



November 30, 2010

Department of Fisheries and Oceans Canada
28 Waubeek Street
Parry Sound, ON
P2A 1B9
Attn: Ms. Jennifer Predie, Senior Habitat Biologist

And to:

Ministry of Natural Resources
Parry Sound District
Highway 11 North at High Falls Road
Bracebridge, ON
P1L 1W9
Attn: Mr. Steve Taylor and Mr. Steve Scholten

Re: North Bala Falls Small Hydro Project

Dear Ms. Predie, Mr. Taylor and Mr. Scholten:

Please find attached a copy of our Letter of Intent as prepared by our environmental consultants Hatch Energy. This Letter of Intent should be reviewed in coordination with our Environmental Screening Review / Report (ESR report) issued October 2009. Items provided in the attached Letter of Intent are meant to update the original ESR report based on comments and commitments made subsequent to its issuance in October 2009.

Please do not hesitate to contact me at 905-331-9692 or email at kmcghee@m-k-e.ca if you would like to discuss the project further.

Yours sincerely,

SWIFT RIVER ENERGY LIMITED

A handwritten signature in black ink, appearing to read "K. McGhee", written in a cursive style.

Karen McGhee, P.Eng.
Bala Falls Project Manager

c.c. Adam Sanzo, MOE EAAB

2300 Yonge Street
Suite 801, P.O. Box 2300
Toronto, ON M4P 1E4
www.balafalls.ca

Project Report

November 30, 2010

**Swift River Energy Limited
North Bala Small Hydro Project**

DISTRIBUTION
J. Predie – DFO
S. Taylor/S. Scholten – MNR
K. McGhee – SREL

**Letter of Intent for Works or Undertakings Affecting Fish Habitat
North Bala Generating Station**

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1. Introduction and Background

Swift River Energy Limited (SREL) is proposing to construct a 4.3-MW waterpower facility between the North and South Dams at the outlet of Lake Muskoka in the village of Bala, Ontario in the Township of Muskoka Lakes (ESR Figure 1.1). Both dams are currently owned and operated by the Ontario Ministry of Natural Resources (MNR) in accordance with the provisions of the Muskoka River Water Management Plan (MRWMP).

The North Bala Dam site was offered for competitive release under the MNR Waterpower Site Release Policy. SREL submitted a Plan of Development (POD) in July 2005 and was named the Applicant of Record (AR). SREL subsequently retained Hatch Energy (Hatch) to undertake detailed feasibility studies to identify a preferred design and mode of operation, and to undertake the environmental screening.

No new dam construction will be involved in the development of the proposed facility. The development will consist of the excavation of an intake channel, construction of a powerhouse, and excavation of a tailrace returning water to the Moon River immediately below the site (ESR Figure 1.2). The arrangement of the proposed development is based on a gross head of approximately 6.2 m, which is provided by the existing dams at the site. There will be no structural changes made to the two existing dams as part of the project.

Both dams are presently operated as water control structures, and are used to regulate the water level in Lake Muskoka and control flows into the downstream area, being Bala Reach and the Moon River. Both dams are presently operated by the removal and replacement of timber stop logs, with the South Bala Dam being the main operational structure. The North Bala Dam is presently operated mainly during the spring freshet to provide additional flow capacity (as required) with stop logs subsequently replaced for the remainder of the season.

The Environmental Screening/Review Report (ESR) was issued for public, agency and First Nation review in October 2009. Fisheries and Oceans Canada (DFO) provided comments on November 26, 2009 (Appendix A) and raised a number of concerns related to loss of aquatic habitat due to the proposed development. Discussions with DFO have led to revisions to the construction and operational plans for the facility as noted in the subsequent sections.

The following sections outline the final plan for fish habitat related measures for the North Bala Dam. Where measures that were outlined in the ESR will remain unchanged, those are noted and identified as such. Where new or replacement measures are proposed, they are also identified as such. The proposals contained herein will supersede the plans and measures outlined in the ESR.

2. Construction Effects and Proposed Mitigation

2.1 Construction Activities and Effects

Section 5 of the ESR identified the construction activities associated with development of the site and described the alterations to habitat at the approach to the intake channel and in the tailrace area.

