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# EMERGENT IN-STREAM TECHNOLOGY REGULATORY REVIEW

**Prepared For:**

Natural Resources Canada  
Marine Energy Technology  
Renewable and Integrated Energy Systems  
CanmetENERGY – Ottawa  
580 Booth Street,  
Ottawa, ON, Canada, K1A 0E4

**Prepared By:**

Tami Sugarman, Karen Fortin and Kai Markvorsen, OEL-HydroSys Inc.

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Canada

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- New Energy Corporation, Alberta
- SABELLA Énergie Inc., Québec
- Verdant Power Canada

## **Executive Summary**

In early 2010, OEL-HydroSys Inc. (OEL) a member of the WESA Group, was commissioned by Natural Resources Canada (NRCan) to conduct an investigative study into emergent in-stream waterpower technologies, specifically how the development of these technologies is progressing in relation to the existing regulatory requirements within four regions of Canada (Quebec, Ontario, Northwest Territories and British Columbia). OEL conducted focused interviews with developers and/or members of project teams to detail their experiences with the various permitting and approval processes. Based on responses received, a limited number of case studies highlighting projects in the Northwest Territories and British Columbia were developed. Although a few emergent in-stream technology projects in other provinces were investigated, it was determined that there was insufficient regulatory information available for inclusion as standalone case studies. However, pertinent information received from respondents was recorded to highlight the state of emergent in-stream technology in other regions.

It was concluded that the design and field application of emergent in-stream waterpower technology is growing most rapidly in British Columbia but development of the technology is being pursued in other parts of the country, both in marine and riverine environments. The present state of emergent in-stream technology is limited primarily to field testing and prototyping stages, predominantly due to matters relating to regulatory approvals, funding and research development. Based on the experiences of the survey respondents, recommendations are presented towards the facilitation of the development of these technologies through improvements in the regulatory approvals process.

## Table of Contents

<b>Executive Summary.....</b>	<b>iii</b>
<b>1 Introduction.....</b>	<b>1</b>
<b>2 Methodology .....</b>	<b>1</b>
<b>3 Summary of Correspondence Results .....</b>	<b>3</b>
<b>4 Case Studies .....</b>	<b>4</b>
4.1 25 kW In-stream Hydro Kinetic Turbine Project Mackenzie River at Fort Simpson, Northwest Territories Power Corporation .....	4
4.2 The Pearson College - EnCana - Clean Current Tidal Power Demonstration Project at Race Rocks, British Columbia.....	6
4.4 EnCurrent Turbine at the Bonnybrook Waste Water Treatment Plant, Calgary, Alberta.....	10
4.4 Supplemental Information - Ontario .....	11
4.4.1 Cornwall Ontario River Energy (CORE) Project – Kinetic Hydropower System Demonstration Project Verdant Power Canada ULC .....	11
<b>5 Conclusions .....</b>	<b>13</b>
<b>5.1 Key Recommendations .....</b>	<b>13</b>
 APPENDIX A.....	 15

## Appendices

**Appendix A:** Excerpts from Small Scale Hydro – Public Policy & Experience, Country Report for Canada, 2009

## **1 Introduction**

Jurisdictional responsibilities for water resources in Canada are shared between federal and provincial governments. As such, the development of waterpower projects is subject to review by a range of legislative bodies with varied mandates and processes. These factors, when combined with the difficulties of applying the requirements of existing legislation to emerging technologies which differ significantly from traditional ones, can result in an extended regulatory approval process and uncertainty for new technology developers.

In early 2010, OEL-HydroSys Inc. (OEL) a member of the WESA Group, was commissioned by Natural Resources Canada (NRCan) to conduct an investigative study into emergent in-stream waterpower technologies, specifically how the development of these technologies is progressing in relation to the existing regulatory requirements within four regions of Canada (Quebec, Ontario, Northwest Territories and British Columbia). The objective of the study was to examine the existing regulatory process and if possible, present recommendations that could be applied towards streamlining these processes for “first-off” innovation technology pilot installations and their commercial applications.

## **2 Methodology**

OEL proposed to conduct focused interviews with developers and/or their project teams to detail the various permitting and approval processes that were realized in order to secure the commissioning of their in-stream technology projects. A questionnaire was developed to assist with the interview process, a copy of which is appended to this document. The intended outcome was to identify the successes and failures of the regulatory process specific to emergent in-stream technology in four Canadian regions and offer recommendations towards improving the process if developers deemed that improvements were required.

Working from the approval procedure outlined in the Small Scale Hydro-Public Policy and Experience Report for Canada, published by NRCan in 2008, inquiries into each region were to be conducted through web-based searches and electronic interviews to determine whether any new legislation, or policies and procedures for emergent in-stream technology have been implemented.

For the reader’s convenience, sections of the applicable provincial approval procedures outlined in the Small Scale Hydro-Public Policy and Experience Report for Canada, published by NRCan in 2008 are reproduced in Appendix A.

During initial communications with legislators and developers in the regions of interest it became apparent that, while there was growing interest and development activity in emergent in-stream technology, few developers were at the stage where they were navigating through the regulatory process. Many of the respondents reported that their technologies were either in the engineering

development or prototype stage, and as such had not yet initiated a formal request for permitting towards the commissioning of their projects. Subsequently, the scope of the investigation was expanded to include marine tidal generation projects and the area of inquiry was expanded to include Manitoba and Nova Scotia.

This report summarizes the results of the investigation into the present state of emerging in-stream technology as it has been applied to projects that have advanced beyond the engineering stage. All of the projects consist of small scale installations and are either test sites operating under a temporary demonstration permit or, in the case of Northwest Territories project, are soon to be commissioned. The information presented herein was collected through the participation of developers and proponents from the Northwest Territories, British Columbia, Alberta, Ontario and Quebec. It should be noted that the survey respondents were not necessarily the individuals tasked with the execution of the permitting and approvals process and as such, the information provided in the case studies is based on the information available to the authors.

OEL-HydroSys Inc. and Natural Resources Canada extend our appreciation to the individuals who participated in this study.

### **3 Summary of Correspondence Results**

Based on a preliminary list of suggested contacts provided by NRCan, initial inquiries were dispatched to Quebec, Ontario, the Northwest Territories and British Columbia within the private and government sectors.

#### **3.1 Quebec**

In speaking with representatives from the Ministère des Ressources naturelles et Faune (MRNFQ) in Quebec it was reported that there was limited activity in the province towards the development of emergent waterpower technology projects. Subsequent to our invitation for comment, the President and CEO of SABELLA Énergie Inc. responded that the firm was in the process of developing a prototype turbine system as part of a joint French/Canadian partnership. However, it was confirmed that the project was in the early stages of the regulatory approvals process. It was reported that although SABELLA had obtained initial approvals from MRNFQ, the firm had yet to receive any determination of which federal approvals would be required. Since there remained a significant amount of regulatory consultative work to be undertaken, the respondent concluded there was little to contribute to this investigation. It was reported that early contacts with various regulatory bodies indicated that there was some degree of uncertainty within the agencies as to their role and responsibilities as applied to emergent in-stream technology. Since SABELLA's project was still in its infancy both in terms of design and regulatory approvals, it was not considered for inclusion in this report as a case study.

