

## **C8 Heritage Impact Assessment**

# HERITAGE IMPACT ASSESSMENT

## OF THE BALA FALLS BALA ONTARIO

January, 2009

Prepared For:  
Swift River Energy Limited

By:  
HISTORICA RESEARCH LIMITED  
<history@golden.net

# HISTORICA RESEARCH LIMITED

---

January 13, 2009

Karen McGhee, P.Eng.  
Swift River Energy Limited  
1959 Creston Place  
Burlington ON  
L7P 2Y5

Re: *Cultural Heritage Landscape Assessment of the Bala Falls*

Dear Ms. McGhee:

Please find attached my report, *Cultural Heritage Landscape Assessment of the Bala Falls*.

Please let me know if you require any further information.

Yours truly,



Christopher Andreae,  
President

## EXECUTIVE SUMMARY

### Study Purpose and Method

Swift River Energy Limited is proposing to construct a 3-5MW hydroelectric generating station on the Muskoka River at Bala in the Township of Muskoka Lakes. The plant is to be located on the south side of the North Channel of Bala Falls. By resolution dated Oct. 21, 2008, of the Township Council of Muskoka Lakes, Swift River Energy was requested to complete a heritage impact assessment of the proposed power plant. Swift River Energy retained Historica Research Limited at the beginning of November 2008 to undertake this heritage impact assessment.

This study followed the guidelines prepared by the Ministry of Culture in their document *Heritage Resources in the Land Use Planning Process* InfoSheet #5: Heritage Impact Assessments. A report prepared by Archaeological Services Inc for Swift River Energy was used to provide broad background historical information for the proposed development.

### Historical Resources

The North Falls and the South Falls constitute what are known today as the Bala Falls. The North Falls was part of the natural flow of the Muskoka River while the South Falls was created in the 1870s to provide increased flood-water discharge capacity. Over time South Falls has taken on a patina of age and appears to be a “natural” falls to most viewers.

With the beginning of settlement in the area, the former natural flow of Mill Stream was dammed and its falls were flooded. Today the Mill Stream visually appears as a headpond to a small generating station. In 1917 a small hydroelectric generating station commenced operation and is still producing hydro today.

The modern dam over the North Channel was built in 1958 to replace an earlier concrete dam constructed in 1909. The steel bridge over the channel was opened in 1955 to replace an earlier steel structure built in 1906.

South Channel was originally blasted through a rock ridge in 1875. A control dam was also constructed to regulate the water level. The present Highway 169 Bridge was completed in 1965.

Several historic structures are located in the area between the North and South Channels. Purk’s Place was built sometime prior to 1907 as a boat rental facility; a function it still serves today. The nearby Burgess Memorial Church was opened in 1926. The railway across the Muskoka River opened in 1908 and required three bridges to cross the water channels.

## Evaluation

The area of the Bala Falls extending from the park on the south shore of the Muskoka River to the park on the north side is a distinct cultural heritage landscape of water management, power generation, tourism, and transportation.

## Recommendations

### **Design of Powerhouse and Intake**

The powerhouse and intake structure should be designed such that they are visually sympathetic to the cultural heritage landscape of the Bala Falls,

### **Falls Interpretation**

Interpretive plaques should be designed and installed.

### **Deposit Copies of Report**

Copies of this report and all other relevant documentation produced by this undertaking should be deposited with the:

- Muskoka Lakes Library branches at Bala and Port Carling
- Muskoka Lakes Museum, Port Carling
- Bala Museum
- The Swift River Energy web site

# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b> .....	<b>I</b>
<b>TABLE OF CONTENTS</b> .....	<b>III</b>
<b>1 STUDY PURPOSE AND METHOD</b> .....	<b>1</b>
<b>2 PHYSICAL SETTING</b> .....	<b>3</b>
<b>3 SITE FEATURES/HISTORICAL CONTEXT</b> .....	<b>8</b>
3.1 Beginning Of Bala.....	8
3.2 North Channel.....	8
3.2.1 Bridges and Dams.....	8
3.2.2 North Shore of Channel .....	10
3.3 Burgess Island.....	12
3.3.1 Bala Road/Highway 169 .....	12
3.3.2 Buildings and Structures .....	13
3.4 South Channel.....	17
3.4.1 Dams and Bridges.....	17
3.4.2 South Shore of Channel .....	22
3.5 Mill Stream .....	22
<b>4 CULTURAL SIGNIFICANCE OF BALA FALLS</b> .....	<b>24</b>
4.1 Introduction.....	24
4.2 Cultural Heritage Values .....	25
4.2.1 Design Value/Physical Values .....	25
4.2.2 Historical Values .....	26
4.2.3 Contextual Values.....	26
4.3 Heritage Attributes .....	26
4.3.1 Design.....	27
4.3.2 Historical.....	27
4.3.3 Contextual .....	27
4.4 Summary.....	27
<b>5 PROPOSED UNDERTAKING</b> .....	<b>28</b>
5.1 Description.....	28
5.2 Potential Impacts of Undertaking.....	28
5.2.1 Intake structure .....	28
5.2.2 Powerhouse .....	28
5.3 Mitigation .....	30
5.3.1 Intake structure .....	30
5.3.2 Powerhouse .....	30
5.3.3 Interpretation of Falls.....	31

<b>6</b>	<b>RECOMMENDATIONS .....</b>	<b>32</b>
6.1	Design of Powerhouse and Intake .....	32
6.2	Falls Interpretation .....	32
6.3	Deposit Copies of Report.....	32
<b>7</b>	<b>SOURCES.....</b>	<b>33</b>

# 1 STUDY PURPOSE AND METHOD

Swift River Energy Limited is proposing to construct a 3-5MW hydroelectric generating station on the Muskoka River at Bala in the Township of Muskoka Lakes. The plant is to be located on the south side of the North Channel of Bala Falls. [Fig 1] By resolution dated October 21, 2008, the Township Council of Muskoka Lakes requested that Swift River Energy prepare a heritage impact assessment of the proposed power plant. Swift River Energy retained Historica Research Limited at the beginning of November 2008 to undertake this heritage impact assessment.



**Figure 1** Aerial view with North Falls on left and South Falls on right. *Source:* Swift River

This study follows the Ministry of Culture guidelines for conducting heritage impact assessments.<sup>1</sup> Background historical information was provided by a report prepared by Archaeological Services Inc. for Swift River Energy. Additional research was undertaken by Historica to provide a more site specific land use history of the impacted area. The sources consulted are given in Section 8 of this report.

A site assessment of the study area was undertaken on November 3, 2008. All colour photography was undertaken by Christopher Andreae during the site visit, unless otherwise noted in the captions.

---

<sup>1</sup> *Heritage Resources In The Land Use Planning Process* InfoSheet #5: <[www.culture.gov.on.ca/english/heritage/Toolkit/Heritage\\_PPS\\_infoSheet.pdf](http://www.culture.gov.on.ca/english/heritage/Toolkit/Heritage_PPS_infoSheet.pdf)>

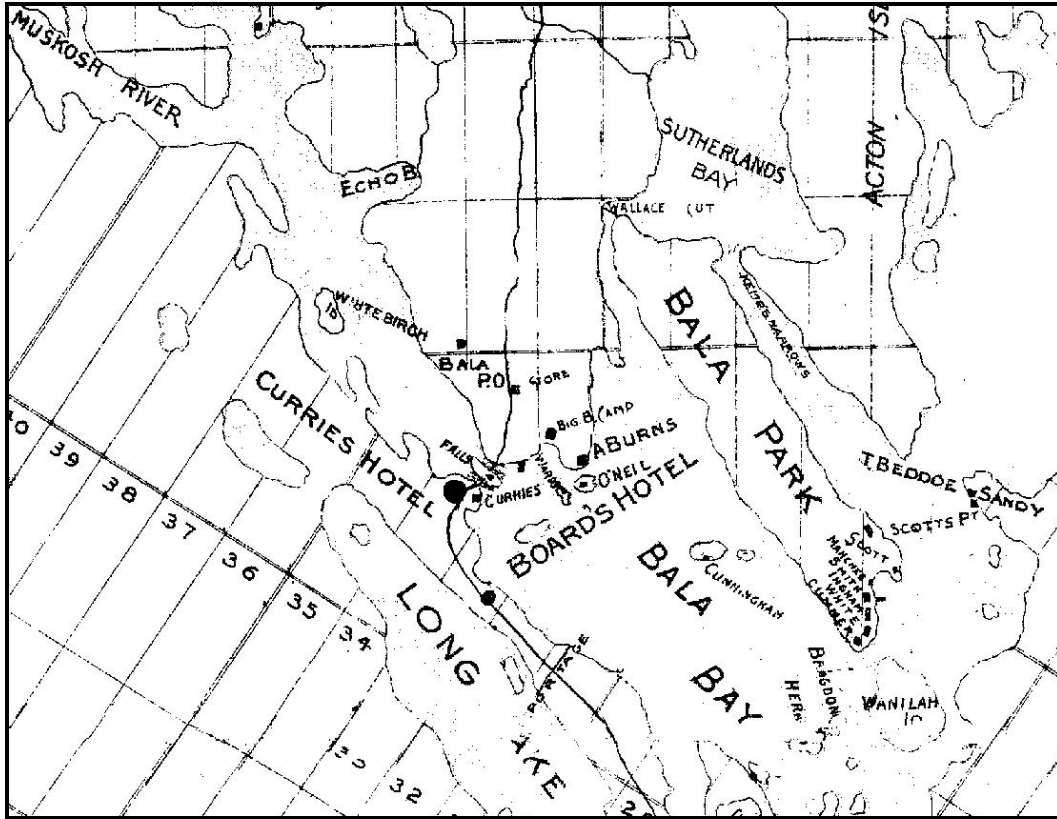


All structural dimensions in this text are given in Imperial units. In general the use of Imperial rather than metric is preferred for describing historic structures.

