poorly drained, gently sloping Bog veneer, (30%), (1< m. peat) overlying clay. **Environmental Sensitivity: LOW.**

Ecosection: B-14 Very well drained, gently sloping, stratified, sandy Glaciofluvial, hummocky, (100%).

Ecosection: B-16 Poorly drained Fen stream and **Stream Crossing 6-2 (R6)(167+60) Environmental Sensitivity: MOD**

Permafrost is present in the peat plateau and along the runnels, (minor drainage), in the Bog veneers.

Refer to text pages 55, 61, 74 and 75 for detailed Ecosection Descriptions and Environmental Sensitivity.

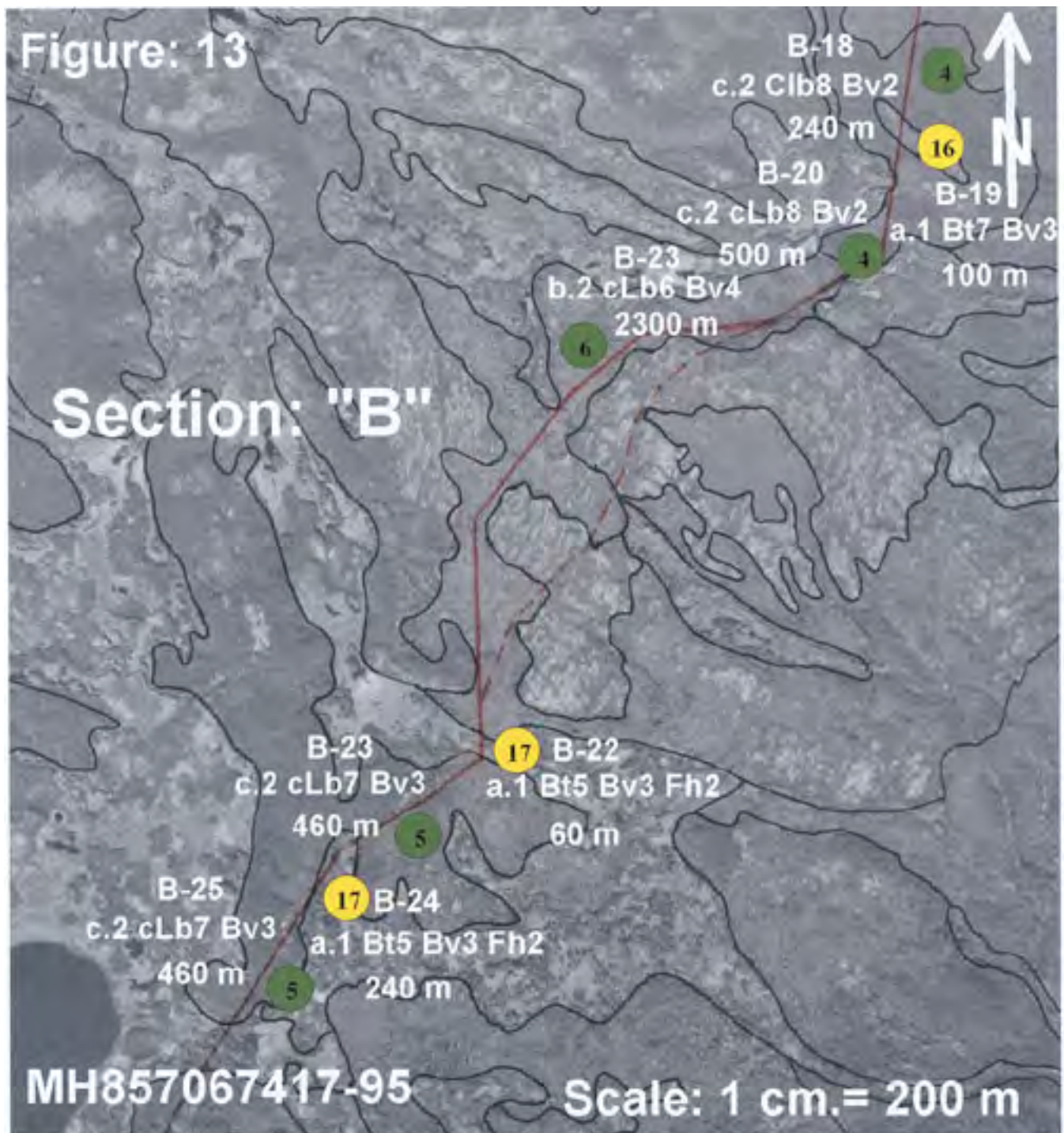


Figure: 13 Mile 17 Upland Access Route to Wuskwatim G. S.

Ecosection: B-18 and 20 Imperfectly drained, moderately sloping clay Lacustrine blanket (80%) and poorly drained, gently sloping Bog veneer, (20%), (<1m. peat) overlying clay. **Environmental Sensitivity: LOW.**

Ecosection: B-21, (misnumbered B-23) Imperfectly drained, moderately sloping clay Lacustrine blanket (60%) and poorly drained, gently sloping Bog veneer, (40%), (<1m. peat) overlying clay. **Environmental Sensitivity: LOW.**

Ecosection: B-22 and 24 Poorly drained, nearly level, deep Peat plateau, (>2 m. forest peat), overlying clay Lacustrine sediments, (50%) and poorly drained, gently sloping Bog veneer, (30%), (less than 1 m. peat) overlying clay sediments and very poorly drained Fen, (20%). **Environmental Sensitivity: MODERATE.**

Ecosection: B-23 and 25 Imperfectly drained, moderately sloping clay Lacustrine blanket (70%) and poorly drained, gently sloping Bog veneer, (30%), (<1 m. peat) overlying clay. **Environmental Sensitivity: LOW.**

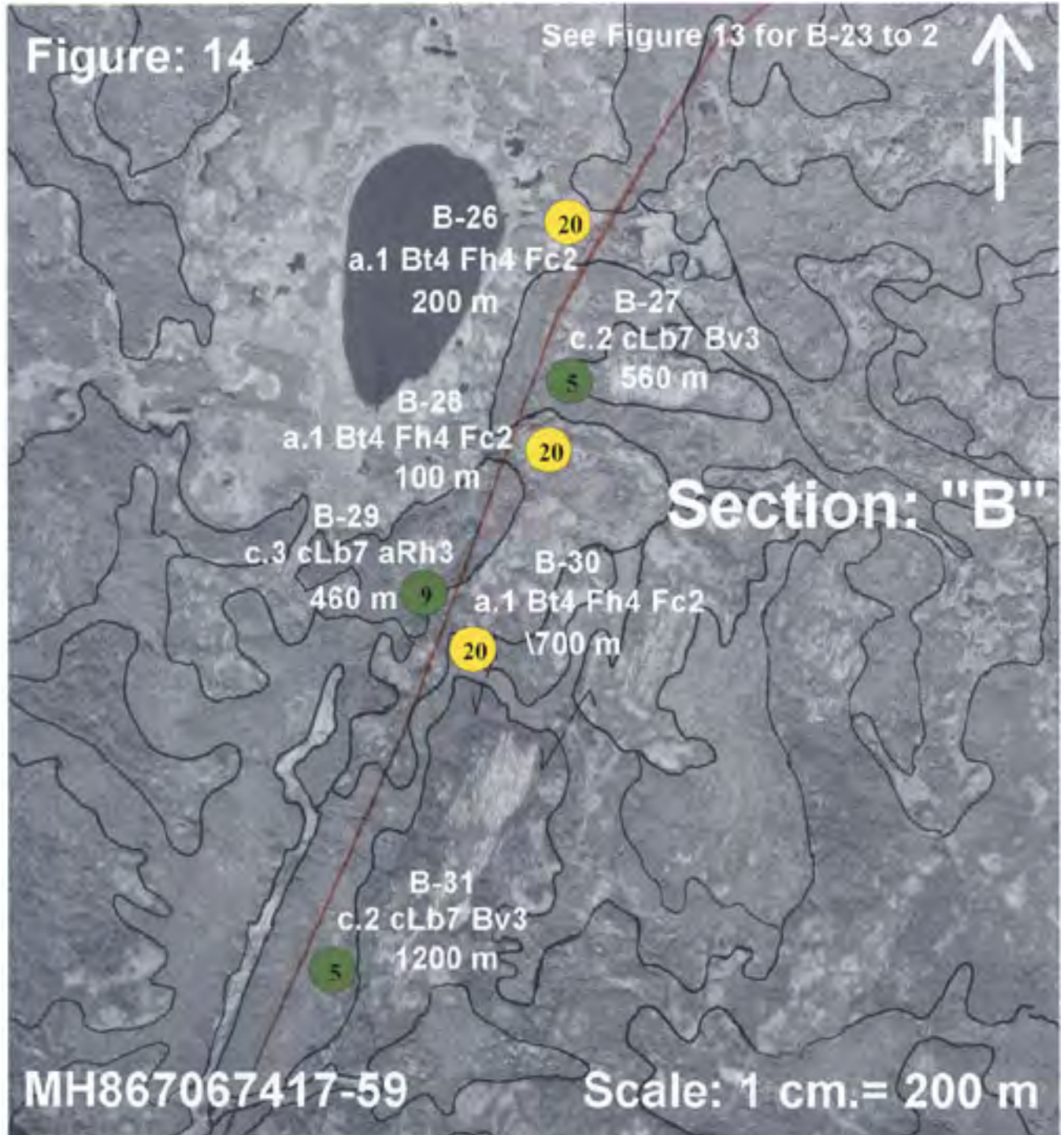


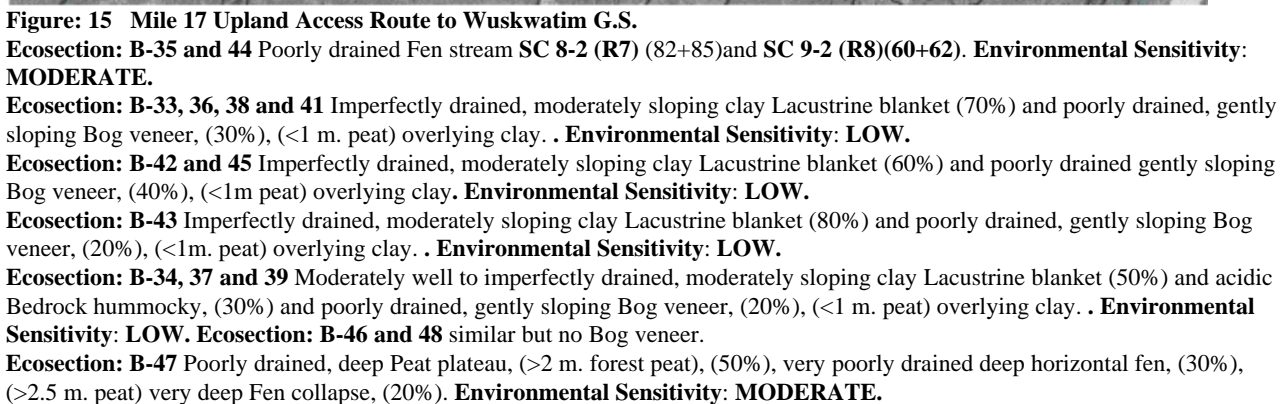
Figure: 14 Mile 17 Upland Access Route to Wuskwatim G. S. Ecosection: B-26, 28 and 30 Poorly drained, nearly level, deep level, deep Peat plateau, (>2 m. forest peat), overlying clay Lacustrine sediments, (40%), very poorly drained deep horizontal fen, (40%), (>2.5 m. peat) overlying clay sediments and saturated, very deep Fen collapse, (20%).. **Environmental Sensitivity: MODERATE.**

Ecosection: B-29 Moderately well to imperfectly drained, moderately sloping clay Lacustrine blanket (70%) and acidic Bedrock hummocky (30%). **Environmental Sensitivity: LOW.**

Ecosection: B-27 and 31 Imperfectly drained, moderately sloping clay Lacustrine blanket (70%) and poorly drained, gently sloping Bog veneer, (30%), (<1 m. peat) overlying clay. **Environmental Sensitivity: LOW.**

Permafrost is present in the peat plateaus and along the runnels, (minor drainage), in the Bog veneers.

Refer to text pages 55, 59 and 71 for detailed Ecosection Description and Environmental Sensitivity.



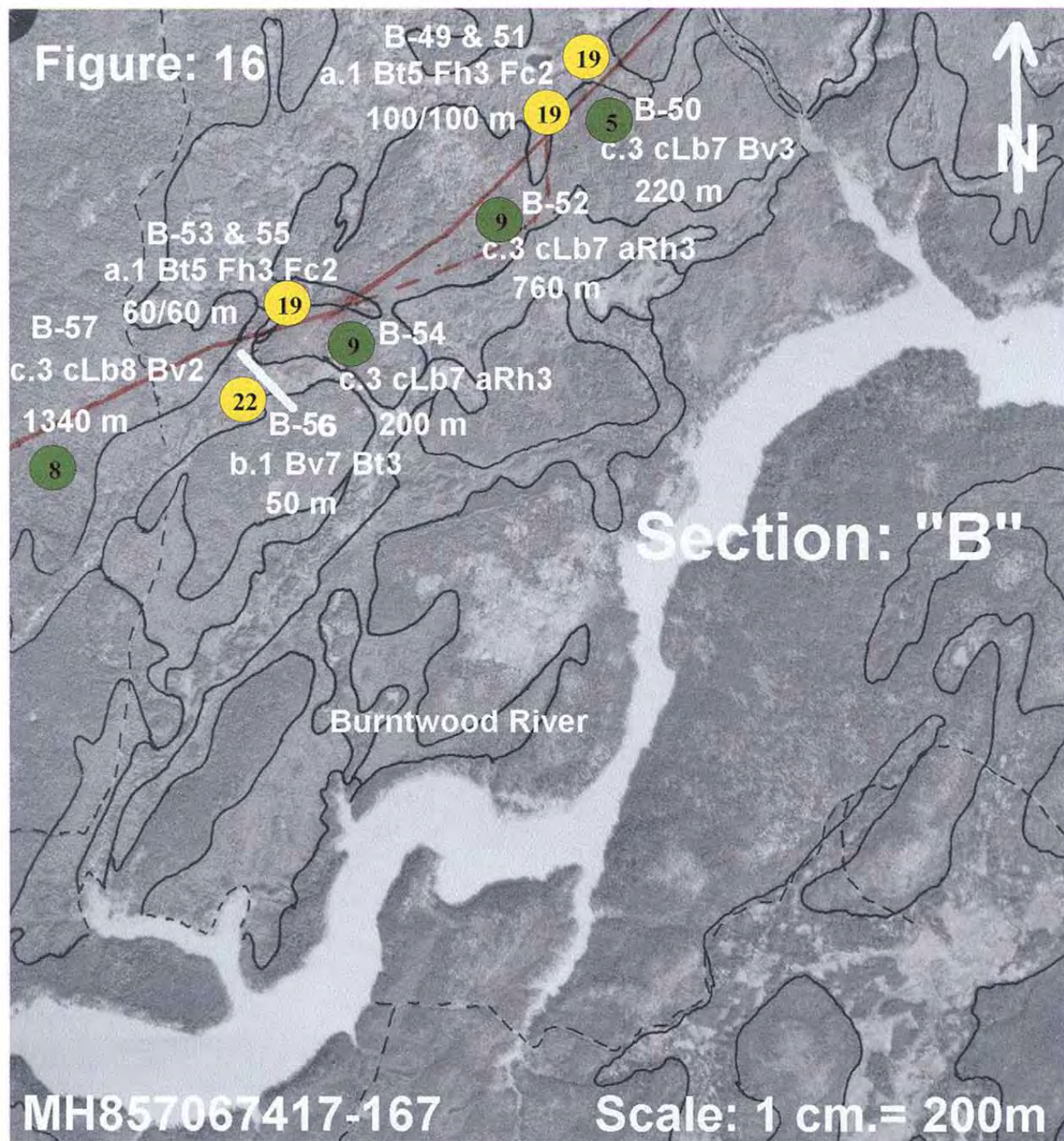


Figure: 16 Mile 17 Upland Access Route to Wuskwatim G. S.

Ecosection: B-49, 51, 53 and 55 Poorly drained, deep Peat plateau, (>2 m. forest peat), (50%), very poorly drained deep horizontal fen, (30%), (>2.5 m. peat) very deep Fen collapse, (20%). **Environmental Sensitivity: MODERATE.**

Ecosection: B-50 Imperfectly drained, moderately sloping clay Lacustrine blanket (70%), and acidic Bedrock hummocky, (30%). **Environmental Sensitivity: LOW.**

Ecosection: B-52 and 54 Moderately well to imperfectly drained, moderately sloping clay Lacustrine blanket (70%) and acidic Bedrock hummocky, (30%). **Environmental Sensitivity: LOW.**

Ecosection: B-53 and 55 Poorly drained, moderately deep Peat plateau, (50%), very poorly drained Fen horizontal (30%) and saturated, very deep Fen collapse, (20%). **Environmental Sensitivity: LOW.**

Ecosection: B-56 Gently sloping Bog veneer, (70%) and poorly drained, deep Peat plateau, (>2m. forest peat), (30%). **Environmental Sensitivity: MODERATE.**



Figure: 17 Mile 17 Upland Access Route to Wuskwatim G. S.

Ecosection: B-57 Moderately well to imperfectly drained, moderately sloping clay Lacustrine blanket (80%) and acidic Bedrock hummocky, (20%). **Environmental Sensitivity: LOW.**

Ecosection: B-58 Gently sloping Bog veneer, (70%) and poorly drained, deep Peat plateau, (>2 m. forest peat), (30%). **Environmental Sensitivity: MODERATE.**

Permafrost is present in the peat plateaus and along the runnels, (minor drainage), in the Bog veneers.

Refer to text pages 58 and 73 for detailed Ecosection Descriptions and Environmental Sensitivity.

Section: "A" UPLAND and LOWLAND ECOSECTION-LENGTHS and CUMULATIVE DISTANCE (METERS)

Table: 1

ECO-SECTION	RELIEF SLOPE	ECOSECTIONS and ECOSITES	SENS.	LENGTH meters	UPLAND	LOWLAND	CUM. DISTANCE
Figure: 1	Page 78	Photo: MB89015-264 Scale:1:20,000					
A - 1	b 2	clay Lacustrine 6 Bog veneer 4	Low	1900	1140	760	1,900
A - 2	a 1	Peat plateau 7 Bog veneer 3	Mod	400		400	2,300
Figure: 2	Page 79	Photo: MB89015-189 Scale:1:20,000					
A - 3	b 2	clay Lacustrine 6 Bog veneer 4	Mod	760	455	305	3,060
A - 4	a 1	Peat plateau 5 Bog veneer 3 Fen hor. 2	Mod	300		300	3,360
A - 5	c 2	sandy Glaciofluvial apron 10	Low	1220	1220		4,580
Figure: 3	Page 80	Photo: Mb89015-187 Scale:1:20,000					
A - 6	c 2	clay Lacustrine 7 sandy Glaciofluvial 3	Low	580	580		5,160
A - 7	b 1	Bog veneer 10	Low	320		320	5,480
A - 8	a 1	Peat plateau 5 Fen hor.3 Fen coll.2	Mod	140		140	5,620
A - 9	c 2	clay Lacustrine 7 sandy Glaciofluvial 3	Low	500	500		6,120
A - 10	a 1	Fen stream 10	Mod	100		100	6,220
SC 1 - 3		Class 3 Stream - 6,170 to 6,185 m	Mod	15		15	6,235
A - 11	c 2	clay Lacustrine 7 sandy Glaciofluvial 3	Low	960	960		7,195
Figure: 4	Page 81	Photo: MB89015-185 Scale:1:20,000					
A - 12	a 1	Peat plateau 4 Bog veneer 4 Fen hor.2	Mod	140		140	7,335
A - 13	c 2	sandy Glaciofluvial apron 10	Low	5100	5100		12,435
Figure: 5	Page 82	Photo:MB89015-183 Scale:1:20,000					
A - 14	a 1	Peat plateau 4 Bog veneer 4 Fen hor.2	Mod	100	515	100	12,535
A - 15	b 2	clay Lacustrine 6 Bog veneer 4	Low	860		345	13,395
Figure: 6	Page 83	Photo:MB89015-182 Scale:1:20K					
A - 16	a 1	Peat plateau 4 Bog veneer 4 Fen hor.2	Mod	260		260	13,655
A - 17	b 2	clay Lacustrine 6 Bog veneer 4	Low	440	265	175	14,095
A - 18	a 1	Peat plateau 4 Bog veneer 4 Fen hor.2	Mod	300		300	14,395
A - 19	b 2	clay Lacustrine 6 Bog veneer 4	Low	560	335	225	14,955
Figure: 7	Page: 84	Photo:MH857067417-274 Scale:1:20K					
A - 20	a 1	Fen stream 10	Mod	100		100	15,055
SC 2 - 2		Class 2 Stream - 14,985 to 15,000 m.	Mod	15		15	15,070
A - 21	b 2	clay Lacustrine 6 Bog veneer 4	Low	1200	720	480	16,270
A - 22	a 1	Peat plateau 4 Bog veneer 4 Fen hor.2	Mod	520		520	16,790
A - 23	b 2	clay Lacustrine 6 Bog veneer 4	Low	300	180	120	17,090
A - 24	a 1	Peat plateau 4 Bog veneer 4 Fen hor.2	Mod	400		400	17,490
A - 25	b 2	clay Lacustrine 6 Bog veneer 4	Low	300	180	120	17,790
Distance	Meters	(Sub Total - Section A)		17,790	12,150	5,640	17,790

**SECTION: "A" UPLAND and LOWLAND ECOSECTION-LENGTHS AND CUMULATIVE DISTANCE
(METERS)**

ECO-SECTION	RELIEF SLOPE	ECOSECTIONS and ECOSITES	SENS.	LENGTH meters	UPLAND	LOWLAND	CUM. DISTANCE
Figure: 8	Page 85	Photo:MH857067418-18 Scale:1:20K	Sub-	Tot. 17,790	12,150	5,640	17,790
A – 26	c 2	sandy Glaciofluvial apron 10	Low	880	880		18,670
A – 27	c 3	sandy skeletal Glaciofluvial ridge 10	Low	200	200		18,870
A – 28	c 2	sandy Glaciofluvial apron 10	Low	1000	1000		19,870
A – 29	a 1	Peat plateau 5 Bog veneer 3 Fen hor. 2	Mod	420		420	20,290
A – 30	c 2	sandy Glaciofluvial 7 clay Lacustrine 3	Low	840	840		21,130
Figure: 9	Page 86	Photo:MH857067417-193 Scale:1:20K					
A – 31	b 2	clay Lacustrine 6 Bog veneer 4	Low	420	250	170	21,550
A – 32	c 2	sandy Glaciofluvial 7 clay Lacustrine 3	Low	450	450		22,000
A – 33	a 1	Fen stream 10 (peripheral stream)	Mod	60		60	22,060
A – 34	c 3	sandy Glaciofluvial ridge 10	Low	100	100		22,160
A – 35	a 1	Peat plateau 4 Fen hor.4 Fen collapse 2	Mod	240		240	22,400
A – 36	c 3	sandy skeletal Glaciofluvial ridge 10	Low	2800	2800		25,200
Figure: 10	Page 87	Photo:MH857067417-195 Scale:1:20K					
A – 37	a 1	Fen stream 10	Mod	40		40	25,240
SC 3 – 3		Class 3 Stream - 25,220 to 25,225 m		5		5	25,245
Distance	Meters	Total Section: "A"		25,245	18,670	6,575	25,245
ECO-SECTION	RELIEF SLOPE	ECOSECTIONS and ECOSITES	SENS.	LENGTH meters	UPLAND	LOWLAND	CUM. DISTANCE
Figure: 10	Page 87	Photo:MH857067417-195 Scale:1:20K					
B – 1	c 3	sandy skeletal Glaciofluvial ridge 10	Low	1700	1700		26,945
B – 2	b 2	clay Lacustrine 8 Bog veneer 2	Low	160	130	30	27,105
B – 3	c 3	sandy skeletal Glaciofluvial ridge 10	Low	60	60		27,165
B – 4	a 1	Fen stream 10	Mod	80		80	27,245
SC 4-2		Class 2 Stream - 27, 140 to 27, 150	Mod	10		10	27,255
Figure: 11	Page 88	Photo:MH857067417-197 Scale:1:20K					
B – 5	c 3	sandy Glaciofluvial 7 clay Lacustrine 3	Low	1280	1280		28,535
B – 6	c 3	sandy skeletal Glaciofluvial ridge 10	Low	400	400		28,935
B – 7	c 2	clay Lacustrine 7 Bog veneer 3	Low	80	80		29,015
B – 8	b 1	bog veneer 10	Mod	80		80	29,095
B – 9	c 2	clay Lacustrine 7 Bog veneer 3	Low	700	500	200	29,795
B – 10	a 1	Peat plateau 5 Fen hor.3 Fen collapse 2	Mod	180		180	29,975
B – 11	c 2	clay Lacustrine 7 Bog veneer 3	Low	900	630	270	30,875

B – 12	a 1	Fen stream 10	Mod	80		80	30,955
SC 5-2		Class 2 Stream - 31,400 to 31,410 m	Mod	10		10	30,965
Distance	Meters	(sub total)		30,965	23,965	7,515	30,965

Section “B” UPLAND and LOWLAND ECOSECTION-LENGTHS and CUMULATIVE DISTANCE (METERS)

ECO-SECTION	RELIEF SLOPE	ECOSECTIONS and ECOSITES	SENS.	LENGTH meters	UPLAND	LOWLAND	CUM. DISTANCE
Figure: 12	Page 89	Photo: MH857067417-160 Sca: 1:20K	Sub-	Tot. 30,965	23,450	7,515	30,965
B – 13	c 2	clay Lacustrine 7 Bog veneer 3	Low	340	240	100	31,305
B – 14	c 3	sandy Glaciofluvial hummocky 10	Low	280	280		31,585
B – 15	c 2	clay Lacustrine 7 Bog veneer 3	Low	1280	900	380	32,865
B – 16	a 1	Fen stream 10	Mod	100		100	32,965
SC 6-2		Class 2 Stream - 32,950 to 32,960 m	Mod	10		10	33,975
B – 17	b 2	clay Lacustrine 7 Bog veneer 3	Low	640	450	190	33,615
Figure: 13	Page 90	Photo: MH857067417-95 Sca: 1:20K					
B – 18	c 2	clay Lacustrine 8 Bog veneer 2	Low	240	190	50	33,855
B – 19	a 1	Peat plateau 7 Bog veneer 3	Mod	100		100	33,965
B – 20	c 2	clay Lacustrine 8 Bog veneer 2	Low	500	400	100	34,455
B – 21	b 2	clay Lacustrine 6 Bog veneer 4	Low	2300	1380	920	36,755
B – 22	a 1	Peat plateau 5 Bog veneer 3 Fen hor.2	Mod	60		60	36,815
B – 23	c 2	clay Lacustrine 7 Bog veneer 3	Low	460	320	140	37,275
B – 24	a 1	Peat plateau 5 Bog veneer 3 Fen hor.2	Mod	240		240	37,515
B – 25	c 2	clay Lacustrine 7 Bog veneer 3	Low	460	320	140	37,975
Figure: 14	Page 91	Photo: MH857067417-59 Sca: 1:20K					
B – 26	a 1	Peat plateau 4 Fen hor. 4 Fen collapse2	Mod	200		200	38,175
B – 27	c 2	clay Lacustrine 7 Bog veneer 3	Low	560	390	170	38,735
B – 28	a 1	Peat plateau 4 Fen hor. 4 Fen collapse2	Mod	100		100	38,835
B – 29	c 3	clay Lacustrine 7 acid Rock hummocky3	Low	460	460		39,295
B – 30	a 1	Peat plateau 4 Fen hor. 4 Fen collapse2	Mod	700		700	39,995
B - 31	c 2	clay Lacustrine 7 Bog veneer 3	Low	1200	840	360	41,195
Figure: 15	Page 92	Photo: MH857067417-04 Sca: 1:20K					
B – 32	a 1	Fen stream 10	Mod	50		50	41,245
B – 33	c 2	clay Lacustrine 7 Bog veneer 3	Low	340	240	100	41,595
B – 34	c 3	clay Lacustrine 5 acid Rock3 Bog vnr2	Low	160	130	30	41,755
B – 35	a 1	Fen stream 10	Mod	120		120	41,875
SC 8 - 2		Class 2 Stream - 441875 to 42,005	Mod	10		10	41,885
B – 36	c 2	clay Lacustrine 7 Bog veneer 3	Low	120	85	35	42,005
B – 37	c 3	clay Lacustrine 5 acid Rock3 Bog vnr2	Low	240	190	50	42,245
B – 38	c 2	clay Lacustrine 7 Bog veneer 3	Low	360	250	110	42,605
B – 39	c 3	clay Lacustrine 5 acid Rock3 Bog vnr2	Low	400	320	80	43,005
B – 40	a 1	Peat plateau 6 Bog veneer 4	Mod	280		280	43,285
Distance	Meters	Sub - Total Section: "B"		43,285	30,835	12,450	43,285

**Section "B" UPLAND and LOWLAND ECOSECTION-LENGTHS and CUMULATIVE DISTANCE
(METERS)**

ECO-SECTION	RELIEF SLOPE	ECOSECTIONS and ECOSITES	SENS.	LENGTH meters	UPLAND	LOWLAND	CUM. DISTANCE
Distance	Meters	Sub - Total Section: "B"		43,285	30,835	12,450	43,285
Figure: 15	Page 92	Photo: MH875067417-197 Sca: 1:20K					
B – 41	c 2	clay Lacustrine 7 Bog veneer 3	Low	140	100	40	43,425
B – 42	b 2	clay Lacustrine 6 Bog veneer 4	Low	360	215	145	43,785
B – 43	c 2	clay Lacustrine 8 Bog veneer 2	Low	260	210	50	44,045
B – 44	a 1	Fen stream 10	Mod	120		120	44,165
SC 9 - 2		Class 2 Stream - 44,100 to 44,110	Mod	10		10	44,175
B – 45	c 2	clay Lacustrine 6 Bog veneer 4	Low	540	325	215	44,715
B – 46	c 3	clay Lacustrine 7 acid Rock hummocky 3	Low	50	50		44,765
B – 47	a 1	Peat plateau 5 Fen hor. 3 Fen collapse 2	Mod	80		80	44,845
B – 48	c 3	clay Lacustrine 7 acid Rock hummocky 3	Low	300	210	90	45,145
Figure: 16	Page 93	Photo: MH875067416-167 Sca: 1:20K					
B – 49	a 1	Peat plateau 5 Fen hor. 3 Fen collapse 2	Mod	100		100	45,245
B – 50	c 3	clay Lacustrine 7 acid Rock hummocky 3	Low	220	220		45,465
B – 51	a 1	Peat plateau 5 Fen hor. 3 Fen collapse 2	Mod	100		100	45,565
B – 52	c 3	clay Lacustrine 7 acid Rock hummocky 3	Low	760	760		46,325
B – 53	a 1	Peat plateau 5 Fen hor. 3 Fen collapse 2	Mod	60		60	46,385
B – 54	c 3	clay Lacustrine 7 acid Rock hummocky 3	Low	200	200		46,585
B – 55	a 1	Peat plateau 5 Fen hor. 3 Fen collapse 2	Mod	60		60	46,645
B – 56	b 1	Bog veneer 7 Peat plateau 3	Mod	50		50	46,695
Figure:17	Page 94	Photo: MH875067416-165 Sca: 1:20K					
B – 57	c 3	clay Lacustrine 8 acid Rock hummocky 2	Low	1340	1340		47,035
B – 58	b 1	Bog veneer 7 Peat plateau 3	Mod	1040		1040	49,075
Distance	Meters	Sub - Total Section: "B"		23,830	15,795	8,035	23,830
Distance	Meters	GRAND TOTAL: Section "A and B"		49,075	34,465	14,610	49,075

SECTIONS A&B – UPLAND LACUSTRINE (DOMINANT)-ECOSECTION OCCURRENCE AND DISTANCE

Summary



TABLE: 2

SECTION:	Clay lacustrine	Blanket	Dominant	Ecosection		
"A"-						
b&c.2 cLb8 Bv2	b&c.2 cLb7 Bv3	b.2 cLb6 Bv4	c.2 cLb7 sGa3	c.3 cLb8 aRh2	c.3 cLb7 aRh3	c.3 cLb5 aRh3 Bv2
		A - 1 1900	A - 6 580			
		A - 3 760	A - 9 500			
		A - 15 860	A - 11 960			
		A - 17 440				
		A - 19 560				
		A - 21 1200				
		A - 23 300				
		A - 25 420				
SECTION: "A"		9 6,740 m.	3 2,040 m.			12 8,780 m.
SECTION: "A"	TOTAL - CLAY	DOMINANT	ECOSECTIONS			12 8,780 m.
SECTION: "B"	Clay Lacustrine	Blanket	Dominant	Ecosection		
b&c.2 cLb8 Bv2	b&c.2 cLb7 Bv3	b.2 cLb6 Bv4	c.2 cLb7 sGa3	c.3 cLb8 aRh2	c.3 cLb7 aRh3	c.3 cLb5 aRh3 Bv2
B - 2 160	B - 7 80	B - 21 2300		B - 57 1340	B - 29 460	B - 34 160
B - 18 240	B - 9 700	B - 42 360			B - 46 50	B - 37 240
B - 20 500	B - 11 900	B - 45 540			B - 48 300	B - 39 400
B - 43 260	B - 13 340				B - 50 220	
	B - 15 1280				B - 52 760	
	B - 17 640				B - 54 200	
	B - 23 460					
	B - 25 460					
	B - 27 560					
	B - 31 1200					
	B - 33 340					
	B - 36 120					
	B - 38 360					
	B - 41 140					
4 1,160 m.	14 7,580 m.	3 3,200 m.		1 1,340 m.	6 1,990 m.	3 800 m.
SECTION: "B"	TOTAL CLAY	DOMINANT	ECOSECTION			31 16,070 m.
SECTIONS A&B	TOTAL - CLAY	DOMINANT	ECOSECTION			
4 1,160 m.	14 7,580 m.	12 9,940 m.	3 2,040 m.	1 1,340 m.	6 1,990 m.	3 800 m.
SECTIONS A&B	TOTAL - CLAY	DOMINANT	ECOSECTION			43 24,850 m.

SECTIONS A&B-UPLAND GLACIOFLUVIAL (DOM)-ECOSECTION OCCURRENCE and DISTANCE SUMMARY



SECTION: "A"-GLACIOFLUVIAL DOMINANT ECOSECTIONS

c.3 sGh10	c.2 sGa10	c.3 ssGr10	c.2 sGa7 cLb3	c.3 ssGr7 cLb3	
	A - 5 1220	A - 27 200	A - 30 840		
	A - 13 5100	A - 34 100	A - 32 450		
	A - 26 880	A - 36 2800			
	A - 28 1000				
SECTION: "A"	4 8,200 m.	3 3,100 m.	2 1,290 m.		9 12,590 m.
SECTION: "A"	TOTAL -	GLACIOFLUVIAL	DOMINANT	ECOSECTION	9 12,590 m.
SECTION: "B"		GLACIOFLUVIAL	DOMINANT	ECOSECTION	
c.3 sGh10	c.2 sGa10	c.3 ssGr10	c.2 sGa7 cLb3	c.3 ssGr7 cLb3	
B - 14 280		B - 1 1700		B - 5 1280	
		B - 3 60			
SECTION: "B"		B - 8 400			
1 280 m.		3 2,160 m.		1 1,280 m.	5 3,720 m.
SECTION: "B"	TOTAL -	GLACIOFLUVIAL	DOMINANT	ECOSECTION	5 3,720 m.
SECTION A&B	TOTAL -				14 16,310 m.
1 280 m.	4 8,200 m.	6 5,260 m.	2 1,290 m.	1 1,280 m.	14 16,310 m.