#### **3.2 Ontario**

A call for the participation of emergent in-stream technology developers within Ontario was issued to the Ontario Waterpower Association (OWA). The OWA distributed an invitation internally to key members. With the exception of Verdant Power Canada ULC (herein referred to as Verdant), no other response from OWA emergent technologies group was received. Although Verdant's Cornwall Ontario River Energy (CORE) has received a significant amount of attention since it was announced, a hold on the project in late 2008 due to funding limitations and its subsequent re-launch almost one year later subsequent to the resolution of funding, has left the project at the early stages of an environmental assessment, and at the early stages of the regulatory approval process.

An inquiry by OEL to New Energy regarding the Edwardsburgh Cardinal Power Project which proposed the installation of a 25kW EnCurrent turbine in the St. Lawrence at Cardinal, Ontario determined that the project was stalled due to the complexity and cost of the regulatory approval process and, according to the developer, unlikely to proceed.

#### **3.3 Northwest Territories**



One project in the Northwest Territories is slated for commissioning in late spring 2010, later than was initially anticipated, a result of an unforeseen delay in the approvals process. A case study of the Fort Simpson project is presented herein.

### 3.4 British Columbia

By comparison, initial communications with developers and regulators in British Columbia revealed that the development of emergent in-stream technology projects is significantly more advanced than in the other regions. It was reported that multiple projects (some using the same technology) were at varying stages of demonstration or prototyping. For those projects that have reached the demonstration stage, the permitting process was based on the projects being classified as temporary, and as such the approvals processes were truncated. Of these projects, two were selected for examination as case studies for this report; Clean Currents tidal turbine demonstration project at the Race Rocks Ecological Reserve and InStream Energy Corporation's demonstration project at the Duncan Dam.

### 3.5 Expanded Scope

Additional requests for information were issued to Alberta, Manitoba and Nova Scotia, one response was received from Manitoba but the authors were unable to arrange for the completion of the survey with the respondent. No response was received from Nova Scotia. New Energy Corporation was contacted regarding their temporary turbine installation in the outflow canal of the Bonnybrook Waste-Water Treatment Plant in Calgary, Alberta.

## 4 Case Studies

### **4.1 25 kW In-stream Hydro Kinetic Turbine Project Mackenzie River at Fort Simpson, Northwest Territories Power Corporation**

The project was proposed by the Northwest Territories Power Corporation (NTPC), a Crown corporation owned by the Government of the Northwest Territories, to study an in-stream kinetic turbine technology and evaluate its applicability to power generation in remote northern communities which rely heavily on diesel generation for their energy supply.

#### Project Description

NTPC has been monitoring the development of the EnCurrent Vertical Axis Hydro Turbine (VAHT) technology, developed by New Energy Corporation since 2004, for its potential for clean energy generation with minimal environmental impact. Other technologies, such as fixed underwater riverbed mounted turbines, were discounted the logistics of deploying these systems to this remote location.

The project involves the installation of a single 25 kW EnCurrent kinetic turbine on the Mackenzie River at Fort Simpson in the Northwest Territories to be launched in late spring 2010. The turbine will be supported by a pontoon platform which will be anchored to the bed of the river. The turbine unit is designed to be installed after ice breakup (early June) and remain in the water over the course of the open water season with annual retrieval of the system scheduled for the fall. The electricity generated by the turbine will be transferred to an interconnection point on shore via an underwater cable.

Hydrological flows at the project site were slightly lower than specified for efficient EnCurrent turbine operation which necessitated minor mechanical adjustments for performance optimization.

The installation of the EnCurrent technology at Fort Simpson is considered a temporary installation but the expectation is that it will be deployed seasonally over a period of several years. The project is deemed a pilot installation; NTPC will be evaluating the technology's performance for its application at up to six additional sites. NTPC would eventually like to investigate the feasibility of installing larger turbine units or multiple smaller units at a single location however this remains financially prohibitive relative to the cost of the existing diesel generation supply.

#### Funding and Partnerships

Through a 2008 territorial funding initiative, NTPC was able to complete a water resource survey which identified a suitable installation site on the McKenzie River near NTPC's Fort Simpson diesel power plant. The power entity was aware of an upcoming territorial funding program, The Priorities Investment Plan as described in the 2009/10 territorial budget for the development of alternate and emergent energy technologies and initiated the preparatory process for the study. The development of the technology was also supported by the federal government through CanmetENERGY's Small Hydro Group and the Technology Early Action Measures Program, and the National Research Council via the Industrial Research Assistance Program.

With the confirmation of the funding in March 2009, the process for the installation of the EnCurrent turbine was officially launched.

#### Regulatory and Approvals Process

In March of 2008, NTPC initiated regulatory consultation with Transport Canada (TC), Fisheries and Oceans Canada (DFO) and the Mackenzie Valley Land and Water Board (MVLWB) for agency input on the proposed project.

DFO promptly determined that due to the small scale of the project, the agency would not have a role in the undertaking. MVLWB determined that a public and aboriginal consultation process would be required for the project but deemed that an environmental assessment was not required due to

the scale of the project. MVLWB estimated that its project review and approval period would take approximately one month. The mandatory submission of a request for project review under the *Navigable Waters Protection Act* was required by Transport Canada.

A water use permit was issued to NTPC by the Mackenzie Valley Land and Water Board. As a condition of the permit, Indian and Northern Affairs Canada (INAC) determined that it will conduct annual inspections of the project site. NTPC is also required to provide an annual report to MVLWB detailing the status of the project and any implemented or anticipated changes. Though INAC determined it did not have any approval requirements for the undertaking, the agency will also review the annual project reports as submitted by NTPC.

Based on the responses it received from DFO and MVLWB, NTPC expected that Transport Canada would determine that the undertaking would be classified an “insignificant project.” However because of the infancy of the practical application of this technology and the unavailability of field data in the Northwest Territories, Transport Canada requested additional information about the project design and the project site. The agency also directed NTPC to consult with the public and the aboriginal and First Nation communities, specifically the Métis and the Liidlii Kue First Nation. During consultation the Liidlii Kue First Nation approached NTPC about the possibility of a partnership agreement on the project but it was decided by NTPC that, because of its relatively small scale and temporary nature, this particular project did not represent a reasonable opportunity for partnership.

Securing the required approvals for the project was finalized in November 2009 resulting in a total approval process of seven months. As a result, NTPC had to postpone the installation of its EnCurrent turbine until after the winter season. The installation is scheduled for June 2010. NTPC surmised that the delayed agency approval process was partly due to the absence of internal permitting and approval guidelines for this type of technology.

#### **4.2 The Pearson College - EnCana - Clean Current Tidal Power Demonstration Project at Race Rocks, British Columbia**

The project was proposed by Clean Current Power Systems Inc, a private company, as a demonstration site for their tidal turbine technology with the additional goal of generating clean power for a marine research station located within the Race Rocks Ecological Reserve operated by the Lester B. Pearson College of the Pacific.

