PROJECT DESCRIPTION FOR FEDERAL AGENCY REVIEW

NEW POST CREEK HYDROELECTRIC PROJECT

Submitted to:
Ontario Power Generation Inc.
700 University Avenue
Toronto, Ontario
M5G 1X6

And

Coral Rapids Power
36 Birch Street South
Timmins, Ontario
P4N 2AS

Prepared by:

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July 2011

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INTRODUCTION

This document is the Project Description for the proposed New Post Creek Hydroelectric Project (New Post Creek Project or Project) prepared for the Canadian Environmental Assessment Agency (CEA Agency), Ontario Region. The Project Description provides an overview of proposed Project components, general information on the Project setting and relevant background information on the Project. The Project Description allows (i) potential responsible authorities to determine whether the proposed Project will trigger the *Canadian Environmental Assessment Act* (*CEAA*), and (ii) technical expertise departments to review and provide comment on the proposed Project and background information presented in the document.

This document has followed the guidance for preparation of Project Descriptions under the *CEAA* outlined in the CEA Agency (2007) Operational Policy Statement. This document has also considered the Federal Requirements for Waterpower Development Environmental Assessment Processes in Ontario, Practitioner's Guide (DFO and OWA, 2010).

A draft of this document was provided to the Ontario Ministry of the Environment (MOE), Ontario Ministry of Natural Resources (MNR) including Ontario Parks, Ontario Ministry of Tourism and Culture (MTC), Department of Fisheries and Oceans (DFO), Transport Canada, Indian and Northern Affairs Canada (INAC) and Environment Canada prior to an Agency Kickoff meeting on May 25, 2011. The purpose of the meeting was to (i) present the proposed New Post Creek Project, (ii) discuss environmental assessment (EA) and permitting requirements, (iii) obtain feedback on planned field work and (iv) ascertain whether the proposed Project will likely trigger the *CEAA*.

1.0 GENERAL INFORMATION

1.1 GENERAL

1.1.1 Nature of the Project

In April 2006, a Memorandum of Understanding was signed between Ontario Power Generation Inc. (OPG) and the Taykwa Tagamou Nation (TTN) to jointly explore hydroelectric development opportunities within the Abitibi River drainage basin, north of Highway 11. As a result of this initiative, a potential waterpower generation location was identified on New Post Creek, a tributary of the Abitibi River.

In 1963, Ontario Hydro constructed the New Post Creek Diversion Dam on the Little Abitibi River in order to supply additional generating capacity at its Otter Rapids Generating Station (GS). The Otter Rapids GS is now owned and operated by OPG under the authority of a Water Power Lease. The dam allows significant flows to be diverted along the constructed New Post Creek Diversion Channel and New Post Creek to the Abitibi River upstream of Otter Rapids GS. The New Post Creek Hydroelectric Project (New Post Creek Project or Project), proposed by OPG with its partner Coral Rapids Power (CRP), a corporation wholly owned by the TTN, would take advantage of a portion of this diverted flow descending 60 metres (m) between New Post Creek and the Abitibi River, all within TTN Traditional Territory, to generate approximately 25 megawatts (MW) of electricity.

The New Post Creek Project provides some unique opportunities for economic and social development of TTN and its members. TTN's equity share in the Project will provide a steady flow of revenue to use as a source on which to build future development within TTN Traditional Territory. There will also be opportunities for employment during the Construction Phase of the Project.

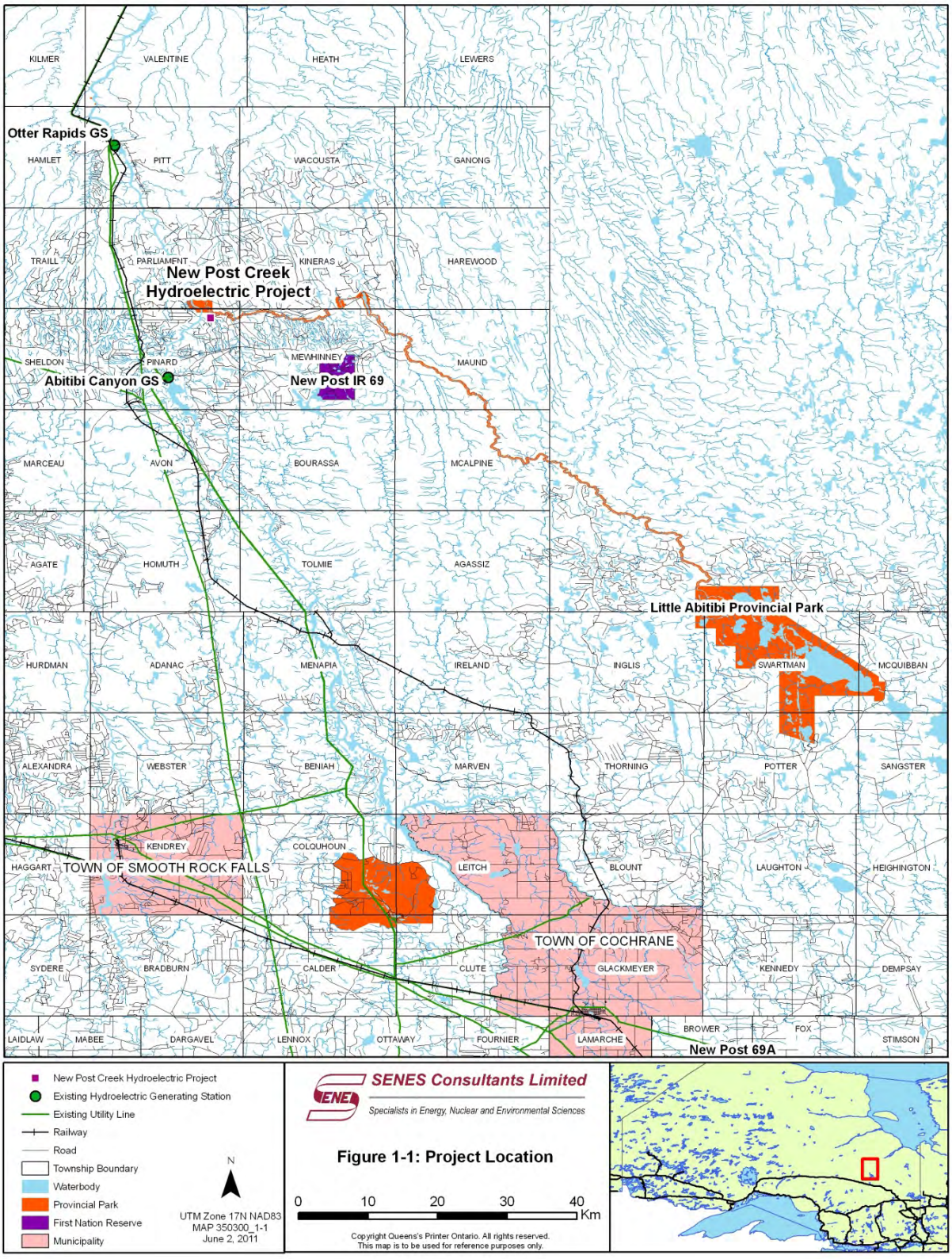
The New Post Creek Project also provides comfort to the First Nation in the knowledge that the New Post Creek waterfalls will be returned to a similar flow regime that existed prior to the diversion of the Little Abitibi River.

The utilization of water resources and the establishment of a generating station in an area already manipulated by human influence represent a preferred option over a project proposed on an unaffected watercourse.

1.1.2 Proposed Location of the Project

The proposed New Post Creek Project is located in the District of Cochrane within the Geographic Township of Pinard, approximately 100 kilometres (km) north of the Town of Smooth Rock Falls and 13 km northeast of Abitibi Canyon GS (Figure 1.1). Part of the Project is currently within Little Abitibi Provincial Park (LAPP). The proposed generating station would be located on Abitibi River shore lands with the intake at New Post Creek approximately 6 km

Figure 1.1: Project Location



upstream of its outlet to the Abitibi River. The proposed generating station, penstock and intake are located within TTN Traditional Territory, whereas the proposed transmission line occurs within overlapping Traditional Territories of the TTN and Moose Cree First Nation (MCFN).

1.1.3 Distribution

This document was submitted to the CEA Agency, Ontario Region, for distribution to and review by other federal agencies. In addition, copies of this document was also sent to the MOE, MNR, Parks Ontario, MTC, DFO, Transport Canada, INAC and Environment Canada as background information for the Agency Kickoff meeting on May 25, 2011.

1.1.4 Consultation

On November 10, 2007, members of the TTN voted to accept the Grievance Settlement Agreement from OPG that made reparations for past utilization of water resources within their Traditional Territory. The community members also voted to proceed with the New Post Creek Project in partnership with OPG. A detailed commercial Partnership Term Sheet was signed by OPG and TTN in November 2008.

Coral Rapids Power General Partner Inc., a company formed and wholly owned by the TTN to enter into the electricity generation business in Ontario, was incorporated by the Chief and Council in 2004 as a vehicle to carry out potential commercial activities related to electricity generation. TTN and its incorporated company subsequently created Coral Rapids Power Limited Partner Inc. (Coral Rapids Power or CRP) to enter a limited partnership with OPG for the New Post Creek Project.

In March 2008, CRP representatives met with INAC to request Project support and funding for CRP. INAC funding was obtained for partial support of early (Concept Phase) geotechnical and geophysical studies completed in 2009/2010 and the update to the feasibility study completed in 2010. Additional funding is currently being sought by CRP from INAC, the Northern Ontario Heritage Fund Corporation (NOHFC), Industry Canada FedNor and the Ontario Financing Authority. Discussions with INAC, NOHFC and FedNor are ongoing.

In May 2008, a newsletter series “New Post Creek Project News” was commenced by CRP for the purpose of providing information on Project achievements, status and ongoing endeavours. Subsequently, this and five additional newsletters (October 2008, May 2009, November 2009, July 2010 and February 2011) have been distributed within the TTN Community and have been posted on the CRP website: www.coralrapidspower.com since October 2008 to provide information and updates to the Community.

In January 2011, the TTN finalized a “Consultation and Accommodation Protocol”. This Protocol outlines how meaningful consultation on development projects and decisions can take place between TTN, the Crown and project proponents (TTN, 2011).

CRP has been involved in the proposed amendment to the management direction for LAPP (Ontario Parks, 2008) to permit activities (such as the installation of a water gauge) related to the feasibility assessment of the New Post Creek Project. These amendments were posted on the Environmental Registry (EBR Registry Number: 010-4962) for inspection and comment from October 20 to November 19, 2008 (see Section 1.4.2). The MNR received four comments with three supporting the proposed management statement amendment and one being neutral.

The generation of electricity is not permitted within a Provincial Park as stipulated by the *Provincial Parks and Conservation Reserves Act* (*PPCRA*). As part of the New Post Creek Project is proposed for land currently located within LAPP, a deregulation of the specific Project site and a regulation of suitable replacement lands must be proposed and accepted in accordance with the applicable MNR processes. MNR requested that TTN participate in the identification of replacement lands that would compensate for the removal of the small portion of land related to the Project (see Section 1.4.2).

OPG, CRP and TTN have been working with MNR and Ontario Parks since 2006 to (i) discuss mechanisms for allowing the hydroelectric facility to be built on lands currently within LAPP, and (ii) discuss the required site release process since the existing MNR Site Release Process does not allow for this. OPG, CRP and TTN have come to an agreement with MNR and Ontario Parks for a coordinated process to deregulate and regulate a small portion of the LAPP. This requires that the Ontario Waterpower Association (OWA, 2011) Class Environmental Assessment for Waterpower Projects (OWA Class EA) be coordinated with the MNR (2005) Class Environmental Assessment for Provincial Parks and Conservation Reserves (MNR Class EA). As well, since New Post Creek Project does not meet the existing MNR Site Release Policy or Guidelines, MNR has agreed to release the site as a 'pilot'. Based on the Coordinated Regulatory Approval Process (see Section 1.1.5), consultation activities, such as Aboriginal consultation, community meetings and public open houses, will be coordinated for the OWA Class EA and the MNR Class EA.

In a letter to the Chairman of the Moose River/James Bay Coalition, from then Minister of Environment and Energy, Bud Wildman, the provincial government agreed that "within the Moose River Basin north of Highway 11, there will be no hydroelectric development beyond Ontario Hydro's Mattagami River Hydroelectric Station Extensions project until such time as a co-planning process has been developed, agreed to and applied by the affected First Nations and Ontario" (Co-planning Commitment). More recent correspondence (August 1, 2007) from A/Assistant Deputy Minister David de Launay of the MNR invited discussion on the Moose River Basin Co-planning Commitment, and proposed to MCFN, TTN and MoCreebec Council of the Cree Nation (MoCreebec) that (1) lands within the Moose River Basin north of Highway 11 could be directly allocated where such applications for new hydroelectric projects are proposed by the local First Nation and/or their development partner; (2) there not be a megawatt limit on the installed capacity of a project; and (3) the current Northern Rivers Policy for the Albany, Winisk, Attawapiskat and Severn Rivers remain in place for the time being.

Subsequently, the MCFN, in a written agreement with TTN, has acknowledged receipt of both of the above letters, and agrees to actively support the New Post Creek Project. Further, the MCFN agreed that the Project could proceed as an exception to the Co-Planning Commitment.

Similarly, MoCreebec has provided a letter of support to TTN for the New Post Creek Project in light of the co-planning discussions.

As indicated in the Introduction, an Agency Kickoff meeting was convened on May 25, 2011 in Timmins with representatives of OPG and CRP and their environmental consulting team, TTN, DFO, Environment Canada, Transport Canada, INAC, MNR, Ontario Parks, MOE and MTC to (i) present the proposed New Post Creek Project, (ii) discuss EA and permitting requirements, (iii) obtain feedback on planned field work and (iv) determine whether the proposed Project will likely trigger the *CEAA*.

1.1.5 Environmental Assessment Regimes

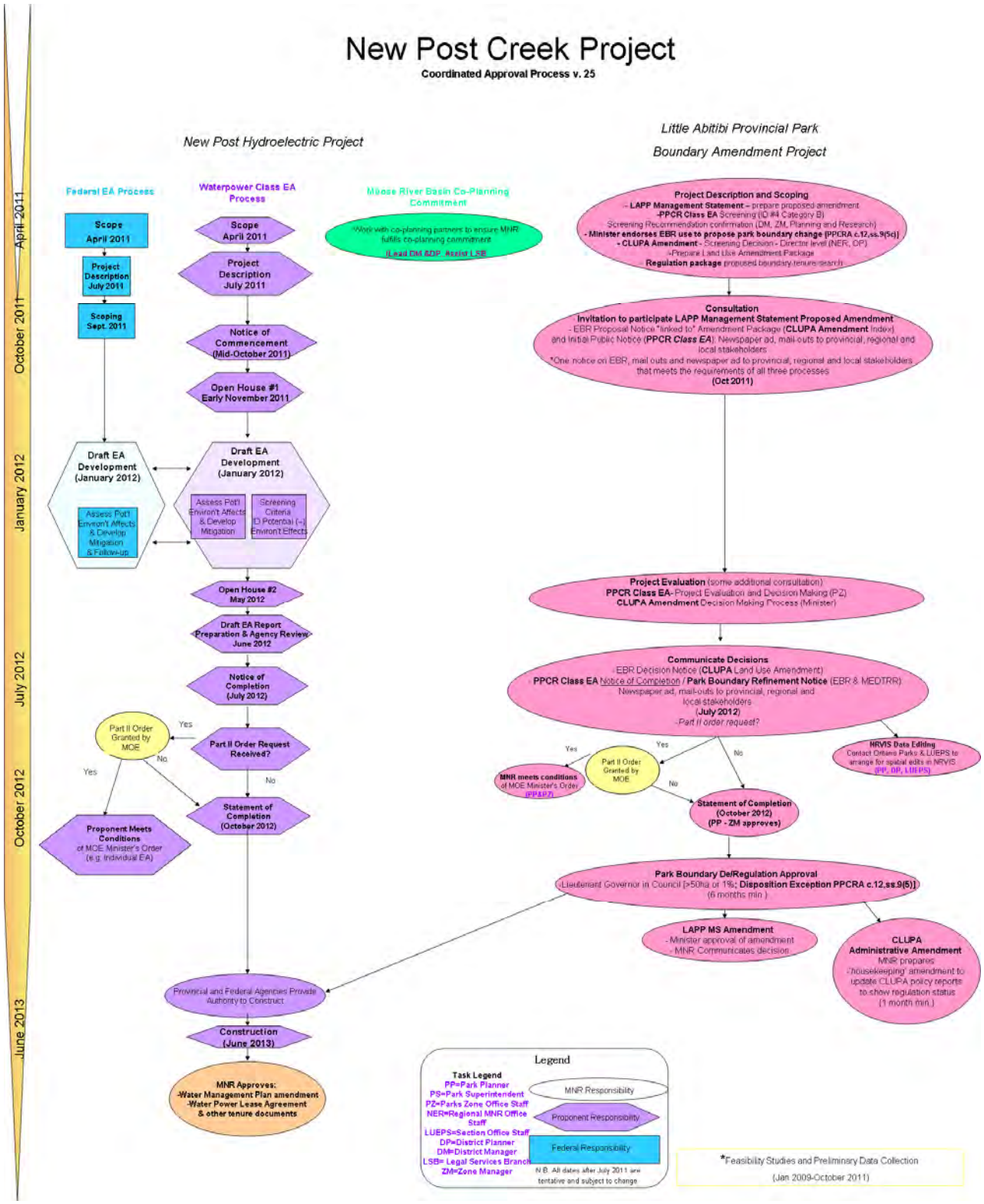
In Ontario, proposed waterpower facilities are subject to the *Environmental Assessment Act* (*EA Act*). The OWA developed the Class EA process which was approved by the Ontario Minister of the Environment and the Lieutenant Governor in Council in 2008. The *EA Act* formally recognizes the OWA Class EA process and outlines the requirements for EA approval.

Under the OWA Class EA, the New Post Creek Project will be classified as a "New Project on a Managed Waterway". Provided the requirements of the OWA Class EA planning process are met, and a Part II Order request is not made (or denied), a project is considered approved under the *EA Act*. The OWA Class EA planning process is comprehensive as the definition of the environment to be assessed is quite broad, and therefore will be used as the basis for coordinating consultation activities required under the *CEAA* and water management planning.

As per the OWA Class EA, transmission lines, which are 115 kilovolts (kV) or greater and are used to transmit electricity at a proposed waterpower facility or from the facility to the Independent Electricity System Operator (IESO) controlled grid, are to be considered part of the project and evaluated using the OWA Class EA process. Transformer or distribution stations that are 115 kV or greater and associated with a waterpower project under this OWA Class EA are also to be reviewed through this process

As indicated in Section 1.1.4, a Coordinated Regulatory Approval Process has been agreed to by OPG, CRP, MNR and Ontario Parks (see Figure 1.2). OPG and CRP will conduct the EA for the proposed New Post Creek Project according to the OWA (2011) Class EA. MNR has committed to ensuring that their EA requirements under the MNR (2005) Class EA, amendments required under the Crown Land Use Policy Atlas (CLUPA) and other MNR assessments are coordinated with the OWA Class EA. A New Post Creek Task Team comprising of a TTN member and individual representatives from OPG, MNR and Ontario Parks has been established to implement the Coordinated Regulatory Approval Process. Figure 1.2 also includes the Moose River Basin co-planning commitment (see Section 1.1.4).

Figure 1.2: New Post Creek Project Coordinated Approval Process



If a federal EA is also required (see Section 1.3), it will be harmonized with the OWA Class EA and the MNR Class EA (see Figure 1.2).

EA approval is required prior to issuance of other project approvals and permits, including an amendment to the Abitibi River Water Management Plan (WMP) (OPG *et al*., 2006) (see Sections 1.4.2 and 1.4.3).

1.2 Contacts

OPG in partnership with CRP is the proponent for the proposed New Post Creek Project.

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The TTN contacts are:

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SENES Consultants Limited has been retained by OPG and CRP to be their consultant undertaking the EA. The SENES Consultants Limited contact is:

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1.3 Federal Involvement

An electricity project subject to the Ontario *EA Act* may also be subject to the federal *CEAA*. According to section 5(1) of the *CEAA*, a federal EA is required before a federal authority exercises one of the following powers or performs one of the following duties or functions in respect of a project, namely, where a federal authority:

- is the proponent of the project and does any act or thing that commits the federal authority to carrying out the project in whole or in part;
- makes or authorizes payments or provides a guarantee for a loan or any other form of financial assistance to the proponent for the purpose of enabling the project to be carried out in whole or in part, except where the financial assistance is in the form of any reduction, avoidance, deferral, removal, refund, remission or other form of relief from the payment of any tax, duty or impost imposed under any Act of Parliament, unless that financial assistance is

provided for the purpose of enabling an individual project specifically named in the Act, regulation or order that provides the relief to be carried out;

- has the administration of federal lands and sells, leases or otherwise disposes of those lands or any interests in those lands, or transfers the administration and control of those lands or interests to Her Majesty in right of a province, for the purpose of enabling the project to be carried out in whole or in part; or
- under a provision prescribed pursuant to paragraph 59(*f*), issues a permit or licence, grants an approval or takes any other action for the purpose of enabling the project to be carried out in whole or in part.