Those activities are unchanged from those noted in the ESR, and are summarized here for completeness.

2.1.1 Intake Channel

Works proposed to divert flow from Lake Muskoka to the facility (see ESR Figure 5.2) would result in the permanent alteration of 250 m² of shoreline habitat in the approach to the intake channel. This area is considered non-specific fish habitat (foraging, resting) and consists of bedrock (60%), boulders (20%), cobble (10%) and gravel (10%). Existing substrates would be removed and the area would be deepened to match the invert elevation of the intake channel leading to the powerhouse.

The remainder of the intake channel would be excavated into the existing shoreline/island between the north and south channel outlets of Lake Muskoka. The intake channel would be approximately 13 m in length, 11 m wide and 4 to 5 m deep. Depending on subsurface conditions encountered during construction, the channel is likely to have near vertical walls (assuming excavation into bedrock) and a relatively flat bottom, sloping downward to the facility intake. The construction of this channel would result in the creation of 182 m² of low quality wetted habitat.

2.1.2 Tailrace Channel

Works proposed to return flow from Lake Muskoka to Bala Reach downstream of the facility (see ESR Figure 5.2) would result in the permanent loss of 5 m² of wetted habitat and the permanent alteration of 190 m² of shoreline habitat between the North and South Dam outlet channels. This area is also considered non-specific fish habitat (foraging, resting) and consists of exposed bedrock (40%), boulders (10%), cobble (30%) and gravel (20%). Existing substrates would be removed and the area would be deepened to match the invert elevation of the outlet from the powerhouse.

2.1.3 Blasting Effects

The following information related to blasting is contained in Section 5.2.7.2 of the ESR and is repeated here for completeness.

Blasting in and around water has the potential to result in disturbance, injury or death to aquatic biota (including incubating eggs) (Wright and Hopky 1998). Therefore, in order to protect fish and fish habitat, all blasting is to be conducted in accordance with the *Guidelines for the Use of Explosives in or near Canadian Fisheries Waters* (Wright and Hopky 1998). These guidelines specify that

1. no explosive should be used in or near fish habitat that could produce an instantaneous pressure change greater than 100 kPa in the swim bladder of a fish (appropriate setback distances or charge burial depths are specified in the Guidelines to ensure this criteria is satisfied)
2. no explosive should be detonated if it is likely to produce a peak particle velocity greater than 13 mm/s in a spawning bed during the period of egg incubation (i.e., during the MNR in-water works timing restriction period of April 1 to July 15).
3. no ammonium nitrate fuel oil mixtures should be used in or near water, as this could potentially result in surface water quality impairment.

SREL acknowledges that a Section 32 Authorization for fish kill due to blasting will be issued for the project. To ensure that the requirements noted within the Authorization are satisfied, the project contract documents will require that the Contractor abide by the applicable approval requirements under the federal Fisheries Act. Monitoring will be conducted throughout the construction period to verify that mitigation measures are implemented as specified and having the desired effect.

2.2 Mitigation of Construction Effects

To mitigate the alteration of habitat due to construction of the intake and tailrace channels, the following measures are proposed. Existing and new measures are noted as such.