##### Project Description

The ecologically sensitive Race Rocks Ecological Reserve is managed by the Lester B. Pearson College educational institution which has had to rely on diesel as its primary source of power generation. The institution was actively seeking alternate energy generation sources to decrease its dependence

on diesel because of the risks associated with its use in this fragile environment. In 2001, a graduate student from the University of Victoria demonstrated that solar, wind and tidal energy were valuable potential sources of energy for Race Rocks, however both solar and wind energy presented logistical constraints. To meet demand, solar panels would require too much surface area while wind turbines could interfere with bird migration. Tidal energy was identified as a reliable and predictable source of energy that could be implemented with minimal impact on the environment owing to its small footprint. In 2005, when Clean Current was consulting with BC Hydro in search of a potential demonstration site for its technology, the company was directed to the Race Rocks site.

The proposal was to install a tidal turbine offshore of the Race Rocks Ecological Reserve located in the Strait of Juan de Fuca, approximately 18km southwest of Victoria, British Columbia.

The Clean Current Power Systems horizontal axis ducted turbine is designed for a generation capacity of 65kW at flows of 3 m/s. The bi-directional turbine was engineered to remain in situ year round but is raised periodically for maintenance; the turbine has a maximum design life of approximately 10 years. The 5.5m diameter turbine is installed in 20 metres of water and is mounted on a pile fixed to the ocean bottom. The top of the turbine rests approximately 5m below the surface. The energy generated by the turbine is transferred to an undersea storage system via undersea cable from which the electricity is used to power the college's facilities on Race Rocks. The temporary system has allowed the institution to almost completely eliminate its use of diesel generators.

### Funding and Partnerships

Clean Current partnered with several organizations in order to establish the turbine project at Race Rocks. Pearson College was instrumental in providing the test site as well as providing a platform for project promotion; in return the College receives the electricity generated free of charge. Additionally, Clean Current compensates Pearson College for the ability to access the test site. Through its EnCana Environmental Innovation Fund, EnCana Corporation provided development and demonstration phase project funding. Funding was also provided by Sustainable Development Technology Canada. If the EnCana Clean Current horizontal axis ducted turbine is adopted as a permanent installation at Race Rocks a new financial agreement between the college and Clean Current will be required.

### Regulatory and Approvals Process

Due to Race Rocks' status as an Ecological Reserve, BC Parks was the lead provincial regulatory body overseeing permitting and approvals for the project, with additional involvement by BC Hydro. Federally, both Fisheries and Oceans Canada and Transport Canada had a role in the approval process.

To advance the application of the generation of waterpower through tidal systems, Clean Current partnered with Lester B. Pearson College. Owing to the special nature of this undertaking, permitting was primarily executed as an amendment to the College's operations permit from BC Parks which has a mandate to assist in the demonstration of alternative energy technology. The project was exempt from key legislative requirements because it was a non-commercial generator that did not require connection to the hydroelectric grid and because of its small scale which required very little civil works.

Transport Canada's prime concern was that the turbine did not create an impediment or danger to navigation. The Agency's concern was focused on recreational traffic because of the site's location within a protected area. As a result, TC stipulated that the top of the turbine would have to have a minimum clearance of 5m below the surface.

While the project was exempt from an environmental assessment, Clean Current was required to complete a habitat assessment of the site by both BC Parks and DFO. The assessment determined that there were no species at risk (SAR) or endangered species habitats within the project area; this was supported by the monitoring undertaken during the construction activities. Once underway, construction activities were also monitored to ensure that these would not result in long term effects to local wildlife populations. During the demonstration project regular monitoring and annual reporting is required to ensure that the turbine is not causing negative impacts on the environment. The environmental monitoring is conducted by a sub-consultant; annual reports are submitted to Pearson College.

The proponent was required to undertake consultation with the Scia'new First Nation, facilitated by both BC Parks and Pearson College which encouraged early and open consultation with the First Nation.

The overall permitting and approvals process was completed within six to seven months. The condensed timeframe was facilitated by the support of BC Parks which undertook promotion of the project to other regulatory bodies. Clean Current reported that the permitting and approvals process proved to be a very positive experience because of the involvement of BC Parks.

The Clean Current turbine received permitting to operate as a demonstration project until 2011. The options will then be to remove the turbine or seek permission to adopt it at the site permanently.

#### **4.3 Duncan Dam Hydrokinetic Power Demonstration Project, British Columbia**

The project was proposed by Instream Energy Systems Corp. (Instream) as a field test in order to evaluate the vertical axis hydrokinetic turbine (VAHT) technology.

## Project Description

The project involved the temporary installation and testing of four 25kW prototype VAHTs in the discharge channel of the Duncan Dam which controls flows from the Duncan River into the Kootenay River, approximately 200km east of Kelowna, British Columbia. The test site is wholly located on BC Hydro property.

## Funding and Partnerships

Instream contracted Powertech Labs Inc., a subsidiary of BC Hydro that specializes in clean energy consulting, testing and power solutions, to design, manage, and execute the test program on behalf of Instream. Powertech Labs' experience and expertise was instrumental in ensuring that the data collected was reliable and would provide Instream with a solid foundation of information to refine hydrokinetic technology and develop future projects.

## Regulatory and Approvals Process

As owner of the existing facility, BC Hydro submitted applications for regulatory approval in September 2009 to FrontCounter BC and to Transport Canada under the Navigable Waters Protection Act. FrontCounter BC provides a “one window” point of contact for individuals or small-to-medium-sized natural resource businesses to provide assistance with the approvals process, and acts as an initial point of contact with provincial regulators. BC Hydro also contacted local regulators ahead of the formal application to introduce them to the project so they were aware of it prior to their formal review. The project was subject to an environmental and regulatory review by the BC Ministry of Environment (MOE), Department of Fisheries and Oceans (DFO), and Transport Canada. After being notified of the project and reviewing the Environmental Management Plan, the MOE and DFO deemed that further approval processes were not required, as long as the project adhered to Provincial Water Act Regulations and Best Management Practices. This was due to the low risk of environmental impacts and the relatively small scale and temporary nature of the project. Permanent installations of this nature would be subject to more rigorous regulatory review. The regulators reviewed the potential environmental and fisheries impacts of the turbines and construction activities under the Provincial Water Act, the Federal Fisheries Act as well as navigational issues under the Navigable Waters Protection Act.

Because the project was situated within an engineered waterway (dam discharge channel), the potential impacts of the project were considered to be lower risk than a new installation in a natural waterway. The environmental management plan outlined existing conditions, assessed potential environmental risk and specified mitigation measures and practices that would be followed. The turbines were considered as “floating docks” for the purposes of the Navigational Waters Protection Act application and approval.

BC Hydro and Powertech Labs issued notifications regarding the test project to potentially affected

First Nations in the region. Some First Nations expressed interest in being consulted on any future testing or permanent installations of this technology.

The field test is scheduled for decommissioning in May 2010. While this was their first hydrokinetic test, Instream is of the opinion that the experience gained from this undertaking will be beneficial towards the pursuit of similar projects in the future. Instream has reported that it is committed to developing and deploying hydrokinetic technology.

#### **4.4 EnCurrent Turbine at the Bonnybrook Waste Water Treatment Plant, Calgary, Alberta**

New Energy has partnered with the City of Calgary to design and install a prototype 5kW EnCurrent turbine in the outflow of the Bonnybrook Waste Water Treatment Plant.