The dams at Bala are technically referred to as “control structures.” This report uses the term dam to describe both the historic and modern structures.

## 2 PHYSICAL SETTING

The Bala Falls are located where Lake Muskoka enters the Muskoka River. [Fig 2] The falls were created by a ridge of Precambrian bedrock that formed a natural dam in the river. Originally the river was known as the Musquosh River to distinguish it from the Muskoka River that flowed into the east side of the lake.



**Figure 2** Map of Bala and water system in 1899. Bala Bay on right is part of Lake Muskoka. Muskoka River flows north-west from Bala. The Bala Road is the black line running roughly north/south through Bala. The map also depicts the tourist resorts at the time. Source: *Map & Chart of the Muskoka lakes, 1899.*

The river bifurcated at Bala into two channels known today as the North Channel and the Mill Stream. In 1875 a new channel was blasted to create what is known today as the South Channel.

South Falls was created to provide increased flood-water discharge capacity. Over time South Falls has taken on a patina of age and appears to be a “natural” falls to most viewers. With the beginning of settlement, the Mill Stream was dammed and its falls were flooded. Today the Mill Stream visually appears to be a headpond to a small generating station. Since 1870 other changes have occurred to the falls area that altered their landscape. The changes are summarized in Figure 3

Portage Island was the name given to the land between the Mill Stream and the North Channel. The historic portage around the North Falls was located on this island.<sup>2</sup> When

<sup>2</sup> Bala – The way it was

the South Channel was constructed, a second island was created that is sometimes referred to as Burgess Island. It appears that modern usage calls this island Portage Island. As well, the presence of the island formed by the Mill Stream and North Channel is ignored. This report uses Burgess and Portage Island to differentiate the two.

Pre 1870:	natural; two channels – today known as North Channel and Mill Stream
c.1870:	Wide range of change in seasonal flow from Lake Muskoka
1873:	Mill Stream dammed and flow regulated for water power of mill
1875:	Enlargement of North Channel and construction of dam to regulate water level of Lake Muskoka
1875:	Excavation of South channel and construction of dam to regulate water of Lake Muskoka
1886:	Enlargement of South Channel to increase discharge capacity
1965:	Filling of bay and doubling length of South Channel

**Figure 3** Principal changes to Bala Falls c.1870 -1965

Man made changes to the Bala Falls were undertaken to control large seasonal variation in flows from Lake Muskoka. By the 1870s it was well known that the surface level of Lake Muskoka could vary by as much as nine-feet throughout the year. Since logging in the Muskoka watershed had only just begun and settlement was negligible, this variable flow was probably natural and not created by removal of the forest cover.

In 1872 the Ontario Minister of Public Works recommended that construction should be carried out at Bala Falls to deal with the dual problem of flood and shallow water.<sup>3</sup> In spring, high water caused extensive flooding along the shoreline and in the summer and fall, low water interfered with the safety of commercial steam navigation.

Today the dams at Bala maintain the surface of Lake Muskoka at 224.6-225.7 m. The Muskoka River is at 219.0-219.5 m. [Fig 46] This creates a gross head of 6.2 m (18.9-foot) which had been established at least by the beginning of the 20<sup>th</sup> century.<sup>4</sup> Before construction of the dams, the Falls had a “natural height of roughly ten-feet.”<sup>5</sup> [Fig 4, 5]

---

<sup>3</sup> DPW *Annual Report 1872*

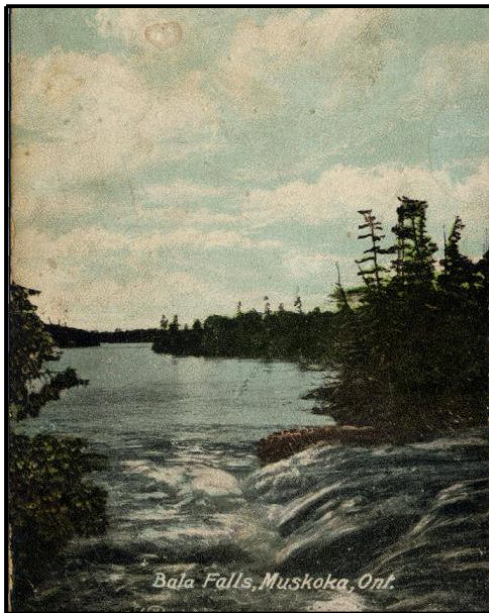
<sup>4</sup> Commission of Conservation, *Water Powers of Canada*, 1911.

<sup>5</sup> DPW *Annual Report 1913*

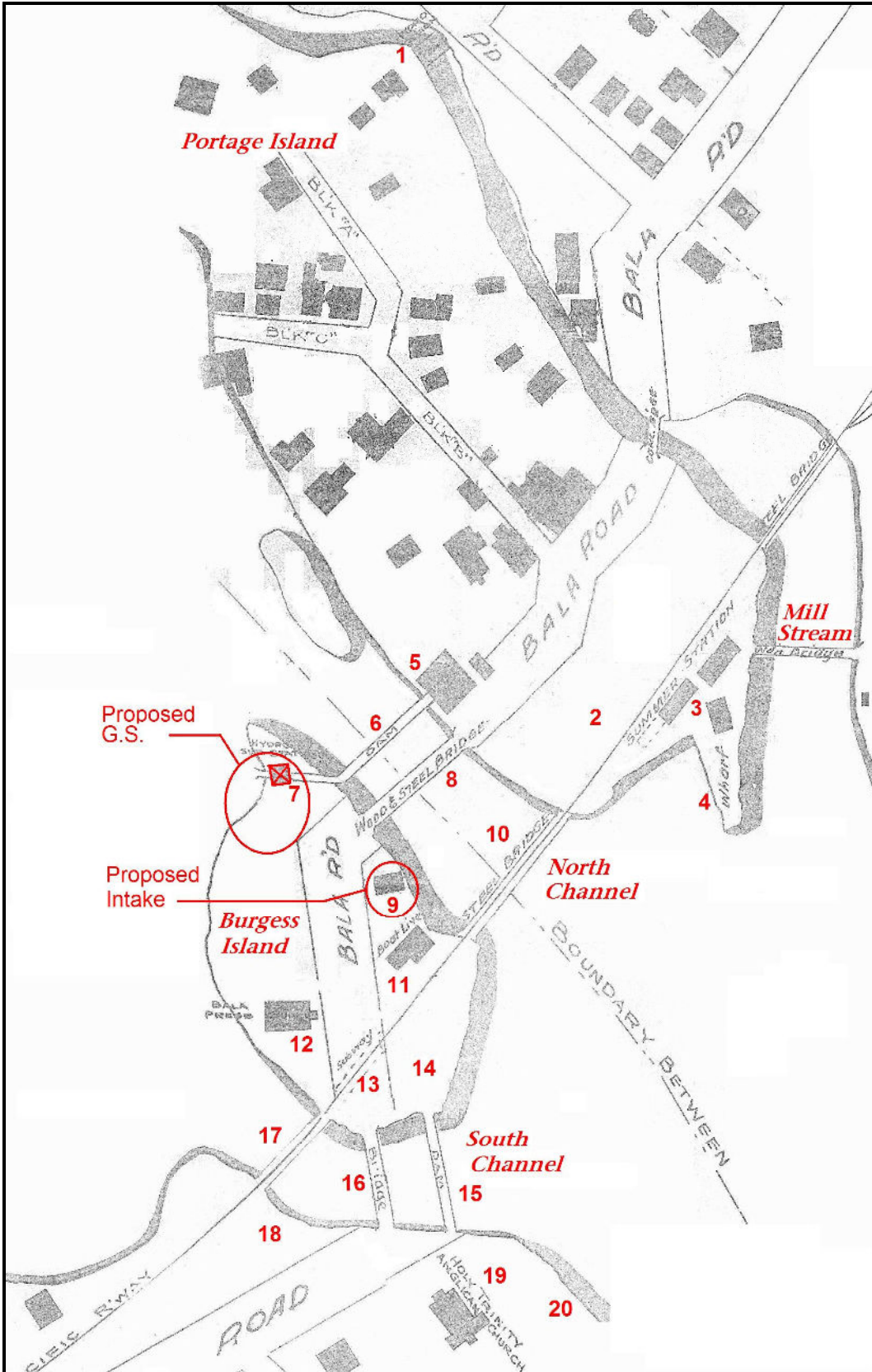


**Figure 4** Bala Falls, artist's impression, 1870s. This is assumed to be the North Channel. *Source: Page, Guide Book*

**Figure 5** Bala Falls, date unknown. The photo bears a striking resemblance to the print in Figure 4 and may have been used as the source. *Source: Sutton, Early History*



**Figure 6** Postcard of North Bala Falls. *Source: Google Images.*



**Figure 7** Plan of Bala in 1936. See following page for legend. *Source:* Underwriter's Survey Bureau, Bala Fire Insurance Plan.

