#### December 2019







# SEGUIN RIVER SIMPLIFIED WATER MANGEMENT PLAN









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## 1.0 Overview

The Seguin River Simplified Water Management Plan (SRSWMP) was amended June 29<sup>th</sup>, 2018 by the Ministry of Natural Resources and Forestry (MNRF), under the authority of Section 23.1 (6) of the *Lakes and Rivers Improvement Act*. The amendment was undertaken in order to align the SRSWMP with the 2016 Maintaining Water Management Plans Technical Bulletin.

The implementation reports must be submitted by the proponent every 5 years. The date of submission for the first report is December 31, 2019.

The implementation report should include the four components:

- Summary of all amendment requests
- Status of the Standing Advisory Committee (if applicable)
- Results of effectiveness monitoring (if applicable)
- Status and results of any data or information collected outlined in the WMP's data collection program (if applicable)

On July 1<sup>st</sup>, 2014 Parry Sound PowerGen merged with Bracebridge Generation Ltd. Bracebridge Generation Ltd. is the legal company name moving forward.

Bryan Ingram, Operations Manager Bracebridge Generation Ltd.

Date



# 2.0 Summary of Amendment Requests

## March 2015 Amendment

On March 31st, 2015, the Ministry of Natural Resources and Forestry (MNRF) approved an administrative amendment to the Seguin River Water Management Plan to extend the term of the plan for an additional three years.

## September 2017 Amendment Request

On September 1st, 2017, Bracebridge Generation submitted an amendment request to the MNRF to address the completion of the Cascade Street Generating Station redevelopment and to clarify an issue regarding the Mill Lake Dam operating plan. The amendment process for this request is continuing.

## March 2018 Amendment

On March 23rd, 2018, the Ministry of Natural Resources and Forestry (MNRF) approved an administrative amendment to the Seguin River Water Management Plan to extend the term of the plan for an additional six months.

## June 2018 Amendment

On June 29th, 2018, the Ministry of Natural Resources and Forestry (MNRF) approved an amendment to the Seguin River Water Management Plan to align the plan with the approved 2016 Maintaining Water Management Plans Technical Bulletin. The administrative amendment resulted in changes to the following sections of the plan.

Expiry Date:	
Monitoring and Reporting:	
Compliance:	
Amendments:	

Implementation Reporting:

The expiry date has been removed Section 5.2 and 8 have been revised Section 5 has been revised Section 7.2 has been replaced Section 7.3 has been added



# 3.0 Status of the Standing Advisory Committee

Through the process of redeveloping of the Cascade Street Generating Station, Bracebridge Generation elected to strike a Standing Advisory Committee for the SRSWMP. A SAC is not a mandatory requirement. SACs are recommended as a best management practice to provide plan proponent(s) with a mechanism for engaging First Nation and Métis communities and the public.

The SAC Committee initially met on May 30<sup>th</sup>, 2017 and was composed of 6 members including

(Chair), **Chair**, **Ch** 

Meeting minutes are available from Bracebridge Generation Ltd. upon request.

Contacts:

(Chair)

resigned from the committee.

The SAC Committee met on October 5th, 2017 to review the Cascade Street GS WMP amendment and the MNRF Technical Bulletin for Maintaining Water Management Plans. The attendance level resulted in not achieving a quorum.

resigned from the committee.

resigned from the committee.

The Committee has not held any subsequent meetings. Bracebridge Generation Ltd. is reaching out to the remaining elected SAC members and will be replacing the members who have resigned to resume committee function.



# 4.0 Results of Effectiveness Monitoring

### 4.1 Specialized Flow Management

The SRSWMP effectiveness monitoring program will determine whether the operational changes arising from implementation of the WMP result in the anticipated ecological and social improvements. Specialized flow management through dam operations, identified within the SRSWMP, was intended to address/improve the sustainable minimum flow at walleye spawning sites at Hurdville Dam, Mill Lake Dam, Grey Owl Lake Dam, Harris Lake Dam, Haines Lake Dam and the CPR Trestle Dam. The dam operation changes were also intended to maintain/improve the continued enjoyment of lake-based recreational activities and waterpower production.