The proposed New Post Creek Project will be designed, constructed, owned and operated by OPG and CRP. As indicated in Section 1.1.4, CRP is currently in discussions with INAC regarding funding for the Definition Phase. CRP did obtain partial funding from INAC to support the geotechnical and geophysical feasibility studies completed in 2009/2010 during the Concept Phase of the Project. Additional funding is currently being sought from INAC and Industry Canada FedNor. CRP will seek the support of the INAC Major Resource and Energy Development Program for funding during the Definition Phase to support third party costs, and to support their equity contribution in the Execution Phase

The proposed New Post Creek Project is located on Crown lands owned by the Province a portion of which is within LAPP. No federal or First Nation reserve lands will be affected by the Project. However, the Project is located within TTN Traditional Territory with the transmission component within the overlapping the Traditional Territories of the TTN and MCFN, lands for which there are Aboriginal interests and Treaty rights, including traditional uses.

The decisions or planned actions of federal authorities listed above are commonly called “triggers”. The last mentioned trigger could apply to the proposed New Post Creek Project (i.e., where a federal authority exercises a regulatory duty in relation to a project, such as issuing a permit or authorization). For example, if a project results in the harmful alteration, disruption or destruction (HADD) of fish habitat, authorization under the *Fisheries Act* from the DFO would be required thereby triggering *CEAA* (see Section 4.1). The DFO and OWA (2010) have prepared a Practitioner’s Guide providing advice on federal information requirements for waterpower projects and on opportunities to coordinate *CEAA* and provincial EA requirements.

A project may also trigger the federal EA process if it significantly interferes with navigation, requiring a permit under the *Navigable Waters Protection Act* (*NWPA*) from Transport Canada (see Section 4.2),

If the *CEAA* is triggered, the coordination process developed by CEA Agency, Ontario Region and the MOE Environmental Assessment and Approvals Branch would be followed to ensure that requirements of both levels of government are fully addressed (MOE and CEA Agency, 2007).

1.4 Authorizations Required

1.4.1 Ontario *EA Act*

As indicated in Section 1.1.5, the proposed New Post Creek Project will follow the process set out in the *EA Act*. The OWA (2011) Class EA requires the preparation of a draft Environmental Report (ER) for stakeholder review and comment over a 30-day period. If there are no concerns expressed during the 30-day review period, the project is considered acceptable and the final ER is filed with the MOE and approval is granted.

1.4.2 Provincial Approvals and Permits

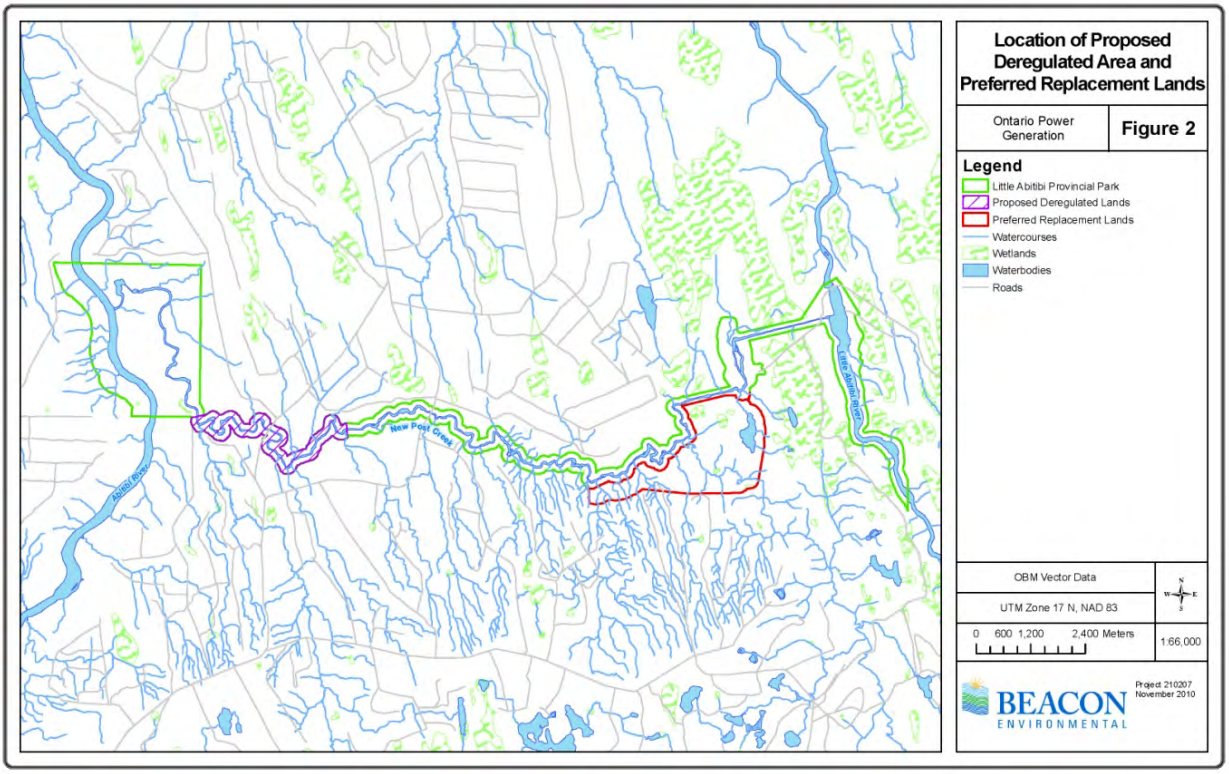
A transmission line greater than 2 km long associated with a generation project will also require a section 92 Leave to Construct under the *Ontario Energy Board Act* (*OEB Act*) from the Ontario Energy Board (OEB). The legislation and regulations provide that, for the purposes of granting Leave to Construct under section 92 of the *OEB Act*, the considerations of the OEB shall deal only with "the interests of consumers with respect to prices and the reliability and quality of electricity service". As a result of promulgation of the *Green Energy and Green Economy Act* in March 2009, the *OEB Act* was revised to contain new provisions that require licensed transmitters to develop transmission system plans to accommodate renewable generation such as hydroelectric projects, and to file those plans for review and approval by the OEB.

Based on a request by CRP and OPG to install a stream flow gauge station on New Post Creek, the MNR prepared a proposed amendment to the management direction for LAPP (Ontario Parks, 2008). The amendment states that no new dispositions of Crown lands for private use of individuals or corporations are permitted within a Provincial Park (MNR, 2003), "with the exception of dispositions related to the assessment of a potential water-power facility". The EA requirements for streamflow gauge installation followed the MNR (2005) Class EA for *PPCRA*. As indicated in Section 1.1.4, the amendment for the management Direction, together with a project description of the streamflow station, was posted on the Environmental Registry. A project description for a proposed geotechnical investigation was subsequently posted in February 2009.

The generation of electricity is not permitted within a Provincial Park as stipulated by the *PPCRA*. As part of the New Post Creek Project is proposed for land currently located within LAPP, a deregulation of the specific Project site and a regulation of suitable replacement lands must be proposed and accepted in accordance with the applicable MNR processes. Through consultations between MNR, Ontario Parks and the TTN Community, a 440 hectare (ha) area, immediately south of the LAPP, in the vicinity of the New Post Diversion Dam has been proposed as the "Preferred Replacement Lands" (Figure 1.3). The transaction would be consistent with the provisions of the *PPCRA* that would allow for the deregulation of land to facilitate the proposed New Post Creek Project. It is anticipated that the Project may impact approximately 168 ha of land along New Post Creek within LAPP and represents less than 1%

of the total LAPP area (20,296 ha). Basically, 168 ha of land (including the creek bed and 120 m on either side of the high water mark) would be removed from the LAPP and exchanged for a 440 ha parcel of land referred to as the "Replacement Lands". An Ecological Integrity Assessment was undertaken by Beacon (2010) which compared the land needed to be removed from the LAPP and the identified replacement lands that were proposed by the TTN Community. Beacon (2010) concluded that the proposed land exchange would increase the size of the LAPP and enhance its ecological integrity.

Figure 1.3: Proposed Deregulation Area and Preferred Replacement Lands



Energy transmission corridors may be permitted in LAPP if they are necessary to maintain essential public services and there is no other alternative (Ontario Parks, 2006). New utility crossings must meet MNR Class EA requirements and be managed to reduce their impact on recreational and aesthetic values

Based on current information, a number of permits, licences and approvals under provincial legislation may be required. A final determination cannot be made until the detailed design phase of the proposed Project is complete. These approvals and permits will likely include:

- Authorization from the MNR under the *Lakes and Rivers Improvement Act* (*LRIA*) for location approval of new facilities, and plans and specification approval for powerhouse works, temporary cofferdams, approvals for location and design of water crossings, etc.;

- Approval of amendment to the Abitibi River WMP (OPG *et al*., 2006) by the MNR under the *LRIA*;
- Land Use and Work Permits from the MNR under the *Public Lands Act* for site alteration and temporary occupation (construction camp) on Crown lands and infrastructure on or over Crown lands as well as water designated as Crown lands;
- Amendment to the waterpower lease agreement and amendment to the Licence of Occupation from the MNR under the *Public Lands Act*;
- Permit for species at risk (SAR) plant removal, or disturbance or destruction of SAR habitat from the MNR under the *Endangered Species Act* (*ESA*);
- Scientific Fish Collection Permit from the MNR under the *Fish and Wildlife Conservation Act*;
- Forest Resource Licence, Forest Management Plan amendments and Authority to Haul Crown Wood and Timber Scaling Agreement (licence and clearance to harvest and remove Crown wood) from the MNR under the *Crown Forest Sustainability Act* (*CFSA*);
- Amendment of the Sustainable Forest Licence by the MNR under the *CFSA*;
- Aggregate Permit from the MNR under the *Aggregate Resources Act* for new aggregate sites and inactive, existing sites not under permit;
- Memorandum of Understanding with the MNR outlining ownership and maintenance of certain roads and all water crossings;
- Certificate-of-Approval (C-of-A) (air/noise) and C-of-A (waste) – Waste Generator Registration from the MOE under the *Environmental Protection Act* (*EPA*);
- C-of-A (Industrial Sewage) and Permits to Take Water (PTTW) for construction and dewatering if greater than 50,000 litres (L)/day from the MOE under the *Ontario Water Resources Act* (*OWRA*);
- Permit from the Ontario Ministry of Transportation under the *Dangerous Goods Transportation Act*; and
- Letters of Clearance for archaeological resources from the MTC under the *Ontario Heritage Act*.

1.4.3 Federal Approvals and Permits

A number of permits, licences and approvals under federal legislation may also be required. In some cases, a final determination cannot be made until the detailed design phase of the proposed Project. Federal approvals and permits include:

- *Fisheries Act* authorization from the DFO for HADD of fish habitat with conditions for mitigation and compensation, which would trigger the federal *CEAA* process (if it is determined that there will be no HADD of fish habitat, permits for temporary watercourse crossings must still be obtained from the MNR with a Letter of Advice from DFO);
- *NWPA* Letters of Exemption from Transport Canada (Navigable Waters Protection Program Office) for any works built or placed in, on, over, under, through or across navigable water (including transmission line crossing of a riverine waterway that is 15 m or wider at the crossing location) prior to construction of the works (the requirement for a formal approval due to the determination that a project poses a substantial interference with navigation would trigger the federal *CEAA* process); and

- Explosives Transportation Permit from Natural Resources Canada under the *Explosives Act*.

1.4.4 Other Approvals and Permits

In addition, a Sewage System Permit and/or Roads approvals will be required from Local Services Boards and the health units. A permit letter will also be required from Ontario Northland Railway (ONR) for the transmission line crossing.

1.4.5 Other Relevant Regulatory Legislation Not Requiring Permitting

There are a number of federal and provincial regulations/guidelines that need to be considered throughout the EA process and the subsequent construction phase that do not necessarily require a formal permitting process. These include but are not limited to the following:

Provincial

- Provincial Policy Statement (OMMAH, 2005) which provides policy direction on matters of provincial interest related to land use planning and development;
- Proposed Growth Plan for Northern Ontario (MEI and OMNDMF, 2009) promotes initiatives for economic and community renewal in northern Ontario;
- Under the *EPA*, regulations regarding the systematic control of collection, storage, transportation, treatment, recovery and disposal of waste including hazardous waste;
- Water Management Policies and Guidelines (Policy 1 and 2) of the MOE (MOEE, 1994); and
- Statements of Environmental Values by the MNR, MOE and Ontario Ministry of Culture (now MTC) under the *Environmental Bill of Rights.*

Federal

- *Migratory Birds Convention Act* and Migratory Birds Regulation prohibit the taking or killing of migratory birds and their nests and eggs, and the deposit of substances harmful to migratory birds in areas they frequent;
- *Species at Risk Act* (*SARA*) is intended to prevent Canadian wildlife species from becoming extinct or extirpated, secure the recovery of extirpated, endangered and threatened species, and manage species of special concern to prevent them from becoming endangered or threatened (a permit is required for the removal of SAR plant species, or damage or destruction of SAR habitat on federal lands in Ontario);
- Policy on Wetland Conservation (Environment Canada, 1991) with the goal of sustaining wetland functions;
- A Wildlife Policy for Canada (CWS, 1990; Lynch-Stewart, 2004) with the goal to maintain and restore ecological processes and the diversity of ecosystems, species and genetic variability within species; and
- Canadian Biodiversity Strategy (Environment Canada, 1995) based on the Convention on Biological Diversity (UNEP, 1994) with the goal of conserving biological ecosystems, species and genetic variability within species.

2.0 PROJECT INFORMATION

Four potential hydroelectric development sites were evaluated along New Post Creek during the Concept Phase of the Project (KGS Group, 2006). A preferred site was recommended based on environmental and technical considerations (Figure 2-1). This alternative provides the least impact on the natural heritage values of the LAPP because it affects the smallest park area and causes the least fragmentation of the park.

A feasibility level preliminary geotechnical investigation of the preferred site was subsequently undertaken that included a seismic refraction survey, archaeological survey, nesting bird survey, test pit excavations, geotechnical drilling, cone penetration testing, instrumentation and monitoring (KGS Group, 2010a,b). Based on the findings of this geotechnical program, the Project layout was revised and updated and project costs estimated based on those of other existing hydroelectric development projects in the region (KGS Group, 2010c). Based on the feasibility update work, the proposed New Post Creek Project would generate from 110 to 133 Gigawatt-hour (GWh) per year (depending on the diverted flows). The total plant capacity will be selected during the Definition Phase and may vary somewhat from the 25 MW capacity identified by KGS Group (2010c). The estimated energy generation is sensitive to the required flows down the existing channel and over the New Post Creek waterfalls during low flow periods. The required flows in the existing channel will be examined in detail during the Definition Phase as part of the OWA Class EA.

It should be noted that the proposed Project components/structures and activities presented in Sections 2.1 and 2.2, respectively, will be refined during the New Post Creek Project Definition Phase.

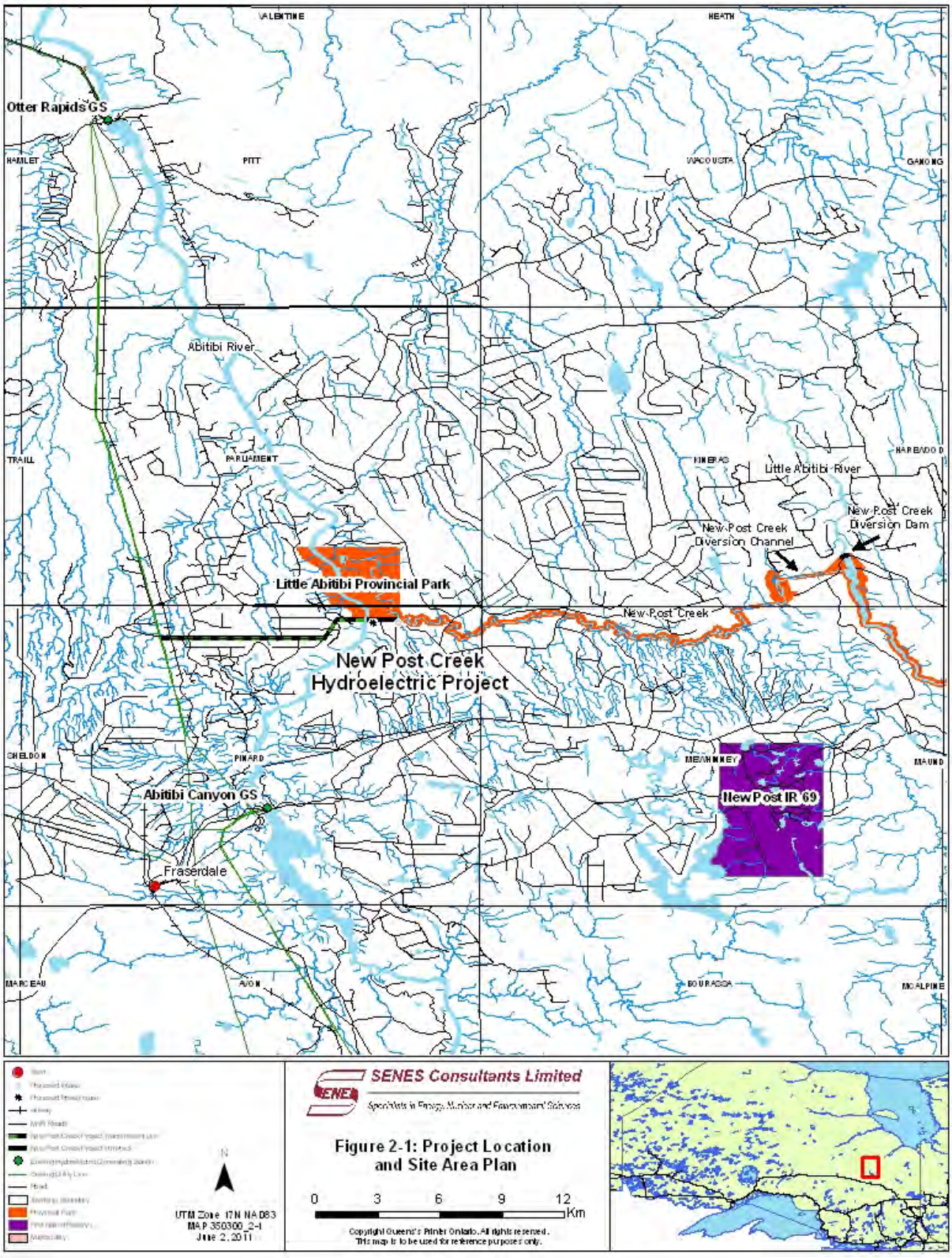
2.1 Project Components/Structures

As indicated above, final detailed designs of Project components/structures will be completed during the Definition Phase, which involves detailed engineering design to be undertaken concurrently with EA preparation.

Access to the Project site from Abitibi Canyon GS is via an existing forestry road that branches off of Otter Rapids Road near KM 6.0. The access roads will be upgraded and extended approximately 2.5 km to the intake site and the powerhouse (Figure 2.1). The access road to the intake will also serve as a water-retaining dyke under high flow flood conditions.

As indicated in Section 1.4.2, a streamflow gauge station was proposed and subsequently installed in 2009. Data from the gauge are being used to extend and verify existing New Post Diversion Dam flow data, particularly during low flow periods and in winter under ice cover.

Figure 2.1: Project Location and Site Area Plan

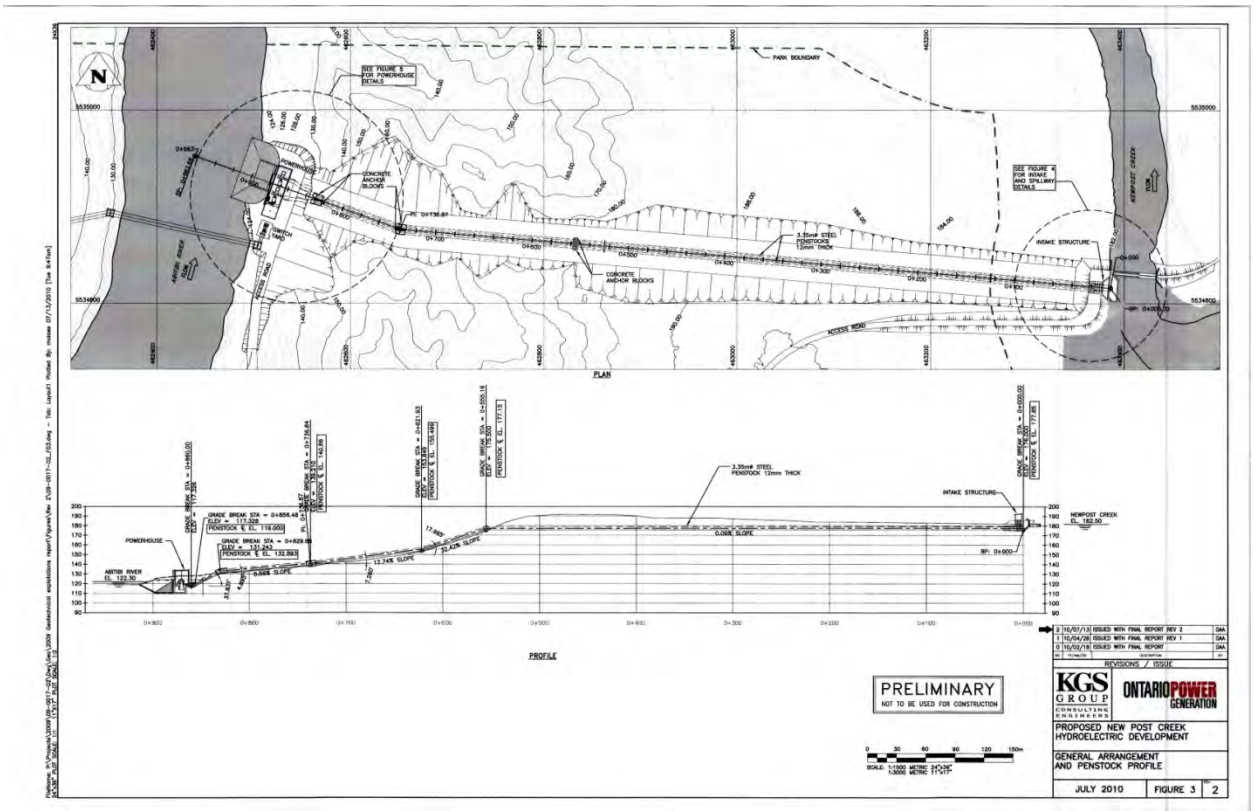


The proposed New Post Creek Project will consist of the following primary project components/structures:

- intake and spillway structures;
- water conveyance system that includes shallow buried penstocks and possibly a portion of open water canal;
- powerhouse structures; and,
- transmission line.