Legend #	Text Fig #	Feature	Legend #	Text Fig #	Feature
1	43, 44	Bala #1 G.S.	12	20, 32	Unknown Building
2	16	CPR station Park		24, 25	Presbyterian Church
3	15	CPR Summer Station	13	19, 32	CPR Underpass
4	15	Steam Boat Landing	14	33	Unknown Building
5	9	Arcadia Ice Cream Parlour	15	29, 30, 40	1899 dam
6	10, 26	1909 Control Dam	16	32,33,34	1913 dam/bridge
7	26, 27	Bala #2 G.S.	17	--	CPR girder bridge
8	9, 26	1906 Steel Bridge	18	--	Vacant?
9	26	Unknown Building	19	--	Anglican Church
10	15, 26	CPR girder bridge	20	40	Bala Falls Hotel
11	22, 23	Hurling (?) Boat Livery			

Legend for Figure 7



**Figure 8** Aerial view showing the location of historic and modern photography. The numbers on this photo are the figure number in the text. *Source: Swift River*

## 3 SITE FEATURES/HISTORICAL CONTEXT

### 3.1 BEGINNING OF BALA

The Bala townsite was located on the north bank of the Muskoka River in the former Township of Medora. The south shore of the River was the former Wood Township and the boundary between the townships ran down the middle of the North Channel. Administratively, the two townships were combined as a single municipality. Thomas Burgess, the first settler, arrived in 1868. He acquired several adjacent lots in Medora Township that included all of the future townsite of Bala.<sup>6</sup>

No early settlement information was found for the south shore. However, the land for the Burgess Church on the island was apparently donated by the Burgess estate (See Section 3.3.2). This implies that the Burgess Family must have acquired some of the land in Wood Township, adjacent to Bala.

Burgess constructed a sawmill on what became known as the Mill Stream. This was a very fortuitous channel because it meant that he did not have to deal with the main volume of water coming down the river. The narrow Mill Stream would have been relatively easy to dam.

### 3.2 NORTH CHANNEL

#### 3.2.1 BRIDGES AND DAMS

**Musquosh (Bala) Road Bridge 1873:** The Musquosh Colonization Road was completed from Gravenhurst to Bala in 1872. In 1873, the Department of Crown Lands constructed a bridge across the river about 200 feet above the lip of the falls. This would place it somewhere in the vicinity between the present railway and highway bridges.<sup>7</sup>

**Timber Dam and Channel Enlargement 1874:** Construction of a dam and enlargement of the natural channel commenced in 1873 and was completed in 1874. The total cost of the work was \$9,000 and more than half of this (\$4,800) was used for blasting channels in the rock. The dam was located about 30 feet downstream of the bridge. The dam had two 27-foot openings. Rock was blasted and removed from the channel above and below the dam to the level of the stop log sills.<sup>8</sup> No other description of the dam was given. The structure is assumed to have been of timber crib piers with wooden stop-logs between them.

**Dam Extension 1886:** During the year the channel at the dam was widened at each end and two additional stop-log openings were constructed. The new openings were 27-feet and 15-feet in width.<sup>9</sup>

**Steel Bridge, 1906:** By the 20<sup>th</sup> century, the old timber bridge was in a decayed condition. A new steel bridge was erected during 1906 over the North Channel or, as it

---

<sup>6</sup> Archaeological Services Inc. *Stage One Archaeological Assessment: North Bala Hydroelectric Development, Town of Bala, Ontario*. September, 2008.

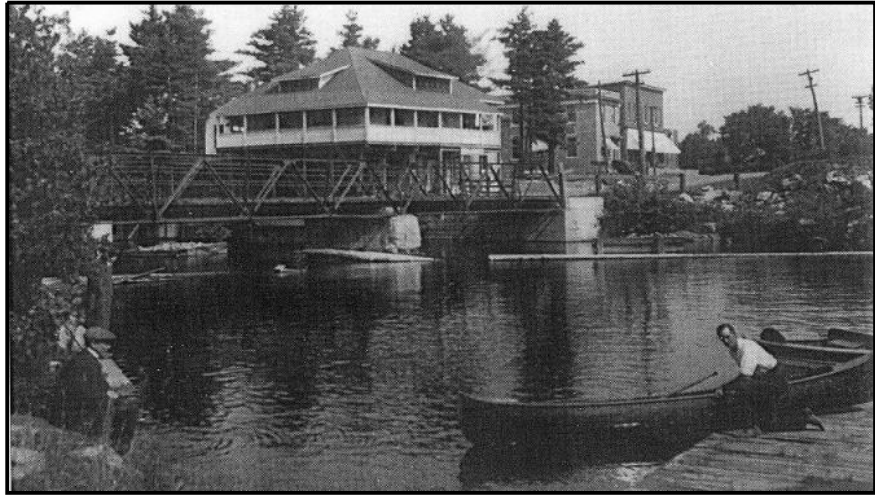
<sup>7</sup> DPW *Annual Report*, 1875

<sup>8</sup> DHO *Annual Report*, 1874,1875,1909

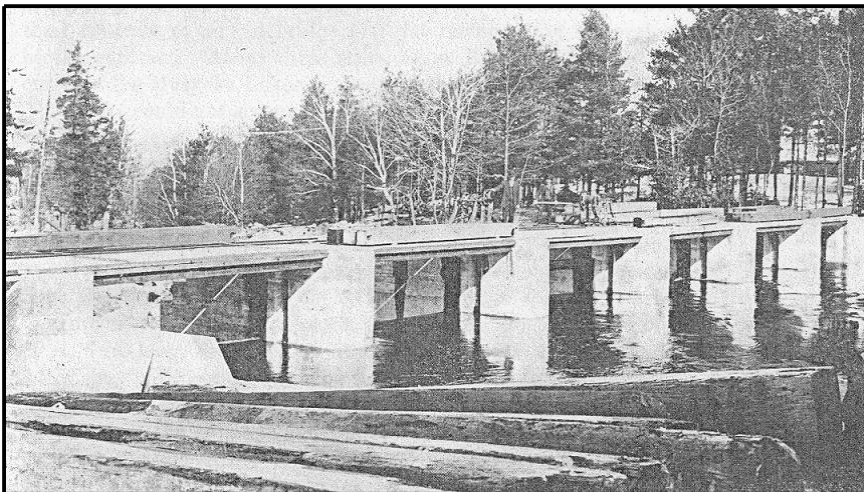
<sup>9</sup> DPW *Annual Report*, 1886, 1909

was sometimes called at that time, the “main channel.” [Fig 9] The new structure consisted of a centre span 75-feet in length, one span of 45-feet and one of 22-feet. The substructure consisted of two concrete piers and two abutments. The approaches were filled in for a distance of 20-feet at the north end and 30-feet at the south end.<sup>10</sup>

**Figure 9** Steel bridge built 1906 over the North Channel, no date. Building behind is the Arcadia Ice Cream Parlour and the canoe is docked at the Hurling Boat Livery. *Source: Petry, Bala*



**Concrete Dam, 1909:** In 1909 a concrete dam was constructed to replace the earlier 1874/1886 structure. [Fig 10, 26] The new dam was about 24-feet below the old one and roughly in the location of the present dam. The discharge capacity was increased to five openings 20-feet in width and one 16-feet wide. Rock was blasted and removed from the channel above and below the dam to the level of the stop log sills.<sup>11</sup>



**Figure 10** 1909 concrete dam. *Source: DPW Annual Report, 1909.*

**Present Bridge, 1955:** The Bala bridge was reconstructed in 1955 on the same site as the previous bridge. The new structure was designed as a continuous, steel-beam of three spans. [Fig 11] The two end spans were 42 feet each while the centre span was 73.5-feet.<sup>12</sup>

---

<sup>10</sup> DPW Annual Report , 1906

<sup>11</sup> DHO Annual Report, 1909

<sup>12</sup> DHO Annual Report, 1956

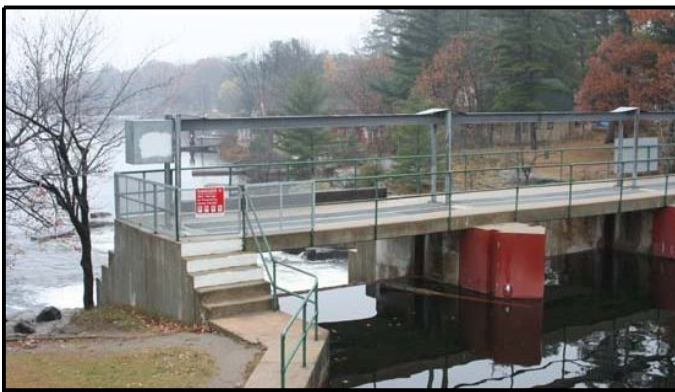


**Present Dam, 1958:** In 1958, the 1909 dam was replaced with the present concrete dam and abutments.<sup>13</sup> [Fig 12, 13]



**Figure 11** Haunched steel girder structure of Highway 169 over the North Channel.

**Figure 12** Looking up the North Falls to the 1958 control dam



**Figure 13** Looking downstream to the Muskoka River from the 1958 control dam.

### 3.2.2 NORTH SHORE OF CHANNEL

Carr's Arcadia Ice Cream Parlour was constructed after 1916 on the west side of the Bala Road. The building was demolished when the new bridge was constructed across North Falls in 1955. The Bala United Church, built 1935, was located adjacent to the ice cream parlour. The building replaced the original church destroyed by fire the previous year.<sup>14</sup>

---

<sup>13</sup> *Bala – The way it was*

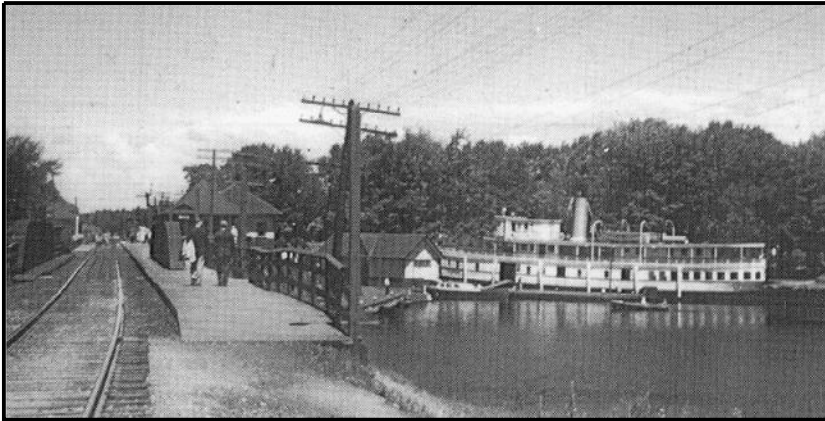
<sup>14</sup> *Bala, an Early Settlement in Muskoka; Early History of Bala.*

Today the site of Arcadia Ice Cream, and the vacant land that was below it is a public park adjacent to the North Falls. The United Church is on the edge of the park. [Fig 14] This area is an open park.