As the SRSWMP is being implemented in two (2) Phases, effectiveness monitoring under Phase 1 will focus on those facilities with "enforceable" operation plans. However, this does not preclude monitoring of the facilities with "preliminary" operation plans, although, at these facilities monitoring efforts will be focused at establishing baseline conditions in most cases.

Water level data analysis of the enforceable operation plans draws the following observations:

**Grey Owl Lake Dam** – due to limited to no data recorded prior to the WMP, comparisons cannot be drawn. Neither walleye spawning monitoring or quantification of spawning habitat have occurred below the Grey Owl Lake Dam by BGL or the MNRF to date in order to develop any operational spawning strategies.

**Hurdville Dam** – The notable changes in water level information include a pronounced reduction in the variance between the minimum and maximum water levels throughout the year. This means that water levels are more consistently close to the target operating level. Further it is observed that since the commencement of the WMP, the average summer water level is 0.04 m higher than the Pre-WMP levels providing social improvements. Neither walleye spawning monitoring or quantification of spawning habitat have occurred below the Hurdville Dam by BGL or the MNRF to

date in order to develop any operational spawning strategies. Bracebridge Generation generally does not receive complaints regarding water levels during the summer at a water level of 240.00 m which is the minimum of the rule curve for Lake Manitouwabing. The Resolution of the Public Utilities Commission of the Town of Parry Sound No. 87-83 align with the SRSWMP rule curve that *"the water level be held around 6" below the benchmark and not less than twelve inches (12") down from the benchmark during the months of June, July, August, September and October, subject to any conditions beyond our control".* Twelve inches (12") below the benchmark of 240.30 m equals 240.00 m. Six inches (6") below the benchmark of 240.30 m equals 240.15 m which is indicated to be the preferred water level for the summer prior to the SRSWMP. Bracebridge



Generation's current practice is to maintain the level of Lake Manitouwabing in the summer between 240.20m and 240.10 m which align with the SRSWMP and the intent of the original Resolution No. 87.83.

BGL receives complaints with stakeholders noting issues aligning with levels below 240.00 m which coincide with being out of compliance with the WMP and typical of the levels observed in the summers of 2018 and 2019. Bracebridge Generation has reviewed data from 1993 to 2019 in regards to summer low water level occurrences and the following years had water levels below 240.00 m.

1993 for a duration of 72 days to a low water level of 239.87 m 1994 for a duration of 12 days to a low water level of 239.96 m 1997 for a duration of 101 days to a low water level of 239.89 m 1998 for a duration of 133 days to a low water level of 239.74 m 1999 for a duration of 28 days to a low water level of 239.93 m 2002 for a duration of 97 days to a low water level of 239.86 m 2005 for a duration of 99 days to a low water level of 239.84 m 2007 for a duration of 63 days to a low water level of 239.91 m **2009 SRSWIMP implemented** 

2011 for a duration of 46 days to a low water level of 239.91 m 2012 for a duration of 38 days to a low water level of 239.94 m 2015 for a duration of 47 days to a low water level of 239.91 m 2016 for a duration of 13 days to a low water level of 239.96 m 2018 for a duration of 39 days to a low water level of 239.94 m 2019 for a duration of 64 days to a low water level of 239.90 m

From the above occurrences BGL notes that since the implementation of the SRSWMP there have been no events where the depth of the low water events exceed a value greater than 0.10 m below the minimum of the plan at 240.00 m. It could therefore be derived that the SRSWMP implementation appears to have reduced the severity of the events. BGL additionally notes that since the implementation of the SRSWMP the duration of the events has decreased from an average duration of 76 days to 41 days.

**Mill Lake Dam** - The notable changes in water level information include a pronounced reduction in the variance between the 25<sup>th</sup> and 75<sup>th</sup> percentile water levels throughout the year. This means that water levels are more consistently close to the target operating level. Winter water levels are consistently closer to target operating level with less occurrences of lower water levels. Further it is observed that since the commencement of the WMP, the average post spring freshet water level is on average 0.10 m higher than the Pre-WMP levels which promote the achievement of spring ecological objectives. Neither walleye spawning monitoring or quantification of spawning habitat have occurred below the Mill Lake Dam by BGL or the MNRF to date in order to develop any operational strategies.