##### Project Description

The project which began in January of 2006 entailed the installation of a fixed, ducted turbine in the outflow of the Bonnybrook facility. The prototype system was in place for over a month, before being removed prior to spring high water conditions. During the installation, the system was operational for over 1000 hours and generated electricity which was supplied to a load bank for testing purposes. The initial 5kW turbine was designed for sustained flows averaging 3 m/s and generated approximately 1.5 kW in a 2 m/s current. The turbine design consisted of a top plate with the hydrofoils welded around the periphery which were in turn welded to an annular ring at the base. Additionally, the turbine was designed to operate under constant rather than variable flow conditions. Subsequent to the prototype installation results, it was apparent that under most conditions, the function and capacity of the turbine would be improved by the development of an alternate blade design and the alteration of the turbine to allow for operation under variable flow conditions. Benefits to the operation of the waste water treatment plant were observed during the prototype testing phase. Because the flow of water exiting the plant was constrained by the presence of the turbine in the outflow, the water level “upstream” of the turbine rose slightly, reducing the amount of air entering and exiting the plant through the outflow channel, thus decreasing heating costs. Additionally, a decrease in the amount of surfactant foam was observed in the Bow River immediately downstream of the plant outflow channel.

Based on the results of the 2006 prototype and demonstration phase, plans for the installation of a second generation, more permanent turbine were enacted. Presently, the schedule is proposing the installation of a new turbine system by the end of 2010. New Energy is investigating several potential international applications of the technology.

##### Funding and Partnerships

In addition to the partnership with the City of Calgary, the project received advice and support from

Natural Resources Canada and its Technology Early Action Measures program and the National Research Councils' Industrial Research Assistance Program (IRAP).

#### Regulatory and Approvals Process

Because the project was a prototype installation located wholly within an engineered channel and was not generating electricity for the grid the approvals process was limited to the municipal level. New Energy Corporation conducted a feasibility study to ensure that the installation of the turbine in the outflow canal would not negatively impact operations. The study was supported by the IRAP program and found that there would be no appreciable negative impact to the plant. Following the feasibility study the City approved the installation of the turbines within a matter of weeks.

#### **4.4 Supplemental Information - Ontario**

In addition to the case studies detailed above, an overview of the initial scoping of the regulatory approvals process for the Cornwall Ontario River Energy (CORE) Project as determined during the initial regulatory consultation is included.

##### **4.4.1 Cornwall Ontario River Energy (CORE) Project – Kinetic Hydropower System Demonstration Project Verdant Power Canada ULC**

If approved, the CORE pilot project would be a world-first demonstration of a commercially viable Kinetic Hydropower System (KHPS) and its associated deployment technology, designed specifically for continuous flow (non-tidal) river applications. The proposed project site is located on the bed of the St. Lawrence River at Cornwall. Verdant Power Canada is building on its Roosevelt Island Tidal Energy (RITE) KHPS turbine project in the tidal channel of the East River at New York City.

#### Project Description

The overall plan for the CORE Project is proposed to be completed over five years, in two phases. The demonstration pilot project (Phase One) is intended to lead to a commercial field build-out project (Phase Two) located just west of the demonstration site. Phase One is divided into three stages of testing: short term deployment and retrieval of two simulated non rotational turbines (Stage 1); short term deployment and retrieval of two operational KHPS turbines involving an electrical cable connection to an on-shore transmission system (Stage 2); longer term deployment of two operations KHPS turbines involving an electrical cable connection to on-shore transmission system (Stage 3). The deployment and retrieval of the two simulated (non-rotating) turbines is planned for late summer 2010. The bed of the St. Lawrence River in the project area is Crown land leased to Ontario Power Generation; OPG has allowed Verdant to access to the site for the undertaking.

The undertaking is subject to a harmonized environmental assessment process including federal,



provincial (Class Environmental Assessment for Waterpower Projects) and the Mohawk Council of Akwesasne EA process. The federal environmental assessment was launched in the summer of 2008 but the project was subsequently placed on hold for approximately one year owing to funding delays. The project was reopened in late fall 2009. Meetings with regulatory agencies will be required to reacquaint the regulators with the project and the revised schedule. The Notice of Commencement under the Class EA for Waterpower Projects will be issued in summer 2010, as will a notice under the Mohawks of Akwesasne EA to officially initiate the provincial and First Nation planning process.

### Funding and Partnerships

Funding for the project is being supported by the Ontario Ministry of Research and Innovation, the Ontario Power Authority and Sustainable Technology Development Canada.

### Regulatory and Approvals Process

Because the project is still in its infancy, it is too early to identify the complete list of regulatory approvals that will be required. Fisheries and Oceans Canada and the Ministry of Natural Resources are determining habitat and fisheries requirements and Transport Canada is involved under the *Navigable Waters Protection Act*. Other stakeholders that may have a regulatory role in the undertaking include Environment Canada, the St. Lawrence Seaway Authority and the Ontario Ministry of the Environment. It should also be noted that the project site is located in trans-boundary waters, as such the International Joint Commission and the Department of Foreign Affairs Canada will likely have a role in the undertaking should the project proceed to the commercial phase.

Based on early planning meetings with both provincial and federal stakeholders towards scoping the environmental assessment of the undertaking, applicable regulatory approvals may be required pursuant to:

#### Federal:

- Canadian Environmental Assessment Act
- Fisheries Act
- Species at Risk Act
- Navigable Waters Protection Act
- International Boundary Waters Treaty Act

#### Provincial:

- Environmental Assessment Act
- Endangered Species Act
- Fish and Wildlife Act
- Ontario Energy Board Act

## **5 Conclusions**

The design and field application of emergent in-stream waterpower technology is growing most rapidly in British Columbia but development of the technology is being pursued in other parts of the country both in marine and riverine environments. Emergent in-stream waterpower technology is gaining momentum, and as the success of the demonstration projects grows so will the momentum.

These technologies are attractive to proponents because they are relatively environmentally benign owing to their small footprint, and they require little in the way of permanent civil works. The proponents are often small companies or groups with limited resources and little experience navigating the regulatory approvals process. They generally anticipate that, due to the nature of their technology and its small scale that they will be exempt from many of the regulatory requirements. However these projects are presently being subjected to a level of regulatory scrutiny that rivals that of the larger, more traditional waterpower projects owing to the lack of internal guidance provided to staff of the regulatory bodies that receive requests for permitting and approvals guidance.

The unavailability of data within regulatory bodies has resulted in extended delays in the issuing of project specific approval guidelines or requirements. The smaller proponents are often constrained by limited resources and these delays present an additional level of uncertainty and strain. Significant research and development costs often a result in limited financial resources to apply toward the approval planning and consultation requirements. As a result, in the absence of substantial initiatives either through public or private funding, the regulatory process can shelve or halt a proposed project.

### **5.1 Key Recommendations**

A common observation noted by most of the study's respondents was the delayed response period involved when dealing with certain regulatory bodies. The delay made it difficult to coordinate and develop concrete project schedules and extended the regulatory process beyond the proponent's projected timelines. It is recommended that agencies strive to establish standard response guidelines and that these be determined as a coordinated effort between agencies (federal and provincial at the regional level if possible) to minimize costly periods of inactivity which have the potential to stall small projects indefinitely.