The proposed spillway and intake structures are within the present boundaries of LAPP; however, most of the proposed penstock and the entire powerhouse are located outside of the present park boundary. The general arrangement of the Project components/structures is presented in Figure 2.2. A ledger size (17 x 11) figure is also provided in Appendix A.

Figure 2.2: General Arrangement and Penstock Profile



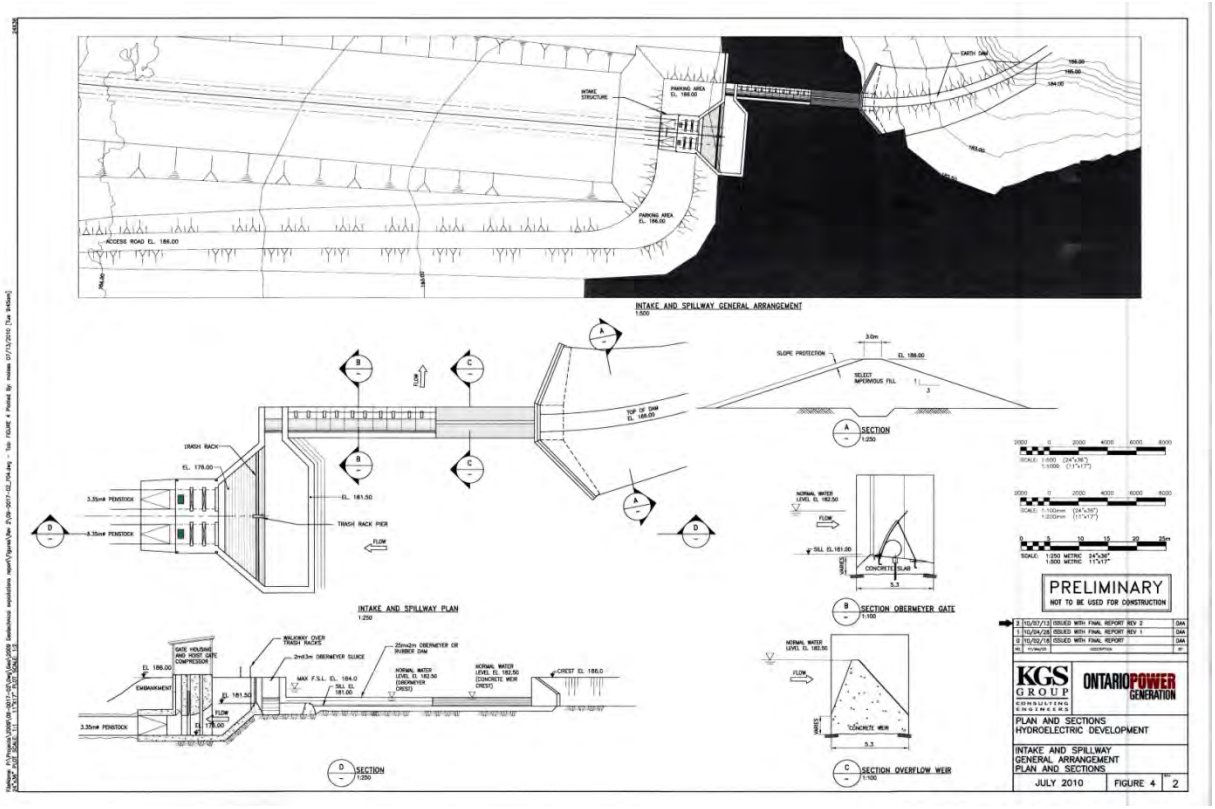
Intake and Spillway Structures

The proposed intake and spillway structures are located approximately 4.4 km upstream of the New Post Creek waterfalls near a bedrock (granitic gneiss) outcrop that extends across New Post Creek (Photo 2.1). Due to its competence and good quality, the bedrock will provide an excellent foundation for the intake and spillway, with no settlement concerns. The proposed intake and spillway structures are separate but immediately adjacent to each other. The

general arrangement of the spillway and intake structures is presented in Figure 2.3. A ledger size figure is also provided in Appendix A. The intent of the spillway and intake layout selected is to minimize inundation upstream while still ensuring flow withdrawals during all flow periods.

Photo 2.1: Bedrock Outcrop

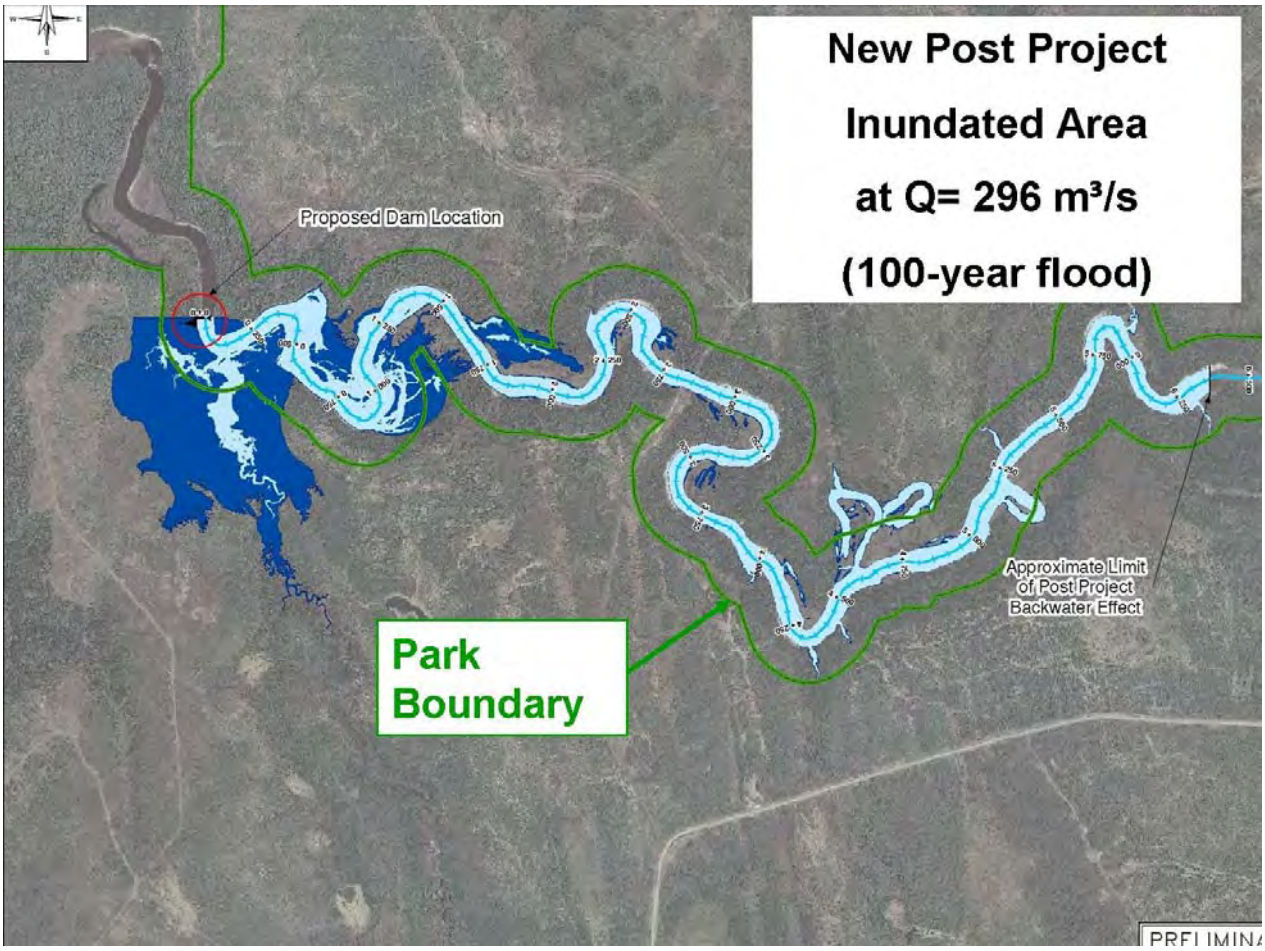
Figure 2.3: Intake and Spillway General Arrangements



The proposed spillway structure presented in the feasibility update report (KGS Group, 2010c) consists of an in-stream low (1.5 m high, although may be increased during Definition Phase work) steel crest gate section and an uncontrolled (fixed) concrete weir. The steel crest gate would be an Obermeyer type, which is operated by a pneumatic bladder. The combination of a gated or rubber dam section with a fixed concrete weir results in minimal incremental inundation upstream.

Based on preliminary hydraulic assessment (KGS Group, 2010c), normal operation of the proposed New Post Creek Project will increase the water level in New Post Creek at the proposed intake by 2 m (Brown and Percheron, 2010). The resultant total inundated area would be quite small (less than 10 ha) and is not very sensitive to changes in plant flow since the shoreline is generally steep (see Figure 2.4). Moreover, the upstream extent of the inundated areas is limited by the rather steep gradient at the upstream limit. However, as indicated in Figure 2.4, the inundated areas would occur within a total park area of approximately 168 ha upstream of the Project spillway (Beacon, 2010).

Figure 2.4: Flooded Areas 100 Year Flood – Post Project Conditions



OPG, CRP and KGS identified late in the 2010 study process that forebay level increases in excess of those studied to date may warrant detailed review, and consequently are included in the definition study work plan. This may increase reservoir levels by up to 3 m above that studied, which would affect structures and area inundated under normal operation (which may be close to the area shown as flooded during 1:100 year event).

A low head earth dam will be constructed on the opposite shore adjacent to the fixed concrete weir to contain flow within the creek channel. The exposed slope at the creek edge will be protected by concrete slab for erosion protection. The access road and parking areas at the intake will also serve as water-retaining dykes under high flow flood conditions. Grouting of the bedrock may be required in areas where the tie-ins for the proposed low head earth dams and spillway structures are on bedrock to minimize the potential of groundwater seepage through the abutments.

As presented in the feasibility update report (KGS Group, 2010c), the proposed intake will include a gravel trap (trash rack) and a downstream sluice, consisting of a 2 m high by 3 m wide

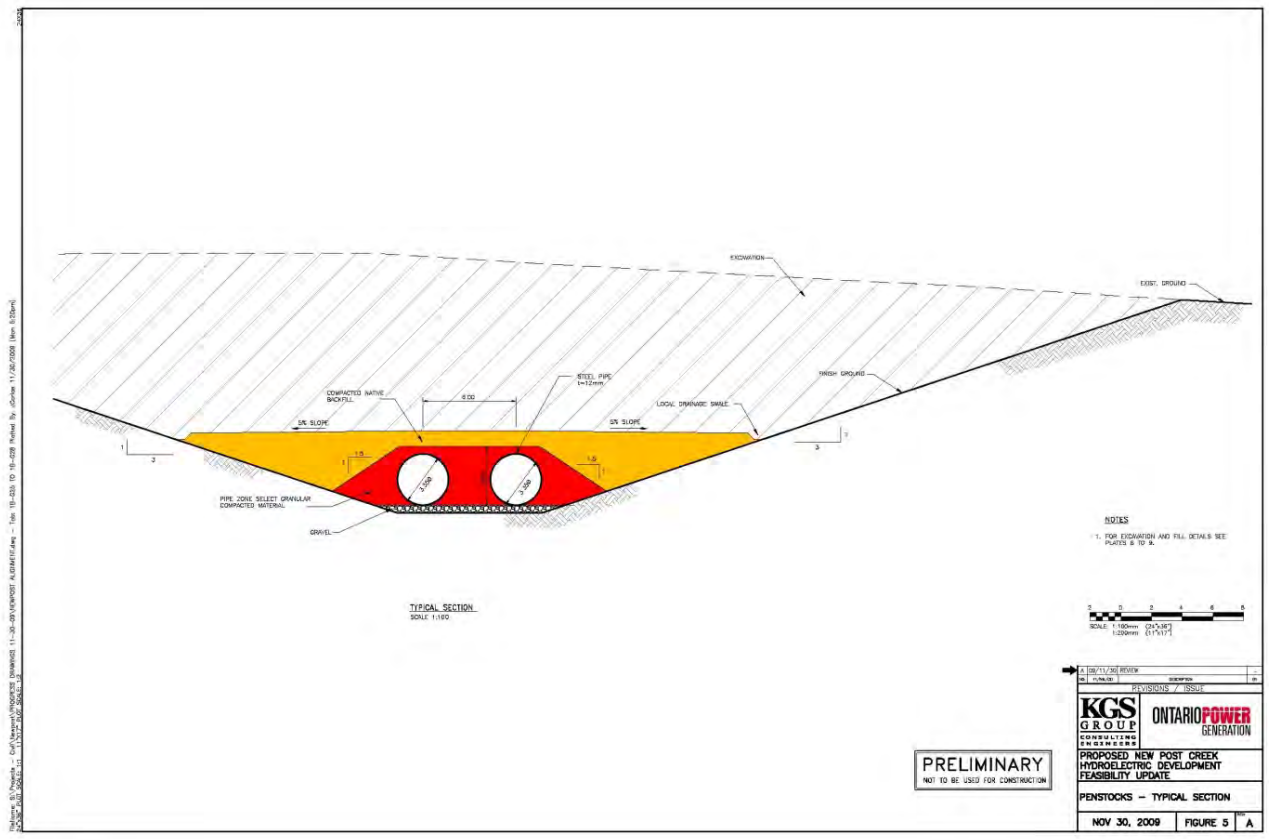
Obermeyer gate, to be used as a sediment sluice and outlet for continued flows to the waterfalls downstream.

The intake bays to the two shallow buried penstocks will be submerged to minimize potential vortex problems. A flow skimmer wall and a low level sluice gate will be included in the design to reduce the potential for sediment entrainment in the diverted flow to the powerhouse. The sluice gate will allow for flushing of any sediment deposits at the intake during high flows downstream into the existing creek channel.

Water Conveyance System

While water conveyance options and alternatives will be refined during the Definition Phase, KGS Group (2010c) has proposed two side by side shallow buried steel penstocks, each 3.35 m in diameter that would extend approximately 820 m from the intake structure to the powerhouse. The twin penstock will extend from the intake area sloping very gently for about 650 m with minimal submergence below the forebay level and then drop at an overall average slope of 18% down to the powerhouse at the Abitibi River shore. A natural head drop of just over 60 m occurs from the intake on New Post Creek to the Abitibi River. Figure 2.5 shows the penstock profile.

Figure 2.5: Penstock Profile



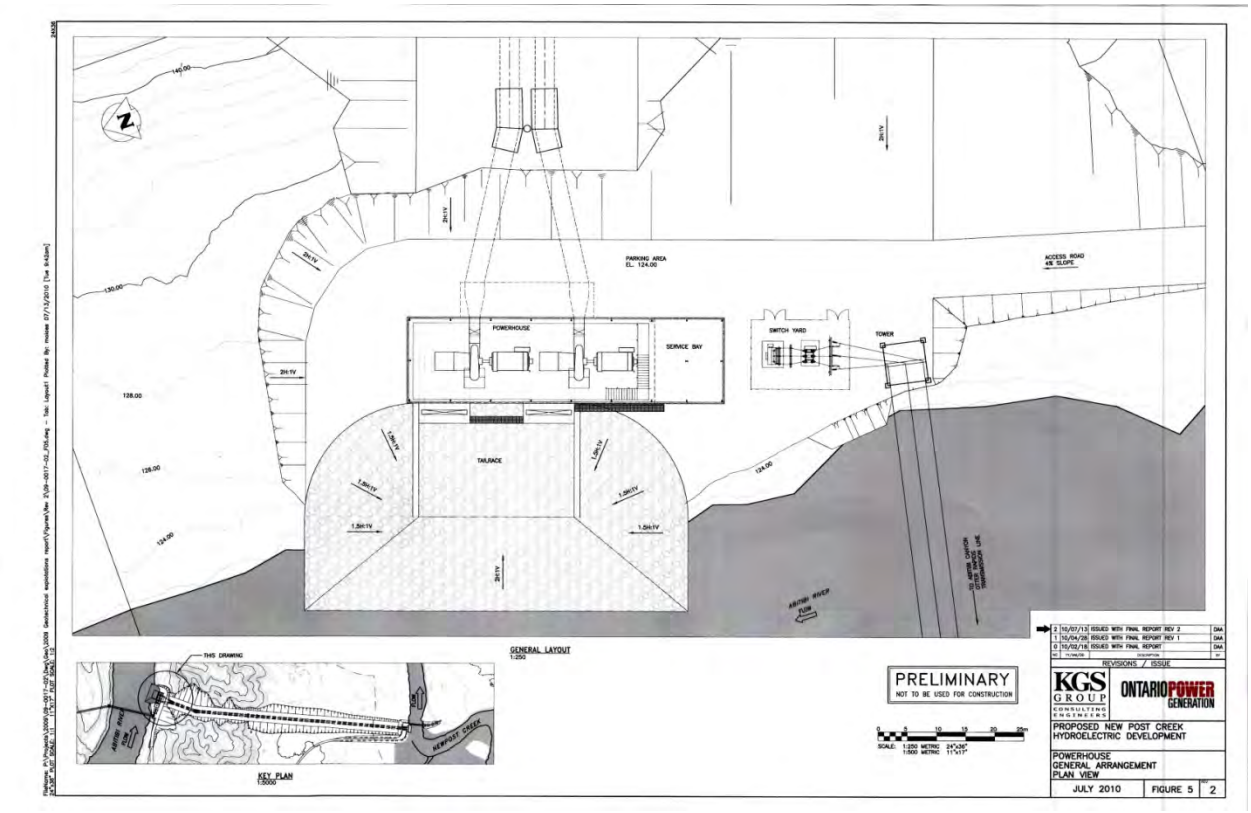
Due to shallow overburden, the penstock would be founded on competent bedrock along its first 150 m length from the intake structure with the remaining portion constructed within overburden. As the overburden sands and silts are erosion prone, the penstock system will be provided with granular drainage layers and drains that can be monitored for leak detection.

The proposed penstocks will be equipped with manhole access along the route near the end of the shallow sloping section and above the steeper portion. Impressed current or sacrificial anode cathodic protection will be provided along the penstock.

Powerhouse Structures

The proposed powerhouse will have a concrete substructure for the turbine draft tubes, with the horizontal generators and turbines mounted on the powerhouse floor. The turbine units may be mounted near or below the normal tailwater level. The turbine shutoff valves will have gravity trip counterweights located within the powerhouse. The layout and details of the powerhouse facility proposed in the feasibility update report (KGS Group, 2010c) are presented in Figure 2.6. A ledger size figure is also provided in Appendix A.

Figure 2.6: Powerhouse General Arrangement



The powerhouse foundation structure will be constructed on a dense sand deposit with sufficient load bearing capacity. The powerhouse and tailrace area will be excavated and founded within sands and gravels (Photo 2.2), with bedrock located more than 15 m below the powerhouse draft tubes and tailrace. Groundwater depressurization/dewatering will be required for powerhouse foundation excavation below the river water level. In addition, long-term seepage control, if necessary, can be provided by the use of cut-off walls, low maintenance gravity drains and relief wells.