**Cascade Street Dam** - due to limited to no data recorded prior to the WMP, comparisons cannot be drawn. However, following the reconstruction of the Cascade Street GS. The flow capacity of the automatically regulated turbine and sluice 3 gate allow for optimized regulation of levels and flow during the majority of the year.

**Overall** - Bracebridge Generation at the time of this Implementation Report concludes that operations are not having a negative of unintended impact and does not believe that revisions to facility operations or the Effectiveness Monitoring Program are required.

Activities as described in the data information sections including deployment of remote level monitoring instrumentation and surveying has enabled the ability to monitor and analyze specialized flow management.



#### 4.2 Data Sharing and Communications

An objective of the SRSWMP was to create a formal data sharing agreement, established between MNR and Bracebridge Generation Ltd. to facilitate sharing of data collected during the SRSWMP.

The data sharing agreement will also include the following:

- survey data for structures included in this plan
- stop log operation (including total number of stop logs after every stop log manipulation) and lake water level information for structures included in this plan
- ecosystem data that will be collected
- site specific bathymetric data that may be collected
- results from a hydrologic simulation model of the watershed that may be developed

In January 2011 it was confirmed by IAS (Information Access Section – MNRF) that Parry Sound PowerGen was covered under the OGDE Agreement with the Township of the Archipelago and Parry Sound since Parry Sound PowerGen was owned by the Town of Parry Sound. Therefore a separate Data Sharing Agreement was not required. The Town of Parry Sound is a shareholder in Lakeland Holdings Ltd and Bracebridge Generation the current owner/operator of SWSWMP structures. A new data sharing agreement is not required by MNRF at this time but may be required if ownership of any of the structures within the scope of the SWSWMP changes.

As part of that process, annual meetings will be organized to discuss operational matters and improve efficiencies. The annual meeting will be scheduled at a time/place convenient to both MNR and Bracebridge Generation Ltd., to review the previous year's operations, identify operational strategies that worked well or caused problems, and develop a proactive, adaptive management style approach to communication, issue identification and resolution. These meetings and discussions between Bracebridge Generation and MNRF have occurred since the inception of the plan in response to water management events, watershed construction projects, ecology and stakeholder engagement.

#### 4.3 Public input comments/complaints log objective

To satisfy the WMP requirements, PowerGen and MNRF will log public complaints/comments that are received relative to all the facilities within the WMP.

MNRF has reviewed emails and available notebook records dating back to 2009 to summarize public comments and complaints received by MNRF within the Seguin River Watershed. Most comments and complaints were in response to high or low water levels and potential damage to docks or other private shoreline infrastructure or ecological values. Considering the length of time since the implementation of the SRSWMP there are relatively few records of public comments or complaints that have been submitted to MNRF. Where comments or complaints have been submitted to MNRF, records were cross referenced with watershed condition information and filed event reports to



Table 1.0	Summary o	f Public Issues and Cond	cerns
Issue	Season	Number of Comments	Nature of Comments
	Winter (1%)	1	Frozen water lines.
Low Water (71%)	Winter Drawdown (35%)	36	Concerns with low levels just prior to freshet and worry the low levels will trend into summer. Frozen water lines. Floating docks hitting bottom.
	Spring (1%)	1	Difficulty assembling docks.
	Summer (29%)	30	Shallow bays and docking. Low outflows. Navigation between Clear Lake and Little Whitefish Lake. Navigation between Lorimer and Grey Owl lakes. Navigation in Lake Manitouwabing due to shallow rocks.
	Fall (6%)	6	Concerned with low levels as winter approaches.
	Winter (2%)	2	Rain/melt events causing unseasonal high flows and levels.
	Spring (2%)	2	
High Water (15%)	Summer (10%)	10	Concerned with high water levels on Horn Lake prior to the July 10th trigger. Rain events causing unseasonal high flows and levels. Loss of usable beach due to high levels.
	Fall (2%)	2	Rain events causing unseasonal high flows and levels.
Shoreline Erosion (2%)		2	Concerned with high water levels on Whitefish Lake causing shoreline erosion during high flows. Concerned that wakeboard boats are aggravating issues with high levels.
Fish & Wildlife (4%)		4	Concerned with the quantity and location of flows at CPR dam to promote effective spawning. Concerned with high levels effecting loons on Whitefish Lake. Concerns with habitat during periods of low water during the summer. Concerns with Horn Lake bass spawning. Concerns with impacts of winter drawdowns on fish and wildlife.
Water Level Fluctuation (0%)		0	
Water Quality (1%)		1	Concerns with low flow period and water quality.
Siltation (1%)		1	Turbidity during Cascade Street GS cofferdam removal.
Other (6%)		6	Ice quality due to unseasonably high flows. Questions about lake levels from person not in the area but hearing news reports. Requests for water management education.