SECTION:"A" Glaciofluvial 12, 590 m.-26% **SECTION:"B"** Glaciofluvial 3720 m.-7%
"A&B" Total-24,850 m.-33

SECTIONS A&B-LOWLAND BOG and FEN (DOM.)-ECOSECTION OCCURRENCE and DISTANCE SUMMARY



SECTION: "A"-Lowland Bog (peat plateau) and Fen Dominant Ecosections

a.1 Bt7 Bv3	a.1 Bt5 Bv3 Fh2	a.1 Bt4 Bv4 Fh2	a.1 bt5 Fh2 Fc2	b.1 Bv10	b.1 Bv 7 Bt 3	a.1 Fs10 Streams
A - 2 400	A - 4 300	A - 12 140	A - 8 140	A - 7 320		A - 10 - 100 SC 1-3- 15
	A - 29 420	A - 14 100				A - 20 - 100 SC 2-2- 15
		A - 16 260				A - 33 - 60 SC 3-3 - 5
		A - 18 300				A - 37 - 40
		A - 22 520				
		A - 24 400				
			a.1 Bt4 Fh4 Fc2			
			A - 35 240			
1 400 m.	2 720 m.	6 1,720 m.	2 380 m.	1 320 m.		4 - 300 m. 3 - 35 m.
SECTION : "A"	TOTAL - BOG	and FEN	DOMINANT	ECOSECTION NS		16 - 3,800 m. 3 - 35 m.
SECTION : "B"	Lowland	Bog (peat pltx)	and Fen	Dominant	Ecosections	
a.1 Bt7 Bv4	a.1 Bt5 Bv3 Fh2	a.1 Bt4 Bv4 Fh2	a.1 bt5 Fh2 Fc2	b.1 Bv10	b.1 Bv 7 Bt 3	a.1 Fs10 Streams
B - 40 280	B - 22 60		B - 10 180	B - 8 80	B - 56 50	B - 4 - 80 SC 4-2 - 10
	B - 24 240		B - 47 80		B - 58 1040	B - 12 - 80 SC 5-2 - 10
			B - 49 100			B - 16 - 100 SC 6-2 - 10
			B - 51 100			
			B - 53 60			B - 35 - 120 SC 8-2 - 10
			B - 55 60			B - 44 - 120 SC 9-2 - 10
a.1 Bt7 BV3			a.1 Bt4 Fh4 Fc4			
B - 19 100			B - 26 200			
			B - 28 100			
			B - 30 700			
2 380 m.	2 300 m.		9 1,580 m.	1 80 m.	2 1,090 m.	6 - 550 m. 6 - 60 m.
SECTION : "B"	TOTAL - BOG	and FEN	DOMINANT	ECOSECTION NS		22 - 3,980 m. 6 - 60 m.
SECTION S A&B	TOTAL - BOG	and FEN	DOMINANT	ECOSECTION NS		
3 780 m.	4 1,020 m.	6 1,720 m.	11 1,960 m.	2 400 m.	2 1,090 m.	10 - 850 m. 9 - 95 m.
SECTION S A&B	TOTAL - BOG	and FEN	DOMINANT	ECOSECTION NS		38 - 7,915 m.

SECTION S A&B	LACUSTRINE	GLACIO- FLUVIAL	PEAT PLATEAU	FEN	STREAMS	GRAND TOTAL
	43 28,850 m.	14 16,310 m.	28 6,970 m.	10 850 m.	9 95 m.	104 49,075 m.

SECTION: “A” Bog and Fen 3,800 m.-8% **SECTION: “B”** Bog and Fen 3,980 m.-8%
“A&B” Total-7,915m.-16%

SECTIONS: “A&B” ECOSYSTEMS: Lacustrine 51%, Glaciofluvial 33%, Peat plateau 14%, Fen 2%, Streams 0.1%

SECTIONS: “A&B” UPLAND: 84% LOWLAND 16%

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6.0 MONITORING, FOLLOW UP AND REPORTING

This EnvPP for the Wuskwatim Generating Station Access Road will be audited annually during construction. The audit will help to evaluate the guidelines in the EnvPP and construction activity monitoring results, to learn from experience, and to improve environmental impact assessments and project planning.

Concurrent with field experience and the audit, **adaptive management** plans will be developed to address any events or impacts that are currently unanticipated. These adaptive management plans will be integrated into the existing mitigation and monitoring plans.

An annual report of the Partnership's monitoring programs will be produced with the following information:

- A summary of actions taken to comply with regulatory requirements and the environmental protection plans.
- Contraventions of regulatory requirements and deviations from guidelines in the environmental protection plan guidelines.
- Corrective actions taken in the case of any contraventions and alternate mitigation measures employed, if applicable.
- Results of monitoring within the EnvPP
- Identification of events or impacts unanticipated at the time that the environmental protection plan was prepared.
- Description of adaptive management plans being developed to address new information since the environmental protection plan was developed.
- Identification of means by which *Ethinisewin* (traditional knowledge, including the collective wisdom of *Nisichawayasihk Nehethowuk*) has been integrated into adaptive management plans based on western scientific knowledge. (Groups participating in the *Ethinesewin* program will review the synthesis before it is released to regulators and other publics.)

On an annual basis during construction, these reports will be provided to Manitoba Conservation. As the community in whose *Aski* (traditional territory) the Wuskwatim Project is being developed, the reports will also be provided to the NCN Wuskwatim Implementation Coordinator and the Nelson House Resource Management Board. The Resident Manager or delegates will meet with Manitoba Conservation, the NCN Wuskwatim Implementation Coordinator and/or the Nelson House Resource Management Board, if requested. The NCN Wuskwatim Implementation Coordinator may invite NCN resource users and/or other NCN members to the meeting. If possible, meetings with NCN representatives will occur in early spring (*sekwun*).

The reports will also be provided to the downstream communities of Tataskweyak Cree Nation (at Split Lake) and York Factory First Nation. As well, an annual report of the Partnership will be produced and made available to the general public.

6.1 Project Record Reports

This section contains sheets to record environmental incidents on a daily, weekly and per incident basis. Copies of these forms should be copied and stored in a separate binder. The Senior Environmental Specialist will monitor the records. Each month the AKO will submit a report to the Resident Manager based on a summarization of incidents and activities occurring during the previous month.

Environmental Protection Plan Incident Reporting Form

Date_____

Form ___ of ___ for Today

Name of Environmental Inspector (AKO) _____

Weather:_____

Incident to Report (who, what, when, where)

Outcome of Incident (Include who reported to and suggestions for future)

Signature_____

Environmental Inspector DAILY LOG WUSKWATIM GENERATION PROJECT	
NAME: _____ DATE: _____ YY/MM/DD	
LOCATION: _____ HOURS WORKED: _____ WEATHER: _____	
Construction Activities List (circle all that apply) <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> Clearing the Right of Way Clearing Stream Crossings Culvert Installation Culvert Maintenance Borrow Pit Clearing Borrow Pit Operation Other _____ Borrow Pit Decommissioning </div> <div style="width: 45%;"> Camp Construction Access Trails Marshalling Yards </div> </div>	
Comments: (Environmental Protection methods applied, success of methods, duration and timing of works, revisions made to the methods) 	
Follow-up Actions: 	
AKO Evaluation <div style="display: flex; justify-content: space-between;"> <div>Did you have enough information to carry out your duties today?</div> <div>Yes No</div> </div> It was difficult to carry out the AKO tasks in the following situations: 	

Weekly Summary Report

AKO Weekly Summary Report	
Project: Wuskwatim Generating Station	Name: _____
From: _____, 200__ To: _____, 20__	
Overall Weather Conditions: _____ _____ _____	
Environmental Activities/Issues Summary: _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	
Follow up Action Required: _____ _____ _____	
AKO Signature: _____	Date: _____

Monthly Report Form Wuskwatim Project

Name of Environmental Inspectors:

Report for Month_____ **of Year**_____

Key Environmental Issues/Activities Undertaken at site:

Summary of Follow-up Undertaken (Including who any incidents were reported to):

Signature:

7.0 ENVIRONMENTAL PROTECTION REPORTING STRUCTURE

The Resident Manager will be the senior management authority on site during the construction of the project. During the operations phase of the project, the senior management authority will be the Plant Manager.

Reporting to the Resident Manager will be an Environmental Supervisor. Environmental Inspectors (*Aski Kihche O'nanakachechikeo* or "AKO's") will report to the Supervisor. The Environmental Supervisor and the Environmental Inspectors will have the responsibility and first-line authority to ensure that all environmental protection plans (*Aski Ketapahchikewe Othaschikekwin*) are followed.

7.1 Project Team's Environmental Roles and Responsibilities

The Resident Manager:

- Applies for the project work permit;
- Ensures construction/activities cease if a heritage resource is discovered;
- If a heritage resource is discovered, in accordance with the Heritage Resources Protection Plan, contacts the Project Archeologist and the NCN Archeologist and others as provided in the plan;
- Ensures all project activities are conducted according to the Environmental Protection Plan and any work permits/regulations;
- Consults with and informs the Senior Environmental Specialist if changes are made to the guidelines;
- Ensures that both Manitoba Hydro employees and all contractors are aware of the contents of the Environmental Protection Plan and other permits/guidelines; and
- Ensures that both Manitoba Hydro Employees and Contractors follow all safety guidelines
- Reviews reports prepared by the Environmental Inspectors

Environmental Supervisor (Onsite):

- Supervises the Environmental Inspector
- Ensures construction/activities cease if a heritage resource is discovered;
- If a heritage resource is discovered, in accordance with the Heritage Resources Protection Plan, contacts the Project Archeologist and the NCN Archeologist and others as provided in the plan;
- Ensures all project activities are conducted according to the Environmental Protection Plan and any work permits/regulations;

- Consults with and informs the Senior Environmental Specialist if changes are made to the guidelines;
- Ensures that both Manitoba Hydro employees and all contractors are aware of the contents of the Environmental Protection Plan and other permits/guidelines;
- Reviews reports prepared by the Environmental Inspectors

AKO (Environmental Inspector):

- Conducts some project specific monitoring.
- Records and reports how traditional knowledge is being used in the project.
- Acts as the onsite monitor of heritage resources found, discovered or disturbed during the course of the project.
- Monitors and reports on the effectiveness of the environmental protection measures outlined in the EnvPP and applied to the project.
- Prepares daily, weekly and monthly reports and submits them to the Environmental Supervisor, Senior Environmental Specialist and the Resident Manager.
- Reports any changes to the EnvPP (*Aski Ketapahchikewe Othaschikekwin*) to the Resident Manager.
- Discuss problems with on-site Environmental Supervisor.
- Discuss difficult problems with Environmental Supervisor and the Senior Environmental Specialist.

The Senior Environmental Specialist:

- Prepares the Environmental Protection Plan (*Aski Ketapahchikewe Othaschikekwin*);
- Advises the Resident Manager of any environmental related project issues;
- Ensures the Resident Manager is aware of the guidelines in the work permits, regulations and the Environmental Protection Plan (*Aski Ketapahchikewe Othaschikekwin*) ; and
- Monitors the site upon decommissioning and ensures all environmental protection measures were implemented.
- Develops a training program for the AKO's (Environmental Inspectors).
- Assists the AKO's with complex environmental protection issues.
- Reviews the AKO reports.
- Circulates and reviews the results of the monitoring programs and assists in decisions to adapt or rescope the program.
- Provides regular/annual reports to the regulators and stakeholders regarding the state of monitoring and environmental protection on the project site.

Manitoba Hydro Employees and Contractors:

- Report any discoveries of heritage resources to the Resident Manager;
- Follow all guidelines and regulations set out in the Environmental Protection Plan and work permits/regulations; and
- Report any violations of the guidelines and regulations to the Resident Manager.

Natural Resources Officer:

- Approves the work permit and establishes any special regulations/conditions for the duration of the project; and
- Monitors the project during all phases of the project including construction, operations and decommissioning and enforces compliance with all applicable regulations.
- Responsible for management of the environment.

Consultants

- Conduct environmental monitoring programs on behalf of the Wuskwatim Limited Partnership.
- Prepare written reports and deliver at a prescribed frequency for review by the Wuskwatim Limited Partnership.
- Participate in consultations regarding re-scoping of monitoring plans and follow up programs.

Regulators

- Ensures conditions in licenses and permits are followed

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7.2 Project Contact Information

Resident Manager (Site)

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Resident Engineer (Site)

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Senior Environmental Specialist (Winnipeg)

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Environmental Supervisor (Site)

Phone:
Cell:
Email:

Environmental Inspector(s) (AKO) (Site)

Phone:
Cell:
Email:

Natural Resources Officer Thompson

[REDACTED]
[REDACTED]
Cell:
Email:

Project Archeologist

Phone:
Cell:
Email:

NCN Archeologist

Phone:
Cell:
Email:

Manitoba Provincial Heritage Resources Branch
Reporting Discovery of Heritage Resources

[REDACTED]
[REDACTED]

RCMP Thompson
Royal Canadian Mounted Police

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Fire Emergency Calls

[REDACTED]
[REDACTED]

Ambulance Emergency Calls

[REDACTED]
[REDACTED]

Spill Response

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]

EMPLOYEE SAFETY & HEALTH

[REDACTED]

Hazardous Materials Officer

[REDACTED]

Workplace Environment Officer

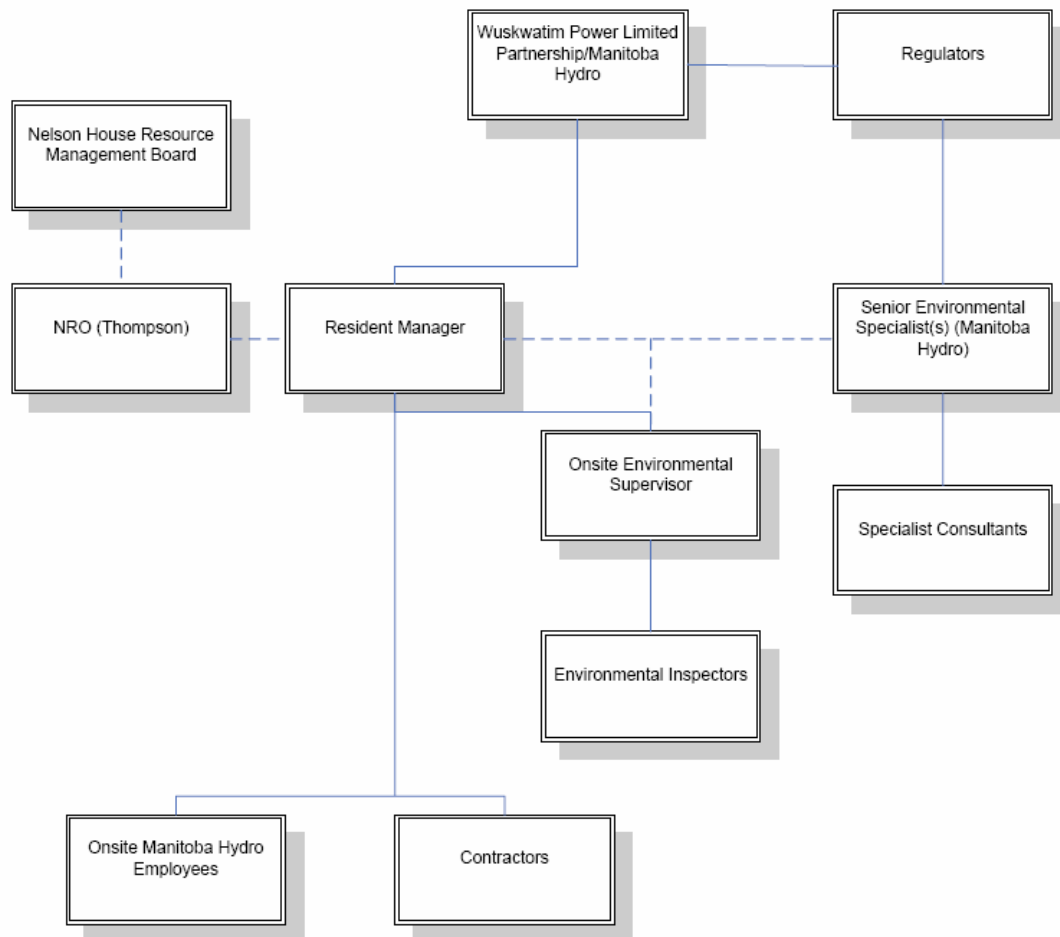
[REDACTED]

Corporate Fire Marshall

[REDACTED]

[REDACTED]

7.3 Project Environmental Communications Structure



8.0 REFERENCES AND GLOSSARY

8.1 List of References

Brush Disposal Guidebook. Manitoba Conservation. March 2005.

Consolidated Buffer Management Guidelines. Manitoba Natural Resources. March, 1996.

Contractor/Non-Employee Safe Practice Publication, Safety Circular 0011/05. 2005
Manitoba Hydro, Workplace Safety Department, Safety & Occupational Health Division.

Corporate Occupational Safety and Health Rule Book. Manitoba Hydro 2003.

Forest Management Guidelines for Wildlife in Manitoba. Manitoba Natural Resources, Draft #8.

Forest Damage Appraisal and Valuation Policy. Manitoba Natural Resources, Forestry Branch. June 1, 1995.

Fur, Feathers & Transmission Lines-Cree, How rights of way affect wildlife. Manitoba Hydro. July, 1995.

Guide to Environmental Legislation. Applicable to Manitoba Hydro's Projects and Operations. Manitoba Hydro. January 2004.

Guidelines For the Use of Explosives In or Near Canadian Fisheries Waters. Department of Fisheries and Oceans. April, 1998.

Manitoba Hydro Code of Practice for Storage and Handling of Petroleum Products and Allied Products Storage Tank Systems. Manitoba Hydro Safety and Occupational Health Division. October, 2002.

Manitoba Hydro Fire Protection Manual. Manitoba Hydro Safety and Occupational Health Division.

Manitoba Hydro Hazardous Materials Management Handbook. Manitoba Hydro Safety and Occupational Health Division. April, 2006.

Manitoba Hydro Safe Practice Guide, Safety for the New Employee, Safety Circular 0005/05 (Revised-2005). Manitoba Hydro Safety and Occupational Health Division.

Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat. Fisheries and Oceans Canada and Manitoba Department of Natural Resources. May, 1996.

Recommended Buffer Zones for Protecting Fish Resources in Lakes and Streams in Forest Cutting areas. Manitoba Natural Resources. 1990.

Shorelines, Shorelands & Wetlands. A Guide to Riparian Ecosystem Protection at Manitoba Hydro Facilities. Manitoba Hydro. March, 2001.

Timber Harvesting Practices for Forestry Operations in Manitoba. Manitoba Natural Resources, Forestry Branch. October, 1996.

Winter Road Safety Guidelines. Winter Road Safety Committee. Manitoba Highways and Transportation. December, 1992.

Workplace Hazardous Materials Information System (WHMIS) in Manitoba Hydro 060323 . March 2006 Manitoba Hydro Safety and Occupational Health Division

8.2 Glossary

Adaptive Management: A systematic process for continually improving management policies and practices by learning from the outcomes of operational programs. Adaptive management employs management programs that are designed to experimentally compare selected policies or practices, by evaluating alternative hypotheses about the system being managed.

Aggregate - sand, gravel, slag or crushed stone; used for mixing with a cementing material to form concrete mortar or plaster, or used alone as in graded fill.

Bedrock - the solid rock that underlies soil and the regolith that is exposed at the surface.

Blow Down- standing trees falling because of weakened root systems. Can occur during strong winds.

Bog - wetland ecosystem characterized by an accumulation of peat, acidic conditions and a plant community dominated by *Sphagnum* moss.

Borrow areas - or borrow 'sites' or 'pits'; areas where materials (e.g., gravel, sand, silt, clay) are excavated for use.

Borrow pit - the hole left by the removal of material (usually sand or gravel) for construction purposes.

Buffer - an area of land separating two distinct land uses that acts to soften or mitigate the effects of one land use on the other.

Decommissioning - to take out of active use (typically involves the dismantling and removal of the original structure(s) and associated facilities).

Ecosystem - a functional unit consisting of all living organisms (plants, animals, microbes, etc.) in a given area, and all non-living physical and chemical factors of their environment, linked together through nutrient cycling and energy flow. An ecosystem can be any size (e.g., a log, pond, forest) but always functions as a whole unit.

Environmental Impact Statement (EIS) - a document setting out the results of an environmental impact assessment, including adverse (and sometimes positive) effects of a proposed development. The document is filed as part of an application for environmental approvals under the *Environment Act* (Manitoba) or the *Canadian Environmental Assessment Act*.

Erosion - the wearing away of the earth's surface by the action of water, wind, current, etc.

Excess Ice - ice which, when melted, exceeds the void volume or pore volume of the enclosing sediments.

Fill - natural soils that are manually or mechanically placed. Soil or loose rock used to raise a grade.

Follow-up- a program for verification of the accuracy of the environmental assessment of a project and determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project. (CEAA)

Groundwater - the portion of sub-surface water that is below the water table, in the zone of saturation.

Habitat - the place where a plant, animal or microorganism live; often related to a function such as breeding, feeding, etc.

Hydrocarbon - an organic compound that contains only carbon and hydrogen, and no other elements; derived mostly from crude petroleum and also from coal tar and plant sources. Excessive levels may be toxic.

Impact - a positive or negative effect of a disturbance on the environment or a component of the environment.

Infrastructure - the basic features needed for the operation or construction of a system (e.g., access road, construction camp, construction power, batch plant, etc.).

Merchantable - a tree or a stand of trees that has reached maturity (rotation age and/or size) and is suitable and/or ready for harvest.

Mitigation - actions taken during the planning, design, construction and operation of works to reduce or avoid potential adverse effects.

Monitoring – measuring the state of the environment after a project is implemented to see if anticipated impacts have actually occurred and how mitigation measures have been applied.

Nuisance Wildlife- animals that have been fed, conditioned to human food and return to the project sites. Also any animal that appears diseased.

Ombrotrophic-receiving nutrients solely from rainwater

Ordinary High Water Mark- As defined in the DFO Manitoba Operational Statements is the usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bank full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water

so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

Organic - soils of the Organic order are composed largely of organic materials. They include most of the soils commonly known as peat, muck, or bog and fen soils. Most organic soils are saturated with water for prolonged periods. These soils occur widely in poorly and very poorly drained depressions and level areas in regions of subhumid to perhumid climate.

Overburden - the soil (including organic material) or loose material that overlies bedrock.

Overwinter - to remain through the ice-covered period.

Permafrost - permanently frozen ground.

Regulatory - pertaining to legal requirements.

Rehabilitation - restoring to a more normal state; when referring to land, restoring the area to promote re-vegetation.

Runoff - portion of liquid (water) that does not percolate into the ground and is instead discharged into surface water bodies.

Sensitive Areas- sensitive areas are parts of the environment which may be easily damaged by projects. For example permafrost areas or stream crossings.

Spawning Habitat - areas suitable for the deposition of eggs and their incubation.

Species - a group of inter-breeding organisms that can produce fertile offspring.

(TK) Traditional Knowledge- Scientific knowledge held by Aboriginal or indigenous people around the world. It is based upon an intimate connection with the lands and waters, oral tradition since time immemorial, and draws upon the people's spiritual connectedness to the land.

Waterfowl - ducks, geese and swans (game birds that frequent water).

(WSK) Western Scientific Knowledge- Scientific knowledge accumulated by systematic study using what is described as the scientific method and organized by general principles.

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9.0 REGULATORY APPROVALS, WORK PERMITS AND LICENSES

Manitoba



FACSIMILE TRANSMITTAL COVER SHEET

MANITOBA CONSERVATION
123 MAIN STREET SUITE 160
WINNIPEG, MANITOBA
R3C 1A5
FAX NO. (204) 945-5229

DATE: June 21, 2006

PAGES:

20

(INCLUDING COVER SHEET)

TO: Ken R.F. Adams, Wuskwatim Power Limited Partnership
cc: Steve Kearney

FROM: Stan Struthers, Minister, Environment Act

☐ Urgent

☐ For Review

☐ Please Comment

☐ Please Reply

☐ For Your Info

COMMENTS: Environment Act Licence No. 2699 - Wuskwatim Generating Station

Mr. Adams, please note confirmation of Receipt on covering letter.

Original to follow

IF YOU DO NOT RECEIVE ALL PAGES BEING TRANSMITTED, PLEASE CALL IRENE CASEY
AT (204) 945-7038.

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CORRECT OUR TRANSMISSION. PLEASE THEN DESTROY THE ORIGINAL.
THANK YOU FOR YOUR COOPERATION.

**MINISTER OF CONSERVATION**

Legislative Building
Winnipeg, Manitoba, CANADA
R3C 0V8

FAXED**CLIENT FILE NO.: 4724.00**

June 21, 2006

Ken R F. Adams
Wuskwatim Power Limited Partnership
820 Taylor Avenue
Winnipeg MB R3C 2P4

Dear Mr. Adams:

Enclosed is Environment Act Licence No. 2699 dated June 21, 2006 issued in accordance with The Environment Act to **Wuskwatim Power Limited Partnership** for the Development being the Wuskwatim Generating Station located on the Burntwood River at Taskinup Falls at the outlet of Wuskwatim Lake, approximately 45 km southwest of Thompson and 35 km southeast of Nelson House, and within the Nelson House Resource Management Area.

In addition to the enclosed Licence requirements, please be informed that all other applicable federal, provincial and municipal regulations and by-laws must be complied with.

For further information on the administration and application of the Licence, please feel free to contact Steve Kearney at (204) 677-6628.

Pursuant to Section 27 of The Environment Act, this licensing decision may be appealed by any person who is affected by the issuance of this Licence to the Minister of Conservation within six weeks of the date of the Licence.

Yours truly,

Stan Struthers
Minister
Environment Act

Enc.

c: S. Kearney, Regional Director, Northeast/Northwest Region, Conservation
Public Registries

NOTE: Confirmation of Receipt of this Licence No. 2699 (*by the Licencee only*) is required by the Director of Environmental Assessment & Licensing (Fax #945-5229). Please acknowledge receipt by signing in the space provided below and faxing a copy back to the Department by June 27, 2006.

On behalf of Wuskwatim Power Limited Partnership

Date

****A COPY OF THE LICENCE MUST BE KEPT ON SITE AT THE DEVELOPMENT AT ALL TIMES****

Environment Act Licence

Loi sur l'environnement Licence

Manitoba
Conservation
Conservation
Manitoba



Licence No./Licence n° 2699
Issue Date/Date de délivrance June 21, 2006

IN ACCORDANCE WITH THE ENVIRONMENT ACT (C.C.S.M. c. E125)
THIS LICENCE IS ISSUED PURSUANT TO SECTION 12(1) TO:

WUSKWATIM POWER LIMITED PARTNERSHIP; "the Licencee"

for the Development being the Wuskwatim Generating Station located on the Burntwood River at Taskinigup Falls at the outlet of Wuskwatim Lake, approximately 45 km southwest of Thompson and 35 km southeast of Nelson House, and within the Nelson House Resource Management Area. The Development involves the construction, operation and maintenance of the Wuskwatim Generating Station, and related dams, dikes, channels, control structures and infrastructure, including roads, in accordance with the Proposal and the Environmental Impact Statement (EIS) filed under The Environment Act in April 2003, in consideration of the September 2004 Clean Environment Commission Report on Public Hearings, and subject to the following specifications, limits, terms and conditions:

DEFINITIONS

In this Licence:

"Department" means Manitoba Conservation;

"Director" means an employee of the department so designated pursuant to The Environment Act;

"Environment Officer" means an employee of the department appointed as such by the Minister; and

"Minister" means the minister of the Department.

****A COPY OF THE LICENCE MUST BE KEPT ON SITE AT THE DEVELOPMENT AT ALL TIMES****

Wuskwatim Power Limited Partnership
Environment Act Licence No. 2699
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GENERAL TERMS AND CONDITIONS

This Section of the Licence contains requirements intended to provide guidance to the Licencee in implementing practices to ensure that the environment is maintained in such a manner as to sustain a high quality of life, including social and economic development, recreation and leisure for present and future Manitobans.

1. The Licencee shall locate fuel storage and equipment servicing areas established for the construction and operation of the Development at a minimum distance of 100 meters from any waterbody, and operate the fuel storage areas in compliance with the requirements of *Manitoba Regulation 188/2001* respecting *Storage and Handling of Petroleum Products and Allied Products*.
2. The Licencee shall, at all times during the construction of the Development, have materials available at the construction sites to contain and recover spills of fuel and other fluids associated with construction machinery.
3. The Licencee shall ensure that non-reusable demolition and construction debris from the Development is disposed of at a waste disposal ground operating under the authority of a permit, pursuant to the *Waste Disposal Ground Regulation, MR 150/91*, or an *Environment Act Licence* pursuant to *The Environment Act*.
4. The Licencee shall, during construction, dispose of all sewage from on-site sanitary facilities in accordance with the *Onsite Wastewater Management Systems Regulation, MR 83/2003*.
5. The Licencee shall during construction and operation of the Development:
 - a) immediately report any reportable spills to Manitoba Conservation's Accident Reporting Line at (204) 944-4888, and
 - b) at the request of the Director, provide a follow-up report to the Director on a reportable environmental accident outlining the cause(s) and propose corrective action to prevent reoccurrence.
6. The Licencee shall, during construction, adhere to the general recommendations contained in the Department guidelines titled *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat, 1996*.
7. The Licencee shall, prior to commencing construction of the Development, obtain Work Permits from the appropriate Department Regional office.
8. The Licencee shall, prior to construction, obtain all permits and agreements as required by Manitoba Transportation and Government Services.
9. The Licencee shall, prior to construction, provide a copy of this Environment Act Licence to the contractor and subcontractor(s) involved in the Development and

Wuskwatim Power Limited Partnership
Environment Act Licence No. 2699
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require that the contractor and subcontractor(s) comply with the requirements of this Licence.

10. The Licencee shall, prior to construction of the Development, prepare access management plans in consultation with the Nelson House Resource Management Board and communities in which new facilities will be located or those where there are expected to be discernable project related changes to the physical environment.
11. Nothing in this Licence shall be construed as negating or in anyway whatsoever altering the obligation of the Licencee to operate the Development in accordance with all existing Licences and agreements for the Churchill-Burntwood River waterway, the Lake Winnipeg Regulation and the Manitoba Water Power Licence.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

12. The Licencee shall consider the elements outlined in Manitoba Clean Environment Commission Recommendation 7.1 B, and prior to commencement of construction activities for the Development, submit to the Director for approval, a Wuskwatim Generating Station Environmental Protection Plan (EPP). If appropriate, separate EPPs can be submitted for the construction and operation phases, as well as for different components of the project, if prior approval by the Director is obtained. The EPP shall describe the approach to be used by the Licencee to monitor environmental conditions during the construction and operation of the Generation Station's components to ensure that mitigative measures are applied systematically, and in a manner consistent with the commitments made in the Wuskwatim Generating Station Environmental Impact Statement (EIS). Specifically, the EPP shall:
 - a) describe the protocol for reporting on monitoring and compliance for the construction and operational phases of the project;
 - b) contain the project-specific environmental protection measures referenced in the EIS, and all additional measures identified and agreed to by the Licencee following the filing of the EIS; and
 - c) address issues and concerns identified by individuals representative of resource user communities in which new facilities will be located or those where there are expected to be discernable project related changes to the physical environment.
13. The Licencee shall, within six months of the date of issuance of this Licence, initiate and facilitate discussions with representatives of the Department, the Government of Canada, where appropriate, individuals representative of resource user communities in which new facilities will be located or those where there are expected to be discernable project related changes to the physical environment, to establish baseline monitoring and ecosystem research programs to:

Wuskwatim Power Limited Partnership
Environment Act Licence No. 2699
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- a) protect vulnerable, threatened or endangered species or ecosystems; threatened or sensitive habitats; and protected areas with particular consideration of woodland caribou; and
 - b) to assess the accuracy of predicted project related impacts within the designated study area.
14. The Licencee shall establish an ongoing advisory committee comprised of representatives of the Department, the Government of Canada and individuals representative of resource user communities in which new facilities will be located or those where there are expected to be discernable project related changes to the physical environment, for the purpose of providing guidance on the research and monitoring activities described in Clause 13 of this Licence related to potential project effects on woodland caribou and, where appropriate, to apply adaptive management measures. The committee shall coordinate its activities with the advisory committee established pursuant to Environment Act Licence No. 2700 for the purpose of modifying project research and monitoring activities in relation to other regional developments, as required.
15. The Licencee shall provide data collected in the course of monitoring or research activities pursuant to Clause 13 of this Licence, to the Governments of Manitoba and Canada, and others as requested.
16. The Licencee shall, within one year of the date of issuance of this Licence, prepare for the approval of the Director, a report on monitoring programs to be undertaken in connection with the EPP. The report shall:
- a) provide a description of the proposed activities including the use of traditional knowledge for monitoring effects to the physical, aquatic, terrestrial, and socio-economic environments (including the evolving baseline conditions) arising from the site preparation, construction, and operation of the Wuskwatim Generating Station Project; and
 - b) describe the equipment to be used, the parameters to be measured, the methodology and frequency of measurement, references to established thresholds and sustainability indicators, where appropriate, and the protocol for reporting the results of monitoring of the environmental conditions affected by the Wuskwatim Generation Project.
17. The Licencee shall report annually to the Director on the results of monitoring programs in connection with the EPP, as approved pursuant to Clause 16 of this Licence.
18. The Licencee shall, within one year of the date of issuance of this Licence, develop a multi-year monitoring program, for review and approval by the Director, for measuring rates of shoreline erosion at representative sites on Wuskwatim Lake, and along potentially-affected downstream reaches of the Burntwood River. Results from the approved monitoring program shall be reported on an annual basis to the Director.

Wuskwatim Power Limited Partnership
Environment Act Licence No. 2699
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19. The Licencee shall, within one year of the date of issuance of this Licence, develop a monitoring program, for approval by the Director, for monitoring sediment concentrations and their downstream transport in the Burntwood River during construction, and their related effects on water quality. Results from the approved monitoring program shall be reported on an annual basis to the Director.
20. The Licencee shall develop a multi-year monitoring program, for approval by the Director, for monitoring fish production and fish harvesting in Wuskwatim Lake. Results from the approved monitoring program shall be reported on an annual basis to the Director.
21. The Licencee shall during the construction and operation of the Development comply with the following Plans and Authorization submitted to/issued by the Department of Fisheries and Oceans Canada:
 - a) Fish Habitat Compensation Plan;
 - b) Aquatic Effects Monitoring Plan;
 - c) Sediment Management Plan; and
 - d) Authorization for Works or Undertakings Affecting Fish Habitat.
22. The Licencee shall during construction in riparian areas associated with the Development:
 - a) maintain a minimum 30 meter buffer zone extending from stream bank shorelines to the top of stream banks. Trees within the buffer zone shall be cleared by hand and all existing low growth vegetation such as grasses, shrubs, and willows shall be maintained on site;
 - b) establish buffers in accordance with practices set out in:
 - i) *Forest Management Guidelines for Wildlife in Manitoba*;
 - ii) *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat*;
 - iii) *Timber Harvesting Practices for Forestry Operations in Manitoba*;
 - iv) *Consolidated Buffer Management Guidelines*; and
 - v) any other relevant provincial guidelines;
 - c) design and/or modify buffers, in consultation with the Department, to ensure post-clearing runoff does not negatively affect sediment loads in local waterbodies;
 - d) minimize in-stream construction time to reduce sedimentation;
 - e) avoid use of organic soil, silt, or clay in temporary winter stream crossings;
 - f) remove all materials used in the construction of ice bridges from the water course or waterbody prior to spring ice breakup;
 - g) locate any temporary marshalling yards and storage sites required for the Development at a minimum distance of 100 meters from any wetland or watercourse, and
 - h) implement and monitor any additional on-site details and mitigative measures recommended for sensitive areas, as identified in the approved Wuskwatim Generation Station Project Environmental Protection Plan.