In order to minimize approval delays and to facilitate future development of emergent waterpower energy projects in other parts of the country where "first- off" installations are already in place, it is recommended that regulators promote inter- and intra-agency communication to highlight a particular technology's regulatory approval and permitting process, essentially creating an

information repository. It is recommended that agencies appoint a designated contact to receive/gather information with regards to emergent in-stream technology development and the required approvals as they relate to each agency's particular mandate. Suggested agencies where this would be considered most beneficial to both the developer and agency staff, include Transport Canada, Fisheries and Oceans Canada (DFO) and the provincial natural resources and environment ministries.

The Race Rocks project, perhaps the most technically complicated undertaking with the potential to impact significant ecological resources, reported a very positive experience with regard to the approvals process owing largely to the advocacy the project received from BC Parks. Prospective developers should seek to develop a positive relationship with regulators early on in the planning process in order to foster an understanding of the technology, its potential, and the logistical constraints often placed on smaller projects. Ideally, this is a role that would be adopted by designated agency contact to provide a more streamlined developer relationship with regulators.

Emergent in-stream technologies can be generally considered low impact due to their temporary nature and/or small scale, yet they are currently required to undergo the same level of regulatory scrutiny as that applied to the more traditional, larger footprint projects. The development of criteria and guidelines detailing the required information with respect to the approval and permitting requirements for small, temporary projects would help clarify the process early on for both regulators and developers.

It is recommended that during the field testing of pilot projects the developer and regulatory agencies (DFO and provincial natural resources ministries) work together towards the completion of ecological studies that could act as supporting scientific data for future installations. Establishing baseline studies in support of specific emergent technology may help streamline the approvals process for similar projects in the future. It is recommended that funding initiatives be established to complete these baseline studies.

## **APPENDIX A**

Excerpts from  
Small Scale Hydro – Public Policy & Experience  
Country Report for Canada 2009

## Quebec

The provincial government department of Sustainable Development, Environment and Parks plays an integral role in the development of waterpower projects in Quebec. Crown land management for the purpose of hydroelectric development is managed by this department with the Ministry of Natural Resource and Land collecting on the rent of Crown Land and the overseeing of municipal and private distribution companies. The Ministry of Sustainable Development, Environment and Parks also plays important role in environmental assessment and protection. The management of electricity markets and distribution across the Quebec is undertaken by the Régie de l'énergie. The major legislations that relate to the development and operation of hydropower facilities enacted by the government of Quebec are the Environment Quality Act, Watercourse Act, Dam Safety Act, Hydro-Quebec Act, An Act Respecting the Régie de l'énergie, and an Act Respecting Municipal and Private Electric Power Systems. A short description of these Acts is provided below.

### *Environment Quality Act*

The objectives of this Act are to ensure the wise management of the environment by regulating emission, deposit, issuance or discharge of contaminants into the environment, whereby a change in the quality of the environment is incurred. The Act strives to protect for land, air or waters, the essential ecological processes, the preservation of biological diversity; and the promotion sustainable development. The Act ensures a comprehensive and integrated consideration of environmental effects of development in order to recognize the interests of Quebec residents in a regional, national, and global environmental context.

The Act prescribes:

- Approval of all management, treatment and discharges of waste to the natural environment.
- fundamental water management policy and procedures for protection of the quality of water as a constant or intermittent watercourse, a lake, pond, marsh, swamp or bog.
- regulation and procedures for inland waterway protection of water habitat, construction of works, as well as public rights and responsibility and water privileges, etc.
- the full use of the knowledge and experience of Quebec residents in formulating public policy on the environment; and
- to ensure effective participation by Quebec residents and First Nations in northern area in the making of decisions that will affect the environment.

There are sixty-eight regulations under this Act. Those most applicable to waterpower undertakings are listed below:

- Application of the Environment Quality Act, Regulation respecting the, R.Q. c. Q-2, r.1.001
- Bodies for the protection of the environment and social milieu of the territory of James Bay and Northern Québec, Regulation respecting certain, R.Q. c. Q-2, r.16
- Cadre de gestion relatif à la réalisation des projets municipaux du Programme d'assainissement des eaux, R.Q. c. Q-2, r.1.1
- Cadre de gestion relatif au programme d'amélioration des rives, R.Q. c. Q-2, r.1.2
- Environmental and social impact assessment and review procedure applicable to the territory of James Bay and Northern Québec, Regulation respecting the, R.Q. c. Q-2, r.11
- Environmental impact assessment and review applicable to a part of the north-eastern Québec region, Regulation respecting the, R.Q. c. Q-2, r.10
- Environmental impact assessment and review, Regulation respecting, R.Q. c. Q-2, r.9
- Protection Policy for Lakeshores, Riverbanks, Littoral Zones and Floodplains, R.Q. c. Q-2, r.17.3

#### *Watercourses Act*

This Act was established to ensure the respect of water and watercourses and protection of the water resources of Quebec. The object and purpose of this Act is to provide a regulatory framework for the concession of rights to the beds of state-owned lakes and watercourses, the establishment of priorities for the use of hydraulic powers, control of water and driving of timber, and the construction and maintenance of works in lakes and watercourses.

The Act prescribes;

- the procedures and policies for the alternation of the bed and banks of watercourses
- the right of action of lessee (i.e. the acquisition, registration, survey and sale or disposition of Crown lands)
- the use of watercourses and prevention of flooding
- the expropriation of lands required for the development and utilization of certain water-powers and the construction and maintenance of reservoirs for the storage of the water of lakes, ponds, rivers and streams
- the government fees for every holder of hydraulic powers in Québec
- the procedures for construction and maintenance of other dams and similar works
- emergency recourses for works including any dam, dike, causeway, sluice, embankment or other construction, even if made in conformity with the plans and specifications approved by the government.

There are three regulations under this Act, these are;

- Application of section 2 of the Watercourses Act
- Public Water Regulation
- Water property in the domain of the State

#### *Dam Safety Act*

The Act provides for the protection of persons and of property by ensuring that dams are suitably located, constructed, operated and maintained and are of an appropriate nature with regard to their purpose; two types of dams are targeted by the Act.

- High-capacity dams
- Dams 1 metre or more in height having an impounding capacity greater than 1,000,000 m<sup>3</sup>
- Dams 2.5 metres or more in height having an impounding capacity greater than 30,000 m<sup>3</sup>
- Dams 7.5 metres or more in height, regardless of impounding capacity
- Low-capacity dams
- Dams 2 metres or more in height that are not high-capacity dams

Main provisions apply to high-capacity dams.

The Dam Safety Act imposes a series of measures governing the construction, alteration and operation of high-capacity dams. It requires that dam owners regularly maintain the structures in good repair and monitor their works. The owners of dams likely to be a threat to persons must also, in collaboration with concerned municipalities and Regional County Municipalities (RCMs), prepare emergency action plans.

Owners of high-capacity dams must have their dam undergo a safety review by an engineer to verify the exact condition of the works and determine, where applicable, the proposed remedial measures for increased safety of the works and compliance with current standards. Owners of existing dams have three to ten years to complete the safety review dependant on dam failure consequences, structural condition and the reliability of their discharge facilities.

The Act also provides for the establishment of a register for all dams one metre or more in height.

#### Hydro-Quebec Act, An Act Respecting the Regie de l'énergie, An Act Respecting Municipal and Private Electric Power Systems

The purposes of these Acts is to ensure the adequacy, safety, sustainability and reliability of electricity supply in Quebec through responsible planning and management of public utilities and electricity resources; to facilitate load management in a manner consistent with the policies of the Government to provide generators, retailers and consumers with non-discriminatory access to transmission and distribution systems in the Quebec; to protect the interests of consumers with respect to prices and the adequacy, reliability and quality of electricity service.