Photo 2.2: View Along the Abitibi River Shoreline in the Vicinity of the Proposed Tailrace

Transmission Line

A proposed new 115 kV transmission line extending from the powerhouse switchyard directly west over a distance of approximately 7 km to the existing 115 kV Otter Rapids GS/Abitibi Canyon GS transmission line is the technically preferred connection option (see Figure 2.7). Based on available information, the preferred interconnection would involve a T tap direct with protection provided by a circuit breaker at the new switchyard outside the powerhouse. Based on a System Impact Assessment (SIA) by the IESO (2010), the proposed connection to the existing 115 kV transmission line is acceptable conditional on a number of requirements that have been incorporated by KGS Group (2010c). Based on the Customer Impact Assessment,

Hydro One Networks Inc. (Hydro One, 2010) concluded that the proposed New Post Creek Project can be incorporated with minor impact to Hydro One customers conditional on adherence to the requirements identified in the IESO (2010) SIA.

The transmission line will consist of untreated wood (likely cedar) poles. The aerial cable crossing of the Abitibi River is approximately 150 m wide. The final routing of the transmission line will be addressed as part of the OWA Class EA process.

Figure 2.7: Proposed Transmission Line Route

2.2 PROJECT ACTIVITIES

2.2.1 Construction

Final detailed designs of Project construction will be completed during the Definition Phase, which involves detailed engineering design to be undertaken concurrently with EA preparation.

It is assumed that a temporary construction camp will be needed to accommodate the workers for the approximate 2 to 3 year construction period. It is anticipated that this construction camp would house up to 100 workers depending on the particular phase of the project. Workers at the construction camp will not be permitted to fish, hunt or use ATVs while they are working at the camp. A concrete batch plant is also likely to be required in the vicinity of the Project.

As indicated in Section 2.1, the proposed intake and spillway structures will be constructed adjacent to each other on competent bedrock. The spillway structure consists of an in-stream low (1.5 m high, although may be increased during Definition Phase work) steel crest gate

section (Obermeyer type) and an uncontrolled (fixed) concrete weir (see Figure 2.3). At the intake and spillway location, New Post Creek is 1 to 4 m deep and approximately 50 m wide.

An initial perspective on what might be the intake and spillway construction method that would be employed by the design/build contractor is presented below. However, it should be noted that the final sequencing, construction and dewatering methods used would be defined by the successful contractor on the basis of environmental requirements and constraints outlined in the tender documents.

The intake and spillway are integrated, and consequently construction of the two works requires close coordination. The intake and west portion of the spillway would be excavated in dry conditions. The construction will take place behind an existing rock plug with an added surface berm cofferdam constructed along the west river edge to protect the work area and allow the required excavation during flow passage.

Upon completion of the intake and westernmost spillway work, the berm and rock plug would be removed and the new spillway bay on the west side will be used to pass New Post Creek flows downstream while the remaining spillway is constructed.

The cofferdam for the in-stream portion of the spillway work could be launched from either shoreline. It is anticipated that an access trail from the Otter Rapids Road to the east abutment could be enhanced. Alternately, a temporary logging bridge could be used to cross the open portion of diverted flow, in combination with limited in-stream work for timber crib abutments. In either case the cofferdams would be quite small, with a dewatered river channel area in the order of 25 m by 15 m using a cofferdam in the order of 1.5 m to 2 m high. The cofferdam selected by the contractor is anticipated to be either an in-stream water tight barrier (e.g., aquadam) or constructed of granular fill with a water retaining core (membrane or silty sand).

Due to the limited work and volume of concrete required for the in-channel spillway and east abutment work, the total duration of dewatering of the 25 m by 15 m channel is anticipated to be in the order of 3 to 4 months, and would be performed following spring flood passage.

Existing slopes along the Abitibi River and inland at the Project site are relatively steep. Some slope angles were near 1V:1H locally, with overall slopes of 1V:3H, reflecting fairly high strength materials in the *in-situ* sands, silts and tills and limited groundwater pressure influence. There was no evidence of deep-seated slumping or slides occurring at the Project site. For preliminary design purposes, a slope angle of 1V:2H could be used for construction excavations above the groundwater table. As the native soils are highly erodible, extensive stabilization works may be required to prevent vegetation removal, drainage pattern alteration and slope destabilization by heavy loads. Freshly exposed surfaces due to construction activities will require erosion control measures such as granular material placement over exposed surfaces, surface water diversion from slopes and French drain installation for water control in water-bearing granular areas.

The proposed penstocks will be buried with a minimum 2 m cover to provide thermal insulation during winter operation. Blasting of surface and near-surface bedrock along the initial 150 m distance from the intake will be required to facilitate penstock burial.

As indicated above, groundwater depressurization/dewatering will be required for powerhouse foundation excavation. This may be achieved by installation of a pump well system or a low permeability seepage barrier such as sheet pile walls or slurry trench to reduce seepage gradients at the downstream face of the natural cofferdam (dyke) around the powerhouse foundation excavation.

Construction of the proposed powerhouse and a portion of the tailrace will be set back from the Abitibi River shoreline (see Figure 2.4). Due to the presence of sand, it is anticipated that a pumped dewatering system possibly combined with a trench cut-off and/or sheet pile cut-off will be required during excavation and construction.

It is anticipated that tailrace construction in the channel involving overburden excavation would be undertaken after completion of the powerhouse substructure. Construction of much of the in-water portion of the tailrace will be undertaken in the dry using a cofferdam. Once the cofferdam is constructed, the area enclosed by the cofferdam will be pumped dry to facilitate nearshore sediment excavation and extension of the tailrace. The tailrace area will require rip-rap lining to protect against erosion and sloughing of the overburden. Upon completion of tailrace construction, the temporary cofferdam material will be re-used as rip rap. Portions of the Abitibi River bank in the immediate vicinity of the tailrace area may also require shoreline rip-rap protection to minimize toe erosion due to scouring and lower bank sloughing along the river bank. A concrete stackwall, retaining wall or a tied steel sheet pile wall will extend out from the powerhouse draft tube piers to assist in reducing the excavated quantities. After construction completion the final shoreline plug will be removed in the wet.

OPG currently envisions hiring a third party construction contractor that will be responsible for the detailed design and construction of the New Post Creek Project. This contractor would be responsible for providing detailed design for construction-related permits and approvals, such as Land Use Permit for the temporary construction camp, PTTW, C-of-A (Industrial Sewage). C-of-A (Air) for the concrete batch plant, and aggregate permits for new aggregate sites and inactive, existing sites not under permit. The permits and approvals required for the proposed Project will be dependent on the final designs prepared by the contractor and will be incorporated into a Project Environmental Requirements document, which will be prepared as an approvals guide for Project engineering and construction staff.

Construction is anticipated to last up to 30 months.

2.2.2 Operation

The existing Water Management Plan for the Abitibi River (OPG *et al*., 2006) will need to be amended. Operation of the New Post Creek Project will comply with the amended Abitibi River Water Management Plan.

Operation will be constrained by the anticipated minimum flow required in the existing channel mandated as required for the waterfalls downstream. This minimum flow will be determined during the EA in the Definition Phase. Typically, there are two to three months of the year when the New Post Creek flows available for generation will be very low (KGS Group, 2010c). The minimum flow is likely to have some temporal variations to address fish spawning requirements in the spring.

Maintenance of the trash rack and intake, such as removal of timber debris or excessive sediment deposits, will be facilitated by the ability to lower the crest gate during low flow periods to drop the forebay by 1.8 m and essentially to the existing channel bottom.

The intake bay for each penstock will have self-closing vertical lift gates to ensure that the penstocks and powerhouse can be safely isolated and dewatered under all conditions.

Maintenance of the draft tubes or turbines will require the use of a draft tube bulkhead system. Consequently, the powerhouse will be equipped with one set of draft tube bulkhead gates (for one unit at a time), with the gates installed using a monorail hoist travelling across the tailrace deck. The gates will be stored in the gate slots above tailwater level.

The operating regime of the proposed New Post Creek Project continues to be assessed and developed on the basis of ongoing technical review and the initiated EA process.

The base case operating scheme, as outlined in the feasibility update report (KGS Group, 2010c), involves the passage of established flows downstream to the New Post Creek waterfalls and the remaining flow diverted from the creek and passed through the turbine units to generate electricity. During high flow periods, flow diversion will meet the maximum flow capacity of the turbines. Plant capacity was estimated to be in the order of 50 cubic metres per second (m^3/s or cms) by KGS Group (2010c), but will be further reviewed as part of the Definition Phase work. During spring, significant flows will continue downstream of the intake to the waterfalls, as the estimated average New Post Creek flows for May and June are 133 m^3/s and 70 m^3/s, respectively. During the rest of the year, the required flows will be released downstream while diverting the remaining flow to the turbines to generate electricity.

When the diverted creek flows are less than the lowest plant operating flow of the smallest turbine unit (typically 40% of the unit capacity for a Francis turbine), diversion through the intake would be shut down and all of the creek flow would continue downstream over the waterfalls. For two equal sized turbine units with a capacity of 25 m^3/s each, the plant would cease generation at diverted flows of approximately 10 m^3/s, typically in February and March (KGS

Group, 2010c). Plant shutdown would occur on average about 17% of the year (G. McPhail, KGS Group, 2011, pers. comm.). The penstocks having a minimum 2 m cover could be left filled and ready to resume operation once increased creek flows permit.

The use of alternate turbine types and sizes could reduce the periods of insufficient flow for generation; thereby, extending the duration of plant operation and increasing the energy generated. For example, the use of three equal sized turbines would reduce the minimum operating flow to 6.6 m^3/s (50 / 3 x 0.4), allowing generation 87% of the time. Alternately, one of the two turbine units could be a horizontal double Francis unit equipped with a crown (or sleeve) valve, which isolates one of the two runners, allowing the unit to operate on diverted flows down to 5 m^3/s (25 / 2 x 0.4), which would allow generation for 90% of the time.

In addition to using special turbines to better utilize low flows, another option is to use additional reservoir volume created by a small water level change (0.1 m or less) over the inundated reservoir area to allow the units to be cycled on and off during low flow periods. Based on an inflow of approximately 5 m^3/s (which is exceeded 90% of each typical year), a water level change of 0.1 m provides sufficient volume to allow one of two units to be operated for 2 hours on, 2 hours off, thereby maintaining flow through the penstocks for energy generation even during the lowest of flow periods. Such an operating regime would only be used during a limited portion of the year (less than 2 months) during low flow periods, with flows during the remaining period sufficient for continuous operation of the units.

The technical and environmental aspects associated with the various turbine type and operation options will be reviewed during the Definition Phase, and will be refined and confirmed as the engineering work and EA proceeds.

Water levels on the reservoir will normally be maintained near the upper licence limit, with water levels temporarily increasing during passage of extreme floods but remaining at or below the flood passage licence limit.

2.2.3 Decommissioning

Decommissioning involves the permanent removal of the hydroelectric facilities, with the resultant loss of the site as a renewable source of electricity generation. Rather than decommissioning, redevelopment of a facility that is at the end of its designed service life is a viable option. A number of hydroelectric facilities built in the early 1900s have recently been redeveloped, e.g., Wawaitin GS, Sandy Falls GS and Lower Sturgeon GS on the Upper Mattagami River, and Hound Chute GS on the Montreal River. Redevelopment, rather than decommissioning, would be an option to consider for the New Post Creek Project once it has reached the end of its designed service life.

If redevelopment is not an option, all infrastructure will be removed from Crown land at the end of the service life of the Project generating station.

2.3 RESOURCE/MATERIAL REQUIREMENTS

The overburden silts and silty fine sand available at the Project site cannot be readily compacted to achieve the desirable density and stiffness required as backfill material for the shallow buried penstock. However, there is a high prospect for a large inventory of good granular material and a rock quarry to be found at reasonable distance from the site.

The spoil materials may be used as non-structural random fill above the structural backfill that would surround the penstocks.

2.4 WASTE DISPOSAL/ENVIRONMENTAL MANAGEMENT PLAN

Some of the excavated silty material may require additional handling and appropriate disposal depending on moisture content and consistency at the time of excavation.

Incidental spills of oil, gas, diesel and other liquids to the environment could occur during construction. In addition, sanitary and other wastes will be generated during construction. Fuelling and lubrication of construction equipment should be carried out in a manner that minimizes the possibility of releases to the environment. Measures for containment and cleanup of contaminant releases will be followed to minimize contamination of the natural environment, followed by approved landfill or other disposal. Interim sanitary waste collection and availability of treatment facilities will be arranged for the duration of the construction period. All construction waste, washwater and wastewater will be disposed of or managed in accordance with regulatory requirements.

A Hazardous Materials Management Plan, Waste Management Plan and a Spills Emergency Preparedness and Response Plan will be developed for the New Post Creek Project as part of the broader Environmental Management Plan for the construction period.

3.0 PROJECT SITE INFORMATION

3.1 PROJECT LOCATION

The location of the proposed New Post Creek Project is shown in Figure 1.1.

3.2 ENVIRONMENTAL FEATURES

3.2.1 Atmospheric Environment

Climate

The climate of the northeastern region of Ontario is classified as modified continental, moderated by the Great Lakes (Lake Huron) to the south and by James Bay to the north (Chapman and Thomas, 1968). The proposed New Post Creek Project is located near the southern limit of the Albany Climatic Region which extends north to James Bay. The Northern Clay Belt Climatic Region occurs to the south of the Albany Climatic Region. Due to the strong influence of Arctic air masses and the cold temperatures they bring, the growing season of the Albany Climatic Region is relatively short, i.e., 154 days.

In summer, warm humid air masses from the south alternate with cooler, drier air masses from the north to produce periods of clear, dry weather followed again by warm, humid weather. Winters are characterized by snow squalls and high winds alternating with clear, cold, dry weather.

Based on the Ecoclimatic Region classification system (Ecoregions Working Group, 1989), the proposed New Post Creek Project occurs near the northern limit of the Humid Mid-Boreal Ecoclimatic Region of the Boreal Ecoclimatic Province, with the Humid High Boreal Ecoclimatic Region extending further north to James Bay. In the Humid Mid-Boreal Ecoclimatic Region, summers are warm and rainy, averaging 100 millimetres (mm) per month from June to September. Winters are cold, with half as much precipitation received as during the summer months. Total annual precipitation is approximately 800 to 900 mm. Mean daily temperatures greater than $0^{o}C$ occur through about seven months of the year, although frosts are common except from mid-June to early September.

Air Quality

Although the average levels of many air pollutants in Ontario have decreased over the last several decades, smog remains an important issue, especially in southern Ontario (MOE, 2005). In northern Ontario, air quality is generally unaffected by anthropogenic activities. For example, the concentrations of ozone, fine particulate matter, nitrogen dioxide and/or sulphur dioxide in North Bay, Sudbury and Sault Ste. Marie (located more than 350 km south of the proposed New Post Creek Project) in 2008 did not exceed their applicable air quality criteria (MOE, 2010). In 2009, only the 1-hour ozone air quality criterion was exceeded infrequently (one to six times) at the three locations (MOE, 2011). Due to its pristine setting, air quality at the

project location is expected to be even better than at the three southern air quality monitoring locations mentioned above.

Environmental Noise

Environmental noise levels will vary according to a number of factors: intensity, kind and number of noise sources; proximity to the noise sources; topography; presence of barriers and absorbers such as vegetation; and meteorological conditions.

The major sources of noise in the area of the New Post Creek Project are associated with streamflow (rapids and waterfalls), forestry operations and railway traffic.

3.2.2 Geology, Physiography and Soils

Geology

The proposed New Post Creek Project site is located in the Superior Province of the Canadian Shield (Stockwell *et al*., 1970). Bedrock in the area consists of Early Precambrian felsic igneous and metamorphic rocks consisting of granitic, metasedimentary and minor metavolcanic migmatite (OGS, 1986). Specifically, the Project site is located within a migmatite – metasedimentary – metavolcanic granulite complex, immediately north of the Fraserdale volcanic gabbro pluton that is present at the Abitibi Canyon GS and west of the Kapuskasing granulite complex (Ontario Hydro, 1982). These areas have been intruded by diabase and pegmatite dykes.

The bedrock outcrop exposed at New Post Creek at the proposed Project intake site consists of granitic gneiss with a few mafic diabase dykes and some pegmatite intrusions, whereas the underlying bedrock encountered in test holes mainly consists of granodioritic gneiss (KGS Group, 2010a). No other bedrock outcrops are present at the Project site.

Physiography

The proposed Project site is near the southern limit of the Hudson Bay Lowland Physiographic Division with the Abitibi Upland Physiographic Division to the south (Bostock, 1970; Clayton *et al*., 1977). The Hudson Bay Lowland is characterized by a low, swampy, marshy plain with subdued glacial features.

Regionally, the original landscape of the Canadian Shield was considerably modified by glaciation during the late Wisconsinan stage of glaciation. Glacial features in the Project area include eskers and moraines including the Pinard Moraine, which extends eastward over a broad area from the west of the Abitibi River across the New Post Creek area to the east (Ontario Parks, 2006). Proglacial Lake Ojibway developed about 9,000 years B.P. resulting in the deposition of lacustrine silts and clays throughout the area. A second glacial advance approximately 8,100 years B.P. resulted in the deposition of a capping layer of clay to silty-clay till over the land surface.

Most of the landscape is nearly flat to slightly hummocky. Organic deposits are common and often extend over large tracts of land in depressional areas.

Numerous faults and fractures are present that affect drainage and topography in some areas. The most significant fault occurs below the 25 m waterfall on New Post Creek approximately 1 km upstream of its confluence with the Abitibi River (Ontario Parks, 2006). This vertical fault includes an 8 m wide canyon which extends for 200 m beyond the waterfalls.

In the proposed New Post Creek Project area, bedrock outcrops have been partially eroded with the underlying bedrock overlain by the glacial clay till, sand and gravel end moraine (Pinard Moraine) that is locally overridden and capped by clay till (KGS Group, 2006, 2010a). More recent deposits include glaciofluvial outwash and alluvial silts and sands.

The overburden deposits encountered at the Project site are highly variable and generally consist of a complex sequence of weakly stratified silt, sandy silt and silty sand materials overlying layers of lacustrine silty clay and till deposits (KGS Group, 2010a). These surficial deposits are underlain by a basal deposit that consists of a mixture of boulders, cobbles and gravel in a grey silty sand matrix.

There is an elevation difference of about 60 m between New Post Creek and the Abitibi River, with the head drop occurring mainly at the New Post Creek waterfall (KGS Group, 2006, 2010a).

New Port Creek has exposed shorelines with active toe erosion and scouring of the silt and sandy slopes that range from a few metres to approximately 10 m in height. Along the Abitibi River, the vegetation frequently extends down to the shoreline, with intermittent areas of exposed steep overburden (sands, silts, tills) bluffs of low (1 to 3 m) to higher (10 m) elevations.

Based on borehole drilling and seismic refraction findings, overburden depth increases from the rock outcrop intake location on New Post Creek to a depth of up to 15 m at the powerhouse location

Soils

As indicated above, surficial material is result of glacial activities during the late Wisconsinan stage of glaciation and is characterized by a weakly broken deep clay till plain and weakly broken deep lacustrine till plain

The soils in the New Post Creek Project area are predominantly Gleysols developed on the clay and lacustrine till plains. These fine mineral soils are characterized by poor drainage and are saturated during parts of the year. Extensive organic soil deposits occur to the south of the Project location.

3.2.3 Surface and Groundwater Hydrology

The Abitibi River and its tributaries (Little Abitibi River and New Post Creek) occur within the Moose River drainage basin in the Hudson Bay Drainage System. The Moose River drainage basin drains approximately 109,000 km^2 traversing three physiographic divisions: the Canadian Shield, the Great Clay Belt and the Hudson Bay Lowlands (Brousseau and Goodchild, 1989).

The Abitibi River extends approximately 285 km from its headwaters to its confluence with the Moose River draining two other major rivers, Frederick House River and Little Abitibi River (OPG *et al*., 2005). The Abitibi River and its tributaries drain approximately 33,987 km^2.

Based on historical hydrological data, greatest streamflow occurs during the spring freshet (April, May, June) with the lowest flows occurring generally in the winter (January, February).

In 1963, the New Post Creek Diversion Dam was constructed by Ontario Hydro to divert flows from the Little Abitibi River into New Post Creek to discharge into the Abitibi River approximately 12 km downstream of Abitibi Canyon GS and 20 km upstream of Otter Rapids GS. The diversion added most of the runoff from the Little Abitibi River drainage area of 2,600 km^2 (above the diversion dam) to the drainage area of 23,000 km^2 being released through Abitibi Canyon GS (KGS Group, 2006).

The flows impounded by the diversion dam are released into New Post Creek through two lengths of excavated channels. The average diverted flow in New Post Creek is 40 m^3/s compared to the estimated average flow of less than 4 m^3/s prior to diversion. The increased diversion flows have eroded the silt and sandy bed and shoreline sections of the watercourse (Photo 3.1). Below the diversion dam, the overall channel grade is controlled by several bedrock outcrops that form rapids and elevation drops along the watercourse. The largest drop (approximately 50 m) occurs at the waterfalls upstream of the outlet of New Post Creek to the Abitibi River.

Photo 3.1: Exposed Banks Along New Post Creek Approximately 500 m Upstream of the Waterfalls

Based on the hydrogeological investigation, there is a relatively shallow groundwater table within the upper silty soils and till zones, approximately 2 m below ground surface. Perched groundwater regimes were also identified within the overburden due to the differing permeability characteristics of the stratigraphic units. Groundwater levels in the sand and basal till layers of the overburden near the proposed powerhouse location closely reflect the water levels of the Abitibi River (KGS Group, 2010a).