**Figure 14** Park at edge of North Falls with Bala United Church in background.

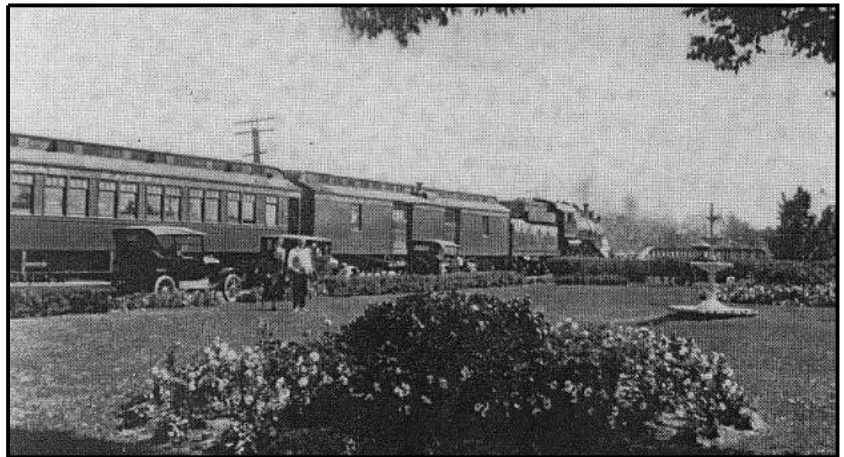


In 1904, construction began on the new Canadian Pacific mainline from Toronto through Bala to Sudbury. Track through Bala was completed in June, 1907 but the line was not open throughout until the following year. A summer station was completed adjacent to the bridge over the North Channel and adjacent to the steamship landing. Since the station was built on top of the track embankment, a ramp connected the summer station to the town dock. The company built a landscaped park between the station and the town to add to the tourist ambiance of the setting. The summer station was demolished in 1957 and the former park is now a parking lot.<sup>15</sup> [Fig 15-18]



**Figure 15** Summer station with platform built on to the railway bridge. Steamship dock on right. *Source: Petry, Bala*

**Figure 16** Station park with bridge over North Channel visible in background. *Source: Petry, Bala*



---

<sup>15</sup> *Bala the way it was*



**Figure 17** Parking lot in foreground was once the Canadian Pacific station park. The two commercial buildings on the opposite side of Bala Road was the historic commercial centre of the village.

**Figure 18** Modern wharf on site of old steamship dock. The Canadian Pacific station was behind the pine trees on the right.



### 3.3 BURGESS ISLAND

#### 3.3.1 BALA ROAD/HIGHWAY 169

The Musquosh Road – later Bala Road, today Highway 169 – in 1872 was likely the first structure built on the future Burgess Island. Most of the island was much lower than it is today. Figure 20 shows an incline in the road leading up to the North Channel Bridge while Figure 31 shows a similar incline up to the South Channel. Although the road is obscured by trees in Figure 26 the road seems to have been raised to its present height by the 1920s. When the new Presbyterian Church was completed in 1926, the front entrance was made level with the road. [Fig 24] Large stone blocks were used as a retaining wall in front of the church. [Fig 25]

The situation of the Bala Road underpass on the Canadian Pacific Railway was typical of conflicts between railways and municipalities experienced in many locations throughout Ontario. When the railway embankment was constructed, the road was raised 11-feet on a ramp to a level crossing of the tracks. This road embankment was so steep that the Township took the Canadian Pacific to court in order to have the elevation changed. In 1909, the township was successful and the underpass was constructed. [Fig 19, 32] However, the resulting low, narrow subway remained a road hazard until the new Highway 69 Bridge and road realignment were completed in 1965.<sup>16</sup>

---

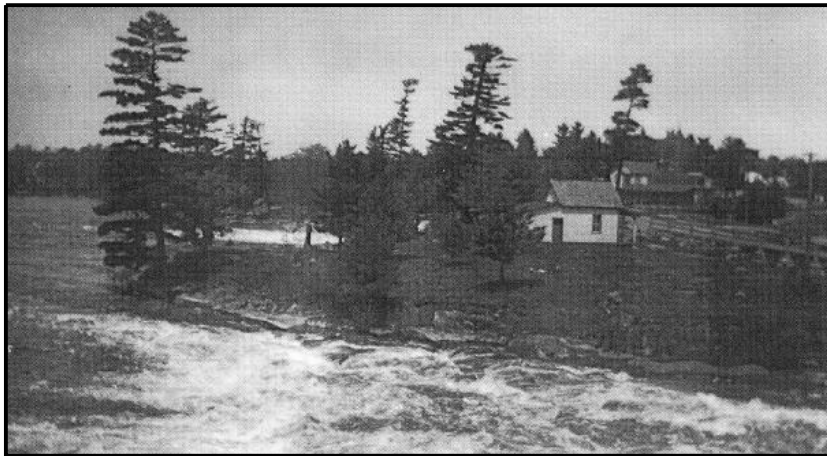
<sup>16</sup> *Bala the way it was*



**Figure 19** The single lane underpass with low headroom under the Canadian Pacific with the Presbyterian church in rear.

### 3.3.2 BUILDINGS AND STRUCTURES

Despite its proximity to the railway station, steamer dock and commercial centre of Bala, Burgess Island never contained many buildings. [Fig 7] Figure 20 shows only one house in the approximate location the later Presbyterian Church. The photo appears to date from c.1900. Figure 33 shows a wooden building adjacent to the railway tracks that might have been used by the railway or was perhaps another boat rental operation. Today there is a circular driveway in the area of this building. [Fig 21] No reason was found for the absence of buildings. It may have been due to land ownership. In 2008, Purk's Place and the former Presbyterian Church are the only two buildings standing on Burgess Island.



**Figure 20** Burgess Island and house. The church standing today is roughly in the location of this house. In the background is an unidentified building that was somewhere in the vicinity of the later Arcadia Ice Cream Parlour. *Source: Petry, Bala*

**Figure 21** Circular driveway at the north abutment of the South Channel dam. A large rock and oak tree are in the centre of driveway.



**Purk's Place/Hurling's Boat Livery:** M.S. "Sam" Hurling had a boat livery (boat rental) and ice cream parlour on the Bala Portage. [Fig 22, 23] It was built before the arrival of the Canadian Pacific in 1907. Since the railway went directly through the building, the structure was relocated to its present location.<sup>17</sup>

**Burgess Memorial Church:** In 1892 Thomas Burgess donated land on the north bank of the North Channel to construct a Presbyterian Church but it was also used by the Methodists and Anglicans.<sup>18</sup> The site is now occupied by the United Church. [Fig 14] In 1925 the United Church of Canada was formed when the Presbyterian, Methodist, and other denominations chose to "unite" as a single denomination. However, a significant number of Presbyterians, including some in Bala, preferred to remain un-united. Therefore in 1926 the Bala constituents completed a new Presbyterian Church, named the Burgess Memorial Church, on land donated by the Thomas Burgess estate. [Fig 24, 25] In 1964 the building was sold and has been in private ownership since then. The building was designated under Part IV of the *Ontario Heritage Act* in 2002.<sup>19</sup>

**Figure 22** Hurling's Boat Livery with new Canadian Pacific line. *Source: Sutton, Early History*



**Figure 23** Purk's Place with railway bridge on left. The orange floats mark the upstream approach to the dam on the North Channel.

**Bala #2 Generating Station:** The Bala Light and Power Company built its first, small powerhouse on the Mill Stream in 1917. (See Section 3.5) In 1924 the company constructed a second station adjacent to the North Falls. [Fig 26, 27] The plant was fitted with one propeller-type, vertical shaft turbine, manufactured by William Hamilton and rated at 400 horsepower.<sup>20</sup>

---

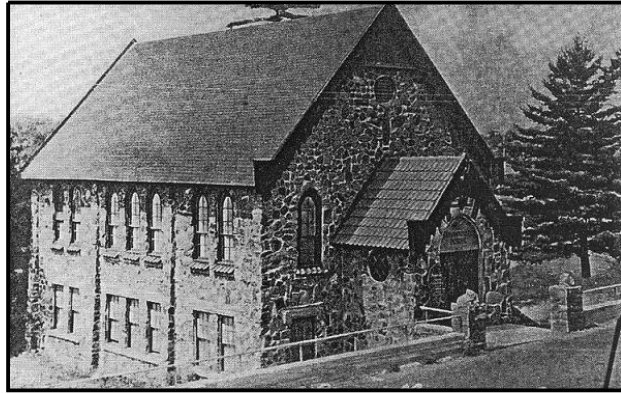
<sup>17</sup> *Early History of Bala; Bala, an Early Settlement in Muskoka.*

<sup>18</sup> *Bala and early settlement*

<sup>19</sup> "Burgess Church Heritage Designation [www.township.muskokalakes.on.ca/siteengine/activepage.asp?PageID=25](http://www.township.muskokalakes.on.ca/siteengine/activepage.asp?PageID=25)

<sup>20</sup> Biggar, *Ontario Hydro's History and Description of Hydro Electric Generating Stations*

**Figure 24** Burgess Memorial Church sometime after completion with Bala Road raised in front. *Source: Petry, Bala*



**Figure 25** Rear of the former Church facing the South Channel. Stone retaining wall can be seen on the right of the church. The church property appears to have been filled to create a relatively levelling building site.