These Acts prescribe:

- the duties of which oversee the establishment and governing of markets related to electricity and ancillary services; coordination of agreements with transmitters; maintenance of grid reliability; outline of technical standards and safety regulations; coordination with responsible authorities outside of Quebec
- the duties of the Régie de l'énergie which oversees the establishing and governing of markets related to electricity and ancillary services; reviews and oversees agreements with transmitters; manages alternative energy sources
- the statutory duties and restrictions of public utilities to protect the interests of consumers with respect to prices; the adequacy, reliability and quality of electricity service; to promote economic efficiency and cost effectiveness in the generation, transmission, distribution, sale and demand management of electricity; and to facilitate the maintenance of a financially viable electricity industry
- the rules, rights and restrictions of power generators
- rules governing electrical safety

Bill 52 (2006, chapter 46), An Act respecting the implementation of the Québec Energy Strategy and amending various legislative provisions.

The main objective of this legislation is to follow up on the measures announced in Québec's Energy Strategy made public on 4 May 2006. It amends the Act respecting the Agence de l'efficacité énergétique, providing that the members of the personnel be appointed in accordance with the staffing plan established by by-law of the agency. The Act broadens the scope of the agency's objectives by making it responsible for promoting the development of new energy technologies for all forms of energy and all sectors of activity and for preparing a comprehensive energy efficiency and new technologies plan.

The Bill describes:

- the procedures for preparing the comprehensive plan, in which the obligations of the distributors are set out and grants new powers to the agency.
- Outlines a reporting process for the plan so that the funds allocated to energy efficiency and new energy technologies are used properly.
- gives the Régie new terms of reference, for instance, the Régie will approve the amounts to be used to finance programs under the plan and fix the annual amount energy distributors must allocate to energy efficiency and technological innovations.
- Establishes the participation of the Régie in the reporting process.
- provides for the financing of measures aimed at reducing greenhouse gas emissions and adapting to climate change
- provides for new measures to ensure the reliability of electric power transmission



## Other Laws, Ordinances and Regulations

Other Quebec legislation that may apply to hydroelectric development projects under certain circumstances includes;

- An Act Respecting Threatened or Vulnerable Species

- An Act Respecting the Conservation and Development of Wildlife

- Forest Act

- Parks Act

- Cultural Property Act

- Pesticides Act

- Municipal Powers Act

- James Bay Region Development and Municipal Organization Act

- An Act Respecting Explosives

- An Act Respecting Land use planning and development

## Ontario

In the province of Ontario the Ministry of Natural Resources is mandated to oversee the development of Crown land and manage the sustainable development of natural resources for the province. The Ministry of Environment and the Ministry of Energy play important roles in environmental assessment and protection and the management of electricity markets and distribution across Ontario. The major legislations that relate to the development and operation of hydropower facilities enacted by the government of Ontario are the *Environmental Assessment Act*, *Lakes and Rivers Improvements Act*, *Public Lands Act*, *Ontario Water Resources Act*, *Environmental Protection Act*, *Planning Act*, *Ontario Electricity Restructuring Act 2004*, *Electricity Act* and the *Ontario Energy Board Act*. A short description of these Acts is provided below.

*Environmental Assessment Act* (specifically the Electricity Projects Regulation, Ontario Regulation 116/01)

The purpose of this Act is the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation and wise management in Ontario of the environment.

The Act prescribes;

- application and approval process for the planning of undertakings (i.e. terms of reference, class environmental assessments, review process)
- obligation for consultation with agencies and the public
- harmonization of the environmental assessment planning process between other levels of government
- ministerial reviews and tribunals
- designation and powers of provincial officers
- issuance of policy guidelines pertaining to the Act
- rules for record keeping of the environmental assessment

Electricity Project Regulation (Ontario Regulation 116/01) outlines what environmental assessment requirements apply to a particular electricity project. The regulation lists the types and categories of electricity project types and outlines whether environmental assessment requirements apply, and if so what level of review is required. Projects are categorized on the basis of the installed capacity to produce electricity. All projects less than 200 MW (Category B) can follow the Class Environmental Assessment (screening) while all other projects (Category C) must undergo an individual EA prior to pursuing other approvals necessary for construction.

The Class Environmental Assessment for Waterpower Projects in Ontario came into effect on October 8, 2008. This Class EA was developed by the Ontario Waterpower Association (OWA) on behalf of the waterpower industry as a planning process to be followed for waterpower projects to which the environmental screening process as prescribed under O. Reg 116/01 (200MW, Category B)

applies. The Class EA for Waterpower Projects helps to ensure that projects are planned in an environmentally responsible manner and assists with the coordination of environmental approvals and public and aboriginal involvement processes that are relevant to planning a waterpower project. Any project that issues its Notice of Commencement after October 8, 2008 is required to follow the new Class EA planning process. Proponents who had initiated a project application under O. Reg 116/01 were granted an opportunity to transition to the new Class EA or could remain with the environmental screening process prescribed under O. Reg 116/01 as long as their Notice of Completion was circulated by December 31, 2010.

#### *Lakes and Rivers Improvements Act*

The purposes of this Act are to provide for the management, protection, preservation and use of the waters of the lakes and rivers of Ontario and the land under them. The Act also provides for the protection and equitable exercise of public rights in or over the waters of the lakes and rivers of Ontario; the protection of the interests of riparian owners; the management, perpetuation and use of the fish, wildlife and other natural resources dependent on the lakes and rivers; the protection of the natural amenities of the lakes and rivers and their shores and banks; and the protection of persons and of property by ensuring that dams are suitably located, constructed, operated and maintained and are of an appropriate nature with regard to their purpose.

The Act prescribes;

- fundamental lake and river management policy, water management plans, waterway works, drought and flood management, etc.
- regulation and procedures for inland waterway use, protection of water habitat, construction of works, as well as public rights and responsibility and water privileges, etc.

#### *Public Lands Act*

The purpose of this Act is to provide the Minister of Natural Resources with responsibilities regarding the management, sale and disposition of the public lands and forests. Public lands may include the beds of rivers.

For the waterpower industry Part IV of the Act is of particular interest as it prescribes;

- the rights of the Minister to design, construct, renovate, service, maintain, repair, furnish, equip, manage and administer dams.
- the rights of the Minister in the event of emergency, as declared by the Lieutenant Governor in Council, and without the consent of the owner, to enter upon, alter, construct roads to, from or across, construct works on and deposit or remove material on private land in an action to protect the safety of persons, public or private property.

#### *Ontario Water Resources Act*

The purpose of this Act is to provide for the conservation, protection and management of Ontario's waters and for their efficient and sustainable use, in order to promote Ontario's long-term

environmental, social and economic well-being.

The Act prescribes;

- the powers of administration and supervision of the Minister of the Environment of all surface waters and ground waters in Ontario.
- the permitting requirements of all water takings from groundwater or surface water source for use more than 50,000 litres per day.
- Approval of all treatment and discharges of sewage to the natural environment.
- exemption of the law (i.e. water taking installed before March 30, 1961 and was not reconstructed, improved, extended, altered or replaced on or after that date.)