3.2.4 Vegetation

The proposed New Post Creek Project is located in the Northern Clay Forest Section of the Boreal Forest Region (Rowe, 1977). White Spruce (*Picea glauca*) and Black Spruce (*Picea mariana*) are characteristic species of the Boreal Forest Region. Other common species are Tamarack (*Larix laricina*), Balsam Fir (*Abies balsamea*) and Jack Pine (*Pinus banksiana*). Although the forests are primarily coniferous, there is a general mixture of broadleaved trees such as White Birch (*Betula papyrifera*), Trembling Aspen (*Populus tremuloides*) and Balsam Poplar (*Populus balsamifera*).

The Northern Clay Forest Section is dominated by Black Spruce which forms large stands on both the poorly-drained lowland flats of the clay plain and the gently rising uplands (Rowe, 1972). Tamarack occurs infrequently in these stands. In the wetter areas, Eastern White Cedar grows in association with Black Spruce. Pure hardwood and mixedwoods stands of Trembling Aspen, Balsam Poplar, Balsam Fir, White Spruce and Black Spruce grow in better-drained areas, such as in areas of higher relief and along the margins of lakes and rivers. Balsam Fir is a common component of the forest understory and has increased in abundance by regeneration on cut-over Black Spruce woods. Jack Pine forms extensive stands on dry, sandy areas, while White Birch is also typically found growing in the sandy soils of old beaches, eskers and outwash deposits.

The Canada Land Inventory (CLI, 1973) indicates that the lands in the New Post Creek Project area are designated as 70% Class 5 and 20% Class 4, with severe and moderately severe limitations, respectively, to the growth of commercial forests due to low fertility. The remaining 10% of lands are designated as Class 7 having severe limitations due to excess soil wetness that preclude the growth of commercial forests.

The forest surrounding the proposed New Post Creek Project area is a mature forest of White Spruce and Balsam Fir. Vegetation communities in the proposed LAPP deregulation area mapped by the MNR are presented in Figure 3.1. Wedeles (2009) reported the presence of four generic communities in the Project area: shrub, young deciduous, mature coniferous and mixwoods. Comprehensive groundtruthing of the vegetation communities in the Project area will be undertaken during the 2011 growing season based on the ELC Working Group (2009) Ecosites of Ontario Operational Draft for the Boreal Region.

Figure 3.1: Vegetation Community Mapping

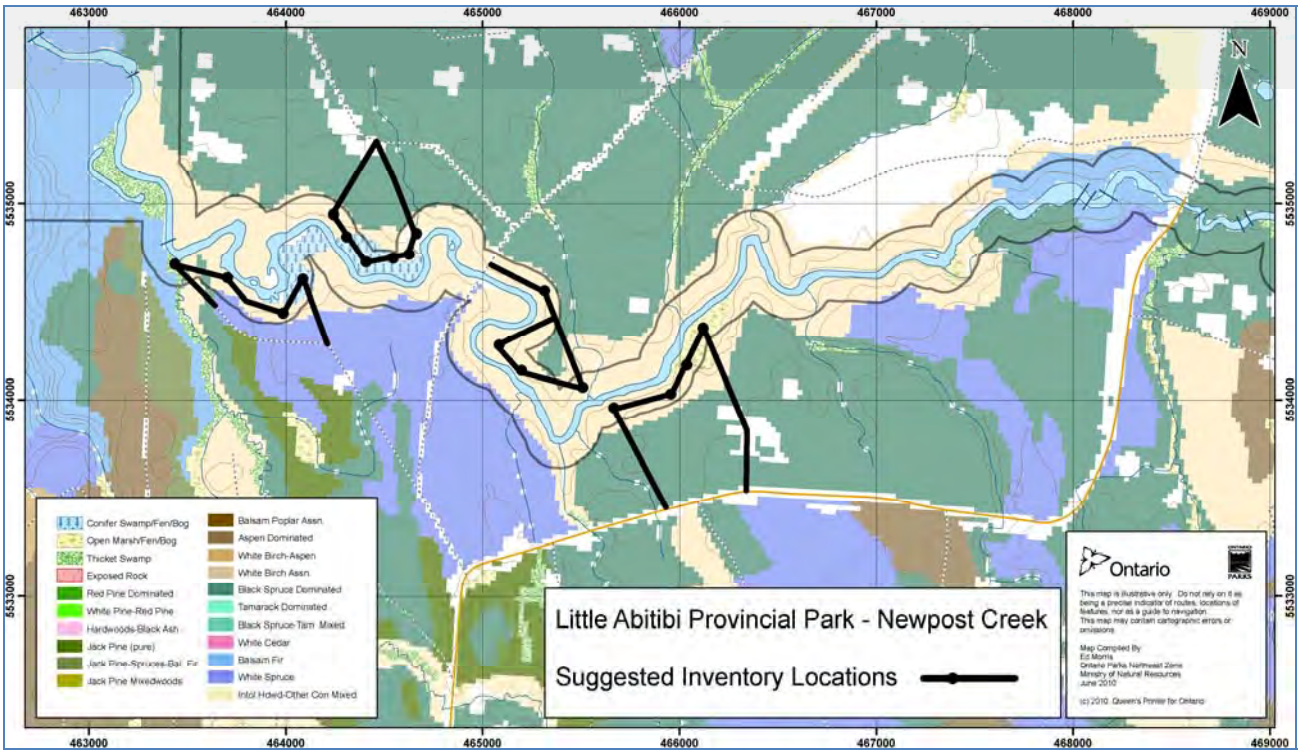


Table 3.1 lists the 82 plant taxa (81 species) identified within the proposed LAPP deregulation area overlapping a portion of the New Post Creek Project area. Of the 81 species that could be ranked, 77 are designated by the MNR Natural Heritage Information Centre (NHIC, 2010) as S5, i.e., secure – common, widespread and abundant in the Province; one is designated as S4?, i.e., apparently secure – uncommon but not rare with some cause for long-term concern due to declines or other factors, rank uncertain; one is designated as S4S5, i.e., apparently secure to secure; and one is designated as SU, i.e., unrankable – currently unrankable due to lack of information or due to substantially conflicting information about status or trends. The remaining species (the exotic Common Dandelion) is designated as SNA, i.e., not applicable – a conservation status rank not applicable because the species is not a suitable target for conservation activities. The percentage of exotic (SNA) species (1.2%) was well below the general proportion of non-native plants in the Province, estimated around 25% (e.g., Kaiser, 1983).

Table 3.1: Plant Species Observed within the Proposed LAPP Deregulation Area[1]

Scientific *Name*	Common Name[2]	Provincial Status[3]
Aceraceae	**Maple Family**	S5
Acer spicatum	Mountain Maple	
Apiaceae	**Carrot or Parsley Family**	S5
Osmorhiza claytonii	Hairy Sweet-cicely	
Araliaceae	**Aralia Family**	S5
Aralia nudicaulis	Wild Sarsaparilla	
Asteraceae	**Composite or Aster Family**	S5
Eupatorium maculatum	Spotted Joe-pye Weed	
Eurybia macrophylla	Large-leaf Wood-Aster	S5
Hieracium canadense	Canada Hawkweed	SU
Lactuca sp.	Lettuce Species	-[4]
Solidago gigantea	Smooth Goldenrod	S5
Symphyotrichum ciliolatum	Ciliolate**(**Lindley's) Aster	S5
S. cordifolium	Heart-leaf Aster	S5
S. lanceolatum ssp *lanceolatum*	Panicled Aster	S5
Taraxacum officinale	Common Dandelion	SNA
Betulaceae	**Birch Family**	S5
Alnus incana spp*. rugosa*	Speckled Alder	
Betula papyrifera	Paper Birch	S5
Corylus cornuta ssp. *cornuta*	Beaked Hazelnut	S5
Caprifoliaceae	**Honeysuckle Family**	S5
Diervilla lonicera	Northern Bush-honeysuckle	
Linnaea borealis ssp*. longiflora*	Twinflower	S5
Lonicera hirsutas[5]	Hairy Honeysuckle	S5
Viburnum edule	Lowbush Cranberry (Squash Berry)	S5
Cornaceae	**Dogwood Family**	S5
Cornus canadensis	Bunchberry	
C. sericea ssp*. sericea*	Red-osier Dogwood	S5
Cupressaceae	**Cedar Family**	S5
Juniperus communis	Ground Juniper	
Cyperaceae	**Sedge Family**	S5
Carex deweyana	Short-scale Sedge	
C. *pedunculata*	Longstalk Sedge	S5
C. *pensylvanica*	Pennsylvania Sedge	S5
C. stricta	Tussock Sedge	S5
Dryopteridaceae	**Wood Fern Family**	S5
Dryopteris carthusiana	Spinulose Wood Fern	
Gymnocarpium dryopteris	Oak Fern	S5
Matteuccia struthiopteris	Ostrich Fern	S5
Equisetaceae	**Horsetail Family**	S5
Equisetum arvense	Field Horsetail	
E. hyemale var*. affine*	Rough Horsetail (Scouring Rush)	S5
E. sylvaticum	Woodland Horsetail	S5
Ericaceae	**Heath Family**	S5
Epigaea repens	Trailing Arbutus	
Gaultheria hispidula	Creeping Snowberry	S5
Kalmia angustifolia	Sheep-laurel	S5
Ledum groenlandicum	Labrador Tea	S5

Table 3.1: Plant Species Observed within the Proposed LAPP Deregulation Area[1] (Cont'd)

Scientific *Name*	Common Name[2]	Provincial Status[3]
Vaccinium angustifolium	Late Lowbush Blueberry	S5
V. myrtilloides	Velvetleaf Blueberry	S5
Grossulariaceae	**Currant Family**	S5
Ribes glandulosum	Skunk Currant	
R. lacustre	Bristly Black Currant	S5
R. triste	Swamp Red Currant	S5
Lamiaceae	**Mint Family**	S5
Mentha arvensis	Corn Mint	
Liliaceae	**Lily Family**	S5
Clintonia borealis	Blue Bead Lily	
Lilium michiganense	Michigan Lily	S5
Maianthemum canadense	Wild-lily-of-the-valley	S5
Maianthemum racemosum	False Solomon's Seal	S5
Lycopodiaceae	**Clubmoss Family**	S5
Huperzia lucidula	Shining Clubmoss	
Lycopodium annotinum	Stiff Clubmoss	S5
Onagraceae	**Evening-primrose Family**	S5
Circaea alpina	Small Enchanter's Nightshade	
Ophioglossaceae	**Adder's Tongue Family**	S5
Botrychium virginianum	Rattlesnake Fern	
Orchidaceae	**Orchid Family**	S5
Goodyera repens	Dwarf Rattlesnake-plantain	
Pinaceae	**Pine Family**	S5
Abies balsamea	Balsam Fir	
Picea glauca	White Spruce	S5
P. mariana	Black Spruce	S5
Pinus banksiana	Jack Pine	S5
Poaceae	**Grass Family**	S5
Bromus ciliatus	Fringed Brome	
Calamagrostis canadensis	**(**Canada) Blue-joint Reedgrass	S5
Elymus canadensis[5]	Nodding Wild-rye	S4S5
Primulaceae	**Primerose Family**	S5
Trientalis borealis ssp. *borealis*	Northern Starflower	
Pyrolaceae	**Wintergreen Family**	S5
Moneses uniflora[5]	One-flower Pyrola (Wintergreen)	
Pyrola asarifolia	Pink Pyrola (Wintergreen)	S5
Ranunculaceae	**Buttercup Family**	S5
Actaea rubra	Red Baneberry	
Anemone canadensis	Canada Anemone	S5
Coptis trifolia	Goldthread	S5
Ranunculus hispidus var. *caricetorum*	Swamp Buttercup	S5
Thalictrum dasycarpum	Purple Meadowrue	S4?
Rhamnaceae	**Buckthorn Family**	S5
Rhamnus alnifolia	Alderleaf Buckthorn	
Rosaceae	**Rose Family**	S5
Fragaria vesca ssp. *americana*	Woodland Strawberry	
Rosa acicularis ssp. *sayi*	Prickly Rose	S5

Table 3.1: Plant Species Observed within the Proposed LAPP Deregulation Area[1] (Cont'd)

Scientific *Name*	Common Name[2]	Provincial Status[3]
Rubus idaeus ssp. *strigosus*	Wild Red Raspberry	S5
R. pubescens	Dwarf Raspberry (Catherniettes Berry)	S5
Spiraea alba	Narrow-leaved Meadow-sweet	S5
Rubiaceae	**Bedstraw Family**	S5
Galium asprellum	Rough Bedstraw	
G. *triflorum*	Sweet-scent Bedstraw	S5
Salicaceae	**Willow Family**	S5
Populus balsamifera ssp. *balsamifera*	Balsam Poplar	
P. tremuloides	Quaking Aspen	S5
Salix bebbiana	Bebb's Willow	S5
S. discolor	Pussy Willow	S5
S. eriocephala	Heart-leaved Willow	S5
Saxifragaceae	**Saxifrage Family**	S5
Mitella nuda	Naked Bishop's-cap	
Violaceae	**Violet Family**	S5
Viola renifolia	Kidney-leaf White Violet	

1 Beacon (2010).
2 Bracketed nomenclature after NHIC (2010).
3 NHIC (2010): S5 = secure; S4S5 = apparently secure to secure; S4? = apparently secure, rank uncertain: SU = unrankable; SNA = not applicable.
4 Status uncertain as taxonomy only at genus level.
5 Identification uncertain.

An inventory of plant species present in the New Post Creek Project area will be undertaken during the 2011 growing season.

3.2.5 Significant Plant Species

Undisturbed areas of native vegetation within the New Post Creek Project area have the potential to support plant species which are at risk, i.e., species which are designated with significant status under federal and/or provincial legislation. Federally, SAR are recognized by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2010) and are protected under the *SARA*. Provincially these are recognized by the Committee on the Status of Species at Risk in Ontario (COSSARO) under the *ESA*, in conjunction with the Species at Risk in Ontario (SARO) List (MNR, 2011). Species listed as provincially endangered or threatened and their habitat are afforded protection under the *ESA*.

An updated *ESA* came into effect on June 30, 2008, providing broader protection of SAR and their habitat and a stronger commitment to recovery and effective enforcement. Once a species is designated to be at risk, it is included on the SARO List. All species that are considered endangered or threatened and their critical habitats are now legally protected.

None of the plant species identified within the proposed LAPP deregulation area overlapping a portion of the New Post Creek Project area are designated as SAR (see Table 3.1).

There is a potential for plant SAR occurrence in the moist (water spray) microhabitat in the vicinity of the New Post Creek waterfalls (KGS Group, 2006). The extent of these vegetation communities may be affected by lower flows due to the Project. A mapping of the communities and inventory of plant species will be undertaken in 2011.

3.2.6 Significant Natural Features

The proposed New Post Creek Project is located within LAPP, which provides waterway and natural environment class representation in the Lake Abitibi Ecodistrict (3E-1). The Little Abitibi River – New Post Creek section of the LAPP is considered waterway class, whereas the upstream lake system is natural environment class. As indicated in Section 1.4.2, a deregulation of the specific Project site and a regulation of suitable replacement lands have been proposed (Beacon, 2010).

The nearest designated natural feature is the Pinard Moraine Conservation Reserve, located west of the Abitibi River approximately 8 km from the Project location. The Fraserdale Wetland Complex Conservation Reserve and the Coral Rapids Wetland Conservation Reserve are located approximately 28 km south and 32 km north of the Project site, respectively.

3.2.7 Wildlife

Most of the lands surrounding the proposed New Post Creek Project remain in native forest vegetation. There is an abundance of wetland habitat throughout the area.

Mammals

The two big game species of significance in northeastern Ontario are Moose (*Alces alces*) and Black Bear (*Ursus americana*). Moose density was estimated to be 0.03 moose/km^2 in Wildlife Management Unit (WMU) 26 in 1996-97 (Bisset *et al*., 1997). The MNR has established WMUs across Ontario for the purpose of regulating hunting and more effective wildlife and habitat management. Black Bear are considered to be common in this area of northeastern Ontario.

Woodland Caribou (*Rangifer tarandus caribou*) are reported to be occasionally sighted in LAPP (Ontario Parks, 2006) and have been observed to the north and south of the New Post Creek Project area (Beacon, 2010). Based on recorded observations, no Woodland Caribou have noted within 5 km of the Project site (M. Gauthier, MNR, 2011, pers. comm.). This species is designated as threatened federally (COSEWIC, 2010) and provincially (MNR, 2011). It is unlikely that Woodland Caribou utilize the Project area due to the presence of roads and clearings.

The New Post Creek Project occurs at the northern extent of White-tailed Deer (*Odocoileus virginianus borealis*) distribution. The bulk of the deer population in northeastern Ontario is concentrated along the agricultural areas of the Great Clay Belt.

Table 3.2 provides a list of mammals likely present in the New Post Creek Project area based on distribution maps (Dobbyn, 1994). The numerous wetlands in the area may provide suitable habitat for a number of aquatic mammals such as Beaver, Northern River Otter and Muskrat. Other furbearers that are relatively abundant throughout the region include Mink, American Marten, Ermine, Fisher, Lynx, Red Fox, Coyote, Northern Gray Wolf and squirrels.

Of the 35 native species listed in Table 3.2, 31 are ranked by the NHIC (2010) as S5, i.e., secure; three are S4, i.e., apparently secure; and one is S3S4, i.e., vulnerable to apparently secure. The vulnerable status is due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making the species vulnerable to extirpation in the Province.

Table 3.2: Mammal Species Likely Present in the New Post Creek Project Area[1]

Common Name	Scientific Name	Provincial Status[2]
Shrews	**Soricidae**	
Black-backed Shrew	*Sorex arcticus*	S5
Masked (Common) Shrew	*S. cinereus*	S5
Smoky Shrew	*S. fumeus*	S5
Pygmy Shrew	*S. hoyi*	S4
Water Shrew	*S. palustris*	S5
Northern Short-tailed Shrew	*Blarina brevicauda*	S5
Moles	**Talpiae**	
Star-nosed Mole	*Condylura cristata*	S5
Bats	**Vespertilionidae**	
Little Brown Bat	*Myotis lucifugus*	S5
Rabbits and Hares	**Leporidae**	
Snowshoe Hare	*Lepus americanus*	S5
Squirrels	**Sciuridae**	
Red Squirrel	*Tamiasciurus hudsonicus*	S5
Northern Flying Squirrel	*Glaucomys sabrinus*	S5
Least Chipmunk	*Tamias minimus*	S5
Eastern Chipmunk	*T. striatus*	S5
Beavers	**Castoridae**	
Beaver	*Castor canadensis*	S5
Mice, Rats and Voles	**Muridae**	
Deer Mouse	*Peromyscus maniculatus*	S5
Gapper's Red-backed Vole	*Clethrionomys gapperi*	S5
Rock Vole	*Microtus chrotorrhinus*	S3S4

Table 3.2: Mammal Species Likely Present in the New Post Creek Project Area[1] (Cont'd)

Common Name	Scientific Name	Provincial Status[2]
Meadow Vole	*M. pennsylvanicus*	S5
House Mouse	*Mus musculus*	SNA
Muskrat	*Ondatra zibethicus*	S5
Jumping Mice	**Dipodidae**	
Woodland Jumping Mouse	*Napaeozapus insignis*	S5
Meadow Jumping Mouse	*Zapus hudsonius*	S5
Dogs	**Canidae**	
Northern Gray Wolf	*Canis lupus occidentalis*	S4
Coyote	*C. latrans*	S5
Red Fox	*Vulpes vulpes*	S5
Bears	**Ursidae**	
Black Bear	*Ursus americanus*	S5
Weasels	**Mustelidae**	
Northern River Otter	*Lutra canadensis*	S5
Striped Skunk	*Mephitis mephitis*	S5
Mink	*Mustela vison*	S5
Ermine	*M. erminea*	S5
American Marten	*Martes americana*	S5
Fisher	*M. pennanti*	S5
Cats	**Felidae**	
Lynx	*Lynx lynx canadensis*	S5
Deer	**Cervidae**	
Moose	*Alces alces*	S5
White-tailed Deer*	*Odocoileus virginianus borealis*	S5
Woodland Caribou*[,3]	*Rangifer tarandus caribou*	S4

* Likely present in the study area based on Beacon (2010).

[1] Source: Dobbyn (1994).

[2] NHIC (2010): S5 = secure; S4 = apparently secure; S3S4 = vulnerable to apparently secure; SNA = not applicable (non-native).

[3] Designated as a threatened species federally by COSEWIC (2010), as well as provincially by COSSARO (MNR, 2011).

Avifauna

Few species of birds reside in the region year-round, e.g., Pine Grosbeak (*Pinicola enucleator*), Boreal Chickadee (*Poecile hudsonica*), Black-capped Chickadee (*Poecile atricapillus*), Common Raven (*Corvus corax*), American Crow (*Corvus brachyrhynchus*), Ruffed Grouse (*Bonasa umbellus*), Spruce Grouse (*Falcipennis canadensis*), Great Horned Owl (*Bubo virginianus*), Boreal Owl (*Aegolius funereus*) and Northern Saw-whet Owl (*Aegolius acadicus*). All waterfowl (ducks, geese and shorebirds), and most passerine and non-passerine species are migratory. The general Project area lies within the Atlantic flyway used by migratory birds. These migratory bird species have breeding habitat preferences within the boreal forest (Erskine, 1977).