The use of a propeller-type turbine appears to have been a relatively new application of this technology particularly well adapted for low head installations – less than 30-50 feet. Most hydro-electric turbines installed in Ontario at that time, including that at Bala #1, were of the mixed-flow design that had been in used since the mid-19<sup>th</sup> century.

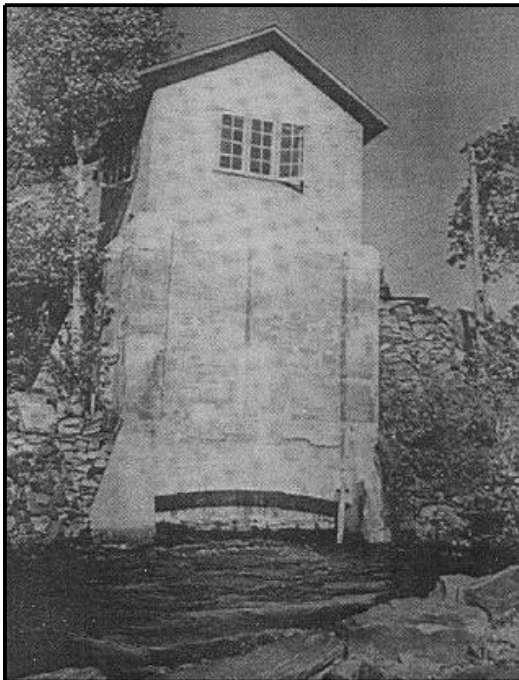
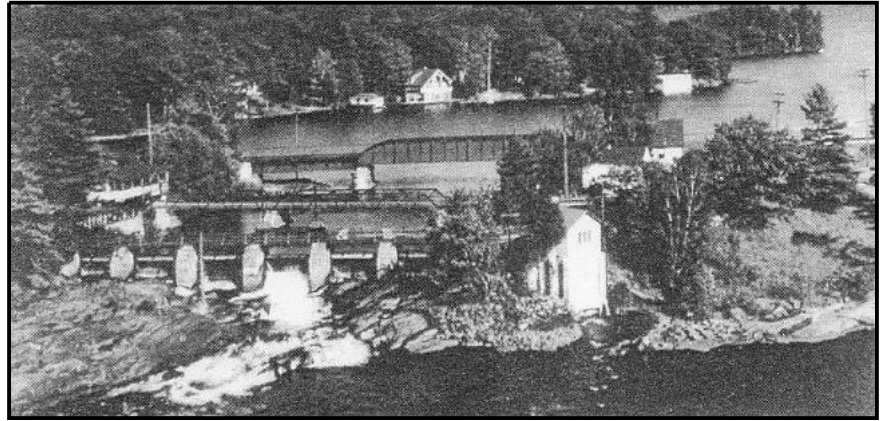
The propeller-type design was quite simple and reliable. Due to the turbine's operating characteristics, a less-expensive generator used could be used. The design's main drawback was that its efficiency dropped quickly if the operating speed shifted from its optimal design speed. Thus it worked well only when a steady flow could be assured. Later, a variable blade known as a Kaplan turbine was developed that could be run under changing operating conditions.<sup>21</sup> This turbine design will likely be used in the proposed new powerhouse.

The use of a propeller turbine may have influenced the shape of the powerhouse. More likely it was due to the small area of flat land beside the river. The building has a small footprint and tall walls. The water intake was adjacent to the south buttress of the dam. [Fig 7] Presumably it flowed directly into the powerhouse forebay that is depicted by the buttressed concrete wall. Water flowed through the turbine and then was discharged back to the river by a short tailrace channel, excavated on a slight curve. The generator was

<sup>21</sup> *Water Power Engineering*, 222-3; *Hydraulic Structures*, 931, 945-9

located in the windowed room at the top and direct-connected by a vertical shaft to the turbine.

**Figure 26** Bala #2, c.1924/1926 showing tailrace channel excavated and relationship to dam. *Source: Jewitt, Bala*



**Figure 27** Bala #2 with tailrace channel in foreground. *Source: Petry, Bala*

In 1929, the company and both power plants were purchased by Ontario Hydro. The station was removed from service in 1957 because of high production costs. Studies in 1960 showed that it was not economical to rehabilitate the plant or to redevelop the site. In 1972, the structure was demolished. [Fig 28] Ownership of the site reverted to the Crown.<sup>22</sup> At the time of demolition, plans were prepared to create an island park. The site of the powerhouse was to become a Falls overview.<sup>23</sup> Apparently none of this work was carried out.

---

<sup>22</sup> Biggar, *Ontario Hydro's History and Description of Hydro Electric Generating Stations*.

<sup>23</sup> *Bala, an Early Settlement in Muskoka*



**Figure 28** Foreground is the approximate location of the Bala #2 plant

### 3.4 SOUTH CHANNEL

#### 3.4.1 DAMS AND BRIDGES

**Channel Excavation/Bridge 1875:** The excavation of the North Channel two years previously did not provide adequate discharge capacity during floods. At least part of the problem might have been that the Mill Stream had been dammed to supply water for the Burgess Mill and no longer acted as a flood channel.

Rather than further enlarge the North Channel, the Department of Public Works decided to blast an entirely new channel, 160-feet wide through a narrow neck of rock about 150 yards to the south. The bottom of this new cut was two feet higher than the North Channel dam in order to function as a regulating weir.<sup>24</sup>

At full flood, water was four feet deep in the new “South Channel” and therefore required a bridge to carry the Bala Road over the stream. The engineers originally proposed to locate the structure at the downstream end where the channel was narrower; roughly where the railway bridge is today. However, because of the risk of damage from log jams it was located higher up the channel. This location required two 70-foot approach spans, the one on the new island was ramped in order to compensate for the high bank on the south side. The Queen post truss centre span was 82-feet long. A large stone pier was constructed to support the main truss and north span. Stone abutments were also constructed on each bank.<sup>25</sup> Figures 29-31 probably illustrate the later, 1901 bridge but the overall design of approaches and truss would have been similar.

**Timber Dam, c.1876/78:** About in 1876 a stop-log dam was built in the new channel to maintain high water during the summer. The dam had five openings of 28-feet each. Because this dam was significantly longer than the one in the North Channel, it seems to have been called the “Long Dam.”<sup>26</sup>

**New Dam 1899:** Within 20 years, the original timber dam had become leaky and unsafe. A new structure was located immediately below the site of the old one. It had four openings that were 28-feet wide and one that was 23-feet wide. Three of the openings were nine feet deep while the others were seven and five-feet. The piers supporting the

---

<sup>24</sup> DPW *Annual Report 1875*

<sup>25</sup> DPW *Annual Report 1875, 1879.*

<sup>26</sup> DPW *Annual Report 1879.*

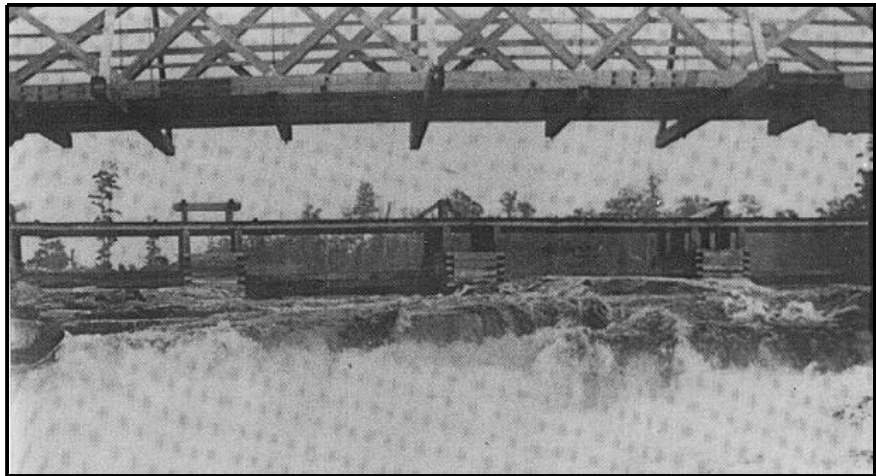


stop logs were timber crib with a cutwater on the upstream end. During construction, a shoal of rocks which had interfered with the passage of flood water in the old dam, was blasted away.<sup>27</sup>



**Figure 29** 1901 bridge with 1899 dam below the central span. The Bala Hotel in the right rear.  
*Source: Petry, Bala*

**Figure 30** 1899 dam and lower portion of 1901 road bridge.  
*Source: Petry, Bala*



**Figure 31** Looking downstream to the 1901 bridge. Stop logs are lying on top of dam at right.  
*Source: Petry, Bala*

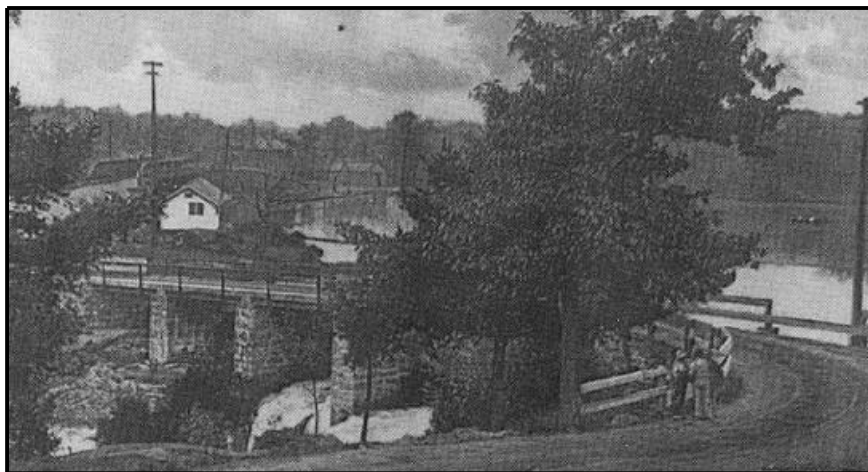
---

<sup>27</sup> DPW Annual Report 1899

**New Bridge 1901:** In 1899 the road bridge was given a new timber flooring and the piers and retaining walls were repaired. The main span of the bridge was entirely rebuilt in 1901 with a new Howe truss structure with a clear span of 69.5 feet. The roadway was 12 feet wide and the truss rested on new masonry piers.<sup>28</sup> [Fig 29-31]