determine if WMP non-compliance occurred. No incidence of WMP non-compliance were found and most comments or complaints coincided with high and low flow conditions within the watershed or drawdown activities where water levels remained within identified compliance zones.

The public comments received by Bracebridge Generation Ltd. and MNRF have been summarized in **Table 1.0** and include comments relative to all structures in the watershed.

#### 4.4 Stakeholders/stewardship

It is recognized that Bracebridge Generation Ltd.'s operation of multiple dam facilities has created impoundments that benefit the local community. This community has a considerable vested interest in the effective management of the reservoirs. Accordingly, in addition to the immediate stakeholders responsible for the SRSWMP, working arrangements/stewardship agreements will be pursued with other watershed stakeholders to assist with monitoring, data analysis and the filling of data gaps. A short list of the many potential partners includes the following organizations/groups:

- Lorimer Lake Cottage Association
- McKellar Lakes Homes & Cottage Association
- Tait's Island Cottager's Association
- Manitouwabing Lake Community Association
- Manitou-Seguin Game & Fish Club
- Whitefish Lake Cottagers Association
- Seguin Township Associations & Ratepayers
- Isabella Lake Ratepayer's Association
- Southdale Property Owners / Duck Lake
- Tri-Lake Cottagers Association
- Municipality of McDougall
- McKellar Township
- McMurrich Township
- Township of Seguin
- Municipality of Whitestone
- Parry Sound Snowmobile District
- Parry Sound Nature Club
- McKellar Conservation Association

Bracebridge Generation has created a contact list for relevant distribution of watershed information. Stakeholder engagement has also been achieved through the implementation of the Standing Advisory Committee and meetings with townships and various associations.



# 5.0 Status and results of any data or information collected as outlined in the WMP's data collection program

#### 5.1 Survey Objective:

- Establish GSC benchmarks to assist with the preparation of river and lake profiles, consistent descriptions of dam operations, and rule curves relative to other water control structures.
- Gather information on specific dam characteristics such as size and number of stop logs in each stop log bay to assist with the preparation of consistent description of operations, stage-storage-discharge curves and potential hydrologic and hydraulic modeling.

The schedule for surveying was proposed to be:

- 2012 Fry's Lake Dam, Horn Lake Dam,
- 2013 Harris Lake Dam, Grey Owl Lake Dam
- 2014 Martin Lake Dam, Whitefish Lake Dam, Haines Lake Dam

#### Surveying work:

Harris Lake Dam orthometric benchmarks were placed in 2014 establishing the weir at 242.534 GSC

Haines Lake Dam orthometric benchmarks were placed in 2014 establishing the weir at 194.829 GSC

Martin Lake Dam orthometric benchmarks were placed in 2014 establishing the weir at 252.807 GSC

Horn Lake Dam orthometric benchmarks were placed in 2014 establishing the weir at 315.390 GSC

Fry's Lake Dam orthometric benchmarks were placed in 2014 establishing the weir at 294.996 GSC

Grey Owl Lake Dam was established in 1974 with the weir at 246.470 GSC. There appears to be some inconsistencies in the Ontario MNRF Vertical Control Monument Record which have been brought forward to the attention of the MNRF in 2018.