Table 3.3 provides a list of bird species recorded in the Ontario Breeding Bird Atlas as breeding or likely breeding within the two 10-km by 10-km square girds (17MR53 and 17MR63) encompassing the New Post Creek Project area (Bird Studies Canada, 2006). Of the 69 species likely or confirmed to be breeding within the two grids, 48 are considered by the NHIC (2010) to be S5, i.e., secure and 21 are S4, i.e., apparently secure.

During the bird nesting survey undertaken in June 2009 prior to the initiation of the geotechnical studies, Wedeles (2009) observed 13 bird species in the New Post Creek Project area: Northern Flicker, Black-capped Chickadee, Winter Wren, American Robin, Northern Parula (*Parula americana*), Yellow-rumped Warbler, Yellow Warbler, Lincoln's Sparrow, Song Sparrow, White-throated Sparrow, Dark-eyed Junco, Red Crossbill (*Loxia curvirostra*) and Pine Siskin. Only the Song Sparrow was determined to be nesting.

Table 3.3: Breeding Bird Species Recorded within 10 km by 10 km Square Grids Overlapping the New Post Creek Project Area[1]

Common Name	Scientific Name	Breeding Status	Provincial Status[2]
Herons and Bitterns	**Ardeidae**		
Great Blue Heron	*Ardea herodias*	Possible	S4
Swans, Geese and Ducks	**Anatidae**		
Canada Goose	*Branta canadensis*	Possible	S5
American Wigeon (Baldpate)	*Anas americana*	Possible	S4
Common Goldeneye	*Bucephala clangula*	Possible	S5
Ospreys, Eagles and Hawks	**Accipitridae**		
Northern Goshawk	*Accipiter gentilis*	Possible	S4
Falcons	**Falconidae**		
Merlin	*Falco columbarius*	Possible	S5
American Kestrel	*F. sparverius*	Probable	S4
Partridges, Pheasants and Grouse	**Phasianidae**		
Ruffed Grouse	*Bonasa umbellus*	Confirmed	S4
Cranes	**Gruidae**		
Sandhill Crane	*Grus canadensis*	Possible	S5
Sandpipers and Phalaropes	**Scolopacidae**		
American Woodcock	*Scolopax minor*	Possible	S4
Typical Owls	**Strigidae**		
Great Horned Owl	*Bubo virginianus*	Possible	S4
Hummingbirds	**Trochilidae**		
Ruby-throated Hummingbird	*Archilochus colubris*	Possible	S5
Woodpeckers	**Picidae**		
Yellow-bellied Sapsucker	*Sphyrapicus varius*	Possible	S5
Downy Woodpecker	*Picoides pubescens*	Possible	S5
Hairy Woodpecker	*P. villosus*	Confirmed	S5

Table 3.3: Breeding Bird Species Recorded within 10 km by 10 km Square Grids Overlapping the New Post Creek Project Area[1] (Cont'd)

Common Name	Scientific Name	Breeding Status	Provincial Status[2]
Northern Flicker	*Colaptes auratus*	**Status**	S4
Pileated Woodpecker	*Dryocopus pileatus*	Possible	S5
Tyrant Flycatchers	**Tyrannidae**		
Eastern Wood-pewee	*Contopus virens*	Possible	S4
Alder Flycatcher	*Empidonax alnorum*	Possible	S5
Yellow-bellied Flycatcher	*E. flaviventris*	Confirmed	S5
Least Flycatcher	*E. minimus*	Possible	S4
Swallows	**Hirundinidae**		
Tree Swallow	*Tachycineta bicolor*	Possible	S4
Jays, Magpies and Crows	**Corvidae**		
Gray Jay	*Perisoreus canadensis*	Possible	S5
Blue Jay	*Cyanocitta cristata*	Probable	S5
American Crow	*Corvus brachyrhynchos*	Possible	S5
Common Raven	*C. corax*	Possible	S5
Titmice	**Paridae**		
Black-capped Chickadee	*Poecile atricapillus*	Probable	S5
Boreal Chickadee	*P. hudsonica*	Possible	S5
Nuthatches	**Sittidae**		
Red-breasted Nuthatch	*Sitta canadensis*	Possible	S5
Creepers	**Certhiidae**		
Brown Creeper	*Certhia americana*	Possible	S5
Wrens	**Troglodytidae**		
Winter Wren	*Troglodytes troglodytes*	Possible	S5
Kinglets and Thrushes	**Muscicapidae**		
Ruby-crowned Kinglet	*Regulus calendula*	Possible	S4
Golden-crowned Kinglet	*R. satrapa*	Possible	S5
Veery	*Catharus fuscescens*	Possible	S4
Hermit Thrush	*C. guttatus*	Possible	S5
Swainson's Thrush	*C. ustulatus*	Possible	S4
American Robin	*Turdus migratorius*	Probable	S5
Waxwings	**Bombycillidae**		
Cedar Waxwing	*Bombycilla cedrorum*	Probable	S5
Vireos	**Vireonidae**		
Red-eyed Vireo	*Vireo olivaceus*	Possible	S5
Philadelphia Vireo	*V. philadelphicus*	Possible	S5
Blue-headed (Solitary) Vireo	*V. solitarius*	Possible	S5

Table 3.3: Breeding Bird Species Recorded within 10 km by 10 km Square Grids Overlapping the New Post Creek Project Area[1] (Cont'd)

Common Name	Scientific Name	Breeding	Provincial Status[2]
Warblers, Sparrows, Blackbirds and Orioles	**Emberizidae**		
Tennessee Warbler	*Vermivora peregrina*	Possible	S5
Nashville Warbler	*V. ruficapilla*	Probable	S5
Black-throated Blue Warbler	*Dendroica caerulescens*	Possible	S5
Bay-breasted Warbler	*D. castanea*	Possible	S5
Yellow-rumped Warbler	*D. coronata*	Probable	S5
Magnolia Warbler	*D. magnolia*	Possible	S5
Chestnut-sided Warbler	*D. pensylvanica*	Possible	S5
Yellow Warbler	*D. petechia*	Possible	S5
Cape May Warbler	*D. tigrina*	Possible	S5
Black-throated Green Warbler	*D. virens*	Possible	S5
Black-and-white Warbler	*Mniotilta varia*	Possible	S5
American Redstart	*Setophaga ruticilla*	Probable	S5
Ovenbird	*Seiurus aurocapilla*	Possible	S4
Northern Waterthrush	*S. noveboracensis*	Possible	S5
Mourning Warbler	*Oporornis philadelphia*	Confirmed	S4
Common Yellowthroat	*Geothlypis trichas*	Possible	S5
Canada Warbler[3]	*Wilsonia canadensis*	Possible	S4
Chipping Sparrow	*Spizella passerina*	Probable	S5
Fox Sparrow	*Passerella iliaca*	Possible	S4
Lincoln's Sparrow	*Melospiza lincolnii*	Possible	S5
Song Sparrow	*M. melodia*	Possible	S5
White-throated Sparrow	*Zonotrichia albicollis*	Possible	S5
Dark-eyed Junco	*Junco hyemalis*	Possible	S5
Rusty Blackbird[4]	*Euphagus carolinus*	Possible	S4
Finches	**Fringillidae**		
Purple Finch	*Carpodacus purpureus*	Possible	S4
White-winged Crossbill	*Loxia leucoptera*	Possible	S5
Pine Siskin	*Carduelis pinus*	Possible	S4
American Goldfinch	*C. tristis*	Possible	S5

[1] Source: Bird Studies Canada (2006); Cadman *et al*. (2007), based on grids 17MR53 and 17MR63.

[2] Source: NHIC (2010); S5 = secure; S4 = apparently secure.

[3] Designated as a threatened species federally by COSEWIC (2010), and as a species of special concern provincially by COSSARO (MNR, 2011).

[4] Designated as a species of special concern federally by COSEWIC (2010), and as not at risk provincially by COSSARO (MNR, 2011).

Herptofauna

Grouped together, amphibians and reptiles are called herptiles. They are generally dependent on wetland habitats associated with mature forests.

Table 3.4 provides a list of amphibian and reptile species possibly present in the New Post Creek Project area based on distribution mapping (Cook, 1984). Of the nine species listed in Table 3.4, seven are ranked by the NHIC (2010) as S5, i.e., secure and two are S4, i.e.,

apparently secure. An Eastern Gartersnake was observed by Ontario Parks staff on the New Post Creek Project area (K. Ursic, Beacon, 2011, pers. comm.).

Table 3.4: Amphibians and Reptiles Possibly Present in the New Post Creek Project Area[1]

Common Name	Scientific Name	Provincial Status[2]
AMPHIBIANS		
Mole Salamanders	**Ambystomatidae**	
Blue-spotted Salamander	*Ambystoma laterale*	S4
Lungless Salamanders	**Plethodontidae**	
Northern Two-lined Salamander	*Eurycea bislineata*	S4
Toads	**Bufonidae**	
American Toad	*Bufo americanus*	S5
Treefrogs	**Hylidae**	
Spring Peeper	*Pseudacris crucifer*	S5
Boreal Chorus Frog	*P. maculata*	S5
True Frogs	**Ranidae**	
Northern Leopard Frog	*Rana pipiens*	S5
Mink Frog	*R. septentrionalis*	S5
Wood Frog	*R. sylvatica*	S5
REPTILES		
Typical Snakes	**Colubridae**	
Eastern Gartersnake	*Thamnophis sirtalis*	S5

[1] Source: Cook (1984); based on distribution maps.
[2] Source: NHIC (2010); S5 = secure; S4 = apparently secure.

3.2.8 Significant Wildlife Species

As indicated in Section 3.2.7, Woodland Caribou, designated as threatened federally and provincially, have been reported in the vicinity of the proposed New Post Creek Project. However, their utilization of the Project area is unlikely due to the presence of roads and clearings. No Woodland Caribou has been observed within 5 km of the Project site (M. Gauthier, MNR, 2011, pers. comm.). A Habitat Regulation for Woodland Caribou is currently being developed by the MNR with an approach to habitat protection recently posted on the Environmental Registry (EBR Registry Number: 011-2303).

Canada Warbler and Rusty Blackbird, with S4 rankings, have been recorded as possibly breeding in the 10-km by 10-km grids overlapping the New Post Creek Project area (Table 3.3). Canada Warbler is designated as a threatened species federally by COSEWIC (2010) and as a species of special concern provincially by COSSARO (MNR, 2011). Rusty Blackbird is

designated as a species of special concern federally by COSEWIC (2010) and as not at risk provincially by COSSARO (MNR, 2011).

Olive-sided Flycatcher (*Contopus cooperi*) and Bald Eagle (*Haliaeetus leucocephalus*) may also be present in the Project area (Beacon, 2010). Olive-sided Flycatcher, which breeds in coniferous or mixedwoods forests adjacent to rivers or wetlands, is designated as a threatened species federally by COSEWIC (2010) and as a species of special concern provincially by COSSARO (MNR, 2011). Bald Eagle, which prefers forests (especially coniferous) near large rivers and lakes, is designated as a species of special concern provincially, but is not considered to be at risk federally.

3.3 LAND USE

Part of the proposed New Post Creek Project is located within LAPP (see Figure 1.1). The Park was regulated in 1985 and encompasses a total area of 20,296 ha. The Park encompasses the Little Abitibi River from the outlet at Harris Lake for a distance of approximately 70 km to the New Post Diversion Dam. From the dam, the park encompasses the New Post Creek Diversion Channel to New Post Creek and the watercourse for distances of 4 and 16 km, respectively (see Figure 2.1). Upstream and downstream of the outlet of New Post Creek, the LAPP expands to include the Abitibi River and adjacent land base to protect a significant historic site (the Hudson's Bay Company New Post). There are no visitor facilities in the park, which offers opportunities for backcountry canoeing, camping and angling. Based on the MNR (2006) Crown Land Use Policy Atlas Policy Report for LAPP, non-motorized recreation travel including canoeing and kayaking is a permitted use. Status First Nation peoples exercising treaty rights are permitted to hunt and trap within LAPP (MNR, 1992, 2000). The generation of electricity is not permitted within a Provincial Park as stipulated by the *PPCRA*. As indicated in Section 1.4.2, a deregulation of the Project site within LAPP is proposed with a regulation of suitable replacement lands.

Various groups of aboriginal peoples occupied the LAPP area prior to the arrival of Europeans, including Cree, Ojibway and Northern Algonquin peoples (Ontario Parks, 2006). The LAPP and the New Post Creek Project is located within the Nishnawbe Aski Nation (NAN) Treaty 9 area (1905-06). First Nations communities residing within the Abitibi River drainage basin including TTN, the Moose Cree First Nation and Wahgoshig First Nation, are signatories to Treaty 9 and are members of the NAN. The Métis Nation of Ontario also has a local community council based out of Cochrane known as the Northern Lights Métis Council that claims traditional harvesting rights in this area.

TTN has two reserves, New Post 69 and New Post 69A. New Post 69 is located 14 km east of the Abitibi Canyon GS. While Canada created this reserve to serve as a settlement area, TTN members viewed this relatively remote location as a base for hunting, fishing and trapping, both within the reserve lands and the surrounding traditional territory. There are a number of cabins on these reserve land, but a large permanent settlement was never established. In the early 1980s, initiatives were undertaken by the Chief and Council to locate a new community location

for the TTN. In 1984, a new reserve, New Post 69A, was located on a 177-ha site in Bower Township, approximately 20 km west of Cochrane on Highway 574.

The New Post area has a long history of use by First Nations. These lands have always been integral to the TTN way of life. Prior to construction of the diversion dam in 1963, New Post Creek (historically referred to by the TTN as New Post Brook) was used extensively by the TTN to facilitate access from New Post to traditional trapline areas within the Bad River drainage basin to the east in the fall and return in the spring. Flows in New Post Creek during the summer were too low to permit canoeing. The diversion dam substantially altered the flow regime of New Post Creek resulting in the damage to its riparian lands (see Section 3.2.3).

As indicated in Section 2.2.1, the Hudson's Bay Company New Post site is located on the east bank of the Abitibi River, approximately 2 km south of the outlet of New Post Creek and 1 km downstream of the proposed powerhouse tailrace. Prior to, and during, New Post operation, the site was occupied during the summer for traditional harvesting (hunting, trapping, and fishing) by the TTN. The post was established in 1867 and remained in operation until 1925 (Finlayson, 2005). It was the only company post between Moosonee and Lake Abitibi. Concerns have been identified regarding shoreline erosion near this cultural heritage site (Pollock, 1976; Finlayson, 2005). Some initial salvage and assessment work was undertaken in 2004, but further work will be required to either protect the site, or salvage any significant artifacts before they are lost (Finlayson, 2005).

No archaeological or cultural heritage resources were found during ground surface observations and subsurface testing and monitoring in areas to be impacted by geophysical test pitting and borehole drilling undertaken in 2009 (Primrose and Pollock, 2009).

The New Post Creek waterfalls location within LAPP has been identified as a tourism destination by the www.northernontario.travel/ website under Wilderness Heritage Canoe Tours. Two tourism operators located in Smooth Rock Falls (Howling Wolf Expeditions, Northern Spirit Adventures) provide half, full and two-day trips to "New Post Falls" and New Post.

Outside of the provincial park, the balance of the lands that are proposed as part of the Project are located within the Crown Land Use Area G1745, G1754 and G1762, Abitibi, Fredrickhouse, Driftwood and Onakawana General Use Area within Cochrane District. This is a large general use area located north of Smooth Rock Falls. The land use intent for the area is primarily recreation along with hydroelectric power production. Commercial power generation is a permitted activity.

There are a number of commercial tourism facilities in the area, primarily remote or semi-remote outpost camps.

Bear Management Areas (BMAs) have been established by the local MNR offices. These BMAs are allocated and licensed to hunting outfitters on Crown Lands. Bear hunt camps may be

allocated to commercial operators in the area under a Mini-land Use Permit during the open bear season. The New Post Creek Project site occurs within BMA CC-26-015.

The Project site is located within licensed Trap Line Area CO-92.

Lands adjacent to LAPP are part of the recently amalgamated Abitibi River Forest, which contains the former Cochrane-Moose River, Smooth Rock Falls, Iroquois Falls and Nighthawk Forests. This Forest is managed jointly by Abitibi-Bowater and Tembec.

OPG has a Crown lease for the New Post Diversion Dam and a Land Use Permit for the Otter Rapids Road bridge across New Post Creek.

The operation of dams and hydroelectric generating stations within the Abitibi River drainage basin must be in compliance with the Abitibi River WMP (OPG *et al*., 2006).

The nearest named communities are Abitibi Canyon and Fraserdale. The community of Abitibi Canyon, located approximately 10 km south of the Project site, was closed by Ontario Hydro in 1982 as a cost-saving measure. Fraserdale, a previous small community and rail siding for the ONR, is located approximately 15 km south of the New Post Creek Project site. Fraserdale is connected by Highway 634 to nearest incorporated community of the Town of Smooth Rock Falls, located approximately 85 km to the south. There is currently one resident, as well as three trapping cabins used by the TTN members during hunting, trapping, fishing and gathering activities on traditional lands, in Fraserdale.

In addition to access by Highway 634, the ONR provides passenger and freight services from North Bay through Cochrane and Fraserdale to Moosonee. The ONR is operated by the Ontario Northland Transportation Commission, a provincial Crown agency.

4.0 FISH, FISH HABITAT AND NAVIGABLE WATERS

4.1 ENVIRONMENTAL FEATURES

The Abitibi River provides coolwater fish habitat, with Walleye (*Sander vitreus*) the most important fish species common throughout the river (Seyler, 1997). Northern Pike (*Esox lucius*) and White Sucker (*Catostomus commersonii*) are also common throughout the river. Lake Sturgeon (*Acipenser fulvescens*) has also been documented throughout the Abitibi River, whereas Lake Whitefish (*Coregonus clupeaformis*) has been reported in the upper reaches of the Abitibi River. Other relatively common fish species include Goldeye (*Hiodon alosoides*), Mooneye (*H. tergisus*), Longnose Sucker (*Catostomus catostomus*), Shorthead Redhorse (*Moxostoma macrolepidotum*), Yellow Perch (*Perca flavescens*), Burbot (*Lota lota*), Mottled Sculpin (*Cottus bairdii*) and various minnows (Cyprinidae).

Seyler (1997) reported the presence of 24 resident fish species in the Abitibi River proper. Brook Trout (*Salvelinus fontinalis*) are also present in those smaller tributaries that provide coldwater habitat (see Table 4.1). Brook Trout are also reported to occur in the Little Abitibi River likely originating from its feeder tributaries (Ontario Parks, 2006).