**New Dam and Bridge, 1913:** Although the timber dam was only 13 years old, it was in such poor condition that Public Works decided to replace it. As well, the wooden highway bridge was also in a bad state of repair. The new dam consisted of a combined dam and highway bridge. The structure was built of masonry piers with 20-foot openings. Three of the piers carrying the bridge were extended upstream to support the floor of the dam and provide space for stop logs.<sup>29</sup> The highway bridge rose on a slight incline upward from Burgess Island to the south shore. The deck was made of reinforced concrete supported by steel beam. The roadway was protected with steel-lattice handrails. Today the bridge has been downgraded to a timber deck with timber handrails.<sup>30</sup> [Fig 32-34]

**Figure 32** 1913 bridge and dam under construction. The house visible through the railway underpass can be seen in Figure 20 *Source: Petry, Bala*



**Figure 33** 1913 bridge and dam with unknown house on Burgess Island beside railway tracks. *Source: Petry, Bala*

---

<sup>28</sup> DPW *Annual Report* 1899, 1901. Figures 20-22 depict a Queen post truss bridge but the framing of the diagonals appears to use a Howe system.

<sup>29</sup> DPW *Annual Report* 1913

<sup>30</sup> DPW *Annual Report* 1913

**Figure 34** Six span Bala Road Bridge over South Channel with remnant of 1913 dam.

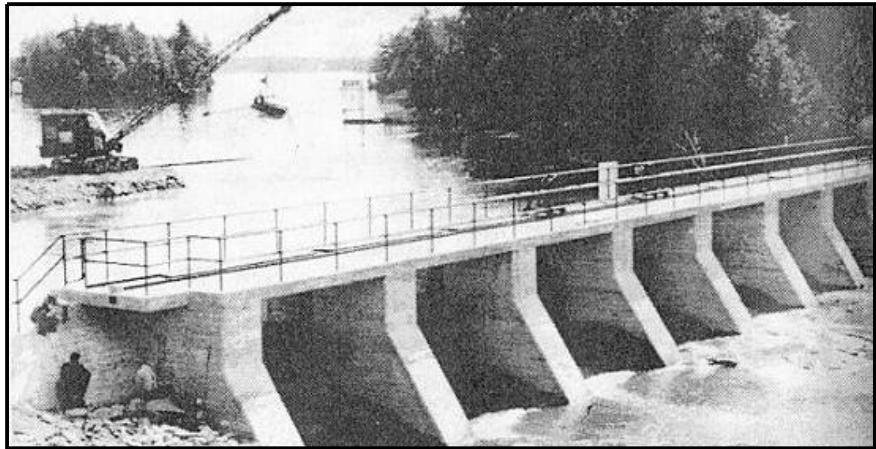


**Present Dam, 1958:** During a 1956 inspection of the dam, it was found to be in an advanced state of deterioration. A new reinforced concrete dam was designed by the engineering staff of the Department. In February, 1957, a coffer dam was installed. The site was dewatered and excavation was carried out to deepen the river channel.<sup>31</sup>

The coffer dam was retained during the winter of 1957-58 and all of the excess water could be runoff through the north dam. The spring had been a low flow water year. Construction was completed in September, 1958. A channel was excavated into the rock for at least one foot in order to provide a better footing for the dam. The new dam was constructed about 50-feet upstream of the old dam. It was 240-feet long and had eight 14-foot spillways. The dam held back a head of 7.6 feet.<sup>32</sup>

The much greater discharge capacity of the new dam made it necessary to make improvements to the old 1913 bridge which had been retained. The concrete plug walls of the two northerly bridge openings were removed. The riverbed was cleared and the outlet channel was widened where necessary.

**Figure 35** 1958 dam showing coffer dam being removed. *Source: DPW Annual Report, 1959.*



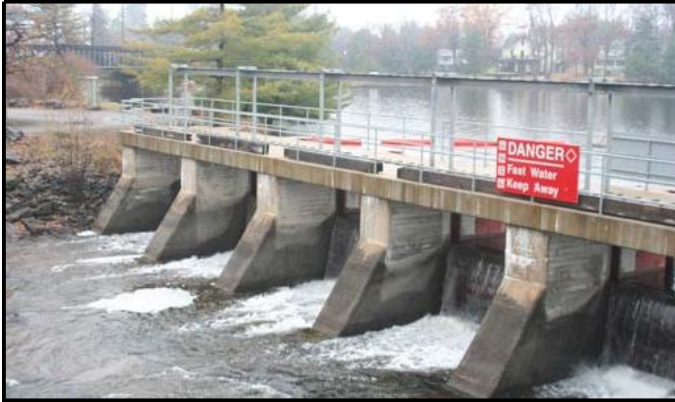
**Present Bridge, 1965:** Until 1965 all highway traffic had to pass through the narrow, low Canadian Pacific Railway underpass and then follow the old Bala Road over the 1913 bridge on the South Channel and then curve up a steep hill. In order to correct these deficiencies, the Department of Highway chose an entirely new alignment. This required

---

<sup>31</sup> DPW Annual Report 1958

<sup>32</sup> DPW Annual Report 1959

that a small bay into which the South Channel discharges was completely filled. [Fig 38, 39] The new bridge was aligned in a straight line to the North Channel Bridge.



**Figure 36** 1958 dam looking north to Burgess Island.

**Figure 37** Relationship of 1913 dam/road (right) to 1958 dam (left).



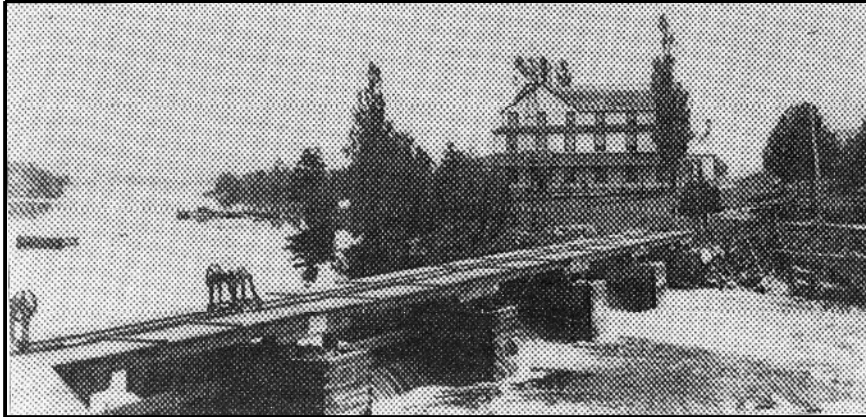
**Figure 38** South Channel Bridge under construction showing land filling of bay. The old Presbyterian Church is in the trees on left. *Source: Petry, Bala*

**Figure 39** South Channel bridge showing bedrock of original shoreline on left and filled shore on right.



### 3.4.2 SOUTH SHORE OF CHANNEL

Thomas Currie built the Bala Falls Hotel about 1889; ten years later it was also known as Curries Hotel. [Fig 40] It was located on the south side of the South Falls west side of the harbour. It burned about 1910 and in 1911 the vacant land was purchased privately and a large cottage erected. Part of the Bala Hotel property was donated to the Anglican Church for the construction of an Anglican Church in 1920. The church is still standing.<sup>33</sup>



**Figure 40** Bala Falls Hotel with South Channel dam in foreground, c.1910. *Source: Petry, Bala.*

Today the area bordered by the South Channel, Old Bala Road and the Canadian Pacific Railway is a public park. [Fig 41] The property was depicted as vacant in 1936 and probably never developed due to the steep down to the river channel.

**Figure 41** Park on south side of South Channel with the 1913 dam and bridge. The Anglican Church and the former Bala Hotel were located to the right of the photo.



### 3.5 MILL STREAM

A third channel in to the Muskoka River was known as the Mill Stream. [Fig 42] Although well north of the two modern Bala Falls, this channel is functionally connected to the falls because of its historic use of water power. Until about 1870 when Thomas Burgess constructed a sawmill, this channel was part of the natural flow of the Muskoka River. The mill closed in 1910 but the raceway was reused in 1917 when a hydroelectric power plant was constructed in the Mill Stream. The present bridge over the Mill Stream was completed in 1967.<sup>34</sup>

---

<sup>33</sup> *Bala, an Early Settlement in Muskoka, Sutton, Early History of Bala; Bala the way it was*