1. New - A series of individual pockets or cross channel ditches, totalling approximately 150 m² (approximately 75 m² per channel), be over-excavated into the outer extent of the intake and tailrace channel bottoms, in which blasted rock is allowed to remain at the completion of the construction process. These areas would be colonized over time by benthic organisms that select their own niche within the variable flow velocities that would be present over and within that material. Given the flow characteristics of each area, these patches of coarse habitat within each channel are expected to develop into a source of drift organisms for the downstream reach.
2. Existing - Two benthic habitat/spawning shoals are proposed on either side of the tailrace channel as shown in ESR Figure 5.3. Each structure will be constructed on the upper edge of the tailrace and will be formed by adding coarse rock fill (consisting of excavated material from the intake channel and powerhouse excavation) topped with a 0.40-m thick layer of 10 to 15-cm diameter rounded river stone. Each structure will be graded so that the surface is approximately 0.8 m below the normal freshet water level. The structure will be subject to relatively constant hydraulic conditions and will be designed to provide benthic habitat and spawning habitat for walleye and white sucker. It is anticipated that the individual structures will enhance approximately 44 m² and 38 m² of habitat for a total area of approximately 82 m².
3. Existing - An existing area of walleye spawning habitat on the south shore of the channel below the South Dam (see ESR Figure 5.3) will be enhanced. The shoal will be created by adding coarse rock fill (consisting of excavated material from the intake channel and powerhouse excavation) topped with a 0.40-m thick layer of 10 to 15-cm diameter rounded river stone. The shoal will be graded so that the surface is approximately 0.8 m below the normal freshet water level. Walleye are known to spawn at depths of up to 2 m. It is anticipated that approximately 64 m² of suitable walleye and white sucker spawning habitat will be created. The rocky shoal will also provide additional habitat for benthic invertebrate production.
4. New – A Section 32 Authorization for fish kill due to blasting will be issued to SREL. The construction Contractor will advise Fisheries and Oceans Canada, Parry Sound office of blasting plans no less than 2 weeks prior to the start of any blasting activities.

3. Operational Effects and Proposed Mitigation

3.1 Operational Activities and Effects

Once the North Bala Small Hydro Project is in place and operational, SREL will take over operation of both the North and South dams. Flows will be passed as per the plan noted below.

3.1.1 Existing Flow Regime

A number of existing flow requirements are currently in place for the outlet of Lake Muskoka as detailed in the Muskoka River Water Management Plan and in Section 6.2.2.1 of the ESR. These are:

- a flow of 4 m³/s through the Burgess Generating Station, and
- a flow of 1 m³/s through each of the North and South Bala Dams (typically by leakage).

Together, these previous commitments amount to 6 m³/s. As noted in Section 1, the South Dam is the main operational structure, with the North Dam used primarily to pass flow in excess of the capacity of the South Dam.

3.1.2 Proposed Flow Regime - New

When the North Bala GS is constructed and in operation, the facility will pass up to 96 m³/s through the powerhouse. Combined with the existing flow requirements at the outlet of Lake Muskoka, the total flow will then equal 102 m³/s. Flow in excess of 102 m³/s will be assigned to either the North or South dam as noted below.

3.1.2.1 North Dam Flow Regime

SREL will provide a flow of 9.5 m³/s into the reach below the North Dam during the spring to maintain the walleye spawning habitat along the north shore of Bala Reach, as shown in Figure 2.9. Initiation of that flow will occur in the spring (typically late March/early April as per ESR Figure 6.1) when outflow from Lake Muskoka typically exceeds 109.5 m³/s, and would be retained for a 2-week period during the walleye spawning event (walleye spawning typically occurs between April 15 to June 1 of any year). The timing of the initiation of the spawning release may vary from year to year depending on water temperature, and will be determined in consultation with MNR's Bracebridge Area Office. Subsequent to the release for spawning, 2 m³/s will be released through the North Dam (primarily via leakage) for an additional two weeks during the egg incubation period.

Should outflows from Lake Muskoka exceed 109.5 m³/s for longer than the required 2-week period during any year, SREL will continue to provide 9.5 m³/s through the North Dam. As Lake Muskoka outflows recede toward 102 m³/s, flows in excess of generating capacity at Burgess and North Bala GS may continue to be passed through the North Dam. SREL will then continue to provide 2 m³/s (by leakage) through the North Dam through the remainder of the incubation period.

Should outflows from Lake Muskoka during any specific year not be adequate to allow for the release of the above-noted walleye spawning flow (9.5 m³/s), SREL will reduce generating capacity to provide the agreed upon flow.

3.1.2.2 *South Dam Flow Regime*

As noted in Section 3.1 above, all flow in excess of 109.5 m³/s would be diverted through the South Dam during the spring walleye spawning period, and flows above 102 m³/s would be diverted through the South Dam during the remainder of the year.

3.1.3 *Entrainment Mortality*

Operation of the North Bala GS may result in entrainment and passage of fish through the facility, with subsequent mortality due to turbine strike, pressure changes or other aspects of facility passage as noted in Section 6 (Subsection 6.2.5.6). DFO has indicated that a Section 32 Authorization under the Fisheries Act for any mortality associated with facility operation will be required for the project.