#### *Environmental Protection Act*

The purpose of this Act is to prohibit the discharge of contaminants to the natural environment with a risk of adverse effect. Prescribed instruments authorized by the Environmental Approvals and Assessment Branch of the Ontario Ministry of the Environment such as certificates of approval for air (noise and vibration) or waste management/disposal are applicable to the construction and operation of hydroelectric facilities.

#### *Ontario Green Energy and Economy Act*

The Act was passed into law on May 14, 2009 with the intended goal of fostering the growth of renewable energy projects, the removal of barrier, and the promotion of opportunities for renewable energy projects towards the creation of a green economy.

For waterpower projects the Green Energy and Economy Act prescribes the use of the Class Environmental Assessment for Waterpower Projects (OWA, 2008). The Act introduced the Ontario Feed-in-Tariff (FIT) program which offers stable pricing under long-term contracts for energy generated from renewable sources, including waterpower. The Ontario Power Authority (OPA) is responsible for implementing the program. The FIT program guarantees a rate of 13.1 ¢/kWh for waterpower projects with nameplate capacities below 10MW and a rate of 12.2 ¢/kWh for projects with nameplate capacities between 10 and 50MW. Increased FIT rates are available for waterpower projects with First Nation involvement.

#### *Planning Act*

The purpose of this Act is to regulate land use planning in the province that promotes sustainable economic development and to provide for a land use planning system led by provincial policy and in cooperation and consideration of municipal planning decisions. The Act also ensures that the planning processes are fair by making them open, accessible, timely and efficient. The Act is administered by the Ministry of Municipal Affairs and Housing and municipalities. The *Planning Act* may apply to hydroelectric projects if an amendment to a municipal official plan or a change in zoning, and/or a minor variance to a zoning by-law is required to build the project. Public consultation is a requirement of most land use applications requiring these changes.

The Act prescribes;

- general administration of land use planning on the local level through official plans, community improvement, land use controls, subdivision of land and power to acquire, clear, grade and exchange lands.
- rules on regulation forming under the Act.

#### *Ontario Electricity Restructuring Act*

The *Electricity Restructuring Act*, 2004, was passed by the Government of Ontario on December 9, 2004. The Act reorganized the province's electricity sector. The new legislation amended the *Ontario Energy Board Act*, 1998, and the *Electricity Act*, 1998. The purpose of the Act is the restructuring of Ontario's electricity sector, to promote the expansion of electricity supply and capacity, including supply and capacity from alternative and renewable energy sources, facilitate load management and electricity demand management, encourage electricity conservation and the efficient use of electricity and regulate prices in parts of the electricity sector.

#### *Electricity Act*

The purposes of this Act are to ensure the adequacy, safety, sustainability and reliability of electricity supply in Ontario through responsible planning and management of electricity resources, supply and demand; to encourage electricity conservation and the efficient use of electricity in a manner consistent with the policies of the Government of Ontario; to facilitate load management in a manner consistent with the policies of the Government of Ontario; to promote the use of cleaner energy sources and technologies, including alternative energy sources and renewable energy sources, in a manner consistent with the policies of the Government of Ontario; to provide generators, retailers and consumers with non-discriminatory access to transmission and distribution systems in Ontario; to protect the interests of consumers with respect to prices and the adequacy, reliability and quality of electricity service; to promote economic efficiency and sustainability in the generation, transmission, distribution and sale of electricity; to ensure that Ontario Hydro's debt is repaid in a prudent manner and that the burden of debt repayment is fairly distributed; to facilitate the maintenance of a financially viable electricity industry; and to protect corridor land so that it remains available for uses that benefit the public, while recognizing the primacy of transmission uses.

The Act prescribes;

- the duties of the Independent Electricity System Operator which oversees the establishing and governing of markets related to electricity and ancillary services; coordinates agreements with transmitters; maintains reliability of the grid; outlines technical standards and safety regulations; coordinates with responsible authorities outside of Ontario.
- the rules governing and duties of the Ontario Power Authority regarding the management of

supply, capacity and demand requirements; management of alternative energy sources; system load management including promotion of conservation and efficient use of electricity and facilitate stability in rates for consumers.

- the statutory duties and restrictions of Hydro One Inc.
- the rules, rights and restrictions of Ontario Power Generation Inc.
- the rules governing the ownership and use of corridor lands.
- the access to distribution and market rules; emergency plans, powers of entry and property interests.
- rules governing electrical safety.

#### *Ontario Energy Board Act*

The purpose of this Act is to establish and regulate the power and duties of the Ontario Energy Board (OEB). In the electricity sector, the duties of the OEB include;

- setting transmission and distribution rates
- approval of the Independent Electricity System Operator (IESO) budget and fees
- setting the rate for the Standard Supply Service for distribution utilities that supply electricity directly to consumers
- licensing all market participants, including generators
- approving the construction of electricity transmission lines longer than two kilometres
- approving specific business arrangements involving the regulated parts of Ontario's electricity industry.
- monitoring markets in the electricity sector and reporting to the Minister of Energy on the efficiency, fairness and transparency and competitiveness of the markets as well as reporting on any abuse or potential abuse of market power.
- reviewing the IESO market rules and consider appeals of IESO orders

The Board does not regulate competitive services (i.e. all business activities other than distribution, transmission and providing Standard Supply Service).

Other purposes of the Act are:

- to protect the interests of consumers with respect to prices and the adequacy, reliability and quality of electricity service.
- to promote economic efficiency and cost effectiveness in the generation, transmission, distribution, sale and demand management of electricity and to facilitate the maintenance of a financially viable electricity industry.

#### *Any Other Laws, Ordinances and Regulations*

Other Ontario provincial legislation that may apply to hydroelectric development projects under certain circumstances include;

*Endangered Species Act*  
*Gasoline-Handling Act & Code*  
*Pesticides Act*

## **Northwest Territories (NWT)**

In the NWT, the most direct influence on hydro development is from the Mackenzie Valley Resource Management Act and associated Regulations, which were proclaimed in 1998, and which in turn established the Mackenzie Valley Land and Water Board. The MVRMA is federal legislation which “creates an integrated co-management structure for public and private lands and waters throughout the Mackenzie Valley in the Northwest Territories”.

According to a handbook prepared by Indian and Northern Affairs Canada, “The Act establishes public boards to regulate the use of land and water, to prepare regional land use plans to guide development, and to carry out environmental assessment and reviews of proposed projects in the Mackenzie Valley. The Act also makes provisions for monitoring cumulative impacts on the environment, and for periodic, independent environmental audits. As institutions of public government, the boards regulate all uses of land and water while considering the economic, social and cultural well-being of residents and communities in the Mackenzie Valley.”

The Mackenzie Valley, as defined in the Act, includes all of the Northwest Territories, with the exception of the Inuvialuit Settlement Region, and the Wood Buffalo National Park.

There are 5 identified groups of First Nations people in the Mackenzie Valley: the Gwich'in First Nation (represented by the Gwich'in Tribal Council), the Sahtu First Nation (represented by the Sahtu Secretariat Incorporated), the Tlicho First Nation (represented by the Tlicho government) or bodies representing other Dene or Métis of the North Slave, South Slave or Dehcho regions. Doing business in the region may include interaction with one of more of these groups and their associated regulatory agencies.