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23. The Licencee shall construct and operate the interim and start-up camps wastewater collection and holding tank system and the temporary wastewater holding cell and the main camp wastewater collection system and wastewater treatment lagoon in accordance with the document entitled Wuskwatim Generating Station Construction Camps Functional Report for Water, Sewage and Solid Waste, filed under The Environment Act, dated September 2004, and in accordance with the specifications, limits, terms and conditions prescribed under Schedules A and A 1 of this Licence.
24. The Licencee shall, during construction and operation of the Development, use mechanical or hand clearing methods to control vegetation to the maximum extent possible. Any chemical vegetation control shall require approval by an Environment Officer, and the Licencee shall:
 - a) maintain a buffer near wetlands and waterbodies of 30 meters for application of herbicides; and
 - b) adhere to *Manitoba Regulation 47/2004* respecting pesticides.
25. The Licencee shall, where practical, set aside cleared vegetation which can be salvaged for local individual or community use as firewood. Cleared vegetation shall be disposed of in accordance with Department requirements.
26. The Licencee shall, during construction minimize erosion to the extent possible, and at the completion of the construction of the Development, stabilize and vegetate all erosion-prone areas where the soil has been disturbed by construction. Erosion prone areas shall be monitored following construction to ensure stabilization procedures are effective.
27. The Licencee shall, during construction and operation of the Development, post appropriate warning signage to advise recreational traffic of construction activity, the presence of structures and water conditions.
28. The Licencee shall, during construction and operation of the Development apply measures determined through discussion and consultation with the Department, to protect:
 - a) vulnerable, threatened, or endangered species or ecosystems;
 - b) threatened or sensitive habitats;
 - c) protected areas;
 - d) waterfowl and furbearers;
 - e) medicinal plants; and
 - f) areas of wild rice production
29. The Licencee shall, during construction and operation of the Development, apply measures to protect heritage resources, as directed by the Historic Resources Branch of Manitoba Culture, Heritage and Citizenship.

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30. The Licencee shall operate the Development within the following parameters:
- a) maintain the mean daily water level on Wuskwatim Lake (wind and wave effects eliminated) between 233.75 meters and 234.0 meters Above Sea Level (ASL), as determined by measurements from a minimum of three water level monitoring stations on Wuskwatim Lake;
 - b) maintain mean daily water levels on Birchtree Lake such that the daily water level variations shall be less than 0.10 meters and 0.15 meters in open water and winter conditions (wind and wave effects eliminated) respectively. Any exceptions to these fluctuations shall be reported within one week to Manitoba Water Stewardship;
 - c) determine water levels on Birchtree Lake through measurements at a minimum of two water level stations; and
 - d) base elevations on the Geodetic Survey of Canada (GS of C), Canadian Government Vertical Datum (CGVD) 1928, 1971 Local Adjustment (also referred to as GS of C CGVD28, 1969 Local Adjustment).
31. The Licencee shall receive approval from Manitoba Water Stewardship with respect to the number and location of all water level monitoring stations, averaging techniques and reporting protocols.
32. Notwithstanding Clause 30 a) of this Licence, the Licencee shall report to Manitoba Water Stewardship, any conditions which may require an exceedance of the mean daily elevation above 234.0 meters ASL and below 233.75 meters ASL on Wuskwatim Lake. Subject to Ministerial authorization pursuant to The Water Power Act, draw downs on Wuskwatim Lake below 233.00 meters ASL shall be allowed during exceptional conditions. Explanations shall be provided for the exceptional conditions, including the magnitude of associated water level changes.
33. The Licencee shall report, to Manitoba Water Stewardship, on a monthly and annual basis, the water levels monitored pursuant to Clauses 30 a) and c) of this Licence including other relevant station and related system operating characteristics. These reports shall also be provided to the Nelson House Resource Management Board, all communities on the Manitoba Hydro Churchill River Diversion Augmented Flow Program notification list and posted on the Manitoba Hydro web site.
34. The Licencee shall at the commencement of the operation of the Development and for a period of five years, unless otherwise directed by the Minister, monitor daily water level variations and the frequency and magnitude of exceedances for the purpose of confirming the appropriateness of the parameters prescribed in Clause 30 of this Licence or the need for adjustments to reflect local hydrological conditions.

Wuskwatim Power Limited Partnership
Environment Act Licence No. 2699
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LICENCE REVIEW AND REVOCATION

- A. If in the opinion of the Minister, the Licencee has exceeded or is exceeding or has or is failing to meet the specifications, limits, terms, or conditions set out in this Licence, the Minister may, temporarily or permanently, revoke this Licence.
- B. If in the opinion of the Minister, new evidence warrants a change in the specifications, limits, terms, or conditions of this Licence, the Minister may require the Licencee to file a new proposal pursuant to Section 12 of The Environment Act
- C. If construction of the Development has not commenced within five years of the date of this Licence, the Licence is revoked.



Stan Struthers
Minister
Environment Act

File: 4724.00

SCHEDULE A TO ENVIRONMENT ACT LICENCE NO: 2699

DEFINITIONS

"accredited laboratory" means an analytical facility accredited by the Standard Council of Canada (SCC), or accredited by another accrediting agency recognized by Manitoba Conservation to be equivalent to the SCC, or be able to demonstrate, upon request, that it has the quality assurance/quality control (QA/QC) procedures in place equivalent to accreditation based on the international standard ISO/IEC 17025, or otherwise approved by the Director;

"approved" means approved by the Director, or an assigned Environment Officer, in writing;

"appurtenances" means machinery, appliances, or auxiliary structures attached to a main structure to enable it to function, but not considered an integral part of it;

"as constructed drawings" means engineering drawings complete with all dimensions which indicate all features of the Development as it has actually been built;

"ASTM" means the American Society for Testing and Materials;

"bentonite" means specially formulated standard mill grade sodium bentonite conforming to American Petroleum Institute Specification 13-A;

"cut-off" means a vertical-side trench filled with compacted clay or a wall constructed from compacted clay;

"Director" means an employee so designated pursuant to the Environment Act;

"effluent" means treated wastewater flowing or pumped out of the wastewater treatment lagoon;

"fecal coliform" means aerobic and facultative, gram-negative, nonspore-forming, rod-shaped bacteria capable of growth at 44.5 °C, and associated with fecal matter of warm-blooded animals;

"five-day biochemical oxygen demand" means that part of the oxygen demand usually associated with biochemical oxidation of organic matter within 5 days at a temperature of 20°C;

"flooding" means the flowing of water onto lands, other than waterways, due to the overtopping of a waterway or waterways;

"high water mark" means the line on the interior surface of the primary and secondary cells which is normally reached when the cell is at the maximum allowable liquid level or the line of the exterior of the perimeter dykes which is reached during local flooding;

"hydraulic conductivity" means the quantity of water that will flow through a unit cross-sectional area of a porous material per unit of time under a hydraulic gradient of 1.0;

"influent" means water, wastewater, or other liquid flowing into a wastewater treatment facility;

"in-situ" means on the site;

"low water mark" means the line on the interior surface of the primary and secondary cells which is normally reached when the cell is discharged;

"MPN Index" means the most probable number of coliform organisms in a given volume of wastewater which, in accordance with statistical theory, would yield the observed test result with the greatest frequency;

"primary cell" means the first in a series of cells of the wastewater treatment lagoon system and which is the cell that receives the untreated wastewater;

"rip rap" means small, broken stones or boulders placed compactly or irregularly on dykes or similar embankments for protection of earth surfaces against wave action or current;

"secondary cell" means a cell of the wastewater treatment lagoon system which is the cell that receives partially treated wastewater from the primary cell;

"septage" means the sludge produced in individual on-site wastewater disposal systems such as septic tanks;

"sludge solids" means solids in sludge;

"sludge" means accumulated solid material containing large amounts of entrained water, which has separated from wastewater during processing;

"split wedge weld" means two welded tracks with an unbonded channel between them that is sealed at both ends and pressurized with air at completion;

"Standard Methods for the Examination of Water and Wastewater" means the most recent edition of Standard Methods for the Examination of Water and Wastewater published jointly by the American Public Health Association, the American Waterworks Association and the Water Environment Federation;

"temporary wastewater holding cell" means the impoundment into which wastewater is discharged for temporary storage;

"total coliform" means a group of aerobic and facultative anaerobic, Gram-negative, nonspore-forming, rod-shaped bacteria, that ferment lactose with gas and acid formation within 48 hours at 35 °C, and inhabit predominantly the intestines of man or animals, but are occasionally found elsewhere and include the sub-group of fecal coliform bacteria;

"wastewater" means the spent or used water of a community or industry which contains dissolved and suspended matter;

"wastewater collection system" means the sewer and pumping system used for the collection and conveyance of domestic, commercial and industrial wastewater; and

"wastewater treatment lagoon" means an impoundment into which wastewater is discharged for storage and treatment by natural oxidation.

GENERAL TERMS AND CONDITIONS

1. The Licencee shall direct all wastewater generated within the road, interim, start-up and main camps toward the temporary wastewater holding cell or the main camp wastewater treatment lagoon at the Development or other approved wastewater treatment facilities.
2. In addition to any of the limits, terms and conditions specified in this Schedule, the Licencee shall, upon the request of the Director:
 - a) sample, monitor, analyze and/or investigate specific areas of concern regarding any segment, component or aspect of pollutant storage, containment, treatment, handling, disposal or emission systems, for such pollutants or ambient quality, aquatic toxicity, leachate characteristics and discharge or emission rates, for such duration and at such frequencies as may be specified;
 - b) determine the environmental impact associated with the release of any pollutant(s) from the Development; or
 - c) provide the Director, within such time as may be specified, with such reports, drawings, specifications, analytical data, descriptions of sampling and analytical procedures being used, bioassay data, flow rate measurements and such other information as may from time to time be requested.

3. The Licencee shall, unless otherwise specified in this Schedule:
 - a) carry out all preservations and analyses on liquid samples in accordance with the methods prescribed in "Standard Methods for the Examination of Water and Wastewater" or in accordance with an equivalent analytical methodology approved by the Director;
 - b) have all analytical determinations undertaken by an accredited laboratory; and
 - c) report the results to the Director, in writing or in a format acceptable to the Director, within 60 days of the samples being taken.
4. The Licencee shall operate and maintain the temporary wastewater holding cell and the wastewater treatment lagoon in such a manner that the release of offensive odours is minimized.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

5. The Licencee shall notify the assigned Environment Officer not less than two weeks prior to beginning construction of the temporary wastewater holding cell and the wastewater treatment lagoon. The notifications shall include the intended starting dates of construction.
6. The Licencee shall construct and maintain all-weather access roads and wastewater dumping stations for truck handled wastewater delivery at the temporary wastewater holding cell and the wastewater treatment lagoon. Each dumping facility shall have a surface splash ramp with a smooth hard surface that can be easily washed free of solids.

Respecting the Temporary Wastewater Holding Cell:

7. The Licencee shall construct and maintain a continuous liner underlying the temporary wastewater holding cell, such that:
 - a) the liner is constructed from polyolefin geomembrane;
 - b) the liner has a minimum thickness of 40 mils;
 - c) all sections of the liner are joined by fusion seaming using split wedge welds;
 - d) the liner is installed to a minimum elevation of 2.5 meters above the base of the cell;
 - e) the liner is underlain by geotextile fabric, sand bedding and an appropriately prepared sub grade; and
 - f) the liner is secured to prevent lifting of the liner.
8. The Licencee shall have the integrity of all field seams tested in accordance with ASTM Standard D-4437 by an independent testing service that was not involved with the supply or installation of the liner and is not the operator of the temporary wastewater holding cell. Non-destructive test methods, including air pressure testing, shall be used and a testing report prepared and submitted to the Director within 30 days of commencing the installation of the liner.

9. The Licencee shall operate and maintain the temporary wastewater holding cell in such a manner that the depth of liquid in the cell does not exceed 1.5 meters.
10. The Licencee shall not discharge effluent from the temporary wastewater holding cell except to approved wastewater treatment facilities.
11. The Licencee shall provide exit ramps from the bottom of the temporary wastewater holding cell to the tops of the dykes.

Respecting the Wastewater Treatment Lagoon:

12. The Licencee shall satisfy the construction requirements for the wastewater treatment lagoon prior to operation.
13. The Licencee shall, prior to the construction of the dykes for the wastewater treatment lagoon:
 - a) remove all organic topsoil from the area where the dykes will be constructed; or
 - b) remove all organic material for a depth of 0.3 meters and a width of 3.0 meters from the area where the liner will be constructed.
14. The Licencee shall operate and maintain the wastewater treatment lagoon in such a manner that:
 - a) the organic loading on the primary cell of the wastewater treatment lagoon, as indicated by the five-day biochemical oxygen demand, is not in excess of 56 kilograms per hectare per day; and
 - b) the depth of liquid in any cell does not exceed 1.5 meters.
15. The Licencee shall construct and maintain the cells of the wastewater treatment lagoon with continuous liners, including cutoffs, under all interior surfaces of the cells in accordance with the following specifications:
 - a) the liners shall be made of clay;
 - b) the liners shall be at least one meter in thickness;
 - c) the liners shall have a hydraulic conductivity of 1×10^{-7} centimeters per second or less at all locations; and
 - d) the liners shall be constructed to an elevation of 2.5 meters above the floor elevation of the primary cell and of the secondary cell.
16. The Licencee shall install and maintain a fence around the wastewater treatment lagoon to limit access. The fence shall be a minimum of 1.2 meters high and have a locking gate, which shall be locked at all times except to allow access to the wastewater treatment lagoon.

17. The Licencee shall, if in the opinion of the Director, significant erosion of the interior surfaces of the dykes occurs, repair the dyke and install rip rap as necessary. The rip rap shall be placed on the interior dyke surfaces from 0.6 meters above the high water mark to at least 0.6 meters below the low water mark to protect the dykes from wave action.
18. The Licencee shall provide and maintain a grass cover on the dykes of the wastewater treatment lagoon and shall regulate the growth of the vegetation so that the height of the vegetation does not exceed 0.3 meters on all dykes.
19. The Licencee shall annually remove by mechanical methods all reeds, rushes and trees located above the low water mark in every cell of the wastewater treatment lagoon.
20. The Licencee shall implement an ongoing program to remove burrowing animals from the site of the wastewater treatment lagoon.
21. The Licencee shall not discharge effluent from the wastewater treatment lagoon:
 - a) except by ditch to the Burntwood River;
 - b) where the organic content of the effluent, as indicated by the five day biochemical oxygen demand, is in excess of 30 milligrams per liter;
 - c) where the fecal coliform content of the effluent, as indicated by the MPN index, is in excess of 200 per 100 milliliters of sample;
 - d) where the total coliform content of the effluent, as indicated by the MPN index, is in excess of 1500 per 100 milliliters of sample;
 - e) between the 1st day of November of any year and the 15th day of June of the following year;
 - f) when flooding from any cause is occurring along the effluent drainage route; or
 - g) when such a discharge would cause or contribute to flooding in or along the effluent drainage route.

MONITORING AND REPORTING

22. The Licencee shall, in case of physical or mechanical breakdown of the wastewater collection, holding and/or treatment system:
 - a) notify the Director immediately;
 - b) identify the repairs required to the wastewater collection, holding and/or treatment system;
 - c) undertake all repairs to minimize unauthorized discharges of wastewater; and
 - d) complete the repairs in accordance with any written instructions of the Director.

Respecting the Temporary Wastewater Holding Cell:

23. The Licencee shall notify the Director one week prior to commencing the installation of the liner of the temporary wastewater holding cell.
24. The Licencee shall not use the temporary wastewater holding cell until receiving the approval of the Minister of the report submitted pursuant to Clause 8 of this Schedule.

Respecting the Wastewater Treatment Lagoon:

25. The Licencee shall prior to each effluent discharge campaign from the wastewater treatment lagoon obtain grab samples of the treated wastewater and have them analyzed for:
 - a) the organic content as indicated by the five day biochemical oxygen demand and expressed as milligrams per liter;
 - b) the fecal coliform content as indicated by the MPN index and expressed as MPN per 100 milliliters per sample; and
 - c) the total coliform content as indicated by the MPN index and expressed as MPN per 100 milliliters per sample.
26. The Licencee shall:
 - a) during each year maintain records of:
 - i) wastewater sample dates;
 - ii) original copies of laboratory analytical results of the sampled wastewater;
 - iii) effluent discharge dates;
 - b) make the records being maintained pursuant to sub-Clause 26 a) of this Schedule available to an Environment Officer upon request; and
 - c) keep the maintained records of any one calendar year available for inspection for a period of three years following the respective calendar year in which they were recorded.
27. The Licencee shall arrange with the designated Environment Officer a mutually acceptable time and date for any required soil sampling between the 15th day of May and the 15th day of October of any year.
28. The Licencee shall take and test undisturbed soil samples, in accordance with Schedule A 1 attached to this Schedule, from the liner of the wastewater treatment lagoon; the number and location of samples and test methods to be specified by the designated Environment Officer up to a maximum of 20 samples.
29. The Licencee shall, prior to operating the wastewater treatment lagoon, submit to the Director the results of the tests carried out pursuant to Clause 28 of Schedule A.

30. The Licencee shall, at completion of construction:
- prepare "as constructed drawings" for the temporary wastewater holding cell and the wastewater treatment lagoon and shall label the drawings "As Constructed";
 - provide to the Director, two sets of "as constructed drawings" of the temporary wastewater holding cell; and
 - provide to the Director, two sets of "as constructed drawings" of the wastewater treatment lagoon.

DECOMMISSIONING

Respecting the Temporary Wastewater Holding Cell:

31. The Licencee shall, after placing the wastewater treatment lagoon into operation, prevent any additional wastewater from being discharged into the temporary wastewater holding cell.
32. The Licencee shall decommission the temporary wastewater holding cell within 90 days of commencing operation of the wastewater treatment lagoon.
33. The Licencee shall decommission the temporary wastewater holding cell in accordance with the following:
- transfer the effluent and sludge from the temporary wastewater holding cell to the wastewater treatment lagoon;
 - remove all components of the liner and all ancillary components;
 - dispose of all components of the liner and all ancillary components;
 - at a waste disposal ground operated under the authority of a permit issued under Manitoba Regulation 150/91 or a Licence issued pursuant to The Environment Act; or
 - by other means approved by the Minister; and
 - level the site to the original grade and return the area to its natural state.

Respecting the Wastewater Treatment Lagoon:

34. The Licencee shall submit, within one year prior to closure of the Main Camp, a wastewater treatment lagoon decommissioning plan for the approval of the Minister.
35. The Licencee shall implement and maintain the approved decommissioning plan for the wastewater treatment lagoon.

SCHEDULE A 1 TO ENVIRONMENT ACT LICENCE NO: 2699

Soil Sampling:

1. The Licencee shall provide a drilling rig, acceptable to the designated Environment Officer, to extract soil samples from the liner which is not placed or found at the surface of the lagoon structure. This includes all wastewater treatment lagoons constructed with clay cutoffs at the interior base of the dyke or with a clay cutoff in the centre of the dyke. The drill rig shall have the capacity to drill to the maximum depth of the clay cutoff plus an additional 2 meters. The drill rig shall be equipped with both standard and hollow stem augers. The minimum hole diameter shall be 5 inches.
2. For lagoon liners placed or found at the surface of the lagoon structure, the Licencee shall provide a machine, acceptable to the designated Environment Officer, capable of pressing a sampling tube into the liner in a straight line motion along the centre axis line of the sample tube and without sideways movement.
3. Soil samples shall be collected and shipped in accordance with ASTM Standard D 1587 (Standard Practice for Thin-Walled Tube Sampling of Soils), D 4220 (Standard Practice for Preserving and Transporting Soil Samples) and D 3550 (Standard Practice for Ring-Lines Barrel Sampling of Soils). Thin-walled tubes shall meet the stated requirements including length, inside clearance ratio and corrosion protection. An adequate venting area shall be provided through the sampling head.
4. At the time of sample collection, the designated Environment Officer shall advise the Licencee as to the soil testing method that must be used on each sample. The oedometer method may be used for a sample were the Environment Officer determines that the soil sample is taken from an undisturbed clay soil which has not been remoulded and which is homogeneous and unweathered. The triaxial test shall be used for all samples taken from disturbed and remoulded soils or from non homogenous and weathered soils.
5. The Licencee shall provide a report on the collection of soil samples to the designated Environment Officer and to the laboratory technician which includes but is not limited to: a plot plan indicating sample location, depth or elevation of sample, length of advance of the sample tube length of soil sample contained in the tube after its advancement, the soil test method specified by the Environment Officer for each soil sample and all necessary instructions from the site engineer to the laboratory technician.
6. All drill and sample holes shall be sealed with bentonite pellets after the field drilling and sampling has been completed.

Soil Testing Methods:

1. Triaxial Test Method

- a) The soil samples shall be tested for hydraulic conductivity using ASTM D 5084 (Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter).
- b) Soil specimens shall have a minimum diameter of 70 mm (2.75 inches) and a minimum height of 70 mm (2.75 inches). The soil specimens shall be selected from a section of the soil sample which contains the most porous material based on a visual inspection. The hydraulic gradient shall not exceed 30 during sample preparation and testing. Swelling of the soil specimen should be controlled to adjust for: the amount of compaction measured during sample collection and extraction from the tube and the depth or elevation of the sample. The effective stress used during saturation or consolidation of the sample shall not exceed 40 kPa (5.7 psi) or the specific stress level, that is expected in the field location were the sample was taken, which ever is greater.
- c) The complete laboratory report, as outlined in ASTM D 5084, shall be supplied for each soil sample collected in the field.

2. Oedometer Test Method

- a) The soil samples shall be tested for hydraulic conductivity using ASTM D 2435 (Standard Test Method for One-Dimensional Consolidation Properties of Soils).
- b) Soil specimens shall have a minimum diameter of 50 mm (2 inches) and a minimum height of 20 mm (0.8 inches). The soil specimens shall be selected from a section of the soil sample which contains the most porous material based on a visual inspection. The soil specimen shall be taken from an undisturbed soil sample. The soil specimen shall be completely saturated.
- c) The complete laboratory report, as outlined in ASTM D 2435, shall be supplied for each soil sample collected in the field.



INFORMATION REGARDING THE TRANSPORTATION AND HARVEST OF TIMBER DURING THE DEVELOPMENT OF THE WUSKWATIM GENERATING STATION PROJECT

RE: Work Permits 2006-1-17-003 , 2006-1-17-004 & 2006-1-17-005

Timber Permit # 37565 authorizes the cutting of timber on Crown Land. This would include the temporary access road, the R2 camp location and the borrow pits and quarries located off of the right-of-way.

Load slips are required for the transportation of any wood cut on Crown or private land.

Load slip books will be issued separately based upon the authority under which the timber is harvested.

i.e. Merchantable timber impacted on Crown Land by activities associated with the Wuskwatim PDA will be assessed by MB Conservation for payment of:

- stumpage dues,
 - forest renewal charges, and
 - forest protection charges
- payable upon completion of harvest.

Timber harvested within the private land claim area is attributed to the valuation of the land purchase.

Load slip books are available from MB Conservation.

July 24, 2006

Timber Permit



NO.

37565

THIS IS TO CERTIFY THAT:

WUSKWATIM POWER LIMITED PARTNERSHIP

BOX 815

WINNIPEG, MANITOBA R3C 2P4

is hereby authorized under the provisions of "THE FOREST ACT" and Regulation made thereunder, subject to the special conditions set out below, attached to this Permit or as requested by an Officer, to cut the following quantity of timber AND NO MORE.

VOLUME M ³	SPECIES (JP, SPR, POPTAM, BIRCH, ETC.)	PRODUCT (LBR, PULP, FWD, TBL, ETC.)	WOOD COND. (GR, C, SAL, 2)
	JP / SPR	LBR	GR
	POPLAR	LBR / PULP	GR

From the following, viz:
(Section, Township, Range)

WUSKWATIM PROJECT AREA

(As per work permit # 2006-1-17-003)

and work permit # 2006-1-17-005

THOMPSON

Natural Resource Officer at _____ will supervise cutting.

FMU # 89 & 87

REG. DIST. #

1-17

FOR. SECTION

NR

USE #

1

QUOTA #

LAND STATUS #

9

PERMIT TO BE RET'D

YES

NO

DATE PERMIT
ISSUED

JULY 24, 2006

DATE PERMIT
EXPIRES

(2.11)

PERMIT FEE 10.00

DUES TO BE DETERMINED

(2.22)

F.P.C. PAYABLE UPON

(2.23)

F.R.C. SW COMPLETION
HW
OF HARVEST

SUBTOTAL

(2.59)

GST

TOTAL

C.N.

GST NO.

LOAD SLIP

This area of the Permit must be filled out and accompany the wood while in transit if formal Departmental Load Slips are not used.

Date Cut

Volume Moved

Date of Movement

Time of Movement

Destination

TIMBER PERMIT CONDITIONS

1. No green timber shall be cut within 150 metres of any Provincial Highway or any other Government Road unless the timber is marked or otherwise designated for removal by the Officer.
2. Brush and logging debris shall be cut, topped and spread so as to lie close to the ground. Brush and logging debris on landings must be spread. Brush disposal must at all times keep pace with the cutting operations. Stumps shall not be cut higher than 30 centimetres from the highest point of adjacent ground.
3. The permittee must in no way interfere with any fencing or other improvements on this land. No green timber shall be cut within 150 metres of any building unless marked or otherwise designated for removal by a Natural Resource Officer.
4. Cutting of Elm for Fuelwood is prohibited under the authority of this Permit.
5. Avoid damages to regeneration and/or planted areas.
6. Report forest fires to 1-800-782-0076.

SEE BACK OF PERMIT FOR PERTINENT EXCERPTS FROM FOREST REGULATION

Signature of Permittee

Director of Forestry

Manitoba 

N 130006

DATE July 24 2006

RECEIVED FROM Wuskwatim Power Limited Partnership (J. Markowski)

THE SUM OF Ten ¹⁰⁰ XX DOLLARS \$ 10.00

ON ACCOUNT OF Wuskwatim Power Limited Partnership

Timber Permit # 37565 (permit fee)

dues, forest renewal & forest protection charges to be determine

☐ CASH ☐ CHEQUE ☐ VISA ☐ MASTERCARD ☐ DEBITCARD

ISSUED AT

Thompson District

PER



MANITOBA CONSERVATION / WATER STEWARDSHIP

MG-773A (REV. 04/04)

Work Permit

Permis d'exploitation

Conservation
Manitoba
Manitoba
Conservation



Permit No./N° de permis			
WP	2006	1	17 003
YEAR ANNEE	REGION	DISTRICT	NUMBER NUMÉRO

This permit, issued under the authority of The Crown Lands Act, and/or The Wildfires Act, and, subject to all Acts and regulations in effect from time to time, authorizes/Le présent permis, délivré conformément à la Loi sur les terres domaniales, et/ou la Loi sur les incendies échappés, sous réserve des textes législatifs et des textes réglementaires en vigueur actuellement ou à l'avenir, autorise:

Name of permittee Nom du titulaire	WUSKWATIM POWER LIMITED PARTNERSHIP		Contact name Nom de contact	JOHN MARKOWSKY	
Address Adresse	BOX 815		City/Town Ville	WINNIPEG	Province Province
Postal Code Code postal	R3C 2P4	Telephone No. N° de téléphone	(Business/Affaires) (Généraliste)	778-0165 981-0134	Fax No. N° de fax

to carry out an operation on the following described à effectuer des travaux sur	<input checked="" type="checkbox"/> Crown (Manitoba) lands des terres domaniales (Manitoba)	<input type="checkbox"/> Other lands d'autres terres décrites ci-après
AS PER ATTACHED MAPS AND WORK PERMIT DESCRIPTION		

for the purpose of, des fins de, en vue de, opération afin de, des fins de, des travaux CLEARING FOR TEMPORARY ACCESS ROAD AND TEMPORARY CAMPS R1 & R2 / CONSTRUCTION OF R1 CAMP AND TEMPORARY ACCESS ROAD	Authority (enter # of permit, tender, contract, etc., if applicable) Autorisation (insérer le n° de permis, de soumission, de contrat, etc., le cas échéant) ENVIRONMENT ACT LICENCE NO. 2699 & TIMBER PERMIT # 37565
--	---

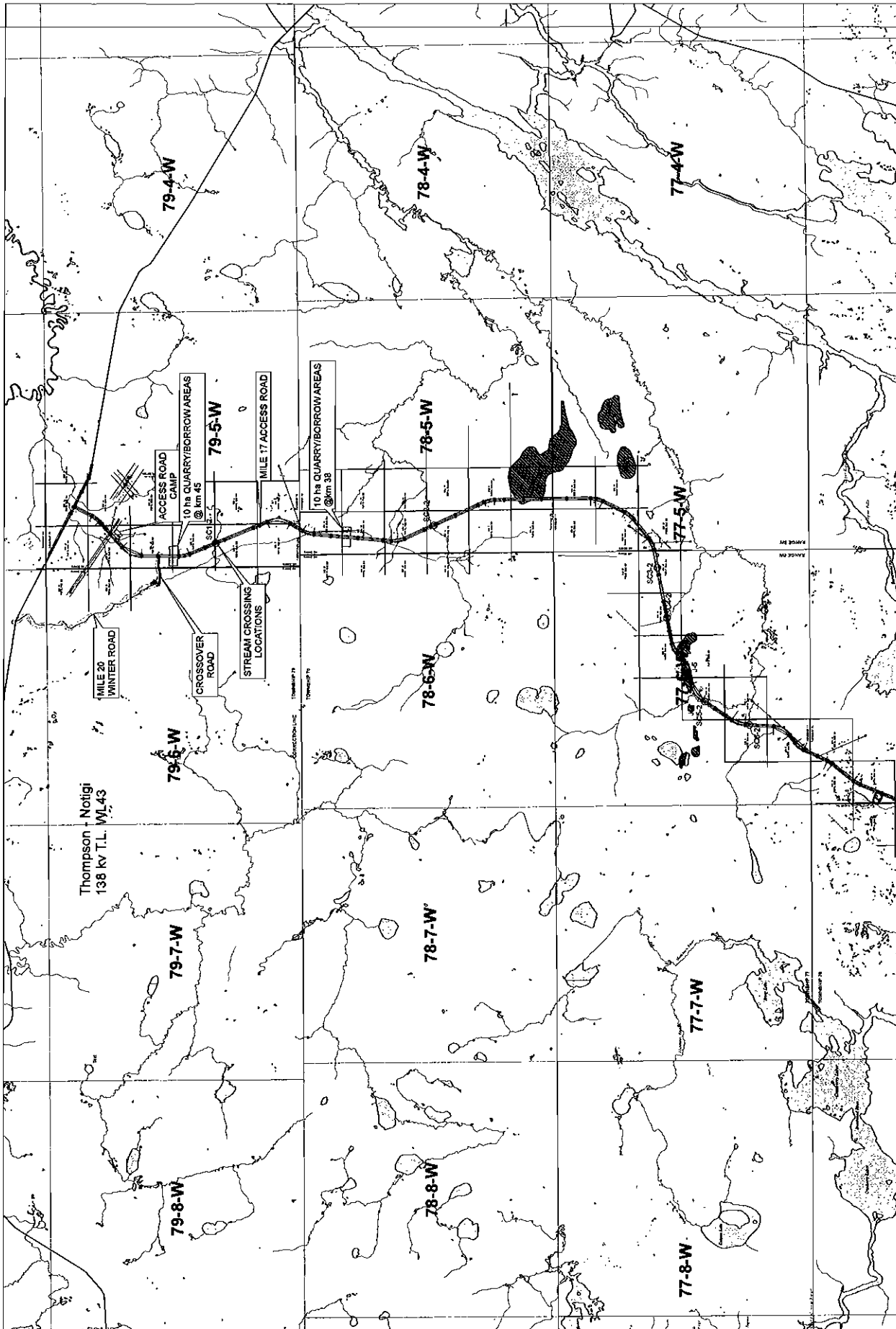
Subject to the following conditions, attach list(s) required, attach le(s) requises/ Sous réserve des conditions suivantes (attache une liste, s'il y a lieu d'attache)

1	This permit must be available at all times on the operation site, produced at the request of an Officer, and may be cancelled by an Officer without advance notice. Ce permis doit pouvoir être présenté à tout moment sur le chantier si un agent demande à le voir, il peut être annulé par un agent préavis.
2	<input checked="" type="checkbox"/> as per attached appendix dated: 24-Jul-06 voir l'annexe en date du:
3	<input checked="" type="checkbox"/> Work shall be conducted in accordance with Environment Act Licence No. 2699 and Timber Permit # 37565 issued to the Wuskwatim Power Limited Partnership for the Development being the Wuskwatim Generating Station.
4	<input checked="" type="checkbox"/> Work shall be conducted as per attached work permit application and project proposal dated June 28 & 29, 2006 respectively.
5	<input type="checkbox"/>

"THIS PERMIT AND THE RIGHTS AND PRIVILEGES GRANTED THEREUNDER ARE NOT TRANSFERABLE"
PERMIT EXPIRES MARCH 31 UNLESS AN EARLIER EXPIRY DATE IS SPECIFIED
"LE PRÉSENT PERMIS AINSI QUE LES DROITS ET PRIVILÈGES QUI S'Y RATTACHENT NE SONT PAS TRANSMISSIBLES"
LE PERMIS EXPIRE LE 31 MARS, À MOINS QU'UNE DATE D'EXPIRATION ANTÉRIEURE N'AIT ÉTÉ PRÉCISÉE

I hereby certify that the information given to obtain this permit is true and that I understand the conditions set out herein./Je certifie que les renseignements fournis pour l'obtention de ce permis sont exacts et que je comprends les conditions indiquées ci-dessus. Signature of Permittee/Signature du titulaire John W. Markowsky Print Name/Lettres majuscules Not valid unless signed by permittee or authorized representative. N'est valide que signé par le titulaire ou son représentant légal.	Date issued/Date de délivrance (y/m/d) (a/m/j) 2006-07-24	 Signature of Issuing Authority/Signature de l'autorité émettrice T. Kuzenko Print Name/Lettres majuscules for Minister of Conservation/ pour le ministre des Conservation Issuing District or Office/ District ou bureau émetteur Thompson District
	Expiry Date/Date d'expiration (y/m/d) (a/m/j) 2007-03-31	

Copy To: PERMITTEE - DISTRICT - REGION
Copie: TITULAIRE - DISTRICT - RÉGION



TEMPORARY ACCESS ROAD

MANITOBA HYDRO
WUSOWATIN GENERATING STATION

"APPENDIX A"

DATE: 24 JUL 2006

New All-weather Road - Work Permit Conditions

Appendix "D"

Work Permit # 2006-1-17-003

Date: July 24, 2006

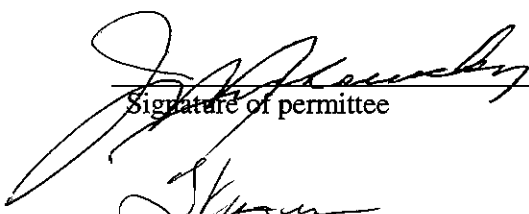
Wuskwatim Power Limited Partnership

The following conditions are in addition to those conditions listed on the face of the permit:

1. The road will follow the route as approved and outlined on the attached map/plan. Any deviation from this route will require prior separate approval from the supervising Natural Resource Officer.
2. There shall be no bulldozing of woody debris into standing timber. All vegetation and debris removed from the road right-of-way shall be piled and burned or compacted in windrows. Windrows shall be compacted to lie as close to the ground as possible (maximum height of 0.6 of a meter) and shall be no closer than 1 meter to the bush line. Burn piles must be located a minimum of 15 metres from standing timber.
3. Merchantable wood may be stockpiled outside and immediately adjacent to the ROW. Stockpile sites shall be located in existing clearings or areas of non-merchantable timber. Stockpile sites shall not be located within 100 meters of a water body. All stockpiled material must be removed from Crown land by March 31, 2008. Timber dues will be payable on all merchantable timber removed.
4. No borrow may be removed from within 50 meters of a water body. The permittee is authorized to remove borrow accessible within 100 m from the right-of-way and requiring less than 2 hectares of clearing at the pit. Borrow areas identified on map "Appendix A" located 38 and 45 kilometers from the Generating Station site and quarries identified as J-5, J-6, G and mile 20 on PR 391 are also permitted at this time. For removal of material and access to additional borrows and quarries, a separate work permit must be obtained. Pits shall be sloped back to a minimum of a 4:1 slope. The removed overburden shall be spread back over the borrow area when finished.
5. A plan for decommissioning and remediation of the temporary access road shall be submitted to the supervising Natural Resource Officer for approval. The approved plan shall be implemented upon discontinued use of the temporary access road.
6. The permittee will ensure that creek crossings are done in accordance with the *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat, May 1996*.
7. Existing trails, portages and other travelways shall not be altered so as to interfere with other users.
8. The Natural Resource Officer in Thompson, (204) 677 6640, shall be notified no less than one week prior to completion of operations to allow for final inspection of the operation.
9. All Operations must be completed to the approval of the local Natural Resource Officer.
10. The local Natural Resource Officer on behalf of the Minister of Conservation, shall have the authority to, at any time, amend or cancel this permit or to suspend operations, should non-compliance of any of the terms or conditions of this permit occur.