Whitefish Lake Dam orthometric benchmarks were placed establishing the weir 245.640 GSC (equates to 100.00m with arbitrary datum)



#### 5.2 Defined Rule Curve Objective:

Operating plans for compliance and enforcement for the preliminary plans objective:

In early 2011 MNRF provided PowerGen with rule curves to assess the performance of water level trends and observations against the objectives of the SRSWMP. The rule curves were formatted in Excel for the following facilities:

- Cascade Generating Station
- Mill Lake
- Hurdville/Manitouwabing
- Grey Owl Lake
- Horn Lake
- Fry's Lake
- Whitefish Lake
- CPR Trestle
- Martin Lake
- Harris Lake
- Haines Lake

A Seguin River Flow Calculator was also provided to assist PowerGen to enhance watershed planning for dam operations and downstream flow management for fisheries or other ecological values where present.

At the time of this implementation report the following dams have enforceable rule curves:

Grey Owl Lake Dam Hurdville Dam Mill Lake Dam Cascade Street Dam

#### 5.3 Gauging stations objective:

During the initial water management planning process it was identified that infrequent visits to remote dams would not provide enough data to provide quantitative water levels.

MNRF purchased Hobo water level data loggers in 2009 and provided to PowerGen to obtain frequent water level data observations at Horn Lake, Fry's Lake and Martin Lake Dams. Increased water level monitoring in combination with the rule curves formed the bases of assessing impacts of the water level management regime on ecological values such as fish communities as an identified gap within the SWSWMP. The data loggers provided were remote type sensors placed in the water for a period of time and retrieved at regular intervals to download logged data. This data was used



by PowerGen and subsequently Bracebridge Generation to establish seasonal water level trends to assess operations for social, ecological and economic benefits. Data was also used to inform placement of more permanent water level logging equipment.

It was identified in a meeting with MNRF and PowerGen held on December 3, 2010 that the following seven (7) of the eleven (11) dams addressed in the WMP require an electronic/automatic water level gauge to record (i.e. daily) lake/reservoir water levels since these dams are infrequently visited by PowerGen to document water levels from existing staff gauges while operating the dams. The following 7 dams were identified:

- o Horn Lake Dam
- Fry's Lake Dam
- o Martin Lake Dam
- Beverages Dam
- o Grey Owl Lake Dam
- Harris Lake Dam
- o Mill Lake Dam

MNRF further suggested that a water level gauge also be considered for Whitefish Lake upstream of the culvert ahead of the dam. MNRF noted that Cascade Street GS will receive a water level/flow gauge once the facility is upgraded/rebuilt.

In December 2013, Parry Sound PowerGen had two remote gauges in service on the Seguin Watershed at Hurdville Dam and Mill Lake Dam. Both stations were functional and able to be observed remotely however they were never properly setup so there was no associated data that provided any information that was relative to water levels. In 2014 following the merger with Bracebridge Generation, a project to improve remote water level monitoring was deployed. Bracebridge Generation reviewed all previous efforts to collect data and the data associated with the infrastructure. Additional solar powered cellular stations were acquired and installed on the following dams: CPR Dam, Cascade Street Dam, Haines Lake Dam, Harris Lake Dam, Horn Lake Dam, Grey Owl Lake Dam, Martin Lake Dam, Fry's Lake Dam and Whitefish Lake Dam. Each station was calibrated and exports data to Bracebridge Generations data servers. The MNRF Hobo sensors were returned to MNRF in 2014 following the installation of permanent water level monitoring equipment.



#### 5.4 Data collection program with stop log operation and lake level information objective:

Bracebridge Generation expanded upon Parry Sound PowerGens daily plant check sheets in September of 2015 to manually record water levels and stop log settings on all the Seguin dam structures. Prior to that, log settings and water levels were recorded sporadically with the oldest historical data occurring on Lake Manitouwabing dating back to 2003. Historical manual water level data has been digitized for graphing.

It was recognized in a meeting with MNRF on December 3, 2010 that "calculated discharge" is a reasonable method for collecting flow data from the dams in the absence of electronic flow gauges below the dams or in the Seguin River system. Discharge from a dam can be calculated based on the relative elevation of the existing dam stop log setting and the lake/reservoir water level elevation (head). Parry Sound PowerGen was to establish a local datum for each dam that currently doesn't have "as-built" drawing that include the confirmed geodetic datum/elevations for the dam. The dam sill for each sluice can be used for the local datum, whereby the sill can be assigned an elevation of 0.00 meters for example. Geodetic datums are confirmed. The MNRF provided PowerGen with calculation tools and suggestions to collect and document water level and discharge information, including the Excel "flow calculator" currently in use by the MNR Parry Sound District. Bracebridge Generation further developed flow calculator. The exclusion of Whitefish Lake Dam outstanding as requiring a calculator. The exclusion of Whitefish Lake Dam is simply due to the flow limitations of the immediate upstream culvert however development of the calculator will continue.