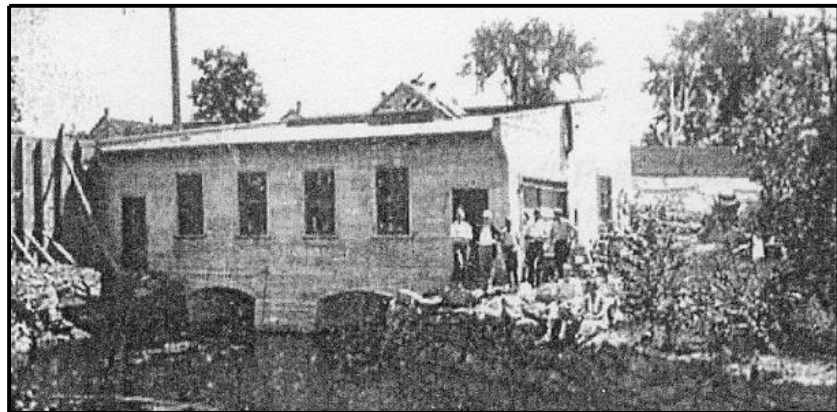
<sup>34</sup> *Bala the way it was*



**Figure 42** Looking downstream on Mill channel from Highway 169 towards dam and powerhouse of Bala #1.

The Bala Light and Power Company started operating a small, 245 kilowatt generating station on the Mill Steam in October, 1917. The two turbines were horizontal shaft, Francis-type turbines built by William Hamilton and each rated at 160 horsepower. In 1929, the company and its plants on the Mill Stream and at the North Falls were purchased by Ontario Hydro. The Mill Stream station became known as Bala #1 generating station at this time. The plant was closed in 1957 and in 1962, Ontario Hydro transferred the property to the town of Bala. Subsequently, the plant was purchased by a corporation, restored and put back into service in 1989. The power generated goes into the Ontario Hydro grid.<sup>35</sup> [Fig, 42-44]

**Figure 43** Bala #1, probably under construction, 1917. Source: Jewitt, *Bala*



**Figure 44** Bala #1 powerhouse

---

<sup>35</sup> Biggar, *Ontario Hydro's History and Description of Hydro Electric Generating Stations; Bala the way it was; Bala, an Early Settlement in Muskoka*

## 4 CULTURAL SIGNIFICANCE OF BALA FALLS

### 4.1 INTRODUCTION

This *Cultural Landscape Assessment of the Bala Falls* has documented that intense human activity has totally altered the natural heritage of the falls that existed before 1870. The Bala Falls area today is a man-made landscape dramatically different to the way it looked in 1870 or even 1960.

By assessing the cultural heritage value of the Bala Falls, one is able to understand why features and structures are of historic interest as well as determining the distinct visual character of the area. Standardized criteria for evaluating the cultural value of structures and landscapes have been developed by the Ministry of Culture and published as Regulation 9/06 of the *Ontario Heritage Act*. [Fig 45]

Section 4.2 applies these Ministry criteria to the features found in the Falls area. On the basis of the cultural values one can then determine what are the attributes – specific features and structures – of individual historic importance as well as contributing to the character of the landscape. This task is undertaken in Section 4.3.

Age, per se, is not a defining characteristic of historic significance. By common convention, any resource more than 40-years old is considered historic but not necessarily significant. In using this 40-year rule, effectively everything from North Shore of North Channel to South shore of South Channel is potentially historic.

Several features in the Falls area have been previously identified as historically significant. The 1926 Presbyterian Church has been designated under Part IV of the *Ontario Heritage Act*. Purk's Place has been listed by the Muskoka Heritage Committee as a site of historic significance. Plaques have been erected by Ontario Hydro and the Ministry of Culture to commemorate construction the Bala #1 generating station, the founding of Bala in 1868, and the geological significance of the Precambrian Shield.

This *Cultural Landscape Assessment* cannot comment on a human disinclination for landscape change. The existing comfortable and familiar landscape of the Bala Falls area is perceived as having been created in a “past” that has no connection to the present. The rock blasted in the South Channel 140 years ago has weathered to a “natural” look. The Canadian Pacific track and bridges from a century ago “look” old. These earlier changes to the landscape are accepted because they are now viewed as part of a fixed, unchanging past.

The converse of the “fixed” past is that new development is unpredictable and, at the very least, will take time to fit in to the landscape. At worst, there is the “risk” that the development will never look familiar or comfortable in the landscape. The “risk” of change has to do with people’s perceptions of change, which cannot be evaluated in this report.

However, the perception of landscape “risk” has changed over time. Up to the mid-20<sup>th</sup> century, improvements of the human condition were more important than conserving the environment. Logging on the Muskoka River at the Bala Falls, for example, might degrade the environment but was necessary because it created jobs and wealth which was

“good” for the country. Frederick Sutton, an early resident of Bala, described the beauty of a sunset at Bala about 1900:<sup>36</sup>

As a boy, I recall standing on the Bala portage with Mr. Jackson admiring a beautiful sunset. He was saying that before the original tall pines were cut, they seemed to meet from both sides of the river, framing the sunset, a site duplicated nowhere on earth.

Sutton does not convey a sense of regret or loss due to logging the pines. Logging was a necessary economic activity even if it meant the loss of unique sunsets. A century of over exploitation and decline of wilderness has created a heightened awareness of pleasing landscapes.

A property may be designated under section 29 of the [*Ontario Heritage*] Act if it meets one or more of the following criteria for determining whether it is of cultural heritage value or interest:

1. The property has design value or physical value because it,
  - i. is a rare, unique, representative or early example of a style, type, expression, material or construction method,
  - ii. displays a high degree of craftsmanship or artistic merit, or
  - iii. demonstrates a high degree of technical or scientific achievement.
2. The property has historical value or associative value because it,
  - i. has direct associations with a theme, event, belief, person, activity, organization or institution that is significant to a community,
  - ii. yields, or has the potential to yield, information that contributes to an understanding of a community or culture, or
  - iii. demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community.
3. The property has contextual value because it,
  - i. is important in defining, maintaining or supporting the character of an area,
  - ii. is physically, functionally, visually or historically linked to its surroundings, or
  - iii. is a landmark.

Figure 45 Portion of Regulation 9/06 of the Ontario Heritage Act

## 4.2 CULTURAL HERITAGE VALUES

### 4.2.1 DESIGN VALUE/PHYSICAL VALUES

Controlling the natural water regime of Lake Muskoka has had a major impact on the Falls. Dams were required to maintain a minimum lake elevation for navigation while enlarging the channels was necessary to eliminate the flood risk. The timber and concrete dams erected over the years were typical of the engineering practice of the eras within which they were built. Distinctive factors are that the artificial South Channel is perceived in 2008 as “natural” and that the natural channel of the Mill Stream has been forgotten.

---

<sup>36</sup> *Early History of Bala*, 9



The falls has also been used as a source of power. The narrowness of the Mill Stream permitted construction of a mill for mechanical power. Hydroelectric power has been generated more-or-less continuously since 1917.

#### **4.2.2 HISTORICAL VALUES**

The Musquosh Colonization Road (today Highway 169) was one of the provincially built routes to encourage settlement in Muskoka. As traffic in Bala increased, the alignment of the road has been improved and the bridges rebuilt.

The tourism value of the Bala area was appreciated from an early date. The community was quite accessible by steamship from the 1870s onwards. Railway transport came much later, not until 1908, but provided even more convenient access to the area. Hotels, boat liveries (what might be called marinas today) and other tourist facilities clustered around the Falls at Bala.

#### **4.2.3 CONTEXTUAL VALUES**

There are five patterns of land use that define the character of the Bala Falls: water, transportation, power generation, tourism, and settlement.

The importance of water has been covered in Section 4.2.1, above. The water flows over the hard bedrock through three channels of which two are natural and one is man-made. The channels have created two islands of which Portage Island is natural and Burgess Island is man-made. As in the past, the sounds and turbulence of the falls vary with seasonal fluctuations in flow.

The pattern of transportation is quite prominent. Possibly the strongest image of transportation are the eight bridges over the three channels: four road, three rail, and one foot bridge. The old Bala Road is still in use. The Canadian Pacific crosses the area on a high earth embankment and the summer station grounds are now a parking lot. The municipal dock is modern but in the same location as the old steamship dock.

The most interesting settlement pattern is the relative absence of buildings on Burgess Island. This is possibly due to historic land ownership of the island. There are only two standing structures today, the former church and Purk's Place, although there were at least two additional buildings in the past. Another interesting pattern is the public parks at each shore of the Muskoka River.

### **4.3 HERITAGE ATTRIBUTES**

Heritage attributes are the physical features that convey the heritage values of a property. Often heritage values are narrowly defined. For example, the "Heritage" page of *Save the Bala Falls* web page indicates that there only two buildings left on Burgess Island; the boat livery and the church.<sup>37</sup> This is indeed true but a restricted view of what is cultural heritage. The railway earthworks, road underpass, and bridges are certainly part of Bala's heritage. The stone piers of the Old Bala Road bridge over the South Channel are quite prominent. The historic resources of the Bala Falls are far more substantial than suggested in the web page.

---

<sup>37</sup> [www.savethebalafalls.ca](http://www.savethebalafalls.ca), Heritage page, accessed November 22, 2008.

### **4.3.1 DESIGN**

The size of the South Channel is indicative of the amount of excavation that has occurred over time in the River. The 1913 combination bridge/dam over the channel is the oldest remaining example of both the dams and roads over either channel. The Presbyterian Church has already been designed as a significant historic site in Bala. The combination powerhouse and dam on the Mill Stream evidence of the water power history of the area.

### **4.3.2 HISTORICAL**

The narrow, low Canadian Pacific road underpass and the 1913 bridge on the South Channel are both on the alignment of former Bala Road. The small dimensions of the underpass are indicative of the change in vehicle size and road traffic over time. Purk's Place is the remaining early tourism structure within the Bala Falls area, although relocated from its original location. The parking lot/former station grounds and the municipal dock are sites of former tourist activities.

### **4.3.3 CONTEXTUAL**

The two dams and excavation of the South Channel are representative of water management issues at Bala Falls. The smaller Mill Stream facilitated construction of a water-powered mill and later a hydroelectric plant. Building the second plant on the North Channel was indicative of the rapidly growing demand for electric power. The raised railway earthworks and bridges as well as the alignment of the Bala Road and its bridges are visual aspects of the impact of transportation along this narrow ridge of land.

## **4.4 SUMMARY**

The Bala Falls area extending from the park on the south shore of the Muskoka River to the park on the north side is a distinct cultural heritage landscape of water management, power generation, tourism, and transportation. An extension of this landscape includes the Mill Stream channel.