IMPORTANT: The Crown Lands Amendment Act assented to July 5th, 1994 states that failure to comply with the terms and conditions of a Work Permit issued under this Act is an offence punishable by a fine of up to \$10,000.

- The onus is on the Permittee (you) to comply with the terms and conditions of this permit.
- You are responsible for the actions of your employees or contractors.
- Corrective action can be ordered at any time during or after the operation.
- The permittee is responsible for consulting with and obtaining all necessary authorizations from the Department of Fisheries and Oceans and Transport Canada.
- To ensure that you are not working on mining restricted lands you should consult with Manitoba Industry, Economic Development and Mines or their website at www.gov.mb.ca/iedm/mrd/geo/gis/minesmaps.html.
- All operations are subject to the appropriate Acts and Regulations, i.e.: The Crown Lands Act, The Fisheries Act, The Wildfires Act, The Forest Act, The Mines Act, The Environment Act, etc.
- A burning permit is required, for open fires, between April 1 and November 15.
- Should your operation require unusual activities or something not clearly identified by this permit consult your local Natural Resource Officer.


Signature of permittee


Natural Resource Officer


Date


Date

Fire Equipment Requirements during Wildfire Season Work Permit Conditions

Appendix "E"

Work Permit # 2006-1-17-003

Date: July 24, 2006

Wuskwatim Power Limited Partnership

The following conditions are in addition to those conditions listed on the face of the work permit:

1. Functional fire suppression equipment is required during the wildfire season, April 1 – November 15. The minimum requirements are dependent on the type of operation and are outlined below;

Road Construction: Each heavy equipment unit (crawler tractor, excavator, skid steer loader, graders) shall be equipped with a minimum of:

- 1 – 20 lb. ABC type fire extinguisher or 2 – 10 lb. ABC type fire extinguishers.
- 1 shovel.

Haulage Trucks: Each truck engaged in log / gravel haulage shall be equipped with a minimum of:

- 1 – 5 lb. ABC type fire extinguisher.
- 1 shovel.

Service / Utility Vehicles: Each service / utility vehicle such as pick-ups or fuel tenders shall be equipped with:

- 1 – 5 lb. ABC type fire extinguisher.

Power Saws / Brush Saws: Each power saw or power hand tool kit shall be equipped with a minimum of:

- 1 – 2 lb. ABC type fire extinguisher.

Logging Operations / Scarification: Each heavy equipment unit (skidder / slasher / forwarder / feller buncher) shall be equipped with in minimum of:

- 1 – 20 lb. ABC type fire extinguisher or equivalent.
- 1 pack pump (full) or equivalent container able to hold a minimum of 20 litres of water.
- 1 shovel.

Forest Camps / Work Crews (drilling / tree planting / line cutting etc.): Each camp shall have the following minimum type of equipment on site;

3 – 5 Person Crew

- 1 pack pump (full) or equivalent container able to hold a minimum of 20 litres of water.
- 1 shovel.

5 – 10 Person Crew

- 2 pack cans (full) or equivalent
- 1 shovel.
- 1 axe.

Permittees Initials: 

Fire Equipment Requirements during Wildfire Season Work Permit Conditions - Continued

Appendix "E"

Work Permit # 2006-1-17-003

Date: July 24, 2006

Wuskwatim Power Limited Partnership

10 Person Crew Plus

- 1 pumping unit (min 50 p.s.i.) c/w 600 feet of forestry hose and accessories.
- 3 pack cans or equivalent.
- 3 shovels.
- 2 axes.

Established Camps / Sawmill Sites etc.: Each camp or sawmill site shall have the minimum type of equipment on site.

- 1 pumping unit (min 50 p.s.i.) c/w 600 feet of forestry hose and accessories.
- 1 – 500 gallon tank wagon / water tender or equivalent (where there is no readily accessible water source)
- 6 pack cans or equivalent.
- 6 shovels.

Other: _____: If none of the above apply the operation shall have the following minimum equipment:

_____ ABC type Fire Extinguisher(s), size _____ Pack can(s)
_____ Shovel(s) _____ Axe(s) _____ Other: _____

2. The operation must have a means of reporting a forest fire from the work site.

The local Natural Resource Officer on behalf of the Minister of Conservation, shall have the authority to, at any time, amend or cancel this permit or to suspend operations, should non-compliance of any of the terms or conditions of this permit occur.

IMPORTANT: The Wildfires Act states that failure to comply with the terms and conditions of a Work Permit issued under this Act is an offence punishable by a fine of up to \$10,000 for an individual and up to \$50,000 for a corporation.

- The onus is on the Permittee (you) to comply with the terms and conditions of this permit.
- You are responsible for the actions of your employees or contractors.
- Spark arrestors are required by law on all internal combustion engines.
- Further conditions or restrictions may be imposed if the wildfire danger levels or specific activity warrants such action.
- A burning permit is required, for open fires, between April 1 and November 15.
- Should your operation require unusual activities or something not clearly identified by this permit consult your local Natural Resource Officer.

Signature of permittee

Date

Natural Resource Officer

Date

Updated: 06/06/12

Temporary Construction Campsite Work Permit Conditions

Appendix "F"

Work Permit # 2006-1-17-003

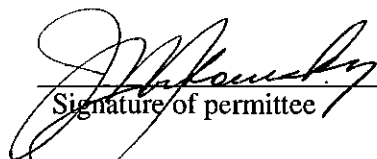
Date: July 24, 2006

Wuskwatim Power Limited Partnership

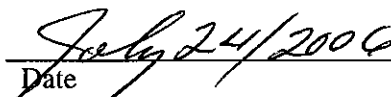
1. Campsites must maintain a distance of 100 metres from all watercourses (Lakes, Rivers and Creeks). Outhouses shall be situated a minimum distance of 30 metres from all watercourses.
2. Campsites shall use existing clearings where possible. There shall be no bulldozing of vegetation into standing timber. All vegetation and debris removed from the site clearing shall be piled and burned or compacted in windrows. Windrows shall be compacted to lie as close to the ground as possible (maximum height of 0.6 of a meter) and shall be no closer than 1 meter to the bush line. Burn piles must be located a minimum of 15 metres from standing timber.
3. Merchantable wood may be stockpiled outside and immediately adjacent to the site clearing. Stockpile sites shall be located in existing clearings or areas of non-merchantable timber. Stockpile sites shall not be located within 100 m of a water body. All stockpiled material must be removed from Crown land by March 31, 2008. Timber dues will be payable on all merchantable timber removed from Crown Land.
4. Existing trails, portages and other travelways shall not be altered so as to interfere with other users.
5. The Natural Resource Officer in Thompson, (204) 677 6640, shall be notified no less than one week prior to completion of operations to allow for final inspection of the operation.
6. All Operations must be completed to the approval of the local Natural Resource Officer.
7. The local Natural Resource Officer on behalf of the Minister of Conservation, shall have the authority to, at any time, amend or cancel this permit or to suspend operations, should non-compliance of any of the terms or conditions of this permit occur.

IMPORTANT: The Crown Lands Amendment Act assented to July 5th, 1994 states that failure to comply with the terms and conditions of a Work Permit issued under this Act is an offence punishable by a fine of up to \$10,000.

- The onus is on the Permittee (you) to comply with the terms and conditions of this permit.
- You are responsible for the actions of your employees or contractors.
- Corrective action can be ordered at any time during or after the operation.
- The permittee is responsible for consulting with and obtaining all necessary authorizations from the Department of Fisheries and Oceans and Transport Canada.
- All operations are subject to the appropriate Acts and Regulations, i.e.: The Crown Lands Act, The Fisheries Act, The Wildfires Act, The Forest Act, The Mines Act, The Environment Act, etc.
- A burning permit is required, for open fires, between April 1 and November 15.
- Should your operation require unusual activities or something not clearly identified by this permit consult your local Natural Resource Officer.



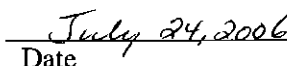
Signature of permittee



Date



Natural Resource Officer



Date

Casual Quarry Permit Work Permit Conditions

Appendix "G"

Work Permit # 2006-1-17-003

Date: July 24, 2006

Wuskwatim Power Limited Partnership

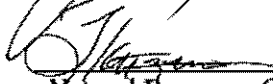
The following conditions are in addition to those listed on the face of the Work Permit and the Casual Quarry Permit Conditions issued by the Mining Recorder:

1. Operations must maintain a minimum distance of 50 metres from all watercourses (Lakes, Rivers and Creeks).
2. If authorized to work in or near a waterbody the permittee will ensure that any work is done in accordance with the *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat, May 1996*.
3. There shall be no bulldozing of vegetation into standing timber. All vegetation and debris removed from the site clearing shall be piled and burned or compacted in windrows. Windrows shall be compacted to lie as close to the ground as possible (maximum height of 0.6 of a meter) and shall be no closer than 1 meter to the bush line. Burn piles must be located a minimum of 15 metres from standing timber.
4. Existing trails, portages and other travelways shall not be altered so as to interfere with other users.
5. The Natural Resource Officer in Thompson, (204) 677 6640, shall be notified no less than one week prior to completion of operations to allow for final inspection of the operation.
6. All Operations must be completed to the approval of the local Natural Resource Officer.
7. The local Natural Resource Officer on behalf of the Minister of Conservation, shall have the authority to, at any time, amend or cancel this permit or to suspend operations, should non-compliance of any of the terms or conditions of this permit occur.

IMPORTANT: The Crown Lands Amendment Act assented to July 5th, 1994 states that failure to comply with the terms and conditions of a Work Permit issued under this Act is an offence punishable by a fine of up to \$10,000.

- The onus is on the Permittee (you) to comply with the terms and conditions of this permit.
- You are responsible for the actions of your employees or contractors.
- Corrective action can be ordered at any time during or after the operation.
- The permittee is responsible for consulting with and obtaining all necessary authorizations from the Department of Fisheries and Oceans and Transport Canada.
- To ensure that you are not working on mining restricted lands you should consult with Manitoba Industry, Economic Development and Mines or their website at www.gov.mb.ca/iedm/mrd/geo/gis/minesmaps.html.
- All operations are subject to the appropriate Acts and Regulations, i.e.: The Crown Lands Act, The Fisheries Act, The Wildfires Act, The Forest Act, The Mines Act, The Environment Act, etc.
- A burning permit is required, for open fires, between April 1 and November 15.
- Should your operation require unusual activities or something not clearly identified by this permit consult your local Natural Resource Officer.


Signature of permittee


Natural Resource Officer


Date


Date

MANITOBA CONSERVATION
SUMMARY OF ENVIRONMENTAL HEALTH REQUIREMENTS FOR
CONSTRUCTION/EXPLORATION CAMPS

Petroleum Storage

- Above ground petroleum storage tanks with a capacity of 5000 litres (1100 gallons) or greater must be registered with Manitoba Conservation prior to installation;
- Above ground petroleum storage tanks with a capacity of 5000 litres or greater must be surrounded by a containment dike or be double walled tanks;
- The diked area must be constructed to retain at least 110% of the capacity of the largest tank within the containment;
- All installations must be done by a Licensed Petroleum Technician
- Above ground petroleum storage tanks with a capacity of 5000 litres or greater must obtain an Operating Permit
- In the event of a spill or leak from a vehicle, pipeline, or storage tank system, the operator must immediately notify an environment officer and take the necessary steps to stop the spill and restore the affected area.
- After normal business hours, call 944-4888 – collect calls accepted.

Waste Oil Storage

- All waste oil generated on-site must be stored in leak-proof drums with tight fitting lids until it can be removed for final disposal.
- Outside storage of waste oil in drums must be on pallets in order to protect the bottom of the drums from corrosion.
- Storage in aboveground tanks 5000 litres or more must comply with the section above.
- The drums must be stored in an area where they are protected from the elements.
- Approved methods of disposal of waste oil include transferal to a recycling facility, or incineration in a registered CSA certified waste oil burner.

Sewage Disposal

- Pit privies and sullage pits are permitted for the disposal of sewage, provided:
 - the depth of available overburden is not less than 1 meter from the bottom of the pit to the bedrock or highwater table;
 - all proper distance requirements are met (contact your local environment officer)
 - toilet buildings are of sound construction
 - buildings are not serviced by pressurized water systems;
- Where buildings are serviced by pressurized water systems, sewage holding tanks or septic fields must be installed to accept sewage;
- All holding tanks and septic fields must be registered with Manitoba Conservation and approved prior to installation and use.

Solid Waste Disposal

- All solid waste generated at the camp must be disposed of at a registered waste disposal ground. On-site burning/burial is not permitted.

Drinking Water Supply

- All surface water used for domestic purposes must be considered unfit for human consumption unless boiled or disinfected prior to use in accordance with Manitoba Regulation 330/88R.
- Drinking water should be boiled vigorously for 1-2 minutes, or disinfected by adding 3-5 drops of unscented household bleach to a gallon of water - let stand for 20 minutes prior to use.

Food Handling

- All food must be stored and handled in accordance with Manitoba Regulation 330/88R.
- The camp kitchen should be designed and maintained in a sanitary manner, as per the regulations.

For more information, contact your local Environment Officer/Public Health Inspector at:

Manitoba Conservation
Northeast Region
Box 28 - 59 Elizabeth Drive
Thompson, MB, R8N 1X4
Phone: (204) 677- 6703
Fax: (204) 677-6359

MANITOBA CONSERVATION
Regional Operations1(a) **APPLICANT** (Go to 1(b) if a Corporation or Federal/ Municipal Government Department/Agency)Name _____
LAST (Please Print) FIRST MIDDLE (no initials)Mailing Address _____
Postal Code _____Telephone: Home: _____ Work: _____
Fax: _____ Mobile: _____
(on site contact number)1(b) **CORPORATE OR FEDERAL/MUNICIPAL GOVERNMENT DEPARTMENT/AGENCY APPLICANT**Registered Name: MANITOBA HYDROType of Organization: ☒ Corporation ☐ Government Department ☐ Government Agency ☐ Other _____Mailing Address: BOX 751, THOMPSON MANITOBA, R8N 1N5
Postal Code R8N 1N5Project Supervisor: JOHN W. MARKOWSKY, P. ENG. Job Title: RESIDENT MANAGER
(Please print)Telephone: Work: 204-778-0165 Fax: 204-778-0179Mobile: 204-981-0134 Email: JWMARKOWSKY@HYDRO.MB.CAOn-Site Supervisor: (SAME) Job Title: _____
(if different than above)

Telephone: Work: _____ Fax: _____

Mobile: _____ Email: _____
(on site contact number)2 **PROJECT DESCRIPTION** (attach a detailed project description and maps if applicable):Type/Purpose of Project: PLEASE SEE ATTACHED COVER LETTERGeneral Location of Project: PLEASE SEE ATTACHED DRAWINGSProject Start Date: JULY 18, 2006 Project Completion Date: MARCH 31, 2007Access to the site will be by: ☒ Vehicles (1/2 tons, etc.) ☐ Boats ☒ Snowmobile/Quad
☐ Aircraft: ☒ Helicopter ☐ Fixed Wing - Float/Skis ☐ Fixed wing - Wheeled
Type of Equipment to be used: ☒ Hand-tools ☒ Heavy Equipment ☐ Other: _____

2(b) DETAILED PROJECT DESCRIPTION

(complete the following if you have not attached a detailed project description or if it does not contain the following information):

Authority: (enter Environment Licence, Exploration Licence, Casual Quarry Permit, Number, etc. if applicable): 2699

Geographic Location (Lake/River/Community Name): SEE ATTACHED DRAWING

Legal Location: Latitude: _____ Longitude: _____ or

☐ NW ¼ ☐ NE ¼ ☐ SW ¼ ☐ SE ¼ ☐ of Section _____ Township _____ Range _____ ☐ WPM ☐ EPM ☐ E of 2nd M

Please note: A map of a minimum 1:50,000 scale showing camp locations and the siting of any new roads is required.

Will access roads be required: ☒ Yes ☐ No If yes: Existing ☐ Yes ☒ No, ☒ Winter ☒ Summer

List where access roads will be required and how they will be constructed (attach separate sheet if necessary): _____

SEE ATTACHED DRAWING

Will camps be required: ☒ Yes ☐ No Size of camp (number of persons): 50 TO 200

List where camps will be located (a map is required) and method of access (attach separate sheet if necessary): _____

SEE ATTACHED DRAWING

Will you have a pressurized water system: ☒ Yes ☐ No

Type of septic system:

☐ Pit privy

☐ Septic tank with a septic field: ☐ Yes ☒ No

☐ Other type HOLDING TANKS

A permit from the Regional Environment Officer is required for sewage systems and pressurized water systems.

3 FUEL STORAGE

Will onsite fuel storage be required: ☒ Yes ☐ No If yes: ☐ Drums Number _____
☒ Envirotank Size 50,000 litres (2 or 3 REQ'D)
☐ Other Type _____ Quantity _____

Will you have a containment berm: ☐ Yes ☒ No Will you have a spill kit: ☒ Yes ☐ No

4 INFORMATION

- Work Permits are required under the Crown Lands Act for work conducted on Crown land.
- Work Permits are required under the Wildfires Act for industrial operations conducted within the Province of Manitoba Burning Permit Area.
- Work permits are no longer required for work within Department of Transportation and Government Services Right-of-Ways. Applicants should contact the nearest TGS Office before beginning work in a TGS ROW.
- Work permit requests of a routine nature will be issued at the district office in a timely manner but depending on the complexity of the project a regional review may be required which can take up to 4 – 6 weeks to complete. Please submit your application accordingly.
- In areas covered by Resource Management Agreements consultation may also be required with the Resource Management Board. Normally the RMB has 45 days to review and provide comments on applications.
- Depending on the project an Environment Licence may also be required. Information on the types of projects that require

an Environment Licence can be obtained at: <http://www.gov.mb.ca/conservation/envapprovals/>

- To ensure that you will not be working on mining restricted lands please consult with Manitoba Industry, Economic Development and Mines or their website at www.gov.mb.ca/iedm/mrd/geo/gis/minesmaps.html.
- The permittee is responsible for consulting with and obtaining all necessary authorizations from other Government Departments or Agencies (i.e. Mines Branch, Department of Fisheries and Oceans, Transport Canada, etc.).
- Fire Equipment is required during the Wildfire Season (April 1 – November 15). (*Insert fire equipment requirements here*)

5 **APPLICANT'S DECLARATION**

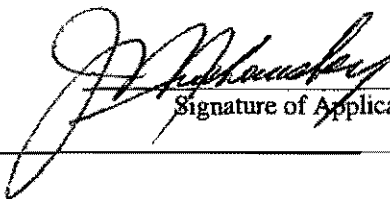
I hereby certify that all information given in this application is true in substance and in fact.

JUNE 28 / 2006

Date

JOHN W MARKOWSKY

Applicant Print Name



Signature of Applicant

Insert map of district boundaries



Box 751 • Thompson Manitoba Canada • R8N 1N9
Telephone / N° de téléphone : (204) 981-0134 • Fax / N° de télécopieur : (204) 778-0179
jwmarkowsky@hydro.mb.ca

2006 06 29

Our File #: 00184-07340

Ms. Tracy Kuzenko
Natural Resource Officer
Manitoba Conservation
Box 28 59 Elizabeth Rd.
Thompson MB R8N 1X4

Dear Ms. Kuzenko:

**Re: Work Permit application for Temporary Road Camps and Borrow Pits
associated with the Construction of the Wuskwatim Generating Station**

Please find enclosed our application for a work permit to conduct works associated with the construction of an all weather access road off Mile 17 of PR 391 to the Wuskwatim Generating Station main construction campsite. The Mile 17 access road is to be a private road owned by the Wuskwatim Power Limited Partnership. See attached map 1-001840-7340-0003 sheets 1 and 2 for location. In addition to the attached work permit application more detailed project information is provided below.

Road camps will be established off the 100 m right-of-way between stations 473+00 and 477+00 as shown on attached drawing Gen-01. An initial camp R1 will be established to provide accommodation for start-up activities and preparation of the Road Camp R2 which will have capacity for the entire anticipated road construction work force. Camp R1 will be located within the same footprint as Camp R2.

In order to provide access to construct the R1 Camp, a temporary access road will be constructed along the existing winter road location from the Mile 20 south of Hwy 391 and cross over to connect to the Mile 17 access road. The cross over road is south of the road camp location. See attached Map 001840-7340-0003 sheet 1 for location.

To construct the access road borrow pits and quarries will be opened. See attached map 1-001840-7340-0003 sheets 1 and 2 for location of known borrow pits and quarries. In addition to the borrow areas identified on the map, borrow materials will also be taken from a 500 m strip on either side of the road centre line along the length of the road. The 500 m strip has been identified on the attached map 1-001840-7340-0003 sheets 1 and 2.

The following are details pertaining to each of the camps and the temporary access road:

Camp R1

Capacity:	50 people
Duration of Camp Operation:	July 18, 2006 to September 2, 2006
Power Source:	Diesel Generator
Sewage Disposal:	10 000 L holding tank pumped out as required
Solid Waste:	Collected in bins and then hauled by truck to the landfill site in Thompson.
Potable Water:	Hauled by truck from Thompson
Method of Access:	Road

Camp R2

Capacity:	200 people
Duration of Camp Operation:	September 2, 2006 to November 30, 2007
Power Source:	Permanent power from power line
Sewage Disposal:	6 x 22 730 L underground fibreglass tanks, pumped out as required
Solid Waste:	Collected in bins and then hauled by truck to the landfill site in Thompson.
Potable Water:	4 x 56 826 L above ground fibreglass tanks, filled as required hauling by truck from Thompson
Method of Access:	Road
Limits of Clearing:	Refer to attached Drawing Gen-01

Temporary Access Road Location

0.5

on map "APPENDIX A"

Location:

The temporary access road extends south from Mile 20 on PR 391 along the route of the existing winter road and crosses over to connect to the new Mile 17 road alignment at approximately km 45. Refer to attached Map 1-001840-7340-0003 sheet 1. A closure plan for the temporary road will follow this application.

Approximate length 3.5 miles, width no more than 100 meters.

Borrow Pits and Quarries

Locations:

Quarry and borrow materials will come from the public pit at mile 20 on PR 391, pits G, H, J and locations at 20 km (pit J-5 and J-6), 31 (pit G), 38 and 45. See attached map 1-001840-7340-0003 sheets 1 and 2 for locations. The approximate size of the pits at kilometre 20, 31, 38 and 45 opened for road construction will be 10 hectares each.

Additional borrow pits will be opened along the length of the roadway no more than 500m from the edge of the ROW. The locations of these pits will be established as the work progresses. It was estimated in the Wuskwatim Environmental Impact Statement that approximately 208 ha would be cleared for this purpose.

Stream Crossings:

The Mile 17 Access Road to the Wuskwatim Generating Station will cross 8 identified stream crossings. Refer to attached map 1-001840-7340-0003 sheets 1 and 2 for locations of the stream crossings. The stream crossings were identified in the Wuskwatim Environmental Impact Statement submitted to Manitoba Conservation in 2003 and are being reviewed by both the Department of Fisheries and Oceans and Transport Canada.

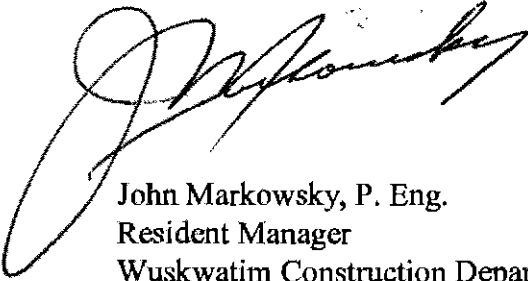
Ms. Kuzenko

2006-06-29

Page 4

If you require further information please contact me directly.

Yours truly,

A handwritten signature in black ink, appearing to read 'J. Markowsky', with a large, stylized loop at the beginning.

John Markowsky, P. Eng.

Resident Manager

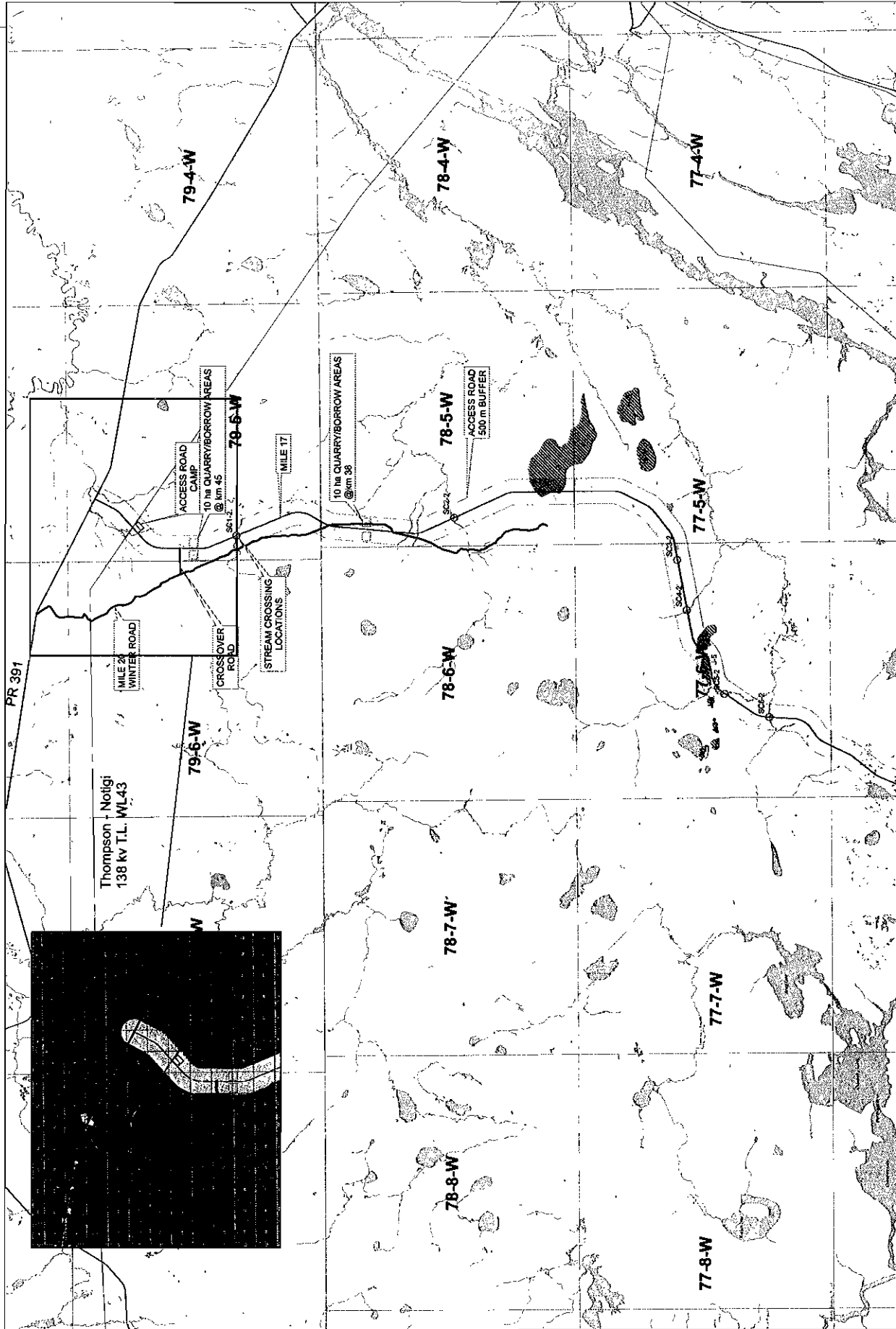
Wuskwatim Construction Department

New Generation Construction Division

Power Supply

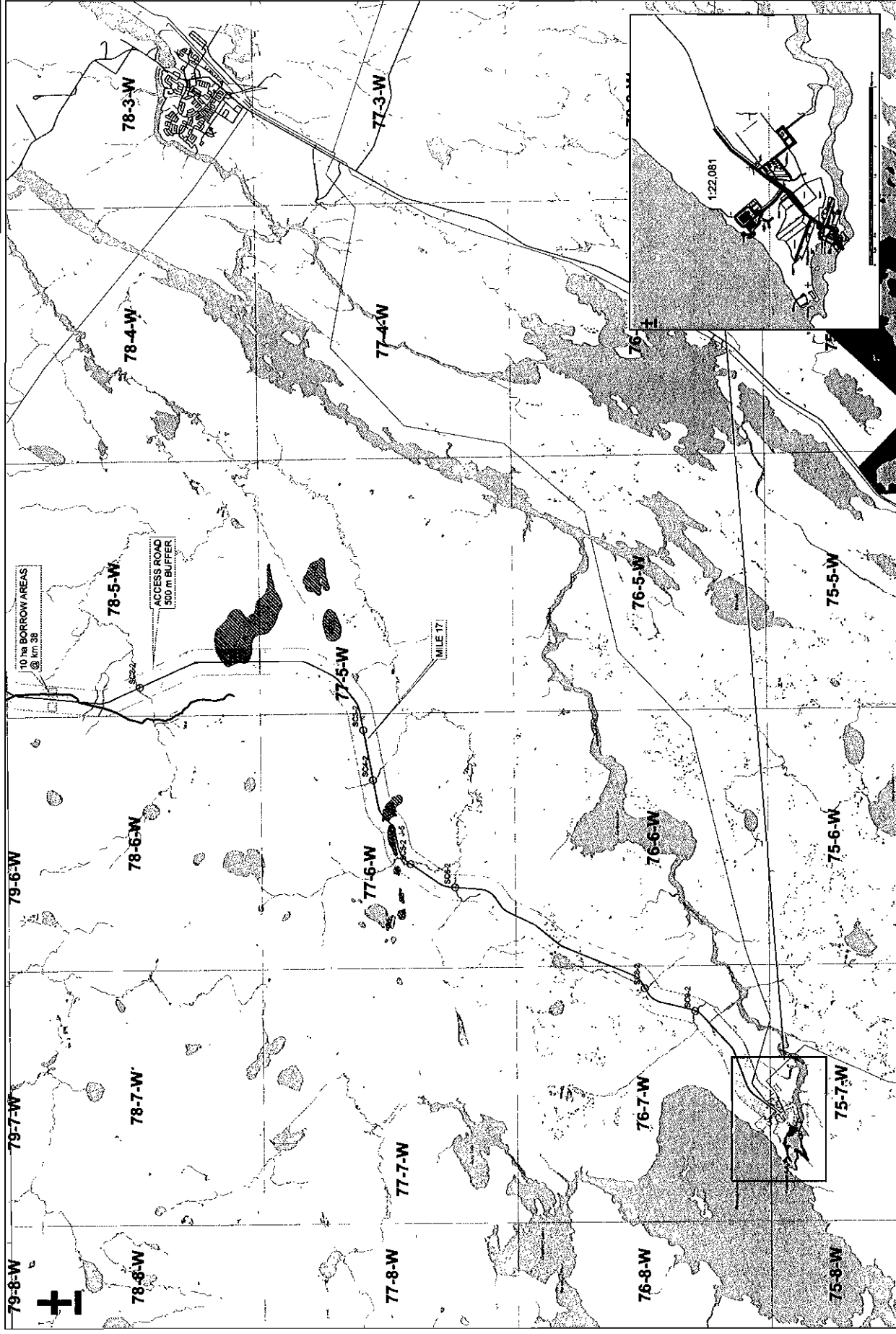
JWM/mmk

Shared\staff\JWM\Permits Temp Road Camps & Borrow Pits



MANITOBA HYDRO		WATERWAYS COLLECTING STATION	
RELATED SITE INFRASTRUCTURE		1-00184-07340-0003	
DATE	BY	SCALE	UNIT
15.03.2006	15.03.2006	1:50,000	1:50,000
PROJECT	DATE	BY	UNIT
1-00184-07340-0003	15.03.2006	1:50,000	1:50,000
<p>NOTES:</p> <p>ALL STREAMS SHOWN ARE 1:50,000 SCALE. ALL STREAMS SHOWN ARE 1:50,000 SCALE.</p>			

Manitoba Water Stewardship No. 57-2-1060



MANITOBA HYDRO
 WATERWATER GENERATING STATION
 RELATED SITE INFRASTRUCTURE

1-00184-07340-0003
 0002 00

DATE: 12/15/2009
 DRAWN BY: J. L. L. L.
 CHECKED BY: J. L. L. L.
 APPROVED BY: J. L. L. L.
 DATE: 12/15/2009

DATE: 12/15/2009
 DRAWN BY: J. L. L. L.
 CHECKED BY: J. L. L. L.
 APPROVED BY: J. L. L. L.
 DATE: 12/15/2009

Work Permit

Permis d'exploitation

Conservation
Manitoba
Manitoba
Conservation



Permit No./N° de permis			
WP	2006	1	17 004
YEAR ANNÉE	REGION RÉGION	DISTRICT DISTRICT	NUMBER N°/N°PER

This permit, issued under the authority of The Crown Lands Act, and/or The Wildfires Act, and, subject to all Acts and regulations in effect from time to time, authorizes/Le présent permis, délivré conformément à la Loi sur les terres domaniales, et/ou la Loi sur les incendies échappés, sous réserve des textes législatifs et des textes réglementaires en vigueur actuellement ou à l'avenir, autorise:

Name of permittee Nom du titulaire	WUSKWATIM POWER LIMITED PARTNERSHIP		Contact name Nom de contact	JOHN MARKOWSKY	
Address Adresse	BOX 815		City/Town Ville	WINNIPEG	Province Province
Postal Code Code postal	R3C 2P4	Telephone No. N° de téléphone	(Business/Affaires) (Cell/Cellule)	778-0165 981-0134	Fax No. N° de fax

to carry out an operation on the following described à effectuer des travaux sur	<input type="checkbox"/> Crown (Manitoba) lands des terres domaniales (Manitoba)	<input checked="" type="checkbox"/> Other lands d'autres terres décrites ci-après
PRIVATE LAND AREA IDENTIFIED IN APPENDIX A & B.		

for the purpose of, des fins, purpose or objective of operation/afin de, déclarer la raison des travaux CLEARING AND CONSTRUCTION OF PERMANENT ACCESS ROAD TO THE WUSKWATIM GENERATING STATION	Authority (enter # of permit, land#, contract # etc. if applicable) Autorisation (insérer le n° de permis, de soumission, de contrat, etc. le cas échéant) Environment Act Licence No. 2699
--	---

Subject to the following conditions, attach if additional apply is intended/Sous réserve des conditions suivantes, joindre s'il y a des d'ajouter

1	This permit must be available at all times on the operation site, produced at the request of an Officer, and may be cancelled by an Officer without advance notice. Ce permis doit pouvoir être présenté à tout moment sur le chantier si un agent demande à le voir, il peut être annulé par un agent préavis.
---	--

2	<input checked="" type="checkbox"/> as per attached appendix dated: voir l'annexe en date du:	24-Jul-06
---	--	-----------

3	<input checked="" type="checkbox"/> Work will be conducted within the private land claim boundary as identified in Appendix A & B.
---	--

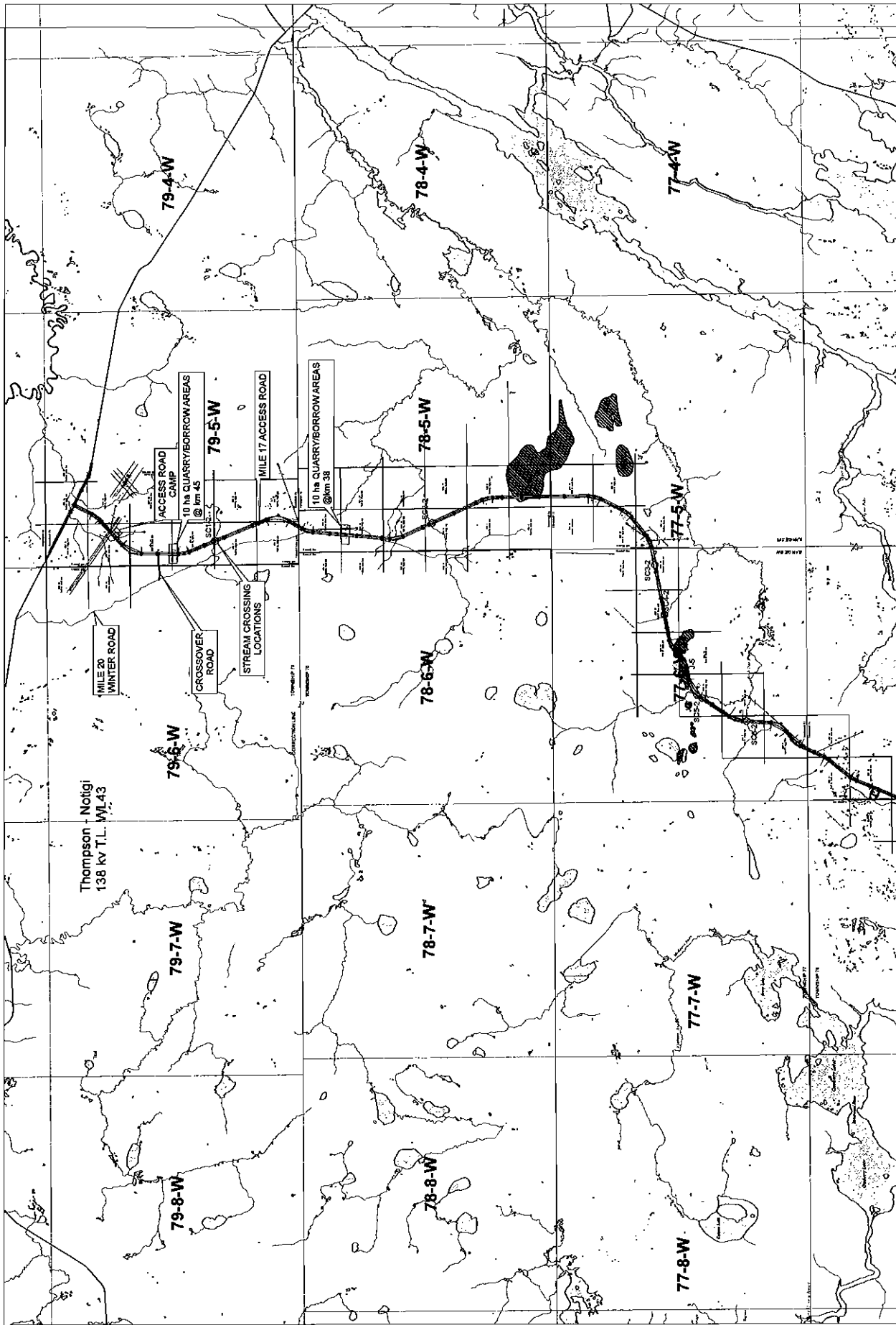
4	<input type="checkbox"/>
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5	<input type="checkbox"/>
---	--------------------------

"THIS PERMIT AND THE RIGHTS AND PRIVILEGES GRANTED THEREUNDER ARE NOT TRANSFERABLE"
PERMIT EXPIRES MARCH 31 UNLESS AN EARLIER EXPIRY DATE IS SPECIFIED
"LE PRESENT PERMIS AINSI QUE LES DROITS ET PRIVILÈGES QUI S'Y RATTACHENT NE SONT PAS TRANSMISSIBLES"
LE PERMIS EXPIRE LE 31 MARS, À MOINS QU'UNE DATE D'EXPIRATION ANTÉRIEURE N'AIT ÉTÉ PRÉCISÉE

I hereby certify that the information given to obtain this permit is true and that I understand the conditions set out herein./Je certifie que les renseignements fournis pour l'obtention de ce permis sont exacts et que je comprends les conditions indiquées ci-dessus. Signature of Permittee/Signature du Titulaire Print Name/Lettres majuscules John W. Markowsky Not valid unless signed by permittee or authorized representative N'est valide que signé par le titulaire ou son représentant légal	Date issued/Date de délivrance (y/m/d) (a/m/j)	2006-07-24	 Signature of Issuing Authority/Signature de l'autorité émettrice T. Kuzenko Print Name/Lettres majuscules For Minister of Conservation/Pour le ministre des Conservation Issuing District or Office/District ou bureau émetteur Thompson District
	Expiry Date/Date d'expiration (y/m/d) (a/m/j)	2007-03-31	

Copy To: PERMITTEE - DISTRICT - REGION
Copie: TITULAIRE - DISTRICT - RÉGION

[illegible]

Parcel A Plan 44575 Plotted In Unsurveyed 10-77-5 Wpm, 5, 8, 9, 15, 22, 23 And 24-77-4 Wpm, 19, 30, 31 And 32-78-6 Wpm And 2, 3, 11, 12, 13, 14 And 24-78-7 Wpm For So Long As The Land Is Required For A Road To The Generating Station Site, Reserving To The Crown All Mines And Minerals, Together With The Right To Enter, Locate, Mine For And Remove Minerals And All Other Estates, Rights And Interests Ordinarily Reserved To The Crown Under The Crown Lands Act.

New All-weather Road (Private Land) - Work Permit Conditions

Appendix "C"

Work Permit # 2006-1-17-004

Date: July 24, 2006

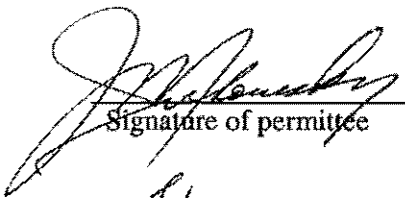
WUSKWATIM POWER LIMITED PARTNERSHIP


The following conditions are in addition to those conditions listed on the face of the permit:

1. The road will be constructed within the private land parcel. Any deviation outside of this parcel onto Crown land will require prior separate approval from the supervising Natural Resource Officer.
2. There shall be no bulldozing of woody debris into standing timber. All vegetation and debris removed from the road right-of-way shall be piled and burned or compacted in windrows. Windrows shall be compacted to lie as close to the ground as possible (maximum height of 0.6 of a meter) and must be located a minimum of 1 metre from standing timber. Burn piles must be located a minimum of 15 metres from standing timber.
3. Merchantable wood may be stockpiled outside and immediately adjacent to the ROW. Stockpile sites shall be located in existing clearings or areas of non-merchantable timber. Stockpile sites shall not be located within 100 meters of a water body. Any stockpiled material must be removed from Crown land by March 31, 2008.
4. On Crown land, no borrow may be removed from within 50 meters of a water body. The permittee is authorized to remove borrow accessible within 100 m from the right-of-way and requiring less than 2 hectares of clearing at the pit. Borrow areas identified on map "Appendix A" located 38 and 45 kilometers from the Generating Station site and quarries identified as J-5, J-6, G and mile 20 on PR 391 are also permitted at this time. For removal of material and access to additional borrows and quarries, a separate work permit must be obtained. Pits shall be sloped back to a minimum of a 4:1 slope. The removed overburden shall be spread back over the borrow area when finished.
5. Existing trails, portages and other travelways shall not be altered so as to interfere with other users.
6. The Natural Resource Officer in Thompson, (204) 677 6640, shall be notified no less than one week prior to completion of operations to allow for final inspection of the operation.
7. All Operations must be completed to the approval of the local Natural Resource Officer.
8. The local Natural Resource Officer on behalf of the Minister of Conservation, shall have the authority to, at any time, amend or cancel this permit or to suspend operations, should non-compliance of any of the terms or conditions of this permit occur.

IMPORTANT: The Crown Lands Amendment Act assented to July 5th, 1994 states that failure to comply with the terms and conditions of a Work Permit issued under this Act is an offence punishable by a fine of up to \$10,000.

- The onus is on the Permittee (you) to comply with the terms and conditions of this permit.
- You are responsible for the actions of your employees or contractors.
- Corrective action can be ordered at any time during or after the operation.
- The permittee is responsible for consulting with and obtaining all necessary authorizations from the Department of Fisheries and Oceans and Transport Canada.
- To ensure that you are not working on mining restricted lands you should consult with Manitoba Industry, Economic Development and Mines or their website at www.gov.mb.ca/iedm/mrd/geo/gis/minesmaps.html.
- All operations are subject to the appropriate Acts and Regulations, i.e.: The Crown Lands Act, The Fisheries Act, The Wildfires Act, The Forest Act, The Mines Act, The Environment Act, etc.
- A burning permit is required, for open fires, between April 1 and November 15.
- Should your operation require unusual activities or something not clearly identified by this permit consult your local Natural Resource Officer.


Signature of permittee


Natural Resource Officer


Date


Date

Fire Equipment Requirements during Wildfire Season Work Permit Conditions

Appendix "D"

Work Permit # 2006-1-17-004

Date: July 24, 2006

Wuskwatim Power Limited Partnership

The following conditions are in addition to those conditions listed on the face of the work permit:

1. Functional fire suppression equipment is required during the wildfire season, April 1 – November 15. The minimum requirements are dependent on the type of operation and are outlined below;

Road Construction: Each heavy equipment unit (crawler tractor, excavator, skid steer loader, graders) shall be equipped with a minimum of:

- 1 – 20 lb. ABC type fire extinguisher or 2 – 10 lb. ABC type fire extinguishers.
- 1 shovel.

Haulage Trucks: Each truck engaged in log / gravel haulage shall be equipped with a minimum of:

- 1 – 5 lb. ABC type fire extinguisher.
- 1 shovel.

Service / Utility Vehicles: Each service / utility vehicle such as pick-ups or fuel tenders shall be equipped with:

- 1 – 5 lb. ABC type fire extinguisher.

Power Saws / Brush Saws: Each power saw or power hand tool kit shall be equipped with a minimum of:

- 1 – 2 lb. ABC type fire extinguisher.

Logging Operations / Scarification: Each heavy equipment unit (skidder / slasher / forwarder / feller buncher) shall be equipped with in minimum of:

- 1 – 20 lb. ABC type fire extinguisher or equivalent.
- 1 pack pump (full) or equivalent container able to hold a minimum of 20 litres of water.
- 1 shovel.

Forest Camps / Work Crews (drilling / tree planting / line cutting etc.): Each camp shall have the following minimum type of equipment on site;

3 – 5 Person Crew

- 1 pack pump (full) or equivalent container able to hold a minimum of 20 litres of water.
- 1 shovel.

5 – 10 Person Crew

- 2 pack cans (full) or equivalent
- 1 shovel.
- 1 axe.

Permittees Initials: 

Fire Equipment Requirements during Wildfire Season Work Permit Conditions - Continued

Appendix "D"

Work Permit # 2006-1-17-004

Date: July 24, 2006

Wuskwatim Power Limited Partnership

10 Person Crew Plus

- 1 pumping unit (min 50 p.s.i.) c/w 600 feet of forestry hose and accessories.
- 3 pack cans or equivalent.
- 3 shovels.
- 2 axes.

Established Camps / Sawmill Sites etc.: Each camp or sawmill site shall have the minimum type of equipment on site.

- 1 pumping unit (min 50 p.s.i.) c/w 600 feet of forestry hose and accessories.
- 1 – 500 gallon tank wagon / water tender or equivalent (where there is no readily accessible water source)
- 6 pack cans or equivalent.
- 6 shovels.

Other: _____ : If none of the above apply the operation shall have the following minimum equipment:

_____ ABC type Fire Extinguisher(s), size _____ Pack can(s)
_____ Shovel(s) _____ Axe(s) _____ Other: _____

2. The operation must have a means of reporting a forest fire from the work site.

The local Natural Resource Officer on behalf of the Minister of Conservation, shall have the authority to, at any time, amend or cancel this permit or to suspend operations, should non-compliance of any of the terms or conditions of this permit occur.

IMPORTANT: The Wildfires Act states that failure to comply with the terms and conditions of a Work Permit issued under this Act is an offence punishable by a fine of up to \$10,000 for an individual and up to \$50,000 for a corporation.

- The onus is on the Permittee (you) to comply with the terms and conditions of this permit.
- You are responsible for the actions of your employees or contractors.
- Spark arrestors are required by law on all internal combustion engines.
- Further conditions or restrictions may be imposed if the wildfire danger levels or specific activity warrants such action.
- A burning permit is required, for open fires, between April 1 and November 15.
- Should your operation require unusual activities or something not clearly identified by this permit consult your local Natural Resource Officer.



Signature of permittee



Natural Resource Officer



Date



Date

Updated: 06/06/12

Work Permit

Permis d'exploitation

Conservation
Manitoba
Manitoba
Conservation



Permit No./N° de permis			
WP	2006	1	17 005
YEAR ANNÉE	REGION RÉGION	DISTRICT DISTRICT	NUMBER NUMÉRO

This permit, issued under the authority of The Crown Lands Act, and/or The Wildfires Act, and, subject to all Acts and regulations in effect from time to time, authorizes/Le présent permis, délivré conformément à la Loi sur les terres domaniales, et/ou la Loi sur les incendies échappés, sous réserve des textes législatifs et des textes réglementaires en vigueur actuellement ou à l'avenir, autorise:

Name of permittee Nom du titulaire	WUSKWATIM POWER LIMITED PARTNERSHIP		Contact name Nom de contact	JOHN MARKOWSKY	
Address Adresse	BOX 815		City/Town Ville	WINNIPEG	Province Province
Postal Code Code postal	R3C 2P4	Telephone No. N° de téléphone	(Business/affaires) 981-0165	Fax No. N° de fax	
			(Cell/Cellule) 981-0134		

to carry out an operation on the following described à effectuer des travaux sur	<input checked="" type="checkbox"/> Crown (Manitoba) lands des terres domaniales (Manitoba)	<input type="checkbox"/> Other lands d'autres terres décrites ci-après
AS PER ATTACHED MAPS AND WORK PERMIT DESCRIPTION		

for the purpose of: (describe purpose or objective of operation)/afin de: (décrire la raison des travaux) OBTAINING BORROW / QUARRY MATERIAL FOR THE CONSTRUCTION OF THE PERMANENT ACCESS ROAD TO WUSKWATIM GENERATING STATION	Authority: (enter # of permit, tender, contract, etc., if applicable) Autorisation: (inscrire le n° de permis, de soumission, de contrat, etc., le cas échéant) ENVIRONMENT ACT LICENCE NO. 2699 / TIMBER PERMIT #37565 / QUARRY LEASE No. OL-1792 TO QL-1807 INCLUSIVE
---	---

Subject to the following conditions: (attach list if additional space is required)/Sous réserve des conditions suivantes: (annexer une liste, s'il n'y a pas d'espace)

1	This permit must be available at all times on the operation site, produced at the request of an Officer, and may be cancelled by an Officer without advance notice. Ce permis doit pouvoir être présenté à tout moment sur le chantier si un agent demande à le voir; Il peut être annulé par un agent préavis.
2	<input checked="" type="checkbox"/> as per attached appendix dated: 24-Jul-06 voir l'annexe en date du:
3	<input checked="" type="checkbox"/> Work will be conducted in accordance with Environment Act Licence No. 2699, and Timber Permit # 37565 issued to the Wuskwatim Power Limited Partnership for the Development being the Wuskwatim Generating Station.
4	<input checked="" type="checkbox"/> Work shall be conducted as per attached work permit application and project proposal dated June 28 & 29, 2006 respectively.
5	<input type="checkbox"/>

"THIS PERMIT AND THE RIGHTS AND PRIVILEGES GRANTED THEREUNDER ARE NOT TRANSFERABLE"
PERMIT EXPIRES MARCH 31 UNLESS AN EARLIER EXPIRY DATE IS SPECIFIED
"LE PRÉSENT PERMIS AINSI QUE LES DROITS ET PRIVILÈGES QUI S'Y RATTACHENT NE SONT PAS TRANSMISSIBLES"
LE PERMIS EXPIRE LE 31 MARS, À MOINS QU'UNE DATE D'EXPIRATION ANTÉRIEURE N'AIT ÉTÉ PRÉCISÉE

I hereby certify that the information given to obtain this permit is true and that I understand the conditions set out herein./Je certifie que les renseignements fournis pour l'obtention de ce permis sont exacts et que je comprends les conditions indiquées ci-dessus. Signature of Permittee/Signature du titulaire John W. Markowsky Print Name/Lettres imprimées Not valid unless signed by permittee or authorized representative. N'est valide que signé par le titulaire ou son représentant légal	Date issued/Date de délivrance (y/mo/da) (a/m/j) 2006-07-24	 Signature of Issuing Authority/Signature de l'autorité émettrice T. Kuzenko Print Name/Lettres imprimées (or Minister of Conservation/pour le ministre des Conservation) Issuing District or Office/District ou bureau émetteur Thompson District
	Expiry Date/Date d'expiration (y/mo/da) (a/m/j) 2006-03-31	

Copy To: PERMITTEE - DISTRICT - REGION
Copie: TITULAIRE - DISTRICT - RÉGION

Casual Quarry Permit Work Permit Conditions

Appendix "C"

Work Permit # 2006-1-17-005

Date: July 24, 2006

Wuskwatim Power Limited Partnership

The following conditions are in addition to those listed on the face of the Work Permit and the Casual Quarry Permit Conditions issued by the Mining Recorder:

1. Operations must maintain a minimum distance of 50 metres from all watercourses (Lakes, Rivers and Creeks).
2. If authorized to work in or near a waterbody the permittee will ensure that any work is done in accordance with the *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat, May 1996*.
3. There shall be no bulldozing of vegetation into standing timber. All vegetation and debris removed from the site clearing shall be piled and burned or compacted in windrows. Windrows shall be compacted to lie as close to the ground as possible (maximum height of 0.6 of a meter) and shall be no closer than 1 meter to the bush line. Burn piles must be located a minimum of 15 metres from standing timber.
4. No borrow may be removed from within 50 meters of a water body. The permittee is authorized to remove borrow accessible within 100 m from the right-of-way and requiring less than 2 hectares of clearing at the pit. Borrow areas identified on map "Appendix A" located 38 and 45 kilometers from the Generating Station site and quarries identified as J-5, J-6, G and mile 20 on PR 391 are also permitted at this time. For removal of material and access to additional borrows and quarries, a separate work permit must be obtained. Pits shall be sloped back to a minimum of a 4:1 slope. The removed overburden shall be spread back over the borrow area when finished.
5. Existing trails, portages and other travelways shall not be altered so as to interfere with other users.
6. The Natural Resource Officer in Thompson, (204) 677 6640, shall be notified no less than one week prior to completion of operations to allow for final inspection of the operation.
7. All Operations must be completed to the approval of the local Natural Resource Officer.
8. The local Natural Resource Officer on behalf of the Minister of Conservation, shall have the authority to, at any time, amend or cancel this permit or to suspend operations, should non-compliance of any of the terms or conditions of this permit occur.

IMPORTANT: The Crown Lands Amendment Act assented to July 5th, 1994 states that failure to comply with the terms and conditions of a Work Permit issued under this Act is an offence punishable by a fine of up to \$10,000.

- The onus is on the Permittee (you) to comply with the terms and conditions of this permit.
- You are responsible for the actions of your employees or contractors.
- Corrective action can be ordered at any time during or after the operation.
- The permittee is responsible for consulting with and obtaining all necessary authorizations from the Department of Fisheries and Oceans and Transport Canada.
- To ensure that you are not working on mining restricted lands you should consult with Manitoba Industry, Economic Development and Mines or their website at www.gov.mb.ca/iedm/mrd/geo/gis/minesmaps.html.
- All operations are subject to the appropriate Acts and Regulations, i.e.: The Crown Lands Act, The Fisheries Act, The Wildfires Act, The Forest Act, The Mines Act, The Environment Act, etc.
- A burning permit is required, for open fires, between April 1 and November 15.
- Should your operation require unusual activities or something not clearly identified by this permit consult your local Natural Resource Officer.


Signature of permittee


Natural Resource Officer


Date


Date

Fire Equipment Requirements during Wildfire Season Work Permit Conditions

Appendix "D"

Work Permit # 2006-1-17-005

Date: July 24, 2006

Wuskwatim Power Limited Partnership

The following conditions are in addition to those conditions listed on the face of the work permit:

1. Functional fire suppression equipment is required during the wildfire season, April 1 – November 15. The minimum requirements are dependent on the type of operation and are outlined below;

Road Construction: Each heavy equipment unit (crawler tractor, excavator, skid steer loader, graders) shall be equipped with a minimum of:

- 1 – 20 lb. ABC type fire extinguisher or 2 – 10 lb. ABC type fire extinguishers.
- 1 shovel.

Haulage Trucks: Each truck engaged in log / gravel haulage shall be equipped with a minimum of:

- 1 – 5 lb. ABC type fire extinguisher.
- 1 shovel.

Service / Utility Vehicles: Each service / utility vehicle such as pick-ups or fuel tenders shall be equipped with:

- 1 – 5 lb. ABC type fire extinguisher.

Power Saws / Brush Saws: Each power saw or power hand tool kit shall be equipped with a minimum of:

- 1 – 2 lb. ABC type fire extinguisher.

Logging Operations / Scarification: Each heavy equipment unit (skidder / slasher / forwarder / feller buncher) shall be equipped with in minimum of:

- 1 – 20 lb. ABC type fire extinguisher or equivalent.
- 1 pack pump (full) or equivalent container able to hold a minimum of 20 litres of water.
- 1 shovel.

Forest Camps / Work Crews (drilling / tree planting / line cutting etc.): Each camp shall have the following minimum type of equipment on site;

3 – 5 Person Crew

- 1 pack pump (full) or equivalent container able to hold a minimum of 20 litres of water.
- 1 shovel.

5 – 10 Person Crew

- 2 pack cans (full) or equivalent
- 1 shovel.
- 1 axe.

Permittees Initials:



Fire Equipment Requirements during Wildfire Season Work Permit Conditions - Continued

Appendix "D"

Work Permit # 2006-1-17-005

Date: July 24, 2006

Wuskwatim Power Limited Partnership

10 Person Crew Plus

- 1 pumping unit (min 50 p.s.i.) c/w 600 feet of forestry hose and accessories.
- 3 pack cans or equivalent.
- 3 shovels.
- 2 axes.

Established Camps / Sawmill Sites etc.: Each camp or sawmill site shall have the minimum type of equipment on site.

- 1 pumping unit (min 50 p.s.i.) c/w 600 feet of forestry hose and accessories.
- 1 ~ 500 gallon tank wagon / water tender or equivalent (where there is no readily accessible water source)
- 6 pack cans or equivalent.
- 6 shovels.

Other: _____ : If none of the above apply the operation shall have the following minimum equipment:

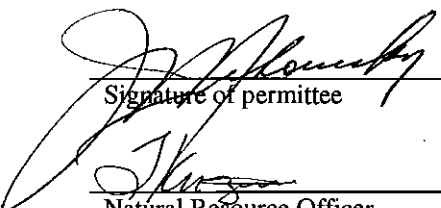
_____ ABC type Fire Extinguisher(s), size _____ Pack can(s)
_____ Shovel(s) _____ Axe(s) _____ Other: _____

2. The operation must have a means of reporting a forest fire from the work site.

The local Natural Resource Officer on behalf of the Minister of Conservation, shall have the authority to, at any time, amend or cancel this permit or to suspend operations, should non-compliance of any of the terms or conditions of this permit occur.

IMPORTANT: The Wildfires Act states that failure to comply with the terms and conditions of a Work Permit issued under this Act is an offence punishable by a fine of up to \$10,000 for an individual and up to \$50,000 for a corporation.

- The onus is on the Permittee (you) to comply with the terms and conditions of this permit.
- You are responsible for the actions of your employees or contractors.
- Spark arrestors are required by law on all internal combustion engines.
- Further conditions or restrictions may be imposed if the wildfire danger levels or specific activity warrants such action.
- A burning permit is required, for open fires, between April 1 and November 15.
- Should your operation require unusual activities or something not clearly identified by this permit consult your local Natural Resource Officer.



Signature of permittee



Natural Resource Officer



Date



Date

Updated: 06/06/12

Forestry Branch
Timber Permit

Manitoba
Conservation



NO. **37565**

THIS IS TO CERTIFY THAT:

WUSKWATIM POWER LIMITED PARTNERSHIP
BOX 815
WINNIPEG, MANITOBA R3C 2P4

is hereby authorized under the provisions of "THE FOREST ACT" and Regulation made thereunder, subject to the special conditions set out below, attached to this Permit or as requested by an Officer, to cut the following quantity of timber AND NO MORE.

VOLUME M ³	SPECIES (JP,SPR,POP,TAM,BIRCH,ETC)	PRODUCT (LBR,PULP,PW,BO,TBA,ETC)	WOOD COND. (GR-O,SAL-2)
	JP / SPR	LBR	GR
	POPLAR	LBR / PULP	GR

From the following, viz:
(Section, Township, Range)

WUSKWATIM PROJECT AREA

(As per work permit # 2006-1-17-003)

and work permit # 2006-1-17-005

Natural Resource Officer at **THOMPSON** will supervise cutting.

FMU #	89 & 87	
REG. DIST. #	1-17	
FOR. SECTION	NR	
USE #	1	
QUOTA #		
LAND STATUS #	9	
PERMIT TO BE RET'D	YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
DATE PERMIT ISSUED	JULY 24, 2006	
DATE PERMIT EXPIRES		
(2.11) PERMIT FEE	10.00	
DUES	TO BE DETERMINED	
(2.22) F.P.C.	PAYABLE UPON	
(2.23) F.P.C.	SW. COMPLETION	
	HW	
	OF HARVEST	
SUBTOTAL		
(2.99) GST		
TOTAL		
C.N.		
GST NO.		

LOAD SLIP		This area of the Permit must be filled out and accompany the wood while in transit if formal Departmental Load Slips are not used.		
Date Cut	Volume Moved	Date of Movement	Time of Movement	Destination

TIMBER PERMIT CONDITIONS

1. No green timber shall be cut within 150 metres of any Provincial Highway or any other Government Road unless the timber is marked or otherwise designated for removal by the Officer.
2. Brush and logging debris shall be cut, lopped and spread so as to lie close to the ground. Brush and logging debris on landings must be spread. Brush disposal must at all times keep pace with the cutting operations. Stumps shall not be cut higher than 30 centimetres from the highest point of adjacent ground.
3. The permittee must in no way interfere with any fencing or other improvements on this land. No green timber shall be cut within 150 metres of any building unless marked or otherwise designated for removal by a Natural Resource Officer.
4. Cutting of Elm for Fuelwood is prohibited under the authority of this Permit.
5. Avoid damages to regeneration and/or planted areas.
6. Report forest fires to 1-800-782-0076.

SEE BACK OF PERMIT FOR PERTINENT EXCERPTS FROM FOREST REGULATION

Signature of Permittee

Director of Forestry

MANITOBA CONSERVATION
Regional Operations1(a) APPLICANT (Go to 1(b) if a Corporation or Federal/ Municipal Government Department/Agency)Name _____
LAST (Please Print) FIRST MIDDLE (no initials)Mailing Address _____
Postal Code _____Telephone: Home: _____ Work: _____
Fax: _____ Mobile: _____
(on site contact number)1(b) CORPORATE OR FEDERAL/MUNICIPAL GOVERNMENT DEPARTMENT/AGENCY APPLICANTRegistered Name: MANITOBA HYDROType of Organization: ☒ Corporation ☐ Government Department ☐ Government Agency ☐ Other _____Mailing Address: BOX 751, THOMPSON MANITOBA, R8N 1N5
Postal Code R8N 1N5Project Supervisor: JOHN W. MARKOWSKY, P. ENG. Job Title: RESIDENT MANAGER
(Please print)Telephone: Work: 204-778-0165 Fax: 204-778-0179
Mobile: 204-981-0134 Email: JWMARKOWSKY@HYDRO.MB.CAOn-Site Supervisor: (SAME) Job Title: _____
(if different than above)Telephone: Work: _____ Fax: _____
Mobile: _____ Email: _____
(on site contact number)2 PROJECT DESCRIPTION (attach a detailed project description and maps if applicable):Type/Purpose of Project: PLEASE SEE ATTACHED COVER LETTERGeneral Location of Project: PLEASE SEE ATTACHED DRAWINGSProject Start Date: JULY 18, 2006 Project Completion Date: MARCH 31, 2007Access to the site will be by: ☒ Vehicles (1/2 tons, etc.) ☐ Boats ☒ Snowmobile/Quad
☐ Aircraft: ☒ Helicopter ☐ Fixed Wing - Float/Skis ☐ Fixed wing - WheeledType of Equipment to be used: ☒ Hand-tools ☒ Heavy Equipment ☐ Other: _____

2(b) DETAILED PROJECT DESCRIPTION

(complete the following if you have not attached a detailed project description or if it does not contain the following information):

Authority: (enter Environment Licence, Exploration Licence, Casual Quarry Permit, Number, etc. if applicable): 2699

Geographic Location (Lake/River/Community Name): SEE ATTACHED DRAWING

Legal Location: Latitude: _____ Longitude: _____ or

☐ NW ¼ ☐ NE ¼ ☐ SW ¼ ☐ SE ¼ ☐ of Section _____ Township _____ Range _____ ☐ WPM ☐ EPM ☐ E of 2nd M

Please note: A map of a minimum 1:50,000 scale showing camp locations and the siting of any new roads is required.

Will access roads be required: ☒ Yes ☐ No If yes: Existing ☐ Yes ☒ No, ☒ Winter ☒ Summer

List where access roads will be required and how they will be constructed (attach separate sheet if necessary): _____

SEE ATTACHED DRAWING

Will camps be required: ☒ Yes ☐ No Size of camp (number of persons): 50 TO 200

List where camps will be located (a map is required) and method of access (attach separate sheet if necessary): _____

SEE ATTACHED DRAWING

Will you have a pressurized water system: ☒ Yes ☐ No

Type of septic system:

☐ Pit privy

☐ Septic tank with a septic field: ☐ Yes ☒ No

☐ Other type HOLDING TANKS

A permit from the Regional Environment Officer is required for sewage systems and pressurized water systems.

3 FUEL STORAGE

Will onsite fuel storage be required: ☒ Yes ☐ No If yes: ☐ Drums Number _____
☒ Envirotank Size 50,000 litres (2 OR 3 REQ'D)
☐ Other Type _____ Quantity _____

Will you have a containment berm: ☐ Yes ☒ No Will you have a spill kit: ☒ Yes ☐ No

4 INFORMATION

- Work Permits are required under the Crown Lands Act for work conducted on Crown land.
- Work Permits are required under the Wildfires Act for industrial operations conducted within the Province of Manitoba Burning Permit Area.
- Work permits are no longer required for work within Department of Transportation and Government Services Right-of-Ways. Applicants should contact the nearest TGS Office before beginning work in a TGS ROW.
- Work permit requests of a routine nature will be issued at the district office in a timely manner but depending on the complexity of the project a regional review may be required which can take up to 4 – 6 weeks to complete. Please submit your application accordingly.
- In areas covered by Resource Management Agreements consultation may also be required with the Resource Management Board. Normally the RMB has 45 days to review and provide comments on applications.
- Depending on the project an Environment Licence may also be required. Information on the types of projects that require

an Environment Licence can be obtained at: <http://www.gov.mb.ca/conservation/envapprovals/>

- To ensure that you will not be working on mining restricted lands please consult with Manitoba Industry, Economic Development and Mines or their website at www.gov.mb.ca/iedm/mrd/geo/gis/minesmaps.html.
- The permittee is responsible for consulting with and obtaining all necessary authorizations from other Government Departments or Agencies (i.e. Mines Branch, Department of Fisheries and Oceans, Transport Canada, etc.).
- Fire Equipment is required during the Wildfire Season (April 1 – November 15). (*Insert fire equipment requirements here*)

5 APPLICANT'S DECLARATION

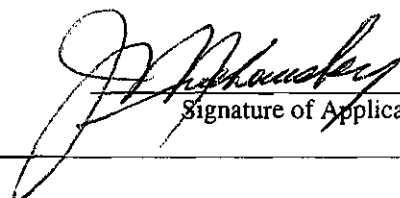
I hereby certify that all information given in this application is true in substance and in fact.

JUNE 28 / 2006

Date

JOHN W MARKOWSKY

Applicant Print Name



Signature of Applicant

Insert map of district boundaries

2006 06 29

Our File #: 00184-07340

Ms. Tracy Kuzenko
Natural Resource Officer
Manitoba Conservation
Box 28 59 Elizabeth Rd.
Thompson MB R8N 1X4

Dear Ms. Kuzenko:

**Re: Work Permit application for Temporary Road Camps and Borrow Pits
associated with the Construction of the Wuskwatim Generating Station**

Please find enclosed our application for a work permit to conduct works associated with the construction of an all weather access road off Mile 17 of PR 391 to the Wuskwatim Generating Station main construction campsite. The Mile 17 access road is to be a private road owned by the Wuskwatim Power Limited Partnership. See attached map 1-001840-7340-0003 sheets 1 and 2 for location. In addition to the attached work permit application more detailed project information is provided below.