#### 5.5 Ecosystem Data - Lake survey and fish habitat distribution data:

It was identified in a meeting with MNRF on December 3, 2010 that the following 3 lakes are high priority for information/data collection:

0	Horn Lake (concerns for water level fluctuations and largemouth bass spawning)
0	Fry's Lake (water level fluctuations and impact on fish community – including Lake Herring?)
0	Martin Lake (water level fluctuations/drawdown and impact on fish community)



Fish community assessments were completed by MNRF on behalf of PowerGen during the fall of 2011 on Martin and Upper Fry's Lakes. The purpose of the assessments were to describe the composition of the fish community and examine potential impacts of water level fluctuations on the lakes' fish populations at that time.

The assessment results for Upper Fry Lake suggest healthy populations of northern pike, walleye, smallmouth, largemouth and rock bass that do not display obvious impacts from the water management regime. However, it was noted that significant water level fluctuations from mid to late spring have the potential to impact these spring spawning species and should be avoided.

The assessment results for Martin Lake suggest healthy populations of largemouth bass and cisco which is consistent with studies completed during the 1960s. There were no obvious impairments of the fish community associated with water management. It was noted that large draw-downs should be avoided during the spring and winter to maintain bass and cisco reproductive success.

Both surveys were fairly superficial and there may be subtle impacts of water management occurring that would be difficult to detect or isolate from other factors.

#### 5.6 Ecosystem Data - Wetlands and related vegetation communities

Studies of this type have yet to occur in the Seguin watershed since the implementation of the WMP and the term covered by this report. This items remains as a data gap not yet addressed.

#### 5.7 Ecosystem data program with MNRF - Walleye spawning areas and dam operations objective:

It was identified in a meeting with MNRF on December 3, 2010 that suitable discharge/flow and duration of flow needed to be determined for walleye spawning and egg incubation at a number of locations:

- Hurdville Dam (Manitowabing Lake)
  - Studies of this this type have yet to occur at Hurdville Dam since the implementation of the WMP and the term covered by this report. This items remains as a data gap not yet addressed. MNRF commitment to complete walleye spawning observations during the spring spawning season below Hurdville Dam may be considered by MNRF for future work planning.
  - BGL/MNRF aim to complete a discharge/flow tests from Hurdville Dam to determine flow volumes and velocities over known spawning locations required for successful walleye spawning and egg incubation. This items remains as a data gap not yet addressed.



- CPR Trestle Dam/Cascade Street GS (spawning below CPR Trestle Dam and possibly Cascade Street GS if it is determined that walleye are able to move upstream from the CPR Trestle Dam location)
  - As a component of the EA process regarding the redevelopment of the Cascade Street GS, Bracebridge Generation has installed walleye spawning substrate in between the tailrace and the confluence with the outflow of the southern spillways. This location was selected as flows from either source would provide currents in the area of the habitat. Bracebridge Generation has been monitoring the walleye spawning activities annually at this location as well as below the CPR Trestle dam with 2020 being the anticipated conclusion of the effort resulting in data from 2018, 2019 and 2020. The report will be provided to the MNRF upon conclusion of the surveying.
  - MNRF commitment to complete walleye spawning observations during the spring spawning season below CPR/Trestle Dam may be considered by MNRF for future work planning. Due to lake sturgeon being identified as a species at risk under the Endangered Species Act, any detailed walleye spawning investigations/assessments below the CPR Trestle Dam (and Cascade Street GS) may be deferred until possible impacts to lake sturgeon below the CPR Trestle Dam are known.
- Grey Owl Lake Dam (McKeller Lake)
  - Studies of this this type have yet to occur at Grey Owl Lake Dam since the implementation
    of the WMP and the term covered by this report. This items remains as a data gap not yet
    addressed. MNRF commitment to complete walleye spawning observations during the
    spring spawning season below Grey Owl Dam may be considered by MNRF for future
    work planning.
  - BGL/MNRF aim to complete a discharge/flow tests from Grey Owl Lake Dam to determine flow volumes and velocities over known spawning locations required for successful walleye spawning and egg incubation. This items remains as a data gap not yet addressed.