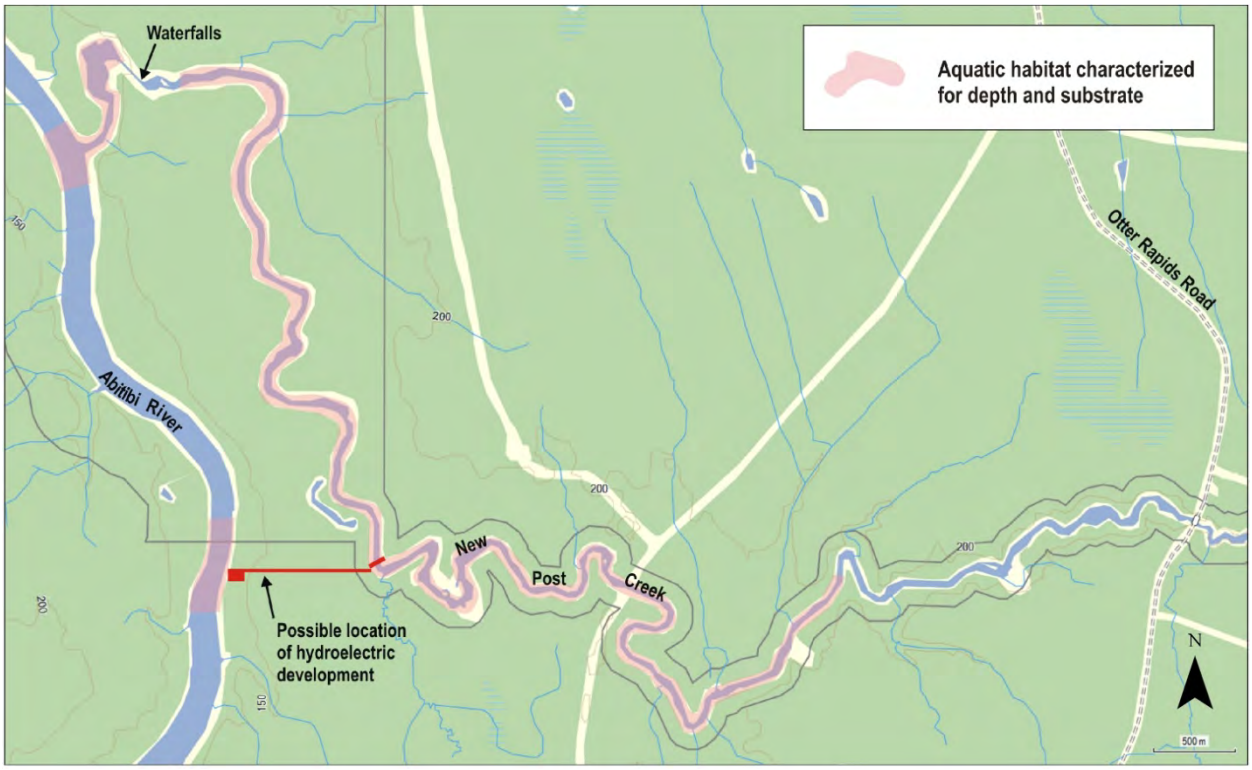
Table 4.1: Fish Species Recorded in the Abitibi River[1]

Common Name	Scientific Name	Status
Lake Sturgeon[2]	*Acipenser fulvescens*	River resident
Goldeye[2]	*Hiodon alosiodes*	River resident
Mooneye[2]	*H. tergisus*	River resident
Lake Chub[2]	*Couesius plumbeus*	River resident
Golden Shiner	*Notemigonus crysoleucas*	River resident
Emerald Shiner	*Notropis atherinoides*	River resident
Spottail Shiner	*N. hudsonius*	River resident
Longnose Dace[2]	*Rhinichthys cataractae*	River resident
Fallfish	*Semotilus corporalis*	River resident, lower reaches only
Pearl Dace	*Margariscus margarita*	River resident
Longnose Sucker[2,3]	*Catostomus catostomus*	River resident
White Sucker[2]	*C. commersonii*	River resident
Shorthead Redhorse[2]	*Moxostoma macrolepidotum*	River resident
Brown Bullhead	*Ameiurus nebulosis*	River resident, upper reaches only
Northern Pike[2]	*Esox lucius*	River resident
Lake Whitefish	*Coregonus clupeaformis*	River resident
Brook Trout	*Salvelinus fontinalis*	Present in tributaries, occasional residents
Burbot (Ling)[3]	*Lota lota*	River resident
Trout-perch	*Percopsis omiscomaycus*	River resident
Ninespine Stickleback	*Pungitius pungitius*	River resident
Mottled Sculpin[2,3]	*Cottus bairdii*	River resident
Rock Bass	*Ambloplites rupestris*	River resident
Yellow Perch[2]	*Perca flavescens*	River resident
Sauger[2]	*Sander canadense*	River resident
Walleye[2]	*S. vitreus*	River resident
Johnny Darter[2]	*Etheostoma nigrum*	River resident
Logperch[2]	*Percina caprodes*	River resident

[1]Source: Seyler (1997).
[2]Collected in New Post Creek below the waterfalls and/or the Abitibi River (Coker and Portt, 2009b, 2010a,b,c, 2011; G. Coker, C. Portt and Associates, 2011, pers. comm.).
[3]Collected in New Post Creek above the waterfalls (Coker and Portt, 2009a; G. Coker, C. Port and Associates, 2011, pers. comm.).

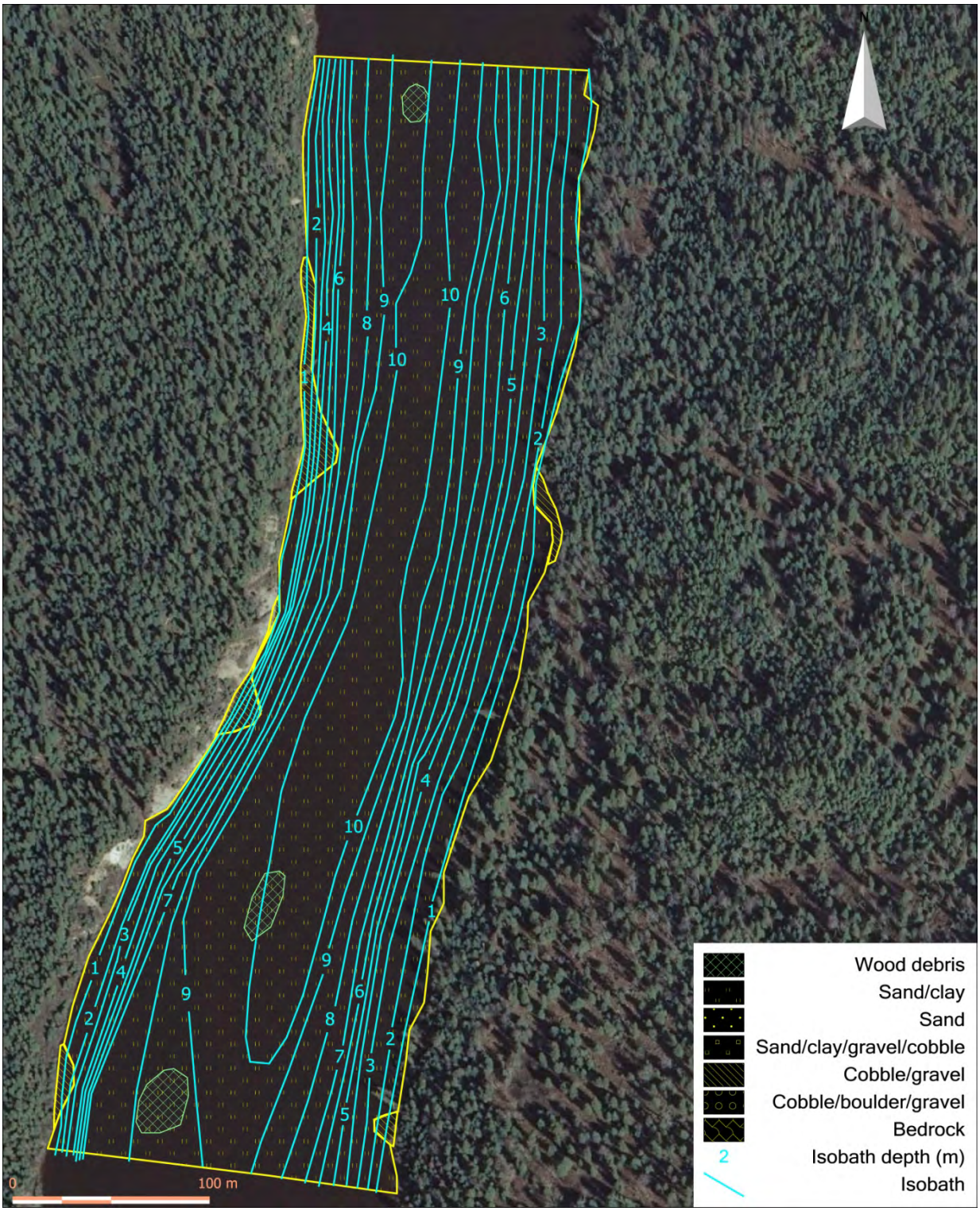
Aquatic habitat mapping and assessment of New Post Creek and the Abitibi River were undertaken in August and October 2009 (Coker and Portt, 2010a), as well as during the 2010 fieldwork (G. Coker, G. Portt and Associates, 2011, pers. comm.). Figure 4.1 shows the areas characterized for depth and substrate.

Figure 4.1: Locations of Habitat Mapping and Assessment in New Post Creek and the Abitibi River



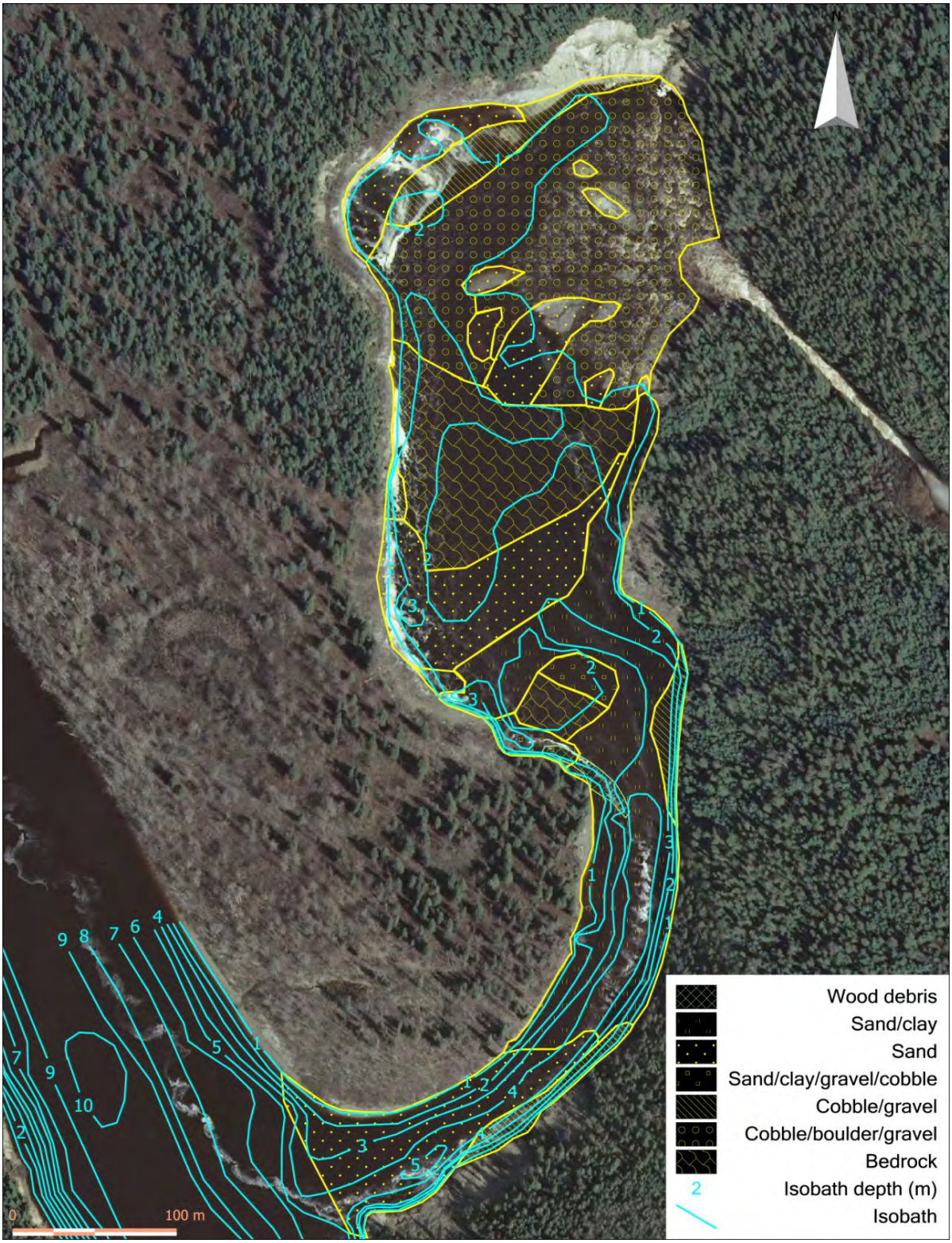
The Abitibi River at the proposed tailrace location is approximately 140 m wide with a maximum depth of about 10.4 m (Coker and Portt, 2010a). The cross-section profile of the Abitibi River shows that the centre of the channel, approximately 50% of the river width, is relatively flat and deep (Figure 4.2). The river bottom then slopes up to each shore in a relatively uniform manner. Substrate is dominated by sand/clay with occasional patches of rocks or wood debris.

Figure 4.2: Depth and Substrate in the Abitibi River at the Proposed Tailrace Location



The Abitibi River at the mouth of New Post Creek is approximately 170 m wide with a maximum depth of about 10 m (Figure 4.3). The cross-channel profile at this location is U-shaped.

Figure 4.3: Depth and Substrate in New Post Creek, Downstream of the Waterfalls and at Its Confluence with the Abitibi River



New Post Creek, at its mouth, is approximately 45 m wide and 3 to 4 m deep, and is similar for approximately 330 m upstream from the Abitibi River (Figure 4.3). This section of channel is relatively uniform with mainly sand or sand/clay substrates, dropping to depth close to shore along the left shore facing downstream, with a more gentle slope to depth along the right shore. Approximately 330 m upstream of the Abitibi River, the channel widens significantly to a maximum of 230 m near the bottom of the rapids that are situated below the high waterfalls (Photo 4.1). The majority of this reach is between 1 and 2.5 m deep, but there are several very shallow bars and some limited deeper sections, with a maximum depth of about 3.6 m. Substrate is a patchy mixture of clay/sand, sand, gravel, cobble and boulder, with areas of exposed bedrock.

Photo 4.1: View of Rapids Below New Post Creek Waterfalls

The New Post Creek waterfalls consists of a 170 m long stretch of steep rapids at its upstream end, a vertical falls that drops approximately 40 m, an 8 to 19 m wide narrow chute that is 210 m long with several smaller waterfalls, and some very shallow rapids about 140 m long with cobble/boulder substrate at the downstream end (Photo 4.1). The total difference in elevation

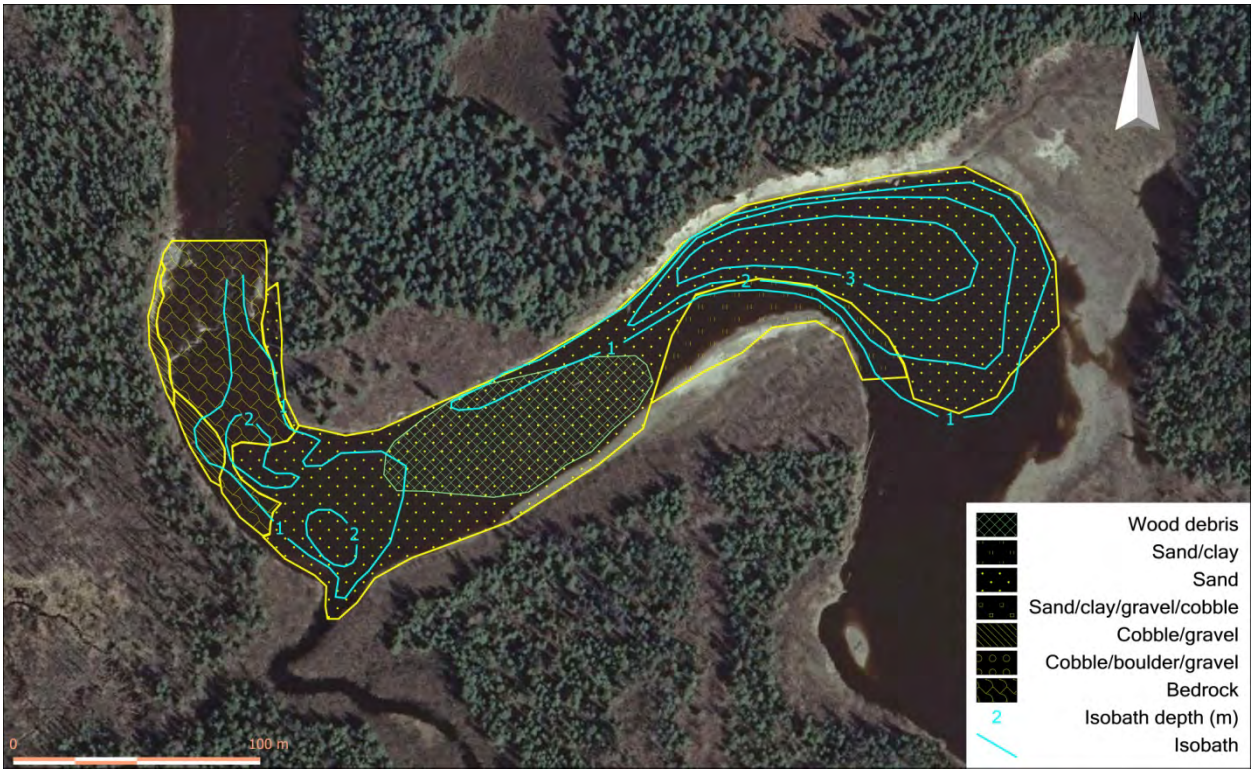
between the upstream and downstream ends of these waterfalls, determined by GPS, is approximately 56 m.

Upstream of the waterfalls, New Post Creek is a meandering watercourse with long flatwater sections and a variety of substrates that are generally dominated by fine-grained material, punctuated occasionally with a few bedrock outcrops that result in short rocky chutes, as well as gently sloped sand/gravel/cobble riffles (Coker and Portt, 2010a; G. Coker, C. Portt and Associates, 2011, pers. comm.). The first 1,390 m upstream of the waterfalls, New Post Creek is flat and meandering with high eroding banks throughout much of the reach, with its width ranging between 44 and 63 m. The next 2,036 m section upstream has more diverse habitat due to a number of bedrock outcrops that create depth and velocity variability, with some outcrops creating short sets of rapids and others constricting the channel width resulting in deeper habitats. Through this section, stream width ranges from 32 to 92 m. The next 1,076 m section, up to the proposed intake weir location, has less variation in depth and flow velocity with a width ranging from 32 to 56 m (Figure 4.4). A bedrock outcrop occurs at the proposed intake weir location (Photo 2.1). In the vicinity of the proposed intake weir location, maximum water depth is approximately 3 m and the substrate is mainly bedrock and sand, with a sizable patch of woody debris. Upstream of the proposed intake weir location, for approximately 2,380 m, the creek is low gradient and meandering, without riffles, and is dominated by fine-grained substrates. A few low gradient riffles, dominated by gravel and sand with some cobble, were apparent on October 27, 2009, when flow was estimated to be 3 to 4 m^3/s. In this area, stream width ranged from 30 to 91 m. For the further 3,100 m upstream, the stream had a slightly greater gradient, higher flow velocities, and generally coarser-grained substrates. In this section, stream width ranged from 31 to 90 m.

In summary, the habitat in the vicinity of the proposed tailrace and at the mouth of New Post Creek appears to be typical for the Abitibi River in this area. The channel is deep and U-shaped in cross-section with fine-grained substrate and little in-stream structure, but with occasional patches of coarser material or wood debris. Most of the variation observed in flow velocity, substrate, in-stream structure, or other fish habitat variables, is generally found at locations of bedrock outcrops that produce rapids or waterfalls.

Habitat in New Post Creek appears to be somewhat more diverse than the Abitibi River. The creek below the waterfalls has a variety of substrates, depths and flow velocities, not found in nearby sections of the Abitibi River, and therefore may provide important seasonal habitats for fish from the Abitibi River. The waterfalls is a complete barrier to upstream fish migration. Upstream of the waterfalls, New Post Creek is a meandering watercourse with long flatwater sections and fine-grained substrates, punctuated with a few bedrock outcrops that result in short rocky chutes, as well as gently sloped gravel/sand/cobble riffles.

Figure 4.4: Depth and Substrate in New Post Creek at the Proposed Intake Location



Eight fish species were collected by electrofishing in New Post Creek downstream of the waterfalls in August 2009: Lake Chub, Longnose Dace, White Sucker, Mottled Sculpin, Yellow Perch, Walleye, Johnny Darter and Logperch (Coker and Portt, 2009a). No fish were captured by electrofishing at the proposed intake weir location in August 2009, although some Mottled Sculpin were observed. In 2010, low numbers of Mottled Sculpin and Burbot were collected by electrofishing at the proposed intake weir location (G. Coker, C. Portt and Associates, 2011, pers. comm.).

In addition, Lake Sturgeon, Mooneye, Longnose Sucker, White Sucker, Northern Pike, Sauger and Walleye were captured during gillnetting and/or hoopnetting surveys in 2009 and 2010 in New Post Creek below the waterfalls (Coker and Portt, 2009b, 2010a,b,c, 2011; G. Coker, C. Portt and Associates, 2011, pers. comm.). No fish were captured by gillnet in New Post Creek near the proposed intake weir location in 2009 (Coker and Portt, 2009b), whereas a decomposed Longnose Sucker was collected in 2010 (G. Coker, C. Portt and Associates, 2011, pers. comm.).

In 2010, Goldeye, Longnose Sucker, Shorthead Redhorse and Walleye were captured by gillnetting in the Abitibi River at the proposed tailrace location (Coker and Portt, 2010c), whereas Lake Sturgeon were netted in the river downstream of the New Post Creek outlet (Coker and Portt, 2011).

Overall, electrofishing, gillnetting and hoopnetting catches were low.

Walleye and Lake Whitefish spawning are likely not a concern in the Abitibi River in the vicinity of the tailrace of the proposed generating station (Coker and Portt, 2009a, b). There does not appear to be suitable spawning habitat at the proposed tailrace location, and habitat that occurs there is common and widespread in this watercourse section.

Based on field observations in May 2009 and 2010, Walleye spawning does occur in the lower section of New Post Creek, downstream of the waterfalls (Coker and Portt, 2009a, 2010b). White Sucker and Longnose Sucker also spawn at this location (Coker and Portt, 2009a, 2010b).

Based on field observations in May 2010, Lake Sturgeon spawning also apparently occurs in the lower section of New Post Creek, downstream of the waterfalls (Coker and Portt, 2011). The James Bay Lake Sturgeon population is designated as a species of special concern federally (COSEWIC, 2010) and provincially (MNR, 2009). Beacon (2010) reported that Lake Sturgeon are not present in New Post Creek upstream of the waterfalls.