Road camps will be established off the 100 m right-of-way between stations 473+00 and 477+00 as shown on attached drawing Gen-01. An initial camp R1 will be established to provide accommodation for start-up activities and preparation of the Road Camp R2 which will have capacity for the entire anticipated road construction work force. Camp R1 will be located within the same footprint as Camp R2.

In order to provide access to construct the R1 Camp, a temporary access road will be constructed along the existing winter road location from the Mile 20 south of Hwy 391 and cross over to connect to the Mile 17 access road. The cross over road is south of the road camp location. See attached Map 001840-7340-0003 sheet 1 for location.

To construct the access road borrow pits and quarries will be opened. See attached map 1-001840-7340-0003 sheets 1 and 2 for location of known borrow pits and quarries. In addition to the borrow areas identified on the map, borrow materials will also be taken from a 500 m strip on either side of the road centre line along the length of the road. The 500 m strip has been identified on the attached map 1-001840-7340-0003 sheets 1 and 2.

The following are details pertaining to each of the camps and the temporary access road:

Camp R1

Capacity:	50 people
Duration of Camp Operation:	July 18, 2006 to September 2, 2006
Power Source:	Diesel Generator
Sewage Disposal:	10 000 L holding tank pumped out as required
Solid Waste:	Collected in bins and then hauled by truck to the landfill site in Thompson.
Potable Water:	Hauled by truck from Thompson
Method of Access:	Road

Camp R2

Capacity:	200 people
Duration of Camp Operation:	September 2, 2006 to November 30, 2007
Power Source:	Permanent power from power line
Sewage Disposal:	6 x 22 730 L underground fibreglass tanks, pumped out as required
Solid Waste:	Collected in bins and then hauled by truck to the landfill site in Thompson.
Potable Water:	4 x 56 826 L above ground fibreglass tanks, filled as required hauling by truck from Thompson
Method of Access:	Road
Limits of Clearing:	Refer to attached Drawing Gen-01

Temporary Access Road Location

Location: The temporary access road extends south from Mile 20 on PR 391 along the route of the existing winter road and crosses over to connect to the new Mile 17 road alignment at approximately km 45. Refer to attached Map 1-001840-7340-0003 sheet 1. A closure plan for the temporary road will follow this application.

Borrow Pits and Quarries

Locations: Quarry and borrow materials will come from the public pit at mile 20 on PR 391, pits G, H, J and locations at 20 km (pit J-5 and J-6), 31 (pit G), 38 and 45. See attached map 1-001840-7340-0003 sheets 1 and 2 for locations. The approximate size of the pits at kilometre 20, 31, 38 and 45 opened for road construction will be 10 hectares each.

Additional borrow pits will be opened along the length of the roadway no more than 500m from the edge of the ROW. The locations of these pits will be established as the work progresses. It was estimated in the Wuskwatim Environmental Impact Statement that approximately 208 ha would be cleared for this purpose.

Stream Crossings: The Mile 17 Access Road to the Wuskwatim Generating Station will cross 8 identified stream crossings. Refer to attached map 1-001840-7340-0003 sheets 1 and 2 for locations of the stream crossings. The stream crossings were identified in the Wuskwatim Environmental Impact Statement submitted to Manitoba Conservation in 2003 and are being reviewed by both the Department of Fisheries and Oceans and Transport Canada.

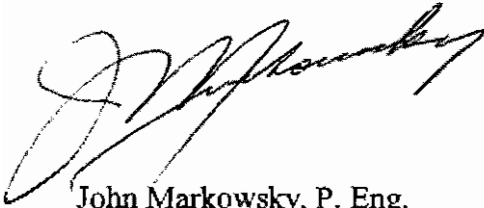
Ms. Kuzenko

2006-06-29

Page 4

If you require further information please contact me directly.

Yours truly,

A handwritten signature in black ink, appearing to read 'J. Markowsky', written in a cursive style.

John Markowsky, P. Eng.

Resident Manager

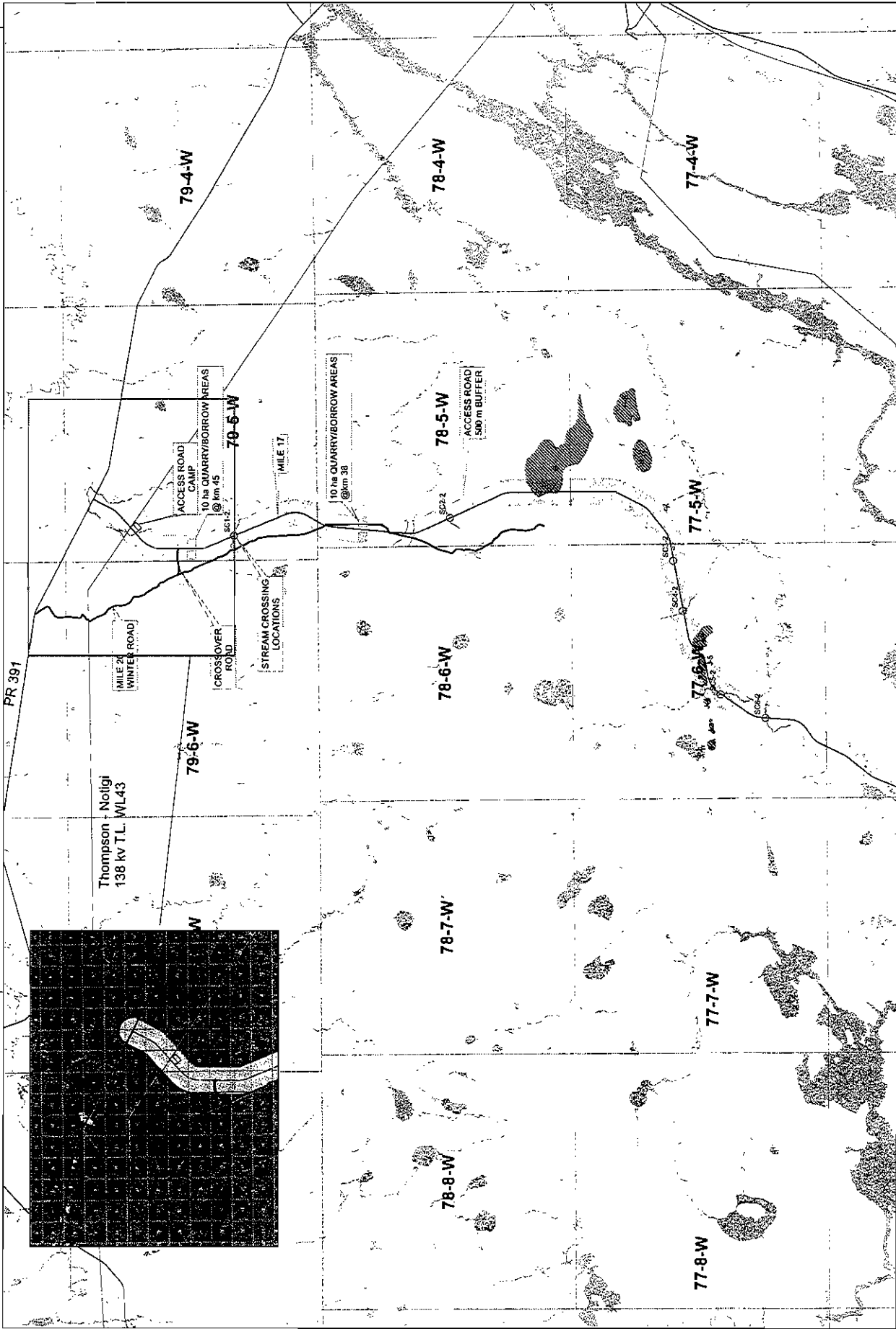
Wuskwatim Construction Department

New Generation Construction Division

Power Supply

JWM/mmk

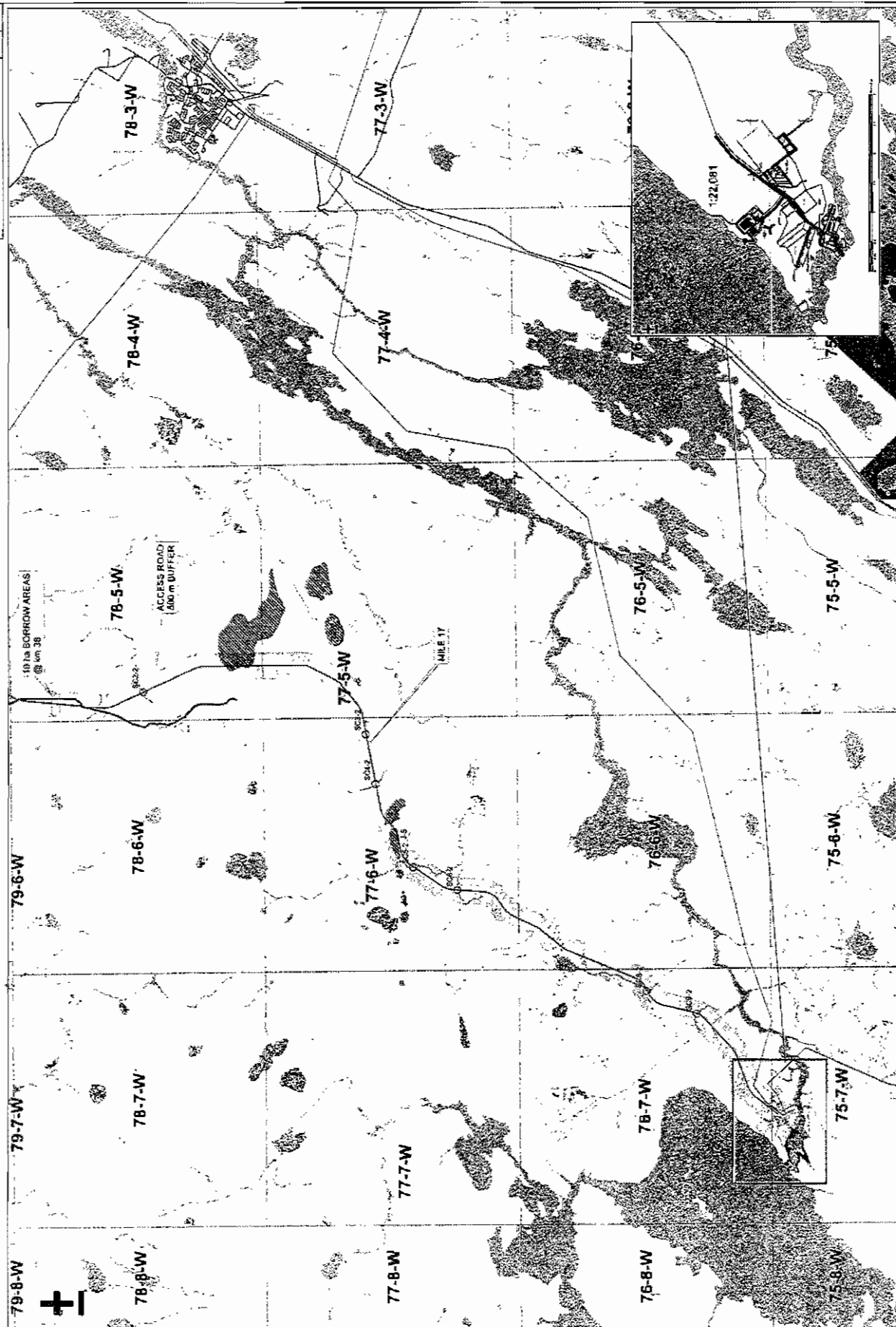
Shared\staff\JWM\Permits Temp Road Camps & Borrow Pits



MANITOBA HYDRO		WATERWAY GENERATING STATION	
RELATED SITE INFRASTRUCTURE		1-00184-07340-0003	
DATE	BY	DATE	BY
01/01/2006	0001	01/01/2006	0001

DATE	BY	DATE	BY
01/01/2006	0001	01/01/2006	0001

DATE	BY	DATE	BY
01/01/2006	0001	01/01/2006	0001



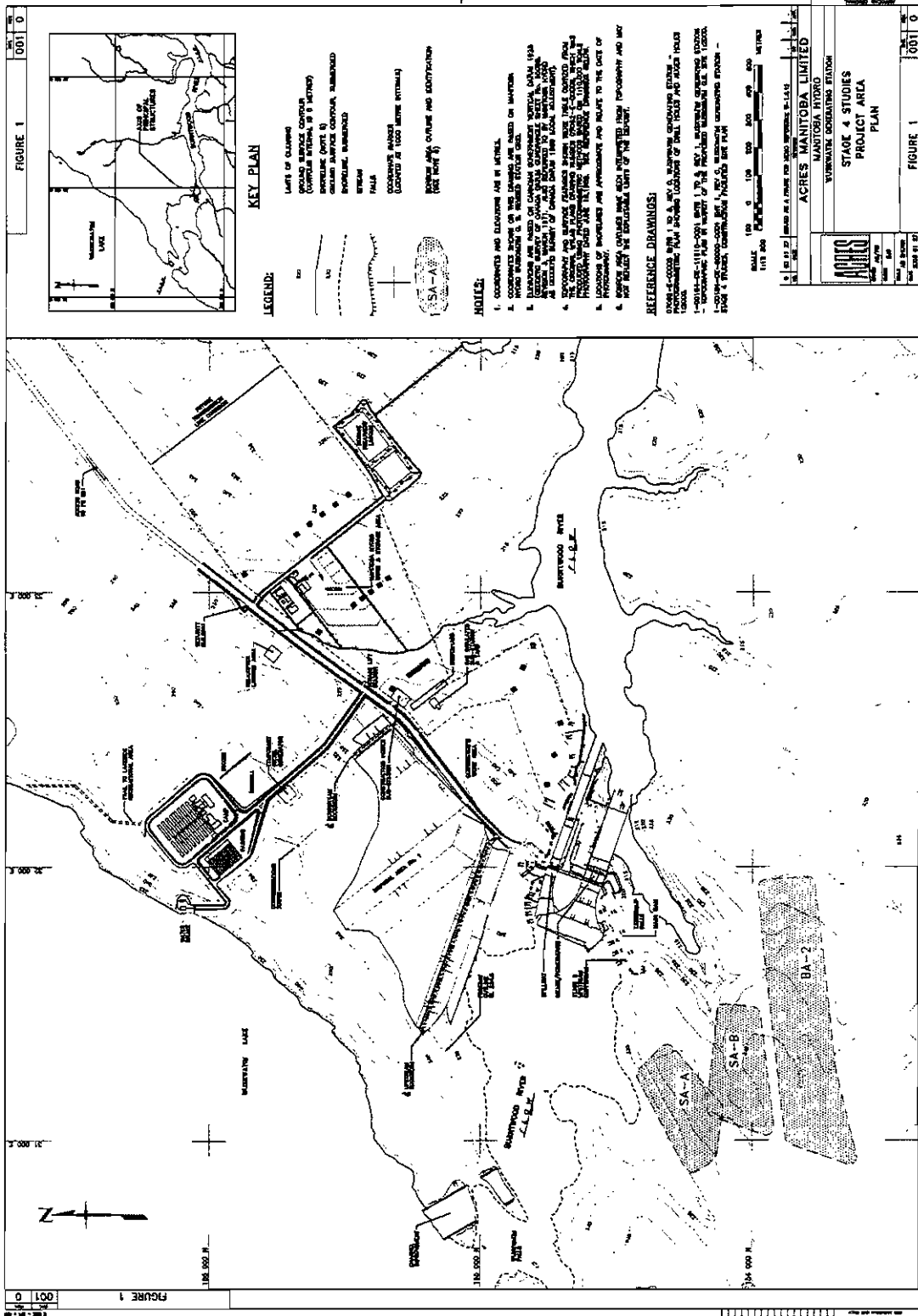


FIGURE 1 001 0



TRANSPORT CANADA
MARINE SAFETY
Navigable Waters Protection
100 Front Street South
Sarnia, Ontario, N7T 2M4

FAX

To: Ken Adams

Phone:

Fax: 204-474-4114

Re: NWPA File #8200-03-6891

Date: July 21, 2006

No. of Pages Including Cover Sheet: 4

From: Kelly Thompson
NWP Administration
Marine Safety, Ontario Region

Phone: 1-519-383-1865

Fax: 1-519-383-1989

MESSAGE:

Please find attached the formal approval document for 4 Culverts, Unnamed Creeks, Wuskwatim Generation Project, Province of Ontario Original complete with approved drawings to follow via registered mail.

Cc: Nick Barnes, Manitoba Hydro Fax # 204-474-4974



Transport Canada
Marine

Transports Canada
Maritime

REGISTERED

100 S. Front Street
Sarnia, Ontario
N7T 2M4

Your file Votre référence

Our file Notre référence
8200-03-6891

Wuskwatim Power Limited Partnership
C/O Manitoba Hydro
820 Taylor Ave (4)
Winnipeg, Manitoba
R3M 3T1

Attention: Ken Adams

Dear Sir:

**RE: Application for approval of Four (4) Culverts, Unnamed Creeks, Wuskwatim
Generation Project, Taskinigup Falls, Wuskwatim Lake at the Burntwood
River, Province of Manitoba**

APPROVAL

Enclosed herewith is a formal document dated **JUL 21 2006** signed on behalf of
the Minister of Transport.

Please acknowledge receipt of this documentation. In addition, kindly advise this office at
the above address of the date of commencement and of completion of the work.

A copy of this Approval shall be kept available on site at all times until completion of the
project.

Yours truly,

Barry Putt
Superintendent
Navigable Waters Protection
Transport Canada

Encl.

Canada

Approval

APPLICANT: Wuskwatim Power Limited Partnership
C/O Manitoba Hydro
820 Taylor Ave (4)
Winnipeg, Manitoba
R3M 3T1

WORK: Culverts (4)

SITE - LOCATION: Unnamed Creeks
Latitude: 55° 32' 29", Longitude: 98° 30' 14"
Wuskwatim Generation Project, Taskinigup Falls, Wuskwatim Lake at the
Burntwood River, Province of Manitoba

IMPORTANT NOTE: This document authorizes the work in terms of its
effect on marine navigation. It is the applicant's
responsibility to obtain any other forms of approval,
including building permits.

WHEREAS the above-named applicant has made application to the Minister of Transport
under the Navigable Waters Protection Act for approval of the above-described work at the above-referred
to site in accordance with the attached plan(s):

WHEREAS it is considered advisable to approve the said work at the said site and plan(s)
thereof for a period of 50 years, subject to the following term(s) and condition(s)

Please ensure compliance with the following conditions in the interest of navigation safety:

Please see attached

THEREFORE, the Minister of Transport, pursuant to the provisions of the Navigable Waters
Protection Act, Revised Statutes of Canada, 1985, chapter N-22, hereby approves the said work at the
said site and plan(s) thereof for the period of time aforesaid providing:

- (a) the construction of the work is commenced within six (6) months and
completed within three (3) years of the date hereof;
- (b) the work is built, placed and maintained in accordance with the plan(s)
and the Navigable Waters Works Regulations and the aforesaid
term(s) and condition(s).

Sarnia, dated

JUL 21 2006



Barry Putt
Superintendent, Navigable Waters Protection
Transport Canada

for Minister of Transport.

File # 8200-03-6891

NAVIGABLE WATERS PROTECTION ACT
CONDITIONS OF APPROVAL



Name: *Wuskwatim Power Limited Partnership*

Work: *Culverts (4)*

Location: *Unnamed Creeks, Wuskwatim Generation Project, Taskingup Falls,
Wuskwatim Lake at Burntwood River, Province of
Manitoba*

Please ensure compliance with the following conditions in the interest of navigation safety:

Conditions During Construction

1. All vessels shall be permitted safe passage through the construction site, and assisted as necessary.
2. During all periods of construction, a portage route, including clearly marked entry and exit points, is installed and maintained on both the upstream and the downstream side of the work.
3. Signage is posted at both the upstream and downstream side of the roadway notifying waterway users of the portage location.
4. Signage is also posted on the access road, notifying roadway users of the portage locations and warning to watch for boaters crossing the roadway.

Conditions After Construction

1. After completion of the project, a portage route, including clearly marked entry and exit points, is installed and maintained on both the upstream and downstream side of the work.
2. Signage is posted at both the upstream and downstream side of the roadway notifying waterway users of the portage locations.
3. Signage is also posted on the access road, notifying roadway users of the portage locations and warning to watch for boaters crossing the roadway.
4. No person shall permit any tools, equipment, vehicles, temporary structures or parts thereof used or maintained for the purpose of building or placing a work in a navigable water to remain in such water after the completion of the project.
5. Where a work or a portion of a work that is being constructed or maintained in a navigable water causes debris or other material to accumulate on the bed or on the surface of such water, the owner of that work or portion of that work shall cause the debris or other material to be removed to the satisfaction of the Minister.

#430/47

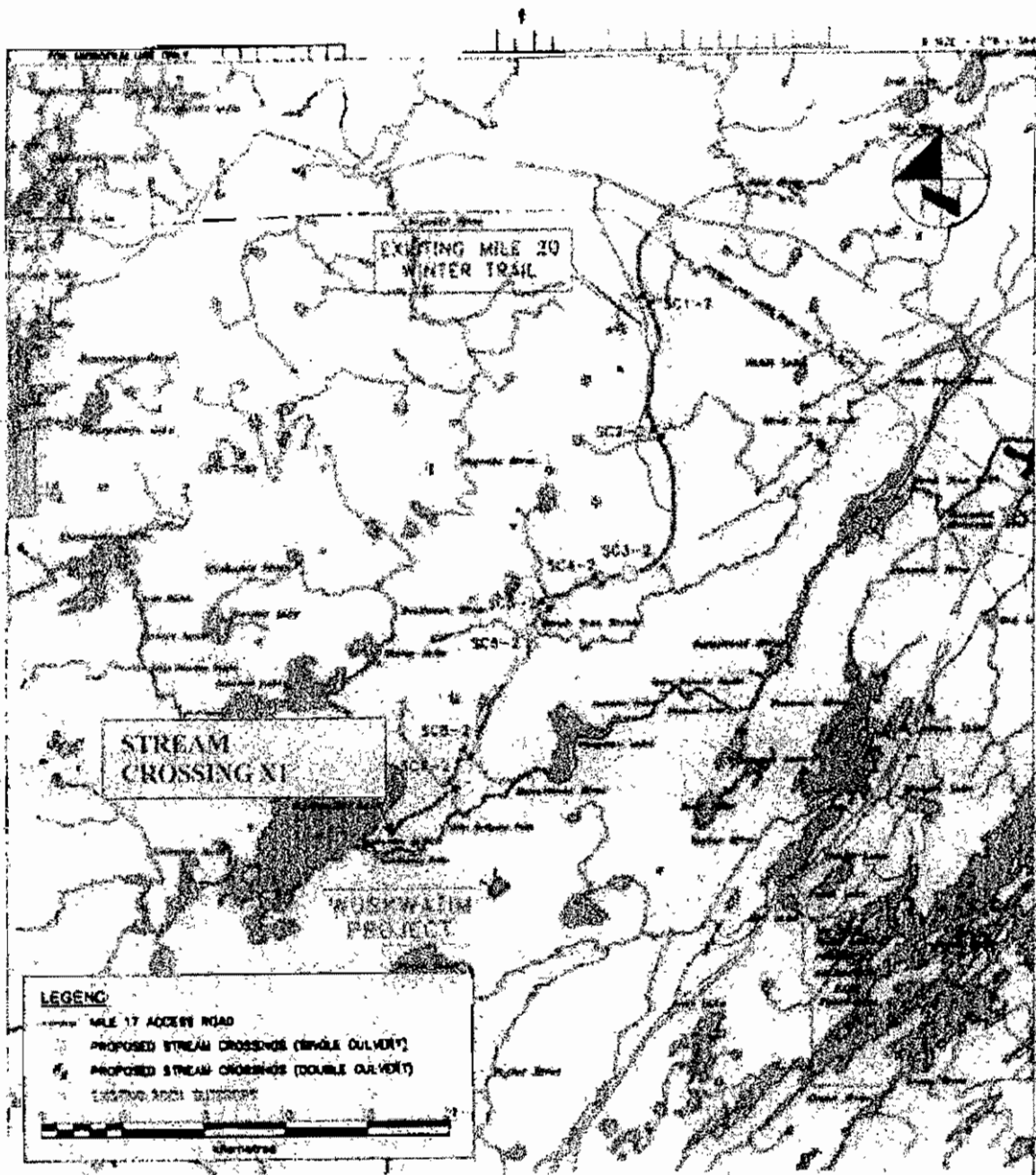
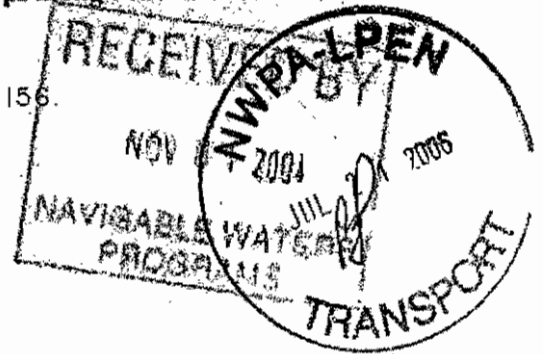


Figure 1 - Location of stream crossings and rock outcrops along Mile 17 access road

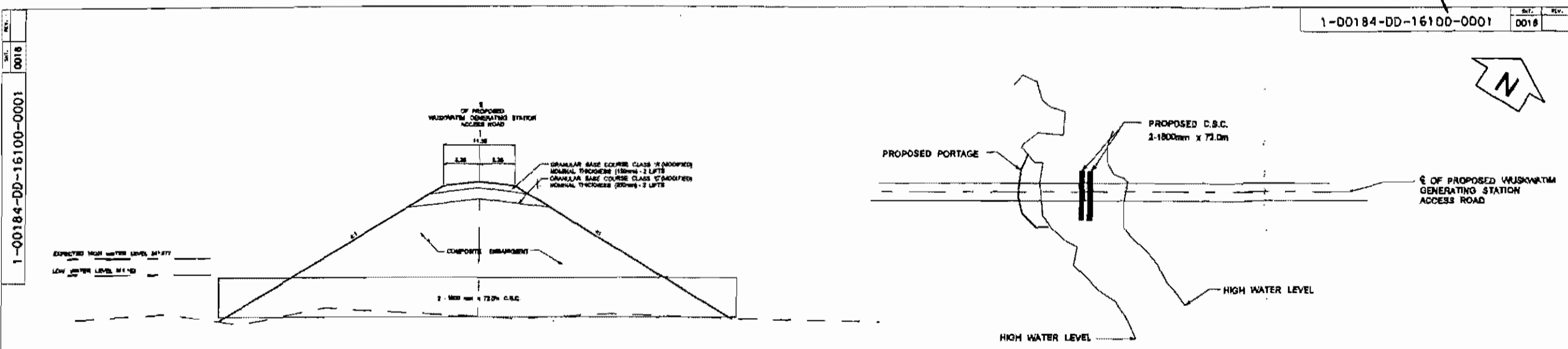
DEPOSITED IN THE WINNIPEG LAND TITLES OFFICE
THIS 12th DAY OF APRIL 2005 AS RAILWAY DEPOSIT NO. R1156.

W.A. [Signature]
FOR DISTRICT REGISTRAR
REGISTRATION NO. 3117536



#44 of 47

8200-03-6891



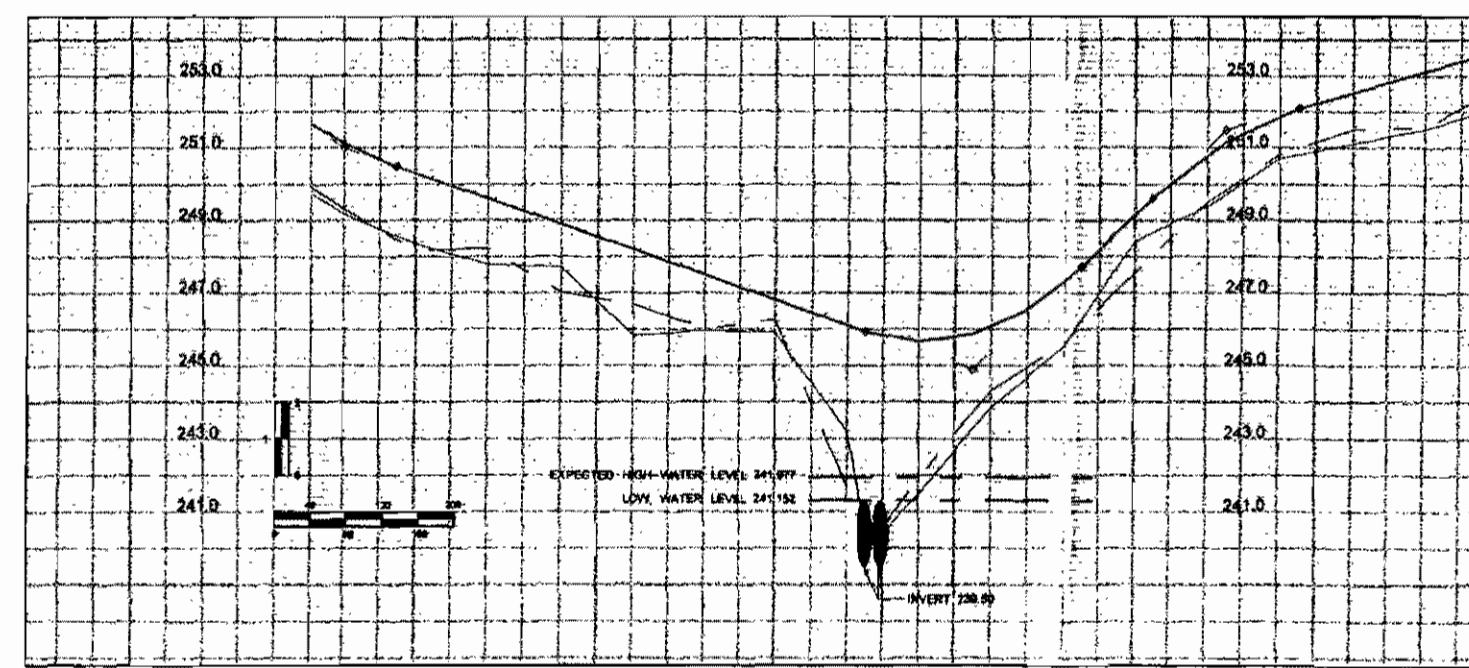
TYPICAL CROSS SECTION
STREAM CROSSING R2 (STA. 345+04)

PLAN VIEW
STREAM CROSSING R2 (STA. 345+04)

DEPOSITED IN THE WINNIPEG LAND TITLES OFFICE
THIS 12th DAY OF APRIL 2005 AS RAILWAY DEPOSIT NO. R1156.