#### 5.8 Bathymetric data objective:

Bathymetric data is available for all the lakes and was received from the MNRF, should additional data be required the collection of site-specific bathymetry data if deemed appropriate relative to any resource management purposes or identified studies could occur.



#### 5.9 Inflow design flood objective:

MNRF suggested that Parry Sound PowerGen complete IDF analysis in conjunction with any Dam Safety Review completed or legislative dam safety requirements. If the modeled return-flood is 100 years or less, a regional frequency analysis could be completed, and may be less time consuming or expensive to complete. Cascade Street GS redevelopment was completed with a full dam safety review of that structure. BGL has secured consulting engineers and is actively working on surveying, hydraulic/hydrologic studies and dam safety studies. This work is anticipated to continue in 2020.

The WMP suggests that any modelling undertaken would be best completed after an IDF is determined through future Dam Safety Reviews. In the interim, it is suggested to develop stage-storage curves based on available bathymetry, or simply develop volume relationships based on the surface area of the reservoirs/lakes (assume vertical shoreline profile within the range of operation). A relationship can then be easily developed between a known/calculated dam discharge and the effect or rate of change to lake levels to more predictably follow water level objectives and downstream minimum flows. Bracebridge Generation assembled a volumetric calculator based on the surface area of the reservoirs/lakes assuming a vertical shoreline profile. The calculator is utilized to predict the variance between lake inflows and outflows to assist in achieving level and flow objectives.

#### 5.10 Determination of the next term of implementation report program revisions:

Bracebridge Generation provides the following determinations regarding the current Data Information Program objectives.

**Specialized Flow Management:** Accurate data collection as detailed in the report has enabled the ability to assess the impacts and benefits of specialized flow management. Continued collection of water levels to build a suitable dataset and identification of specific locations and optimized flows are yet to be determined.

**Data Sharing and Communications:** The data sharing objective is complete as documented in this report. Bracebridge Generation will work with the MNRF following the review of this report to discuss the next term objectives.

**Public input comments/complaints log objective:** This objective will remain unchanged and data will be collected and utilized for support of other program components where relevant.

Stakeholders/stewardship: This objective will remain unchanged.



**Survey Objective:** This objective has been completed and data has been provided in this report.

**Defined Rule Curve Objective:** Data collection has been the key component required to continue with any refinements to the preliminary rule curves. Bracebridge Generation will collect data for another implementation report term in order to have a diversified dataset for analysis and determination of changes.

**Gauging stations objective:** This objective has been completed as documented in this report. The current list of gauging stations will remain active for the term of the next report.

**Data collection program with stop log operation and lake level information objective:** This objective has been completed as documented in this report. Data will continue to be collected for the term of the next report.

**Ecosystem Data - Lake survey and fish habitat distribution data:** Horn Lake (concerns for water level fluctuations and largemouth bass spawning) remain as an objective of the data collection program. Water level information collected prior to this report can be utilized to determine if impacts of level fluctuations are impacting fisheries. Bracebridge Generation will work with the MNRF following the review of this report to discuss the next term objectives.

**Ecosystem Data - Wetlands and related vegetation communities:** This objective will remain unchanged and Bracebridge Generation will work with the MNRF following the review of this report to discuss the next term objectives.

**Ecosystem data program with MNRF - Walleye spawning areas and dam operations objective:** This objective will remain unchanged and Bracebridge Generation will work with the MNRF following the review of this report to discuss the next term objectives in collection of this data.

**Bathymetric data objective:** This object will remain unchanged and engineering work is occurring at the time of this report to contribute toward this objective. Bracebridge Generation will work with the MNRF following the review of this report to discuss the next term objectives in collection of this data.

**Inflow design flood objective:** This object will remain unchanged and engineering work is occurring at the time of this report to contribute toward this objective. Bracebridge Generation will work with the MNRF following the review of this report to discuss the next term objectives in collection of this data.