Other major legislation that relates to the development and operation of hydropower facilities enacted by the government of NWT are the NWT Waters Act, and the Territorial Lands Act. A short description of these Acts is provided below.

### *NWT Waters Act*

The Act provides a unique framework for managing water resources. The Mackenzie Valley Land and Water Board is responsible for conservation, development, and use of water resources. Indian and Northern Affairs Canada (INAC) are responsible for enforcing the legislation and for resource planning, collecting data, and supplying information to territorial water boards and the public. This federal Act regulates the use of inland waters and deposit of waste into such waters in the Northwest Territories and the Yukon, to provide for the conservation, development and utilization of

waters in a manner that will provide the optimum benefit for all Canadians and for the residents of the territories in particular. The Act establishes Water Boards, sets out their purpose and powers, and describes the process for issuing water licences, including the public hearing process.

#### *Territorial Lands Act*

The Territorial Lands Act regulates work on, mineral rights to, and access to federal crown lands in the Northwest Territories, except in areas administered by Aboriginal authorities. The Territorial Lands Act grants long term use or occupancy of crown lands with a lease, license, or Agreement of Sale.

When permanent structures and long-term occupation of the land is requested, the Regulations administer surface rights to parcels of Territorial lands.

#### *Environmental Protection Act*

This Act provides the government of the NWT with the authority to control the discharge of point and non-point source pollutants to the natural environment. It also allows for the development of regulations, standards and guidelines relating to the preservation, protection and enhancement of the environment.

#### Other Laws, Ordinances and Regulations

Other NWT legislation that may apply to hydroelectric development projects under certain circumstances include;

- Wildlife Act

- Dominion Water Power Act

- Canada National Parks Act

- Navigable Water Protection Act

- Species at Risk Act

- Municipal Act



## **British Columbia**

In the province of British Columbia the Ministry of Agriculture and Lands, and Ministry of Environment are responsible for allocating Crown land and water for the benefit of British Columbians. They play important roles in environmental assessment, land tenure and protection and the management of the environment. Applications for a waterpower project will be processed through "one window" with the water licence and Crown land tenure applications adjudicated concurrently. The major legislations that relate to the development and operation of hydropower facilities enacted by the government of British Columbia are the Environmental Assessment Act, Water Act, Land Act, Ministry of Environment Act, Municipal Act, Public Utilities Act, Utilities Commission Act, Hydro and Power Authority Act and the Transmission Corporation Act. A short description of these Acts is provided below.

### **B.C. Environmental Assessment Act (Environmental Assessment Reviewable Project Regulations)**

The purpose of this Act is the betterment of the people of the whole or any part of British Columbia by providing for the protection, conservation and wise management of the environment in the Province.

The Act prescribes;

- application and approval process for the planning of undertakings (i.e. terms of reference, class environmental assessments, review process)
- obligation for consultation with agencies, public and First Nations
- cooperation of the environmental assessment planning process between other levels of government
- ministerial reviews and tribunals
- designation and powers of provincial officers
- issuance of policy guidelines pertaining to the Act
- rules for record keeping of the environmental assessment

### **Water Act (Water Regulation)**

The purpose of this Act is to provide for the conservation, protection and management of BC's waters and for their efficient and sustainable use, in order to promote British Columbia's long-term environmental, social and economic well-being.

The Act prescribes;

- the powers of administration and supervision of the Minister of the Environment of all surface waters and ground waters in BC.
- the permitting requirements of all water takings from groundwater or surface water source for use.
- Approval of all treatment and discharges of sewage to the natural environment.
- exemption of the law

### *Land Act*

The purpose of this Act is to provide the Minister of Agriculture and Lands with responsibilities regarding the management, sale and disposition of the public lands and forests. Public lands may include the beds of rivers.

The Act prescribes;

- the rights of the Minister to design, construct, renovate, service, maintain, repair, furnish, equip, manage and administer dams.
- the rights of the Minister in the event of emergency, as declared by the Lieutenant Governor in Council, and without the consent of the owner, to enter upon, alter, construct roads to, from or across, construct works on and deposit or remove material on private land in an action to protect the safety of persons, public or private property.

### *Ministry of Environment Act*

The purposes and functions of the Act are to outline the responsibilities of the Minister of the Environment to administer matters relating to the environment. Directly taken from the Act is the following list of matters and responsibilities of the Ministry of the Environment;

- (a) to encourage and maintain an optimum quality environment through specific objectives for the management and protection of land, water, air and living resources of British Columbia;
- (b) to undertake inventories and to plan for and assist in planning, as required, for the effective management, protection and conservation of all water, land, air, plant life and animal life;
- (c) to manage, protect and conserve all water, land, air, plant life and animal life, having regard to the economic and social benefits they may confer on British Columbia;
- (d) to set standards for, collect, store, retrieve, analyze and make available environmental data;
- (e) to monitor environmental conditions of specific developments and to assess and report to the minister on general environmental conditions in British Columbia;
- (f) to undertake, commission and coordinate environmental studies;
- (g) to develop and sustain public information and education programs to enhance public appreciation of the environment;
- (h) to plan for, design, construct, operate and maintain structures necessary for the administration of this Act or for another purpose or function assigned by the Lieutenant Governor in Council;
- (i) to plan for, coordinate, implement and manage a program to protect the welfare of the public in the event of an environmental emergency or disaster

Public Utilities Act, Utilities Commission Act, Hydro and Power Authority Act and the Transmission Corporation Act

The purposes of these Acts is to ensure the adequacy, safety, sustainability and reliability of electricity supply in British Columbia through responsible planning and management of public utilities and electricity resources, to facilitate load management in a manner consistent with the policies of the Government to promote the use of cleaner energy sources and technologies, including alternative energy sources and renewable energy sources, in a manner consistent with the policies of the Government to provide generators, retailers and consumers with non-discriminatory access to transmission and distribution systems in British Columbia; to protect the interests of consumers with respect to prices and the adequacy, reliability and quality of electricity service

The Acts prescribes;

- the duties which oversee the establishing and governing of markets related to electricity and ancillary services; coordination of agreements with transmitters; maintenance of grid reliability; an outlines technical standards and safety regulations; coordination with responsible authorities outside of British Columbia
- the duties of the British Columbia Utilities Commission which oversees the establishing and governing of markets related to electricity and ancillary services; reviews and oversees agreements with transmitters; manages alternative energy sources
- the statutory duties and restrictions of public utilities to protect the interests of consumers with respect to prices and the adequacy, reliability and quality of electricity service and to promote economic efficiency and cost effectiveness in the generation, transmission, distribution, sale and demand management of electricity and to facilitate the maintenance of a financially viable electricity industry
- the rules, rights and restrictions of power generators
- rules governing electrical safety

Other Laws, Ordinances and Regulations

Other British Columbia legislation that may apply to hydroelectric development projects under certain circumstances includes;

Environmental Management Act  
Water Protection Act  
Fish Protection Act  
Forest Practices Code of British Columbia Act  
Forest and Range Practices Act  
Dam Safety regulation  
Sensitive Stream Designation and Licensing Regulation  
Provincial Policy for Consultation with First Nations  
Agriculture and Rural Development Act  
Heritage Conservation Act  
Park Act