W.A. Johnston
FOR DISTRICT REGISTRAR
REGISTRATION NO. 3117536

RECEIVED BY
MAY 19 2005
NAVIGABLE WATERS
PROGRAMS



TYPICAL PROFILE
STREAM CROSSING R2 (STA. 345+04)
LAT 55°45'38" LONG 98°13'14"

RECEIVED BY
NOV 01 2004
NAVIGABLE WATERS
PROGRAMS

NO.	DATE	REVISIONS	BY	CHK.
MANITOBA HYDRO WUSKATIM GENERATING STATION				
WUSKATIM GENERATING STATION ACCESS ROAD STREAM CROSSING DETAILS				
DATE	SEPT. 13, 2004	1-00184-DD-16100-0001	0018	

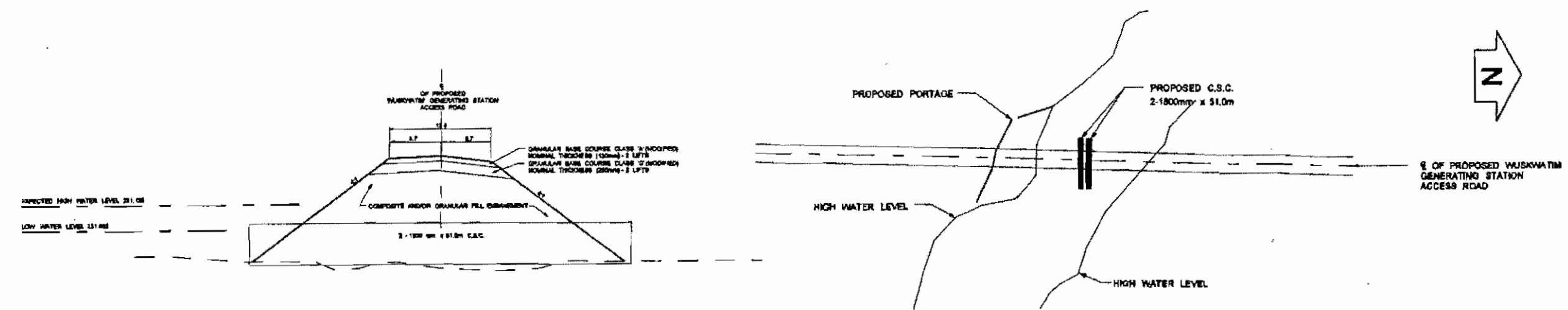
NWPA-LPEN
JUL 21 2005
TRANSPORT

#45 of 47

1-00184-DD-16100-0001

0017

1-00184-DD-16100-0001
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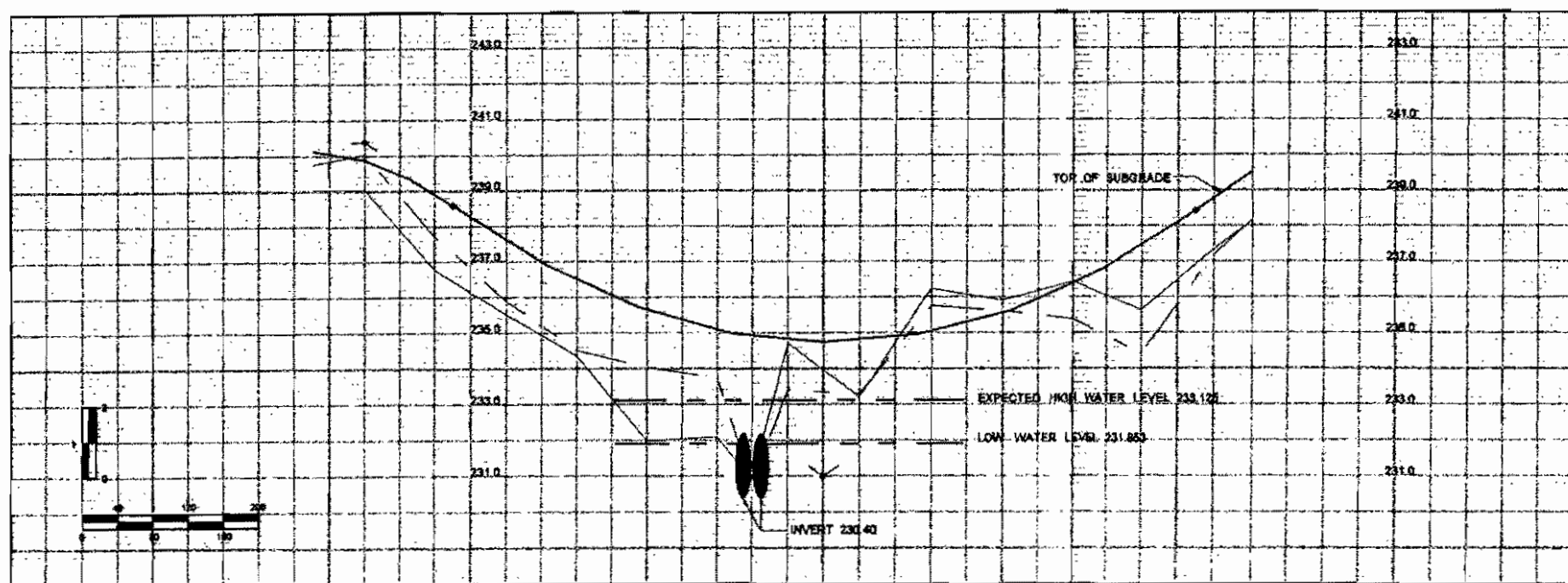


TYPICAL CROSS SECTION
STREAM CROSSING R5 (STA. 187+20)

PLAN VIEW
STREAM CROSSING R5 (STA. 187+20)

DEPOSITED IN THE WINNIPEG LAND TITLES OFFICE
THIS 12th DAY OF APRIL 2005 AS RAILWAY DEPOSIT NO. R1156.
W.A. Johnston
FOR DISTRICT REGISTRAR
REGISTRATION NO. 3117536

RECEIVED BY
MAY 18 2005
NAVIGABLE WATERS
PROGRAMS



TYPICAL PROFILE
STREAM CROSSING R5 (STA. 187+20)
LAT 55°40' 00" LONG 98°19' 37"

RECEIVED BY
NOV 01 2004
NAVIGABLE WATERS
PROGRAMS

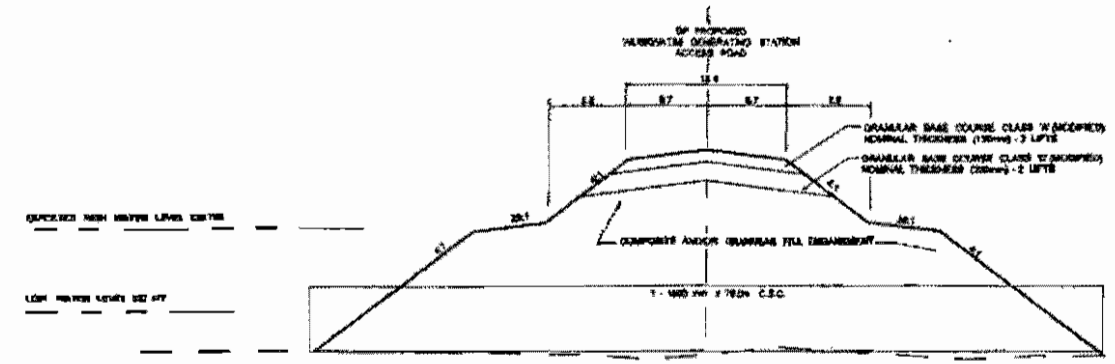
NWPA-LPEN
JUL 21 2006
TRANSPORT

NOTED	REV.	DATE	BY	CHKD.	APPD.
MANITOBA HYDRO MUSKOWATIM GENERATING STATION WUSKOWATIM GENERATING STATION ACCESS ROAD STREAM CROSSING DETAILS					
DATE	AS SHOWN	SEP 15, 2004	1-00184-DD-16100-0001	0017	

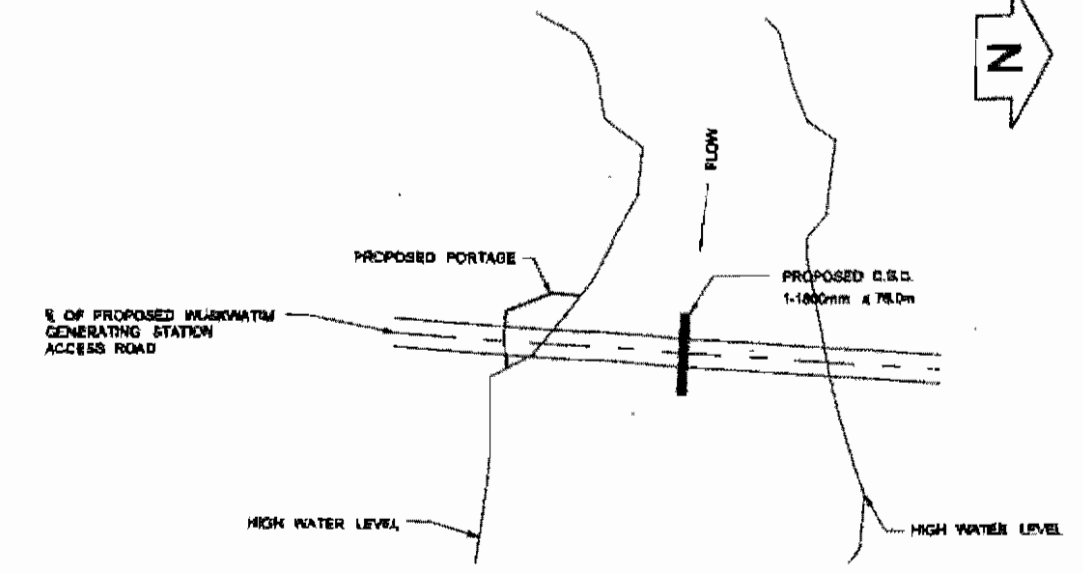
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1-00184-DD-16100-0001
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TYPICAL CROSS SECTION
STREAM CROSSING R6 (STA. 187+60)

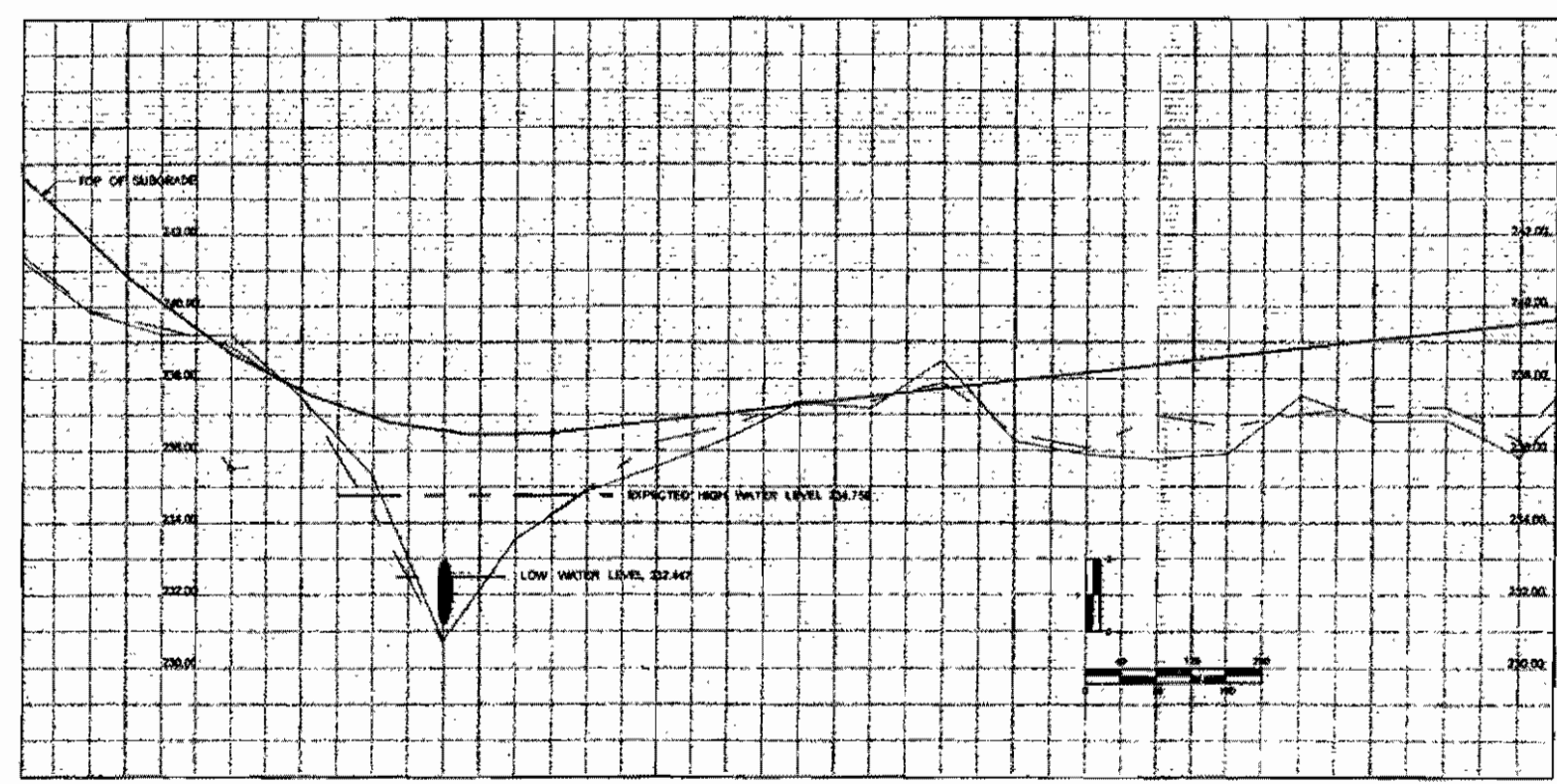


PLAN VIEW
STREAM CROSSING R6 (STA. 187+60)

DEPOSITED IN THE WINNIPEG LAND TITLES OFFICE
THIS 12th DAY OF APRIL 2005 AS RAILWAY DEPOSIT NO. R1156.

W.A. [Signature]
FOR DISTRICT REGISTRAR
REGISTRATION NO. 3117536

RECEIVED BY
MAY 15 2005
NAVIGABLE WATERS
PROGRAMS



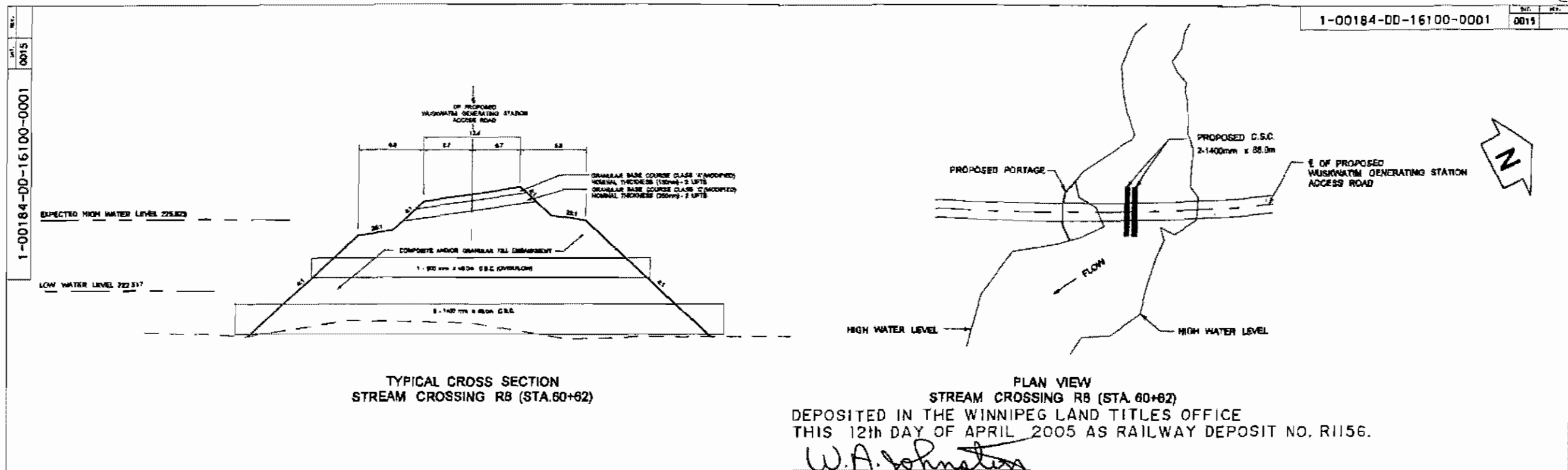
TYPICAL PROFILE
STREAM CROSSING R6 (STA. 187+60)
LAT 55°39'04" LONG 98°20'40"

RECEIVED BY
NOV 01 2004
NAVIGABLE WATERS
PROGRAMS

NWPA-LPEN
JUL 21 2008
TRANSPORT

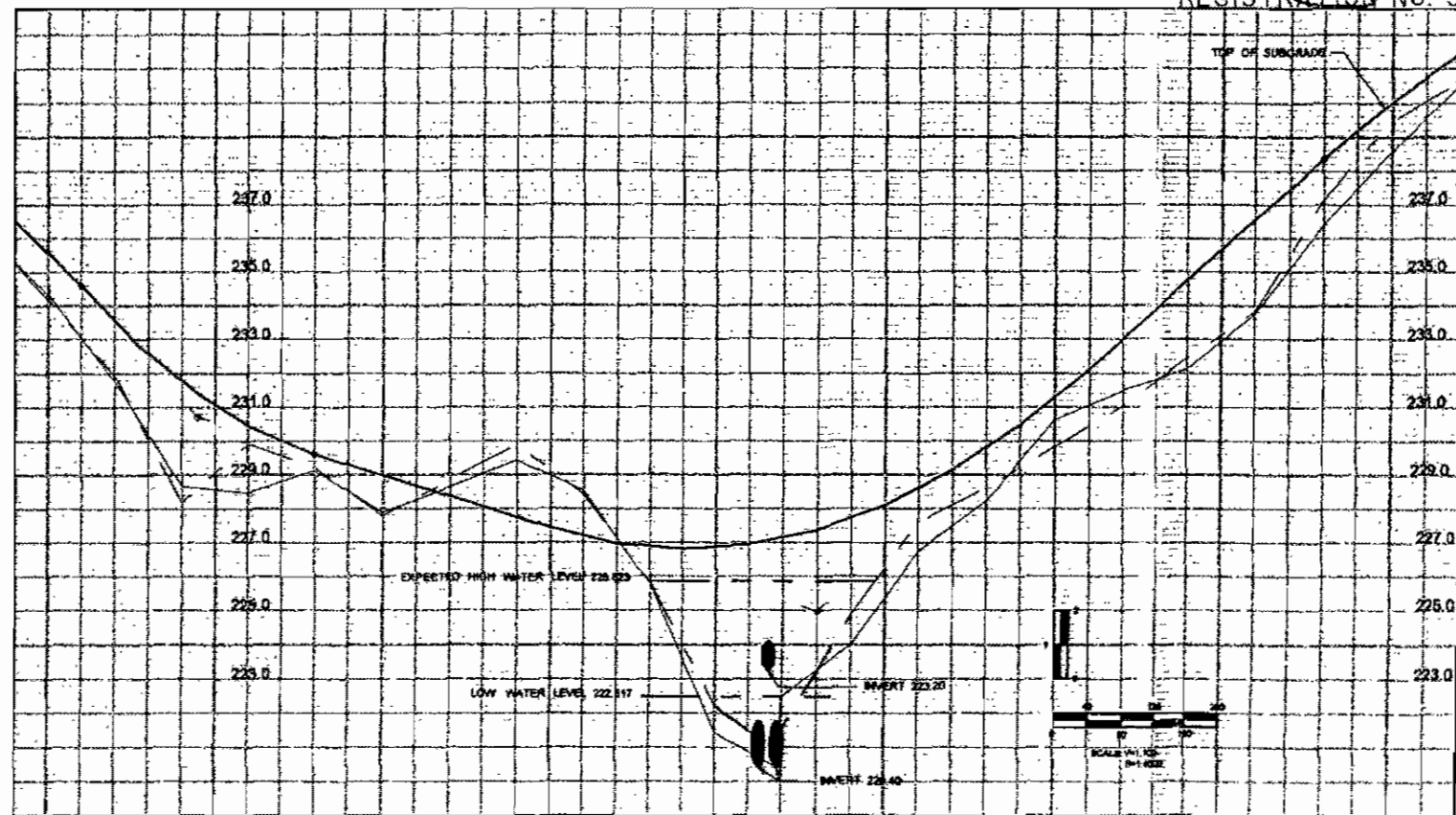
PROJECT	NO.	DATE	REVISION	BY	CHK
MANITOBA HYDRO WUSKATIM GENERATING STATION					
WUSKATIM GENERATING STATION ACCESS ROAD STREAM CROSSING DETAILS					
SCALE	AS SHOWN				
DATE	SEPT. 13, 2005	1-00184-DD-16100-0001			
				0016	

#47 of 47



DEPOSITED IN THE WINNIPEG LAND TITLES OFFICE
THIS 12th DAY OF APRIL 2005 AS RAILWAY DEPOSIT NO. R1156.

W.A. Johnston
FOR DISTRICT REGISTRAR
REGISTRATION NO. 3117536



TYPICAL PROFILE
STREAM CROSSING R8 (STA.60+62)
LAT 55°33'58" LONG 98°25'30"

RECEIVED BY
MAY 19 2005
NAVIGABLE WATERS
PROGRAMS

RECEIVED BY
NOV 01 2005
NAVIGABLE WATERS
PROGRAMS

21 2005

TRANSPORT

MANITOBA HYDRO	REV.	DATE
MUSKWATIM GENERATING STATION		
WUSKWATIM GENERATING STATION ACCESS ROAD STREAM CROSSING DETAILS		
DRAWN	BY	DATE
CHECKED	BY	DATE
APPROVED	BY	DATE
1-00184-DD-16100-0001	0015	



Fisheries and Oceans
Canada

Pêches et Océans
Canada

Prairies Area
Manitoba District

Zone des Prairies
District de Manitoba

501 University Crescent
Winnipeg, Manitoba R3T 2N6

501, Croissant D'Université
Winnipeg, Manitoba R3T 2N6

Your file *Votre référence*

Tel: (204) 983-5163
Fax: (204) 984-2402

Tél: (204) 983-5163
Télé: (204) 984-2402

Our file *Notre référence*

MB-01-0595

August 3, 2006

5022649 Manitoba Ltd.
c/o Ken Adams, Director on behalf of the Wuskwatim Power Ltd. Partnership
P.O. Box 815
Winnipeg, MB, R3C 2P4

Dear Mr. Adams:

**Re: Wuskwatim Generation Project Access Road Stream Crossings (R1-R8)
Application for Authorization for Works or Undertakings Affecting Fish
Habitat**

The harmful alteration, disruption or destruction of 2.64 hectares (26 400 m²) of fish habitat resulting from road construction over eight stream crossings (R1 to R8) along Mile 17 Access Road to Wuskwatim Generation Project development site, is hereby authorized pursuant to Subsection 35(2) of the *Fisheries Act*. This Authorization shall be conditional upon implementation of measures specified on the attached document. The Authorization should be held on site and work crews should be made familiar with its conditions.

A Comprehensive Study Report (CSR) on the proposed Wuskwatim Generation Project was prepared by Fisheries and Oceans Canada (DFO) on behalf of DFO and Transport Canada, the responsible authorities, in accordance with the *Canadian Environmental Assessment Act* (FEAI #: 31130). This review concluded that the project is not likely to cause significant adverse environmental effects, if the mitigation measures specified, and proposed follow-up program, are implemented. In addition the Manitoba Minister of Conservation has issued an Environment Act License (No. 2699) for construction, operation and maintenance of the Wuskwatim Generating Station.

Failure to comply with any of the conditions specified on the attached Authorization may result in a contravention of Section 35 of the *Fisheries Act*. Please be advised this Authorization does not imply authorization of these undertakings with any section of the *Fisheries Act* other than Section 35. It is the proponent's responsibility to obtain any approvals that may be required under other federal, provincial or municipal legislation.

If you require additional information or clarification, please contact Mr. David Duncan at (204) 983-4264 or myself at (204) 984-8891.

Sincerely,

Keith Kristofferson
Manitoba District Manager
Prairies Area, Winnipeg Office

cc. J. Morrell (Transport Canada)
T. Braun (Manitoba Conservation)
J. O'Connor / J. Hunt (Manitoba Water Stewardship)
Winnipeg File

Canada



AUTHORIZATION FOR WORKS OR UNDERTAKINGS AFFECTING FISH HABITAT

Authorization issued to:

5022649 Manitoba Ltd.
c/o Ken Adams – Director, on behalf of the Wuskwatim Power Limited Partnership
P.O. Box 815
Winnipeg, MB, R3C 2P4
Telephone: (204) 474-3923

Location of Project

Eight stream crossings (R1-R8) will be installed on the proposed Mile 17 Access Road, connecting Highway 391 to the proposed Wuskwatim Generation Project development site. Stream crossing R1 intersects a tributary of the Odei River, crossings R2 through R6 intersect tributaries of Birch Tree Brook and crossings R7 and R8 cross tributaries of the Burntwood River. R1 and R2 will be located approximately 24km and 26km west of Thompson respectively, while R3 to R8 will be located approximately 34km southwest of Thompson. See Attachments 1 & 2 for details.

Latitude / Longitude Range: 55°50' N / 98°14' W to 55°34' N / 98°25' W

Valid Authorization Period

The valid authorization period for the harmful alteration, disruption or destruction of fish habitat associated with the construction of Mile 17 Access Road and installation of culverts at eight stream crossings is:

From:
Date of issuance

To:
March 31, 2007

The valid authorization periods for the other conditions of the authorization are as set out below.

Description of Works or Undertakings

The harmful alteration, disruption or destruction of fish habitat hereby authorized is the permanent destruction of a total of 2.64 hectares (26 400 m²) resulting from roadway construction and installation of culverts at eight stream crossings along the proposed Mile 17 Access Road to the Wuskwatim Generating Station work site. Work will include vegetation clearing within the ROW, installation and removal of temporary non-erodible cofferdams, installation of culverts, placement of erosion protection (stone rip-rap) at culvert inlets and outlets and placement of suitable embankment, subgrade and surface materials for the access road.

Conditions of Authorization

1. The conditions of this Authorization notwithstanding, should the above works or undertaking, due to weather conditions, different soil or other natural conditions, or for any other reason, appear, in the opinion of Fisheries and Oceans Canada ("DFO") likely to cause greater impacts than the parties previously contemplated, then DFO may direct the Proponent, and its agents, and contractors, to suspend or alter works and activities associated with the project, to avoid or mitigate adverse impacts to fisheries resources. DFO may also direct the Proponent and its agents, and contractors, to carry out at the Proponent's expense any works or activities deemed necessary by DFO to avoid or mitigate further adverse impacts to fisheries resources. In circumstances where DFO is of the view that greater impacts may occur than were contemplated by the parties DFO may also modify or rescind this authorization. If the authorization is to be changed the Proponent will be given an opportunity to discuss any proposed modifications or rescission.

2. Conditions that relate to the **proponent plan**:

- 2.1. 5022649 Manitoba Ltd. (the "Proponent") confirms that all plans and specifications relating to this authorization have been duly prepared and reviewed by appropriate professionals working on behalf of 5022649 Manitoba Ltd. 5022649 Manitoba Ltd. acknowledges that they are solely responsible for all design, safety and workmanship aspects of all the works associated with this Authorization.
- 2.2. The construction must comply with those criteria as identified within this Authorization. Harmful alteration, disruption or destruction of fish habitat other than that specifically identified within this Authorization is not permitted.
- 2.3. Works will be conducted following the practices outlined in the following reports and documents:
 - 2.3.1. Wuskwatim Generation Station Project Environmental Impact Statement Vol.3 prepared by Manitoba Hydro and Nisichawayasihk Cree Nation, April 25, 2003;
 - 2.3.2. Wuskwatim Generation Station Project Environmental Impact Statement Vol.5 prepared by Manitoba Hydro and Nisichawayasihk Cree Nation , April 25, 2003;
 - 2.3.3. Supplemental Information for the proposed Wuskwatim Generation Project prepared by Manitoba Hydro and Nisichawayasihk Cree Nation dated July 16, 2003; September 18, 2003; May 19, 2004; July 30, 2004; September 21, 2004;
 - 2.3.4. Wuskwatim Generation Project Fish Habitat Enhancement Workshop: Habitat Improvements on Wapisu and Threepoint Lakes prepared by North/South Consultants Inc. November 24, 2004;
 - 2.3.5. Wuskwatim Generation Project Preliminary Sediment Management Plan prepared by Acres Manitoba Limited, May, 2005
 - 2.3.6. Wuskwatim Generation Project – HADD Authorization Application Information prepared and submitted by Manitoba Hydro on June 30 and July 6, 2006; and
 - 2.3.7. Wuskwatim Generating Station Access Road Environmental Protection Plan & Monitoring Program prepared by Manitoba Hydro (In preparation)

3. Conditions that relate to the **mitigation** of potential harmful alteration, disruption or destruction of fish habitat. Measures outlined in the above documents shall be implemented, except where contradicted by the following:

- 3.1. No instream work or any construction activity within the floodplain shall occur inside the restricted activity timing window, for northern Manitoba, of April 15 to July 15, without specific written permission from DFO.
- 3.2. All works shall be undertaken in accordance with "Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat" (Manitoba Natural Resources and the Department of Fisheries and Oceans, 1996).
- 3.3. All materials and equipment shall be operated, maintained and stored in a manner that prevents deleterious substances from entering any watercourse. Deleterious substances include but are not limited to: fuel, oil, grease, hydraulic fluids, coolant, paint, uncured concrete or concrete wash water and sediment. It is the responsibility of the proponent to implement appropriate measures required to ensure deleterious substances do not enter the watercourse. Any intentional or unintentional deposit of any type of deleterious substance into water frequented by fish is prohibited under the *Fisheries Act*.
 - 3.3.1. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.

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- 3.3.2. Wash, refuel and service machinery and store fuel and other materials for machinery away from the water to prevent deleterious substances from entering the water.

 - 3.3.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.

 - 3.4. All reasonable efforts shall be made to minimize the duration of instream work. Disturbance to the streambed and banks of the watercourse shall be confined to the immediate work site. Machinery fording the watercourse shall be limited to a one-time event (over and back) within the footprint of the future crossing. If the streambed and banks are highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation is likely to occur as a result of equipment crossing, then a temporary crossing structure or other practices should be used to protect these areas.

 - 3.5. Effective sediment and erosion control measures shall be implemented before starting work to prevent soil-laden runoff and silt from the construction and operation of the road, its ditches, and stream crossings from entering the watercourse. Regular inspections shall be conducted to ensure erosion control measures are functioning properly; all necessary repairs and adjustments shall be done, if any damage is discovered or if these measures are not functioning effectively. Construction activities near watercourses shall be halted during heavy rains with the exception of works pertaining to sediment and erosion control.

 - 3.6. All instream construction activities shall be isolated using non-erodible cofferdams (e.g. clean granular material wrapped in plastic or sand bags, aqua-dams, sheet piling) upstream and downstream of the crossing. Flows are to be diverted around the construction site and downstream flows equal to the natural flow of the watercourse at the time of construction shall be maintained at all times. If work is completed in winter, natural flows must be maintained beneath the ice. If pumps are used they should have sufficient capacity to handle expected flows during construction, and backup pump(s) of equal or greater capacity are to be maintained on site for use in the event of a pump failure. A crew must remain on site at all times that has the training and equipment necessary to maintain continuous flows should there be a failure (even if pumping is required to continue overnight). All pump intakes used to maintain downstream flows are to be screened according to the Department of Fisheries and Oceans Freshwater Intake End-of-Pipe Fish Screen Guideline (1995) to prevent entrainment of fish. If a different water management plan is considered necessary the proposed plan should be submitted to DFO for review of its potential to harm fish or fish habitat.

 - 3.7. When the isolated worksite is dewatered all water is to be adequately filtered using settling ponds, dense terrestrial vegetation, dirt socks or other effective means to prevent sediment from the construction site from entering the watercourse. If any fish are found within the dewatered area they are to be captured and returned unharmed to the watercourse downstream of the construction activities. All fish collection activities should be reported and conducted in accordance with section 5.1.2. Collection activities will require a Provincial Fisheries Scientific Collection permit.

 - 3.8. Culverts shall be embedded/backwatered a minimum of 30 cm or 10% of the culvert diameter (whichever is greater) and their inlets and outlets shall be adequately armoured with stone rip-rap to prevent undermining and erosion. Rip-rap shall be clean, free of fine materials, of sufficient size to resist displacement during high water events and placed so as not to be a barrier to fish passage at any flows. No aggregate material is to be removed from any stream and borrow pits shall not be located within 100 metres of any watercourse.

 - 3.9. Once construction is complete, all temporary isolation materials are to be completely removed from the watercourse, and natural flows restored. Removal should be gradual to prevent downstream erosion, flooding and the mobilization of sediment from upstream ponded areas. Gradual dewatering will also reduce the potential for stranding fish in upstream areas.

 - 3.10. All disturbed areas shall be stabilized immediately after construction, exposed soil should be seeded as appropriate, and kept in stable condition until reclaimed to vegetation.
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4. Conditions that relate to the **compensation** for the HADD of 2.64 ha (26 400 m²) of fish habitat.
 - 4.1. The Proponent agrees to develop and implement an appropriate habitat Compensation Plan, which will be submitted to DFO for review and approval. The Compensation Plan should include the principalssimilar concepts to those that were discussed in the Wuskwatim Generation Project CEEA Comprehensive Study Report (CSR), dated October, 2005 and in the draft report, “Wuskwatim Generation Project No Net Loss Plan” prepared by North/South Consultants Inc. June, 2005. The Compensation Plan will be developed in consideration of the entire Wuskwatim Generation Project so that all aspects of the proposed works and undertakings can be most appropriately addressed and DFO’s “no net loss” policy can best be attained.
 - 4.2. Components of the habitat Compensation Plan should be implemented as soon as possible, maximizing the benefit of having equipment available and minimizing additional disturbance. Components of the compensation should begin as the Project proceeds and should be completed no later than one year following completion of the overall Project, unless the compensation is of such a scale or scope that a longer time frame is necessary. If at any time the Proponent, or DFO, become aware that the compensatory habitat is not completed and/or functioning as designed, the Proponent shall carry out any works which are necessary to ensure the compensatory habitat is completed and/or functioning as described in the Compensation Plan.
 - 4.3. The Proponent confirms that they shall leave the compensatory habitat undisturbed. After the compensatory habitat has been created the Proponent shall not carry on any work or undertaking that will adversely disturb or impact the compensatory habitat.
 - 4.4. All mitigation measures presented in Section 3 of this Authorization shall also apply to construction of the compensatory habitat referred to in Section 4.
5. Conditions that relate to the **monitoring** of the proponent plan, the mitigation and the compensation.
 - 5.1. The proponent will develop and implement a Monitoring Program similar in scope and nature, as it applies to the access road, as outlined in the Wuskwatim CSR and in the draft report “Aquatic Effects Monitoring Program” (North/South Consultants Inc., May 2005). The Proponent will provide DFO with an annual report, due January 31st, as to whether works were conducted within the schedule of the proponent plan and whether the mitigation measures outlined in Sections 2 and 3 of this Authorization were followed.
 - 5.1.1. Provide dated and labelled photographs of the works before, during and after completion of the stream crossings and associated works. Pictures should be from similar vantage points to show the progress through the construction, and labelled to indicate the direction of view and subject matter.
 - 5.1.2. Reports on results of the fish passage monitoring, fish habitat assessment and any fish salvage operations should include numbers of fish captured as well as species and measurements such as length and weights. All monitoring is to be conducted by individuals experienced in fisheries or fish habitat assessment with adequate training, equipment, and skills to successfully complete the monitoring requirements. Collection activities will require a Provincial Fisheries Collection permit.
 - 5.1.3. Water quality report containing results of water quality data collected during the monitoring plan including (but not necessarily limited to) the following additional information:
 - 5.1.3.1. dated photographs of the sediment control works and details of how they functioned to prevent sediment entry into the watercourse; and
 - 5.1.3.2. details of any contingency measures that were followed in the event that mitigation measures did not function as intended.

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- 5.2. The Proponent will report to DFO, on or before January 31st, on an annual basis for three years subsequent to the compensation being in place to show that the compensation works were constructed according to, within the schedule of and functioning as designed in, the habitat Compensation Plan. The subsequent frequency and duration of such monitoring and reporting will be determined by DFO based on results of the first three years of monitoring.
- 5.2.1. Providing dated and labelled photographs of the compensation works and details on how it was functioning after completion, during both high and low water levels if possible. Including results of fish use and fish habitat assessment collected by individuals experienced in fisheries or fish habitat assessment with adequate training, equipment, and skills to successfully complete the monitoring requirements. Collection activities will require a Provincial Fisheries Collection permit.
- 5.2.2. Providing dated and labelled photographs of sediment control works at the site of compensation works and details of how they functioned to prevent sediment entry into the watercourse.
- 5.2.3. Providing a description of the contingency measures that were followed if, during the Monitoring Program, it was determined that the compensation was not functioning as intended.
6. Written notification of the commencement of works or undertakings shall be provided to DFO 10 days prior to the initiation of those works or undertakings.

The holder of this authorization is hereby authorized under the authority of section 35(2) of the Fisheries Act, R.S.C., 1985, c.F. 14, to carry out the work or undertaking described herein. This authorization is valid only with respect to fish habitat and for no other purposes. It does not purport to release the applicant from any obligation to obtain permission from or to comply with the requirements of any other regulatory agencies.

Failure to comply with any condition of this authorization may result in charges being laid under the Fisheries Act.

This authorization form should be held on site and work crews should be made familiar with the conditions attached.

Date of Issuance: _____

Approved by: _____

Title: Bob Lambe
Regional Director General
Central and Arctic Region

Attachment 1: Map of stream crossings along Mile 17 Access Road (Wuskwatim Generation Project Environmental Impact Statement Vol.3, April 25, 2003)

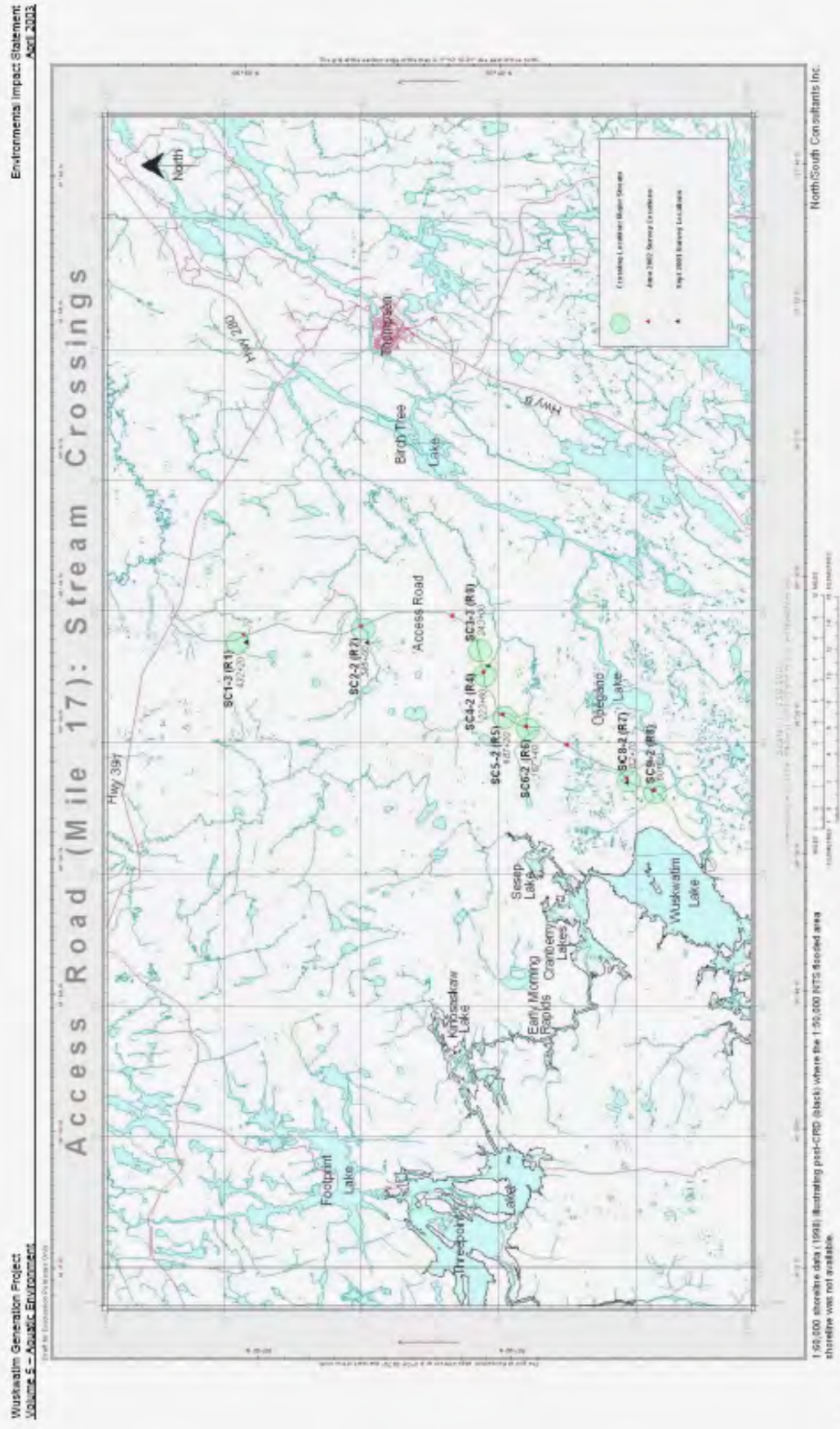


Figure 6-3. Eight major streams crossed by the Mile 17 access road.