Lake Whitefish were not captured or observed in New Post Creek below the waterfalls during field surveys in October 2009 and 2010, although the habitat appeared suitable for spawning, is accessible from the Abitibi River, and the water temperatures were within the usual range for Lake Whitefish spawning (Coker and Portt, 2009b, 2010c). Lake Whitefish have been captured in the tailrace of the Abitibi Canyon GS (M. Gauthier, MNR, 2011, pers. comm.).

Aquatic field studies to be undertaken in 2011 include:

- Walleye and Lake Sturgeon spawning assessments in the spring;
- Lake Whitefish spawning assessment in the fall;
- additional fish collections in New Post Creek near the proposed intake weir location and downstream of the waterfalls, as well as in the Abitibi River at the confluence of New Post Creek and near the proposed tailrace location (Walleye will be retained for analysis of fish tissue mercury concentration);
- characterization of benthic macroinvertebrate community in New Post Creek; and
- habitat characterization to augment information collected in 2009 and 2010.

4.2 USE OF WATERWAY

The Abitibi River is designated as a canoe route (MNR, 1981). However, many of the rapids previously present have been replaced by long stretches of flat water created by the hydroelectric dams at Island Falls, Abitibi Canyon and Otter Rapids. Moreover, from Otter Rapids to approximately the mouth of the Onakawana River (a distance of 60 km), the Abitibi River is unnavigable because of shallow water and dangerous rapids.

A canoe route has been established in LAPP which follows the Little Abitibi River to New Post Creek Diversion Channel, and then west on New Post Creek to the Abitibi River (Ontario Parks, 2006).

The diversion channel and most of New Post Creek from the New Post Creek Diversion Dam to the waterfalls are navigable by canoe (http://www.myccr.com). A portage is required at the Otter Rapids Road bridge, approximately 7.5 km upstream of the proposed intake location to avoid dangerous hydraulic conditions which set up a large (almost geyser-like) standing wave and rapids. A portage is also required at the waterfalls approximately 4.5 km downstream of the proposed Project intake location.

As indicated in Section 3.3, prior to construction of the diversion dam in 1963, New Post Creek was used extensively by the TTN for navigation during higher flows in the spring and fall to facilitate access to traditional trapline areas to the east. The diversion dam substantially altered the flow regime of New Post Creek resulting in the damage to its riparian lands (see Section 3.2.3).

5.0 SUMMARY AND CONCLUSIONS

As indicated in Section 1.3, a federal EA would be required where a federal authority:

- is the proponent of the project and does any act or thing that commits the federal authority to carrying out the project in whole or in part;
- makes or authorizes payments or provides a guarantee for a loan or any other form of financial assistance to the proponent for the purpose of enabling the project to be carried out in whole or in part, except where the financial assistance is in the form of any reduction, avoidance, deferral, removal, refund, remission or other form of relief from the payment of any tax, duty or impost imposed under any Act of Parliament, unless that financial assistance is provided for the purpose of enabling an individual project specifically named in the Act, regulation or order that provides the relief to be carried out;
- has the administration of federal lands and sells, leases or otherwise disposes of those lands or any interests in those lands, or transfers the administration and control of those lands or interests to Her Majesty in right of a province, for the purpose of enabling the project to be carried out in whole or in part; or
- under a provision prescribed pursuant to paragraph 59(*f*), issues a permit or licence, grants an approval or takes any other action for the purpose of enabling the project to be carried out in whole or in part.

As indicated in Section 1.1.4, CRP is in the process of applying for funding from INAC and other federal and provincial agencies. Additional funding will also be sought from federal agencies for equity contribution at a later date. It is assumed that if this funding is obtained and used for financing the construction and operation of the New Post Creek Project, the federal EA process would be triggered.

The federal *CEAA* process would also be triggered if the Project results in HADD of fish habitat requiring an authorization under the *Fisheries Act* from DFO. As indicated in Section 2.2.1, construction of the New Post Creek Project will involve in-water installation of temporary cofferdams to facilitate construction of the intake and spillway structures in New Post Creek, as well as construction of the tailrace in the Abitibi River. Once the cofferdam is constructed, the area enclosed by the cofferdam will be pumped dry to facilitate nearshore construction activities. Low numbers of Mottled Sculpin and Burbot were collected by electrofishing and a Longnose Sucker was captured by gillnet near the proposed intake and spillway location on New Post Creek (G. Coker, C. Portt and Associates, 2011, pers. comm.). Goldeye, Longnose Sucker, Shorthead Redhorse and Walleye were captured by gillnetting in the Abitibi River at the tailrace location (Coker and Portt, 2010c). Any fish found within the cofferdam area at the time of construction will be collected and removed by a licensed fisheries biologist for release to the watercourse.

The effect of the temporary loss of localized habitat in both watercourses will be negligible. Temporary placement of the cofferdam may result in mortality of aquatic macrophytes and displacement of benthic organisms and possibly larval fish. However, aquatic macrophytes are

sparse or non-existent in the areas to be temporarily affected; benthic macroinvertebrate community recovery is expected to be rapid after cofferdam removal; and early stages of fish will be protected by adherence to the in-water construction timing restriction.

Blasting within the cofferdam area of New Post Creek will result in localized destruction of the residual benthic macroinvertebrate communities; however, recovery is again expected to be rapid. Injury to fish due to shockwaves will be precluded by undertaking blasting in the dry (i.e., after dewatering and removal of fish) and utilizing blasting mats. Blasting will result in localized habitat alteration. Existing nearshore habitat will be altered by the creation of deeper-water habitat. Higher localized flows will occur at the tailrace location due to new powerhouse discharges.

Some additional habitat will be created due to the inundation of nearshore areas (less than 10 ha) in New Post Creek due to the Project (see Figure 2.4). Sufficient flows will be provided to the existing channel to ensure no adverse effects on the spawning of Walleye, Lake Sturgeon and other fish species below the New Post Creek waterfalls.

During the May 25, 2011 Agency meeting, the DFO representative indicated that the in-stream locations of the proposed intake weir and tailrace, as well as the resultant inundation of low-lying areas upstream, will result in HADD of fish habitat that will likely require authorization by the Minister under section 35 of the *Fisheries Act*. Potential incidental fish mortality due to blasting operations and fish stranding within the temporary cofferdam areas will also likely require authorization under section 32 of the Act. Residual operational (turbine) fish mortality may also require section 32 authorization, with mortality acceptability based on concurrence of DFO and MNR.

As indicated by the DFO representative, other considerations that possibly apply to the New Post Creek Project under the *Fisheries Act* include the provision:

- of a fish-way at the proposed intake weir location for upstream and downstream fish passage where the Minister determines it to be necessary in the public interest (subsection 20(1) of the Act);
- of sufficient flow of water over the spillway to permit the safe and unimpeded descent of fish (subsection 22(1) of the Act);
- for the free passage of both ascending and descending migratory fish during the period of construction (subsection 22(2) of the Act);
- due to the significant habitat below the New Post Creek waterfalls, of such quantity of water, at all times, to be sufficient for the safety of fish and the flooding of spawning grounds to such depth necessary for the safety of deposited ova (subsection 22(3) of the Act; and
- of a fish guard, screen, covering or netting to prevent the passage of fish into the water intake where the Minister determines it to be necessary in the public interest (subsection 30(1) of the Act).

The federal EA process may also be triggered if it is determined by the Navigable Waters Protection (NWP) Office that the New Post Creek Project will significantly interfere with navigation. The creation of a localized area of deeper waters and localized alteration of flow regime due to powerhouse discharges will not affect the use of vessels (primarily canoes) on the Abitibi River. The construction of the spillway structure on New Post Creek will result in a barrier to navigation by canoeists. However, as indicated in Section 4.2, use of the Little Abitibi River and New Post Creek as a canoe route is minimal. Barriers to navigation are present upstream at the Otter Rapids Road bridge and downstream at the waterfalls. A portage trail that is readily accessible and clearly-marked could be developed to facilitate deviation around the spillway structure. Moreover, the portage trails around the bridge and waterfalls have not been maintained and could be improved for future use.

During the May 25, 2011 Agency meeting, the NWP Manager indicated that the in-stream location of the proposed intake weir in New Post Creek will likely significantly interfere with navigation and approval by the Minister of Transport Canada would be required under subsection 5(1)(2) of the *NWPA*. The aerial transmission line crossing of the Abitibi River will likely not significantly interfere with navigation and a letter outlining that a subsection 5(1)(3) determination has been made by the NWP Office would be provided.

A meeting with the CEA Agency, potential Responsible Authorities (INAC, DFO, Transport Canada) and the MOE was arranged by OPG and CRP on June 6, 2011 to discuss the *CEAA* triggers. There was mutual consent that it is highly likely that the three potential Responsible Authorities will have a federal EA responsibility. The CEA Agency agreed to co-ordinate the preparation of the scoping document which will outline the Responsible Authorities' determination regarding project-specific information requirements and establish the boundaries of the federal EA screening.

As the *CEAA* is likely triggered, the coordination process developed by CEA Agency, Ontario Region and the MOE Environmental Assessment and Approvals Branch will be followed to ensure that requirements of both levels of government are fully addressed (MOE and CEA Agency, 2007).

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7.0 ACRONYMS/ABBREVIATIONS

Acronyms

ATV	All-terrain vehicle
Beacon	Beacon Environmental
BMA	Bear Management Area
B.P.	Before present
CEA Agency	Canadian Environmental Assessment Agency
CEAA	*Canadian Environmental Assessment Act*
CLI	Canada Land Inventory
CLUPA	Crown Land Use Policy Atlas
C-of-A	Certificate-of-Approval
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COSSARO	Committee on the Status of Species at Risk in Ontario
CRP	Coral Rapids Power Limited Partner Inc., or Coral Rapids Power
CWS	Canadian Wildlife Service
DFO	Department of Fisheries and Oceans
EBR	Environmental Bill of Rights
e.g.	For example (exempli gratia)
EA	Environmental Assessment
EA Act	*Environmental Assessment Act*
Ed.	Editor
EPA	*Environmental Protection Act*
ER	Environmental Report
ESA	*Endangered Species Act*
et al.	And others (et alia)
etc.	And so on (et cetera)
GPS	Global Positioning System
GS	Generating Station
Guide	Guide for Environmental Assessment Requirements for Electricity Projects
H	Horizontal
HADD	Habitat alteration, disruption or destruction
Hydro One	Hydro One Networks Inc.
i.e.	That is (id est)
IESO	Independent Electricity System Operator
INAC	Indian and Northern Affairs Canada
Inc.	Incorporated
KGS Group	Kontzamanis, Graumaun, Smith, MacMillan Inc.
KM	Kilometre Post
LAPP	Little Abitibi Provincial Park
LRIA	*Lakes and Rivers Improvement Act*
MEI	Ontario Ministry of Energy and Infrastructure

MNR	Ontario Ministry of Natural Resources
MNR Class EA	Class Environmental Assessment for Provincial Parks and Conservation Reserves
MoCreebec	MoCreebec Council of the Cree Nation
MOE	Ontario Ministry of the Environment
MOEE	Ontario Ministry of Energy and Environment
MTC	Ontario Ministry of Tourism and Culture
NAN	Nishnawbe Aski Nation
NHIC	Natural Heritage Information Centre
NOHFC	Northern Ontario Heritage Fund Corporation
NWP	Navigable Waters Protection
NWPA	*Navigable Waters Protection Act*
OEB	Ontario Energy Board
OEB Act	*Ontario Energy Board Act*
OGS	Ontario Geological Survey
OMMAH	Ontario Ministry of Municipal Affairs and Housing
OMNDMF	Ontario Ministry of Northern Development, Mining and Forestry
ONR	Ontario Northland Railway
OPG	Ontario Power Generation Inc.
O. Reg.	Ontario Regulation
OWA	Ontario Waterpower Association
OWA Class EA	Class Environmental Assessment for Waterpower Projects
OWRA	*Ontario Water Resources Act*
pers. comm.	Personal communication
PPCRA	*Provincial Parks and Conservation Reserves Act*
Project	New Post Creek Hydroelectric Project or New Post Creek Project
PTTW	Permit to Take Water
S3S4	Vulnerable –due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making the species vulnerable to extirpation in the Province to apparently secure
S4?	Apparently secure – uncommon but not rare with some cause for long-term concern due to declines or other factors, rank uncertain
S4	Apparently secure – uncommon but not rare with some cause for long-term concern due to declines or other factors
S4S5	Apparently secure to secure
S5	Secure – common, widespread and abundant in the Province
SAR	Species at risk
SARA	*Species at Risk Act*
SARO List	Species at Risk in Ontario List
SIA	System Impact Assessment
SNA	Not applicable – a conservation status rank not applicable because the species is not a suitable target for conservation activities
sp.	One species

ssp.	Subspecies
SU	Unrankable – currently unrankable due to lack of information or due to substantially conflicting information about status or trends
TTN	Taykwa Tagamou Nation
UNEP	United Nations Environmental Program
V	Vertical
var.	Variety
WMP	Water Management Plan
WMU	Wildlife Management Unit

Measurement Units

°C	degree Celsius
GWh	gigawatt-hour
ha	hectare
km	kilometre
km^2	square kilometre
kV	kilovolt
L	litre
m	metre
mm	millimetre
m^3/s (cms)	cubic metre per second
MW	megawatt
%	percent

Appendix A

Conceptual Design Figures

Figure 2.2: General Arrangement and Penstock Profile

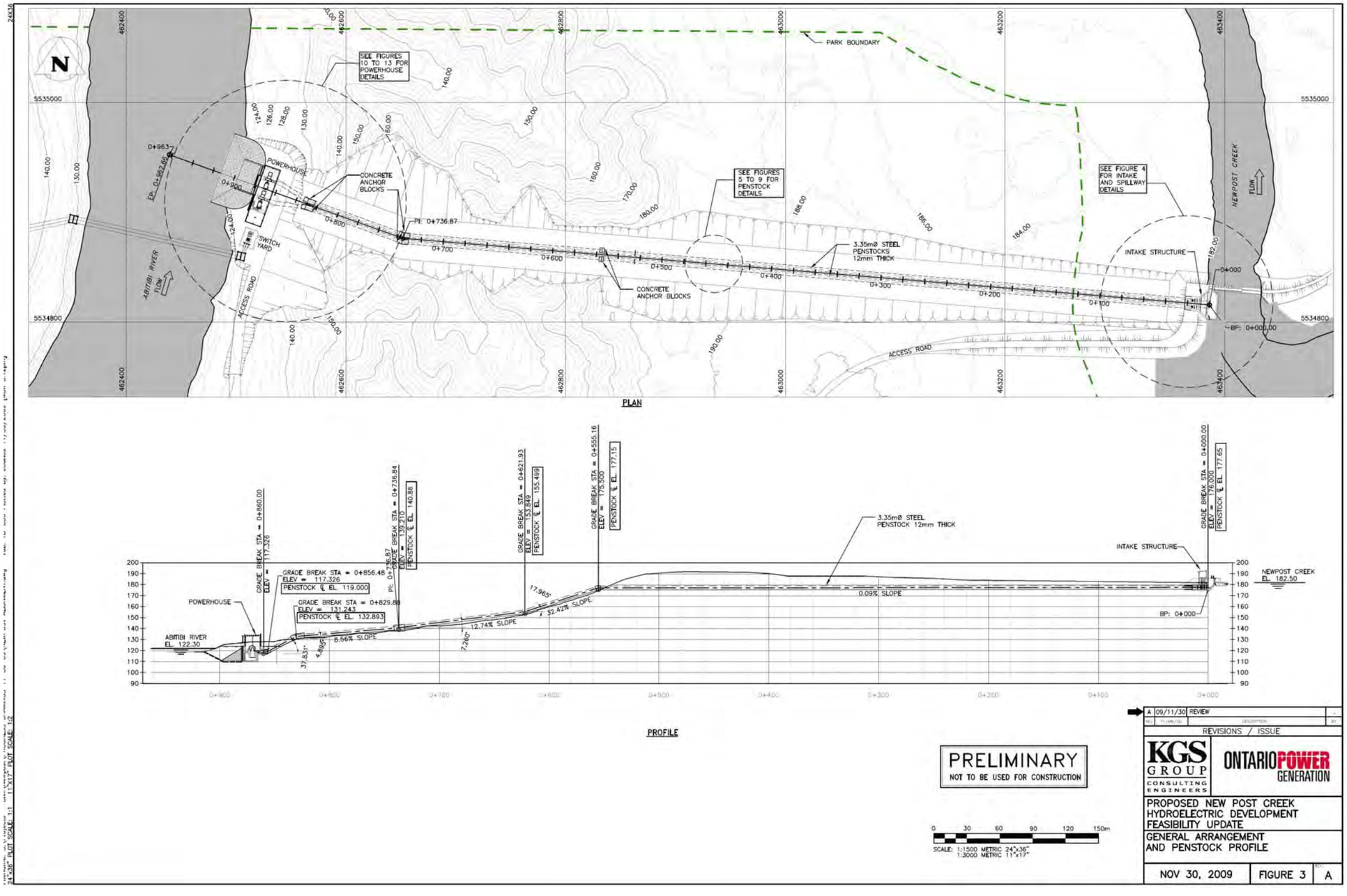

Figure 2.3: Intake and Spillway General Arrangements

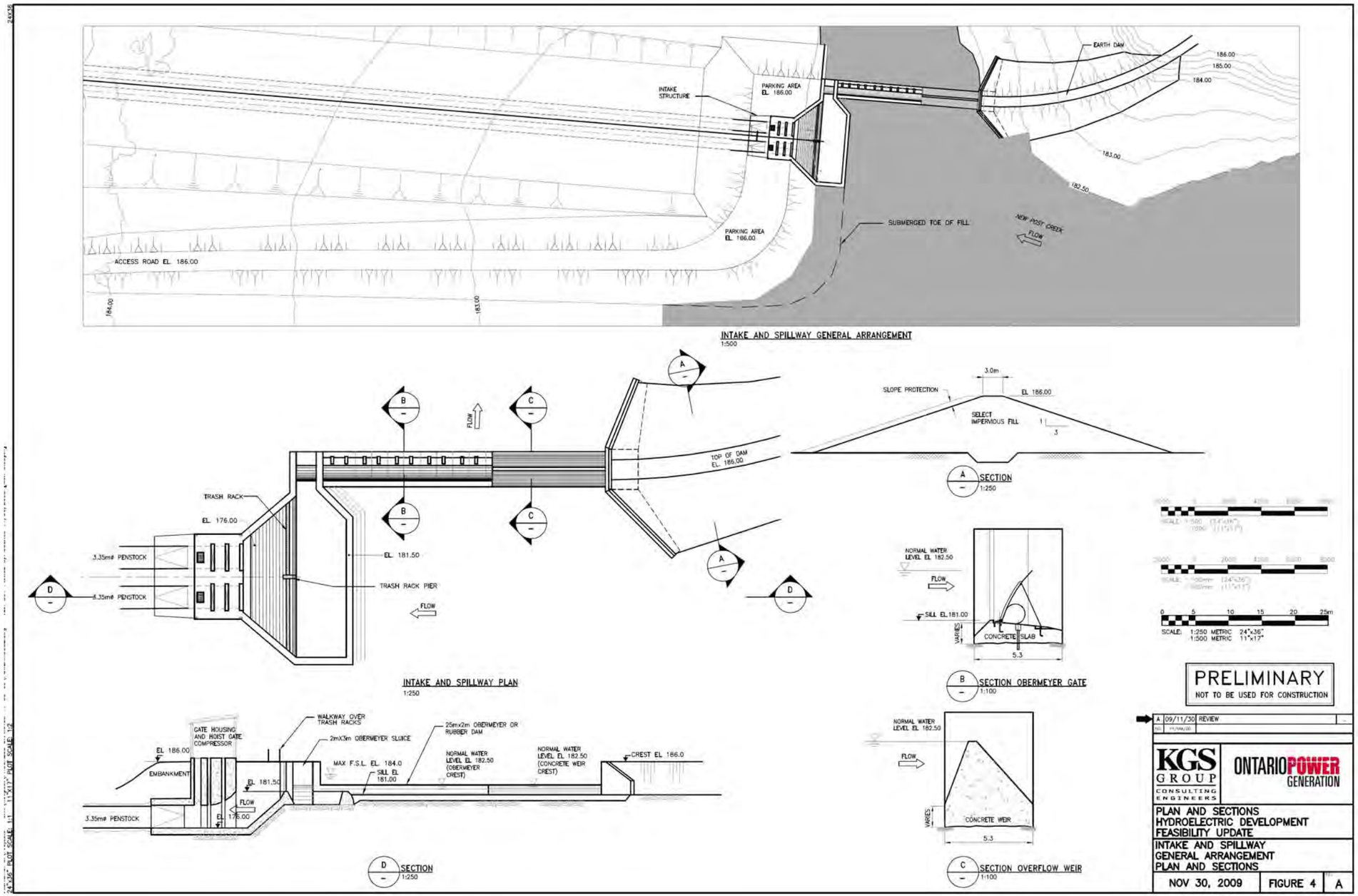

Figure 2.6: Powerhouse General Arrangement