## 5 PROPOSED UNDERTAKING

### 5.1 DESCRIPTION

The Swift River Energy intake structure and powerhouse are the two structural components of the proposed generating station that may impact on the cultural heritage landscape of the Bala Falls. The tailrace does not appear to have any effect.

#### 1. Intake structure and headrace

The intake structure consists of a short canal adjacent to Purk's Place. [Fig 46] The area of the headrace is presently unoccupied land. Trash racks are located in the entrance to a culvert that will carry the headrace under Highway 169. The river will have to be partially dredged to provide adequate flow for the intake and this will require removal of the Purk's Place dock. The headrace channel up to the trash racks will have sloped walls. Most of the headrace will be in a tunnel under the highway.

#### 2. Powerhouse

The turbine/generator unit will be set in a long, low, narrow powerhouse that extends from the east side of the highway to the edge of the river. The preferred location of the Swift River Energy powerhouse is in a ravine south of the North Bala Falls. [Fig 46] The intent is to fill the ravine around the powerhouse to visually bury much of the structure. Road access would be provided to the south side of the powerhouse. Entrances into the structure would include a person door, on top of the structure, adjacent to Highway 169, equipment/person access from the driveway and equipment hatches on top of the powerhouse. Ventilation grills will be necessary. A gatehouse containing a vertical-lift, dewatering gate would be required at the discharge of the powerhouse.

The discharge end of the powerhouse will be at the edge of the river. There would be no visible tailrace but the river bottom will be excavated to provide for adequate discharge capacity.

### 5.2 POTENTIAL IMPACTS OF UNDERTAKING

#### 5.2.1 INTAKE STRUCTURE

The trash rack portal appears to be about four metres high. The size of the structure is made larger by the sloped embankments. The intake will have a pronounced change on the visual character of the land between the railway bridge and Highway 169.

#### 5.2.2 POWERHOUSE

Potential beneficial impacts include construction of a viewing platform and the formalization of the public use of the area today. Potential negative impacts affect the view of the powerhouse from boaters on the Muskoka River, the park on north bank of the North Falls, and from private cottages along the shore. The presence of the powerhouse could detract from the cultural heritage of the community and the visual character of the falls.



Figure 46 Proposed Undertaking. Source: Swift River Power

## 5.3 MITIGATION

### 5.3.1 INTAKE STRUCTURE

The intake canal should be made as narrow as possible and lined with vertical wing walls in order to minimize the size of its footprint in the landscape. The location of the trash rack/headrace portal in relationship to Highway 169 should be oriented to position the portal is in relationship to surrounding historic land use patterns. For example, the portal could be made parallel to either Highway 169 or the old Bala Road.

A parapet wall or other appropriate design should be used to minimize the scale of the structure. [Fig 47] Distinctive safety railings, that meet regulated safety standards and codes, should be used where necessary. [Fig 48] All concrete surfaces should be textured and/or coloured to reduce their visual impact



**Figure 47** Precast concrete culvert with portal designed as a bridge. *Source:* Contech Construction Products Inc. [www.contech-cpi.com](http://www.contech-cpi.com)



**Figure 48** Railing at Victoria Park, Niagara Falls (right), Highway 401 overpass (left). *Source:* C. Andraee

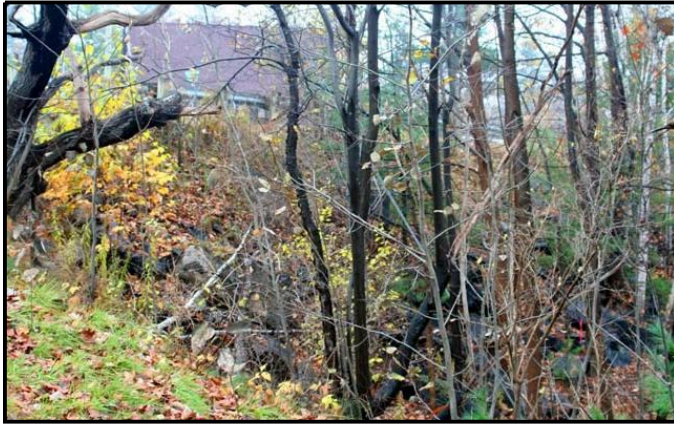
### 5.3.2 POWERHOUSE

The rubble slopes of the east and south sides of the proposed powerhouse site are likely part of the filling undertaken during the 1965 construction of the new South Channel bridge. The north wall is probably original bedrock. [Fig 49] Filling the valley and appropriate landscaping around the powerhouse would hide the powerhouse from views from Highway 169.

The west side of the building facing the Muskoka River and part of the south side beside the access road will be exposed. The current proposal is to clad the west wall in a rock finish. This could be an attractive finish but will not look “natural.” This design will appear as a formally-laid, mortared, vertical stone wall.

An alternative finish would be to design the walls with a visual connection to the evolution of hydro-electric power at Bala Falls and/or early development of hydro power in Muskoka. For example, the concrete design Bala #1 Station could be adapted although

the building is not an attractive example of early 20<sup>th</sup> century powerhouse design. [Fig 43, 44] The tall, narrow Bala #2 station has a simplicity that gives it a modern appearance and an ability to fit in to the site. [Fig 27] However, it had the opposite proportions to the proposed long and low plant.



**Figure 49** Ravine of proposed site of powerhouse. The Highway 169 guardrail and roof of the former Presbyterian Church are visible in top left.

Probably the most successful architectural style could come from the numerous small, brick powerhouse built throughout Ontario up to the 1920s. [Fig 50] Their flat roofs and rectangular shape could be adapted to the proposed Bala plant. This design builds upon the long history of human intervention at the falls.

**Figure 50** Wilson's Falls Generating Station, 1910, on the Muskoka River near Bracebridge. The windows were originally taller. *Source: C. Andreae, June 2008.*



### 5.3.3 INTERPRETATION OF FALLS

Plaques and signage should be used to interpret the historic values of the Bala Falls area that were identified in Section 4.2 of this *Report*.



**Figure 51** Interpretation plaque for the history of the Ocoee No. 1 generating station, Tennessee, Oct, 2008. *Source: C. Andreae.*

## **6 RECOMMENDATIONS**

### **6.1 DESIGN OF POWERHOUSE AND INTAKE**

The powerhouse and intake structure should be designed such that they are visually sympathetic to the cultural heritage landscape of the Bala Falls.

### **6.2 FALLS INTERPRETATION**

Interpretive plaques should be designed and installed.

### **6.3 DEPOSIT COPIES OF REPORT**

Copies of this report and all other relevant documentation produced by this undertaking should be deposited with the:

- Muskoka Lakes Library branches at Bala and Port Carling
- Muskoka Lakes Museum, Port Carling
- Bala Museum
- Swift River Energy web-site

## 7 SOURCES

### Books and Reports

- Barrows, H.K. *Water Power Engineering*. New York: McGraw-Hill, 1927.
- Biggar, Glenys. *Ontario Hydro's History and Description of Hydro Electric Generating Stations*. Ontario Hydro, 1991.
- Canada. Commission of Conservation, *Electric Generation and Distribution in Canada*. By Leo Denis. Ottawa: 1918
- *Water Powers of Canada*. Ottawa: 1911.
- Jewitt, Lorne & Bunty. *Bala – The way it was*. Bala, Ont.?: private, 2005.
- Ontario. Dept. of Public Works. *Annual Report*. Various years 1873-1958.
- Ontario .Ministry of Culture. *Heritage Resources in the Land Use Planning Process* [www.culture.gov.on.ca/english/heritage/Toolkit/Heritage\\_PPS\\_infoSheet.pdf](http://www.culture.gov.on.ca/english/heritage/Toolkit/Heritage_PPS_infoSheet.pdf)
- Ontario Ministry of Municipal Affairs and Housing. Provincial Policy Statement (2005) of the *Ontario Planning Act*. [www.mah.gov.on.ca](http://www.mah.gov.on.ca)
- Page, H.R. & Co. *Guide Book & Atlas of Muskoka and Parry Sound Districts*. Toronto: H.R. Page & Co, 1879 (reprint Stoddart, 2000).
- Petry, Bob. *Bala, an Early Settlement in Muskoka*, n.p.: Lynx Images, 1998.
- Schoklitsch, A. *Hydraulic Structures*. New York: American Society of Mechanical Engineers, 1937, vol. 2.
- Sutton, Frederick William. *Early History of Bala*. Bracebridge, Ont: Herald-Gazette Press, c.1967?

### Files and Reports

- Swift River Energy Limited files and web page [www.balafalls.ca](http://www.balafalls.ca).
- Advance Archaeology. Stage 2 Archaeological Assessment of North Bala Hydroelectric Development. Prepared for Swift River Energy Limited, December 2008
- Archaeological Services Inc. *Stage One Archaeological Assessment: North Bala Hydroelectric Development, Town of Bala, Ontario*. Prepared for Hatch Energy, September, 2008.

### Maps

- Underwriters' Survey Bureau Limited. *Bala Fire Insurance Plan*, April 1936, various scales. Ottawa: NMC 11948.
- Map and Chart of the Muskoka Lakes*, 1899 CIHB

### Web

- Save The Bala Falls* [www.savethebalafalls.com](http://www.savethebalafalls.com) (Accessed various dates, November 2008)
- Township of Muskoka Lakes [www.muskokalakes.ca](http://www.muskokalakes.ca) (Accessed various dates, November 2008)
- Muskokan.com*. "Clarification on Bala Dam," October 11, 2008; "Bala loses fight to save the falls," October 22, 2008.
- Bracebridge Examiner and Gravenhurst Banner*. "Fight to Save Bala Falls gets organized" Sept 17, 2008; "Township responds to Bala Falls heritage petition," Oct. 29, 2008.