Attachment 2: Stream Crossing Locations (UTM Zone 14U):

Stream Crossing	Station	Location
R1 (SC1-3)	432+20	548180.3E 6188345.0N
R2 (SC2-2)	345+00	548861.2E 6180039.7N
R3 (SC3-2)	243+10	547210.6E 6171109.3N
R4 (SC4-2)	223+60	545306.2E 6171109.3N
R5 (SC5-2)	187+20	542099.9E 6169660.4N
R6 (SC6-2)	167+40	541203.7E 6167936.1N
R7 (SC8-2)	82+70	537342.4E 6160674.1N
R8 (SC9-2)	60+70	536474.8E 6158739.9N

5.2. The Proponent will report to DFO, on or before January 31st, on an annual basis for three years subsequent to the compensation being in place to show that the compensation works were constructed according to, within the schedule of and functioning as designed in, the habitat Compensation Plan. The subsequent frequency and duration of such monitoring and reporting will be determined by DFO based on results of the first three years of monitoring.

5.2.1. Providing dated and labelled photographs of the compensation works and details on how it was functioning after completion, during both high and low water levels if possible. Including results of fish use and fish habitat assessment collected by individuals experienced in fisheries or fish habitat assessment with adequate training, equipment, and skills to successfully complete the monitoring requirements. Collection activities will require a Provincial Fisheries Collection permit.

5.2.2. Providing dated and labelled photographs of sediment control works at the site of compensation works and details of how they functioned to prevent sediment entry into the watercourse.

5.2.3. Providing a description of the contingency measures that were followed if, during the Monitoring Program, it was determined that the compensation was not functioning as intended.

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Date of Issuance: 2 August 2006

Approved by: Bob Lambe
Title: Regional Director General
Central and Arctic Region

5.2.1. Providing dated and labelled photographs of the compensation works and details on how it was functioning after completion, during both high and low water levels if possible. Including results of fish use and fish habitat assessment collected by individuals experienced in fisheries or fish habitat assessment with adequate training, equipment, and skills to successfully complete the monitoring requirements. Collection activities will require a Provincial Fisheries Collection permit.

5.2.2. Providing dated and labelled photographs of sediment control works at the site of compensation works and details of how they functioned to prevent sediment entry into the watercourse.

5.2.3. Providing a description of the contingency measures that were followed if, during the Monitoring Program, it was determined that the compensation was not functioning as intended.

10.0 KEY MAP OF THE PROJECT AREA

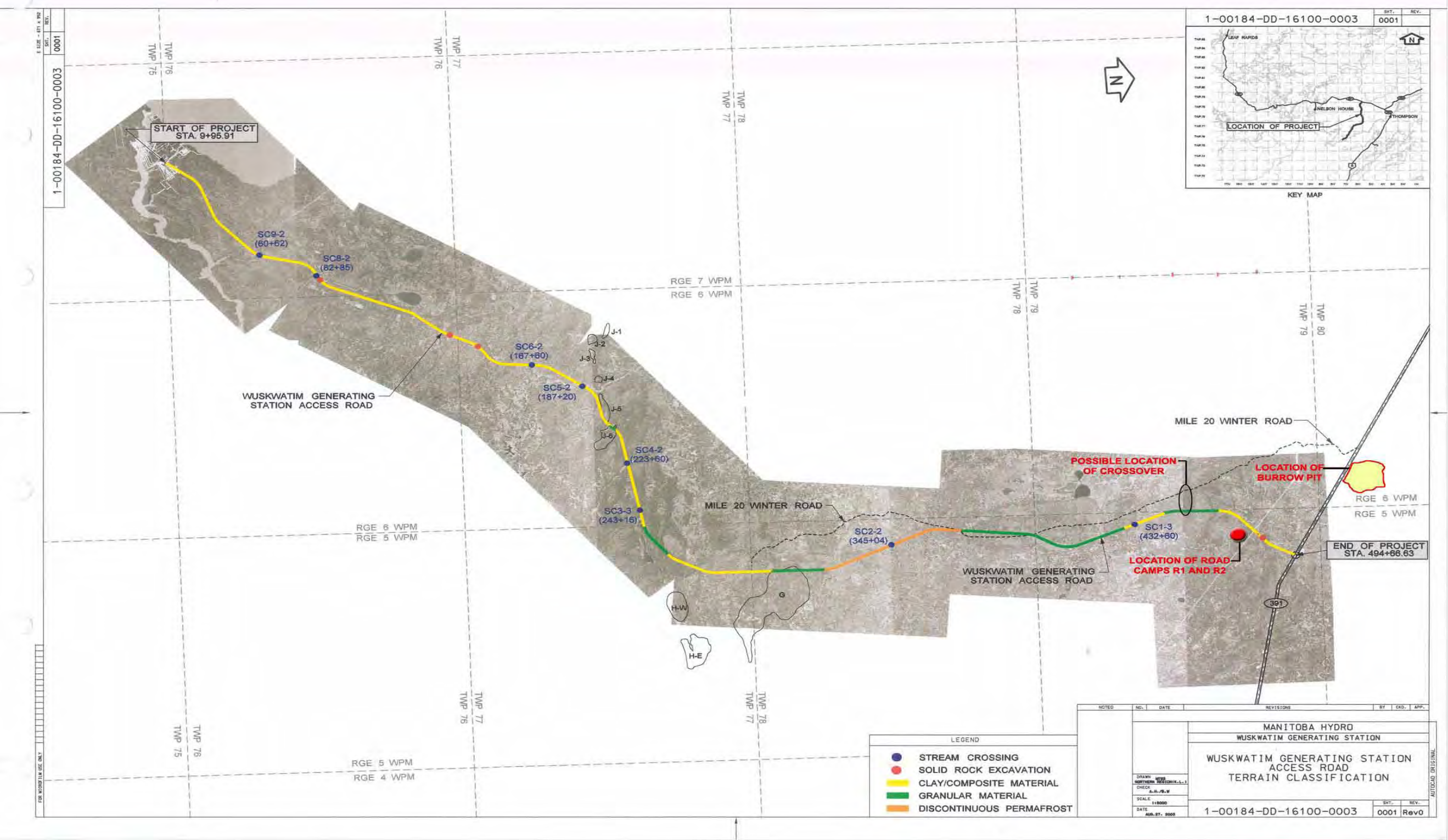


Figure 2-1 Access Road Route and Project Granular Borrow Areas

Appendix A

Table 1 Wuskwatim Generating Station Project Reference Guide

Activities	EIS	
Regulatory Requirements	<p>Vol 1 1.5, 1.5.1, 1.5.2, 1.5.3, 1.6.3, 2.1, 2.3, 2.3.2, 3.1, 3.3.2.1, 4.4.1, 4.4.4, 4.5.2.1, 4.5.3.3, 4.5.4, 5.6.2.1, 6.13, 6.13.4, 8.12,</p> <p>Vol 3 1.3, 4.1, 4.10, 4.11, 5.3.2, 5.3.3.5, 5.3.3.8, 5.3.3.9, 5.3.3.13, 6.0</p> <p>Vol 5 8.1, 12.0, 12.4</p> <p>Vol 6 5.1.4.3.4, 6.3.2, 9.1, 9.2.2, Vol 7 12.0</p> <p>Vol 8 2.0, 2.1.1, 2.2, 2.2.7.2,</p>	
Access and Access Roads	<p>Vol 1 1.1, 1.4.2, 1.4.3, 1.6.2, 2.1, 3.2.1.3, 3.3.3.6, 4.2, 4.3.3, 4.3.5, 4.4.1, 4.4.3, 4.4.4, 4.5.3.1, 5.2.1, 5.2.2.1, 5.7.2.1, 5.11.2, 6.2, 6.3.1, 6.3.2, 6.4.1, 6.4.4, 6.5.2.1, 6.8.2.1, 6.13.2, 6.13.3, 7.2, 7.3.1, 7.4.4, 7.5.2.1, 7.5.2.2, 7.6.2, 7.7.1, 7.7.2, 7.8.2.1, 7.8.2.2, 7.9.2, 7.9.2.1, 7.9.2.2, 7.10.3, 7.11.5, 8.2.2, 8.3.2, 8.4.2, 8.5.2, 8.6.2.2, 8.8.2, 8.10, 8.11, 8.12, 9.3.4.1, 9.3.7, 9.5.3.1, 9.5.4.1, 10.3.5</p> <p>Vol 3 2.3, 2.6.9, 2.6.10, 3.2, 3.6, 3.7, 4.2, 4.5, 4.6.2, 4.6.3.1, 4.6.3.3, 4.6.5, 4.6.6, 4.6.7,</p> <p>Vol 4 3.4.1.4 Vol 5 4.1, 8.4.1,</p> <p>Vol 7 1.0, 2.3.2, 2.4, 2.4.1, 2.4.2, 2.4.4, 3.4.1, 3.4.2, 3.4.3, 4.4.1, 4.4.2, 7.1, 8.1, 8.3.1, 10.0, 12.0</p> <p>Vol 8 3.0, 3.1.1.2, 3.1.2, 3.1.4, 3.2.1, 3.2.3.1, 3.2.5, 5.0, 5.2.1, 5.2.2.1, 5.2.3, 5.2.3.2, 5.2.3.3, 5.2.3.5, 5.2.5,</p> <p>Vol 9 4.3, 4.4, 6.3, 6.5,</p>	
Borrow Pits and Quarries	<p>Vol 1 4.3.5, 4.4.1, 5.2.2.1, 5.7.2.2, 7.5.1.1, 7.5.2.1, 7.5.2.3, 7.6.2, 7.7.2.1, 7.8.2.1, 7.9.2, 7.9.2.1, 7.9.2.2, 8.2.2, 8.4.2, 8.5.2, 10.3, 10.3.5,</p> <p>Vol 3 2.3, 3.8, 4.2, 4.4.1, 4.5, 4.5.1, 4.6.3.3, 4.6.7, 4.10, 5.3.3.9,</p> <p>Vol 4 3.3.3, 3.4.1.3, 3.4.1.8, A3.1, 4.2.4, 4.4,</p> <p>Vol 5 2.0, 5.4.1.6,</p> <p>Vol 6 3.0, 5.2.2, 5.2.4.1.1, 5.3.1.2.1, 5.4.1.1, 5.4.1.3.2, 5.4.1.4.2, 5.4.3.1, 6.4.1, 6.4.2.1, 6.4.3.1, 7.2.2, 7.3.2, 7.4.1, 7.4.2.2, 8.2.4.4, 8.3.4.7, 8.3.5.7, 8.3.6.4, 8.3.7.7, 8.4.1, 8.4.2.2, 8.8.3, 8.8.5.8, 9.3.2.1.1, 9.3.2.1.2, 9.3.2.1.3, 9.3.2.1.4, 9.3.2.1.5, 9.3.2.2.1, 9.3.2.2.2, 9.3.2.2.3, 9.3.2.2.4, 9.3.2.2.5, 9.4.1, 9.4.1.1, 9.4.1.2.1, 9.4.1.2.2, 9.4.1.2.5, 9.4.2, 9.4.2.1, 9.4.2.1.1, 9.4.2.1.2, 9.4.2.1.3, 9.4.2.1.4, 9.4.2.2, 9.4.2.2.1, 9.4.2.2.3, 9.4.3.1, 9.4.3.1.1,</p>	

	9.4.3.2, 9.4.3.2.1, Vol 7 2.4.3, 4.4.2, 5.2.1, 5.2.3.1, 8.3.1, 10.0, Vol 8 3.2.3.1, 5.2.3.2, 5.2.5, Vol 9 3.0, 4.2, 4.3, 5.1.6, 6.6,	
Clearing	Vol 1 4.4.1, 4.4.4, 5.1.2.2, 5.2.2.1, 6.5.2.1, 7.3.1, 7.5.2.1, 7.5.2.3, 7.6.2, 7.7.2.1, 7.8.2.1, 7.12.5.1, 8.2.2, 8.5.2, 8.5.2.1, 8.5.2.6, 9.3.4.1, 9.5.2, Vol 3 4.4.1, 4.6.2, 4.9, Vol 4 2.4.2.2, 3.4.1, 3.4.1.2, 3.4.1.4, Vol 5 4.1, 5.4.1.1, 5.4.1.3, 5.4.1.4, Vol 6 4.1, 5.1, 5.1.4.1, 5.2.4.2.1, 5.4.1.1, 5.4.1.2, 5.4.3.1, 5.4.4.1.2, 5.4.4.1.3, 5.4.4.1.4, 5.4.4.3, 5.4.4.3.2, 5.6.1, 6.4.1, 7.4.1, 7.4.2.3, 7.8.2.5, 8.4.1, 8.4.2.2, 8.4.2.3, 8.7.2, 8.8.3, 9.4.1.1, 9.4.2.1, 9.4.2.2, 9.4.2.2.1, Vol 7 2.4.3, 5.2.1, 5.2.1.1, 5.2.2.2, 5.2.3.1, 10.0, Vol 8 3.1.2, 3.2.3.1, 3.2.5, 5.2.1, Vol 9 5.1.5, 5.1.6, 9.0,	
Grubbing	Vol 1 4.4.1, 9.3.4.1, Vol 3 4.4.1, 4.9, Vol 4 3.4.1.2, 3.4.1.4, Vol 5 4.1, 5.4.1.1, 5.4.1.4, Vol 6 6.4.2.1, 7.4.2.1, Vol 8 3.1.2, 3.2.3.1, 3.2.5,	
Erosion and Sedimentation	Vol 1 5.11.2, 6.3.2, 6.5.2.1, 6.7.2, 7.5.2.3 Vol 3 4.4.2, 4.9, Vol 4 12.2 Vol 5 5.4.1, 5.4.1.1, Vol 6 4.2, 5.4.3.1, 5.4.4.1.1, 5.4.4.1.4,	
Stripping and Grading	Vol 1 4.4.1, 7.5.2.1, 7.5.2.3, Vol 3 4.2, 4.9, Vol 6 5.4.3.1,	
Blasting	Vol 1 4.4.4, 6.5.2.1, 6.8.2.1, 6.12.1, 7.3.1, 7.8.2.1, 7.9.2, 7.9.2.1, 7.9.2.2, 7.12.5.1, Vol 3 4.6.6, Vol 4 2.4.1, 3.4.1.3, Vol 5 4.1, 5.4.1, 5.4.1.1, 5.4.1.4, 8.4.1, Vol 6 4.1, 6.4.2.1, 8.4.1, 8.4.2.2, 8.4.2.5, 8.7.2, 9.4.1, 9.4.1.1, 9.4.1.2.1, 9.4.1.2.2, 9.4.2, 9.4.2.1.1, 9.4.2.1.5, 9.4.2.2.1, 9.4.2.2.2, 9.4.3, 9.5.1,	
Wildlife Encounters	Vol 1 7.9.2, 7.9.2.1, 7.9.2.2, Vol 3 2.6.9, 4.4.1, 4.6.4.3,	
Heritage Resources	Vol 1 4.4.4, 10.3, 10.3.5 Vol 8 5.2.3.5 Vol 9 ALL	
Non Hazardous Waste Management and Recycling	Vol 1 4.4.5, 6.5.2.1, 7.5.2.1, 7.6.2, 9.4.1, Vol 3 2.6.5, 4.6.4.3, 4.10, Vol 5 5.4.1.4 Vol 6 6.4.1, 9.4.2.2.2,	
Petroleum Handling and Storage	Vol 1 4.4.4, 6.3.1, 6.5.2.1, 6.8.2.1, 6.9.2.1, Vol 3 2.6.6, Vol 6 7.4.2.6	

Hazardous Materials and Workplace Hazardous Materials Information System	Vol 1 4.4.4, 4.4.5, 6.3.1, 6.8.2.1, 7.3.1, 7.9.2.1, Vol 3 4.6.4.3, 4.10, Vol 5 7.4.2, Vol 6 6.4.2.1,	
Spill and Emergency Response	Vol 1 4.5.3.2, 6.3.1, 6.5.2.1, 6.5.2.2, 6.8.2.1, 6.9.2.1, 7.3.1, 7.5.2.1, 7.6.2, 7.9.2.1, 7.9.2.2, 7.10.2, 8.2.2, Vol 3 2.6.6, 2.6.10, 4.3.2, Vol 5 4.1, 5.2.3.1, 5.4.1.1, 5.4.1.6, 5.4.2.1, 9.5.3, Vol 6 5.4.1.2, 5.4.1.4.1, 5.4.1.4.2, 6.4.1, 6.4.2, 6.4.2.1, 6.4.3.1, 6.5, 7.4.2.6, 8.4.2.1, 9.4.1, 9.4.1.1, 9.4.1.2.1, 9.4.1.2.2, 9.4.1.2.3, 9.4.1.2.4, 9.4.2, 9.4.2.1.1, 9.4.2.1.2, 9.4.2.1.5, 9.4.2.2.1, 9.4.2.2.2, 9.4.2.2.3, 9.4.3, 9.4.3.1.1, 9.4.3.1.2, 9.4.3.1.3, 9.4.3.1.4, 9.4.3.1.5, 9.4.3.2.1, 9.4.3.2.2, 9.4.3.2.3, 9.4.3.2.4, 9.4.3.2.5, Vol 7 2.4.2,	

Appendix B Figure 1



Corporate Waste Streams & Disposition

If you have any questions about waste stream disposal or waste streams not listed below contact the Waste Management Coordinator at 474-4366 or the Corporate Hazardous Materials Officer at 474-3259 or refer to the Hazardous Materials Management Handbook

Reuse - using a product more than once, either for the same purpose or for a different purpose. Reusing, when possible, is preferable to recycling because the item does not need to be reprocessed before it can be used again.

Disposal - removing the material from the workplace to a licensed landfill facility, or to a licensed facility responsible for the destruction of the material. Verify that the licensed facility will accept the waste stream.

Recycle - a series of activities that includes collecting recyclable materials that would otherwise be considered waste, sorting and processing recyclables into raw materials such as fibers, and manufacturing raw materials into new products. Recycling turns materials into valuable resources and generates a host of environmental, financial, and social benefits. After collection, materials (e.g., glass, metal, plastics, and paper) are separated and sent to facilities that can process them.

Hazardous Waste Streams

Aerosol containers
Antifreeze
Asbestos
Batteries: dry cells
wet cells (substations, gate stations)
wet cells (automotive, marine, equipment)
rechargeable (metal hydride, lithium, ni-cad)
Chemical containers (plastic)
Chemicals (surplus)
Compressed gas cylinders
Electrical apparatus (oil-filled): Non-PCB
PCB
Filters (oil and fuel)
Fire Extinguishers
Fire Systems
Grease
Laboratory waste
Lead containing material
Light/lamp bulbs: fluorescent
incandescent
street light
Mercury (liquid and in sealed switches)
Oils: hydraulic
insulating
lubricating
Non-PCB contaminated materials: soils/solids
insulating oils
PCB contaminated materials: soils/solids
insulating oils
Paint: all except latex - manifest required
latex - no manifest required
Radioactives (smoke detectors, test equipment)
Solvents: halogenated
non-halogenated
Tires

Other Waste Streams

Aluminum cans
Cardboard
Electronics (computers, printers, cell phones)
Insulating materials (rubber, fiberglass)
Paper (office)
Scrap metals
Street light heads (all parts)
Toner containers & printer cartridges
Wood poles, cross arms, rail ties
Wood pallets

Send To	Reuse	Recycle	Disposal
WSC			
WSC			
WSC Local			
WSC			
WSC			
Fleet WSC			
WSC			
Local/WSC			
WSC			
Supplier/Local			
WSC			
WSC			
WSC			
FPS	(474-4227 or 474-4177)		
FPS	(474-4227 or 474-4177)		
WSC			
WSC			
WSC			
WSC			
WSC			
WSC Local			
WSC	(see Non-PCB and PCB)		
WSC Local			
WSC			
WSC			
WSC			
WSC			
WSC			
WSC			
Local/Fleet			
Local			
WSC			
IT/WSC			
WSC			
Local			
WSC/Local			
WSC			
WSC/Supplier			
WSC			
WSC			



Hazardous Material
(yellow with removable top)
CIIC
27 67 01



Used Insulating Oil
(black with yellow top)
CIIC
78 98 89



Waste Antifreeze
(green)
CIIC
27 67 11



Waste Lube Oil
(orange)
CIIC
27 67 09



Waste Halogenated Products
(red)
CIIC
27 67 07



Waste Non-Halogenated Products
(blue)
CIIC
27 67 08

You must ensure that waste streams are properly identified and transported according to TDG regulations.

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Figure 2 Managing Releases of Dangerous Goods or Hazardous Wastes other than PCB's

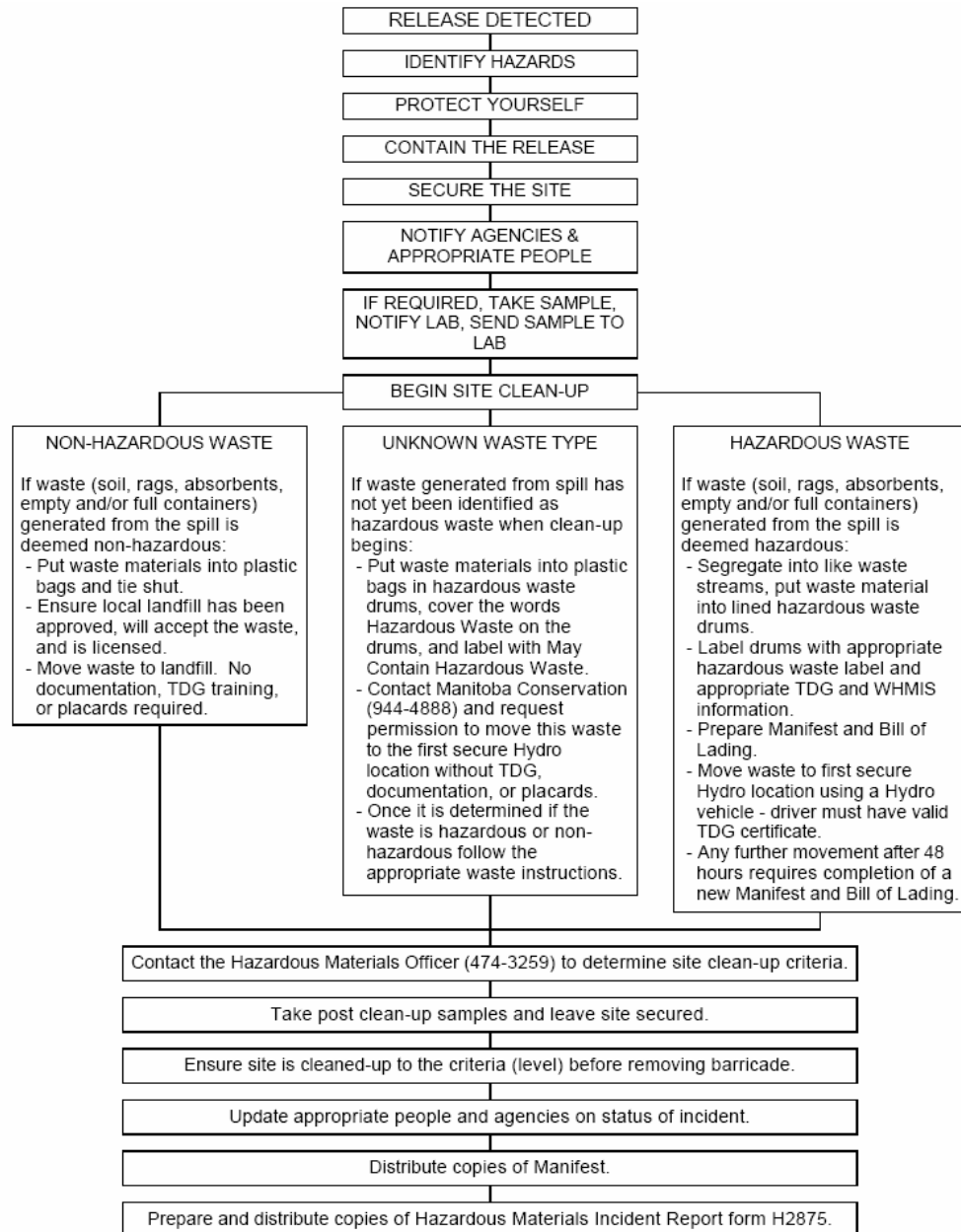
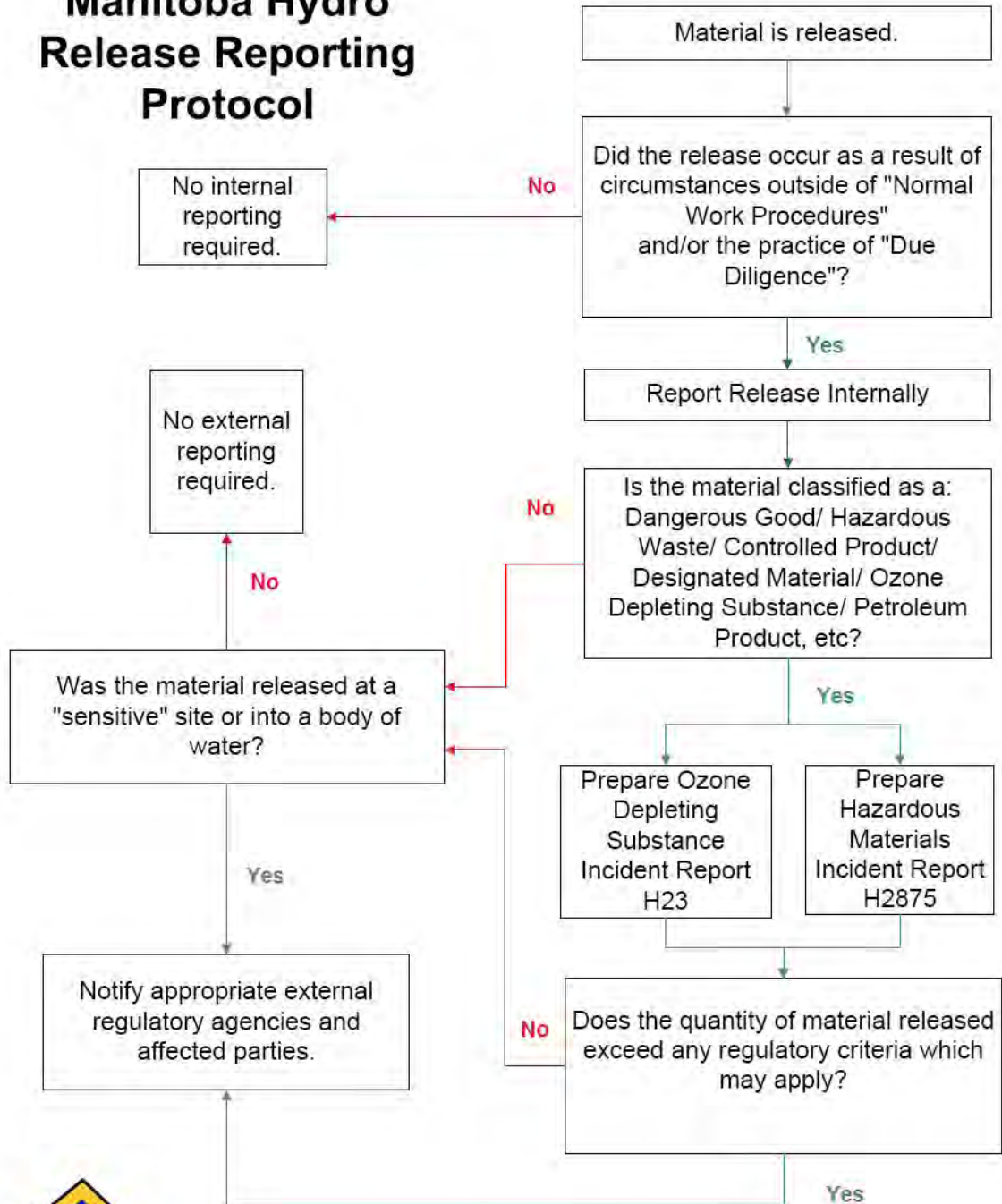


Figure 3

Manitoba Hydro Release Reporting Protocol



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Figure 4

Reportable Quantities for Spills

CLASSIFICATION	HAZARD	REPORTABLE QUANTITY OR LEVEL
1.....	Explosives.....	All
2.1.....	Compressed Gas (Flammable) (i.e. Propane).....	100 L*
2.2.....	Compressed Gas (i.e. Sulphurhexafluoride SF ₆).....	100 L*
2.3.....	Compressed Gas (toxic) (i.e. Hydrogen Sulphide).....	All
2.4.....	Compressed Gas (Corrosive) (i.e. Anhydrous Ammonia).....	All
3.....	Flammable Liquids (includes Petroleum Products).....	100 L
4.....	Flammable Solids (i.e. Sulphur).....	1 Kg
5.1 Packing Groups I and II.....	Oxidizer (i.e. Hydrogen Peroxide).....	1 Kg or 1 L
5.1 Packing Groups III.....	Oxidizer (i.e. Lead Oxide).....	50 kg or 50 L
5.2.....	Organic Peroxide.....	1 Kg or 1 L
6.1 Packing Group I.....	Acute Toxic (i.e. Waste Capacitor Fluids - chlorinated).....	5 Kg or 5 L
6.1 Packing Groups II and III.....	Acute Toxic (i.e. Pesticides).....	5 kg or 5 L
6.2.....	Infectious.....	All
7.....	Radioactive (i.e. Nuclear Densimeters).....	Any discharge or radiation level exceeding 10 m Sv/h at the package surface and 200 USv/h at 1m from the package surface
8.....	Corrosive (i.e. Batteries).....	5 KG or 5 L
9.1.....	Miscellaneous (i.e. Asbestos) except PCB mixtures).....	50 Kg
9.1.....	PCB Mixture.....	500 grams
9.2.....	Aquatic Toxic (i.e. Zinc Sulphate).....	1 Kg or 1 L
9.3.....	Wastes (Chronic Toxic) (i.e. Waste Lubricating Oil).....	5 Kg or 5 L
Ozone Depleting Substances.....	(i.e. R-11 Refrigerant).....	10 Kg

* Container Capacity (refers to container water capacity)

SOURCES: MR 439/87 Environmental Accident Reporting Regulation

NOTE: PCB or PCB contaminated oil spills (greater than 1 gram) and spills of any dangerous good/hazardous waste to a waterway must also be reported to Environment Canada.



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Figure 5

H3875 Rev 06 04
v2.05

HAZARDOUS MATERIALS INCIDENT REPORT

* Mandatory fields

NOTE: It is recommended that an incident log be maintained. Record times of each event and the names and titles of each person contacted or involved in the incident.

INSTRUCTION: To complete this report refer to the [Hazardous Materials Management Handbook](#) and [Manitoba Hydro Release Reporting Protocol](#).

Location of incident *		INCIDENT OCCURRED	yyyy mm dd *	hh mm *
District/Station *	Region/Division *	Business Unit responsible for spill *		
Name of Manitoba Hydro person responding to this incident *			Phone no *	

SPILL REPORTED TO (include name if available)

<input type="checkbox"/> a) Area Spill Response Coordinator (see Hazardous Materials Management Handbook for contact numbers or Safety website on Mpower)	yyyy mm dd	hh mm	Attended? <input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> b) Manitoba Hydro Corporate Hazardous Materials Officer: Ph (204) 474-3259, Fax (204) 477-7800	yyyy mm dd	hh mm	Attended? <input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> c) System Control Centre: Ph (204) 477-7268, Fax (204) 474-3102 (if necessary)	yyyy mm dd	hh mm	
<input type="checkbox"/> d) Manitoba Conservation (24hrs): Ph (204) 944-4888 or 945-4888, Fax (204) 948-2420	yyyy mm dd	hh mm	Attended? <input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> e) Environment Canada (24hrs): Ph (204) 981-7111, Fax (204) 983-0960	yyyy mm dd	hh mm	Attended? <input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> f) Other, specify:	yyyy mm dd	hh mm	Attended? <input type="checkbox"/> Yes <input type="checkbox"/> No

Customer complaint? ☐ Yes ☐ No If Yes, specify customer name, mailing address and telephone no. Customer complaint status
☐ Resolved ☐ Unresolved

Fire ☐ Yes ☐ No If Yes, report to the Fire Marshall at 474-4177. Property damage (describe) ☐ Private ☐ Public ☐ Corporate

Description of hazardous materials involved *

Volume released (L)	PCB Concentration (ppm, mg/L...)	Sensitive location (e.g. close to school, playground, hospital, body of water, food/agricultural areas, storm sewer?) <input type="checkbox"/> Yes <input type="checkbox"/> No
Equipment type/serial no.; type of container; MH Unit #., etc. involved in release *		

Description of incident *

Release to environment (any material that has entered the environment beyond containment/mitigation systems). * ☐ Yes ☐ No If Yes, describe:

Clean up action taken (describe) *

STARTED	yyyy mm dd	hh mm
COMPLETED	yyyy mm dd	hh mm

Contaminated materials (describe) * Disposal procedures (describe) * Hazardous waste manifest no.

Post clean-up samples? ☐ Yes ☐ No If Yes, specify: ☐ Soil ☐ Swab ☐ Water ☐ Other, specify: _____

Number of samples _____ Results: _____ Sample 1 Sample 2 Sample 3 Sample 4

Current status of incident *

Root cause identified and preventative measures taken *

Phone no.	Fax no.	REPORTED ON	hh mm	Report prepared by *	yyyy mm dd
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DISTRIBUTE TO: Corporate Hazardous Materials Officer, Responsible Line Management, Area Spill Response Coordinator and WS&H Committee

This personal information is being collected under the authority of Program Activity. The purpose is to determine the cause of a hazardous materials incident, identify damage, identify locations, document clean up activities, and statistical reporting purposes. Other uses and disclosures may be to: electronic database to administer program, liability, hydro officials on a 'need to know' basis and any disclosures required by law. It is protected by the Protection of Privacy provisions of The Freedom of Information and Protection of Privacy Act. If you have any questions about the collection, contact the Employee Safety & Health Department, MANITOBA HYDRO, PO BOX 815 STN MAIN, WINNIPEG MB R3C 2P4 or telephone 474-3259 e-mail lcains@hydro.mb.ca.