3.2 **Mitigation of Potential Operational Effects**

3.2.1 *Habitat Enhancements*

Existing - Habitat enhancements proposed along the south side of the outlet of the South Dam channel to Bala Reach (as described in Section 2.2 above) are expected to provide additional spring spawning habitat in that area when excess flows are passed through that channel during the spring freshet. No change to that measure is proposed

New - The ESR contained a proposal to install approximately 200 m² of spawning habitat at the outlet of the south channel (as noted in ESR Section 6.2.5.2, last paragraph, p 6-18) to replace habitat lost below the North Dam by the originally proposed flow regime. With the flow regime proposed in Section 3.1.2, the need for that habitat no longer exists, and it is withdrawn.

3.2.2 *Turbine Mortality*

The level of turbine mortality predicted for the facility (see ESR Section 6.2.5.6) is low. A Section 32 Authorization for this mortality will be issued by DFO. Monitoring will be undertaken as requested by DFO.

4. **Monitoring Plan**

Monitoring will be conducted by SREL (or its agents) to ensure the works are constructed according to the final plans and to determine whether the mitigation measures outlined above are developed and functioning as intended. The monitoring program shall include, but not be limited to, the following Construction Monitoring Plan and Mitigation Monitoring Plan. Written notification of the commencement of works or undertakings shall be provided to DFO five (5) days prior to the initiation of those works or undertakings.

4.1 **Construction Monitoring Plan**

4.1.1 *Fish Habitat*

SREL (or its agent) commits to the monitoring of the fish habitat mitigation measures during construction as follows:

- Monitor and ensure the proper function of the erosion and sediment controls; also inspect such activities as dewatering, stockpiling, site stabilization and, refueling/maintenance activities. If

- any problems with erosion, sediment control effectiveness, geo-textile stability or other fish habitat issues are encountered, repairs shall be made promptly.
- A Project Construction Monitoring Report shall include a photographic record of pre-construction conditions, the work phase, including implemented mitigation measures, and completed project showing that all works and undertakings have been completed according to the proponent plan and conditions of this Authorization. The construction report shall be submitted to DFO no later than December 31, 2013 (construction is expected to be completed by spring 2013).
 - All photographs for each period of documentation shall be taken from the same vantage point(s), direction and angle of view, and shall be clearly labelled with the date, location and viewing direction. The photographic locations and viewing directions shall be indicated on a plan view drawing of the work site and clearly indexed to the photographs.
 - “As constructed” drawings shall be included in the final report.

4.1.2 Fish Mortality

Monitoring of the construction process will be undertaken to ensure that blasting activities are not adversely affecting fish. Results of that monitoring will also be reported in the Project Construction Monitoring Report.

4.2 Mitigation Monitoring Plan

4.2.1 Fish Habitat

To assess the success of the fish habitat mitigation measures, SREL will implement a monitoring program consisting of the following components:

- Monitoring shall be conducted for a period of two (2) years upon completion of the mitigation works. The Mitigation Monitoring Report shall be submitted to DFO (Parry Sound Office) on or before December 31 the year of monitoring completion (i.e., 2014 and 2015). Each report shall include, but not be limited to, a detailed summary on the physical stability of each project, and any indications of fish usage including dates of observations and photographs or plan view site sketches whenever possible.
- Any problems encountered with the stability or function of the various fish habitat improvement works that would cause harm to fish or the environment shall be promptly repaired following consultation and approval of the modifications by DFO.

4.2.2 Fish Mortality

Observations of fish mortality will be undertaken throughout the life of the project when SREL personnel are on site for other activities (facility maintenance, North or South Bala dam operations, etc). Results of those monitoring activities will be reported to DFO bi-annually.

5. Reports

All mitigation and environmental monitoring reports will be submitted to MNR, Bracebridge and DFO - Habitat Management Program - Northern Ontario District, Parry Sound Office.

Reports describing the results of all environmental monitoring programs will be submitted on an annual basis (presumably December 31 through construction and post-construction).

Environmental Screening Report (ESR) Figures