Ontario Power Generation

OWA Class EA Screening Process Report

Bingham Chute Generating Station Life Extension Project

May 2025

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Executive Summary

Ontario Power Generation (OPG) has been considering extending the life of the Bingham Chute Generating Station (GS) for several years. The Bingham Chute GS is at or approaching its end-of-service life with over one hundred years of continuous operation and utilizing the original generating equipment.

OPG is planning to refurbish the GS by maintaining the existing powerhouse and replacing the two existing generating units with two new units. This option would: provide an opportunity to match more closely the flow of the other generating stations on the South River; better utilize the available river flows in nearly doubling the green energy generation; extend the service life of the facility by another 80 years; and make use of the existing infrastructure at the site. The two existing camelback Francis-style turbine units will be replaced by vertical DIVE propeller turbine units which have become common in Europe over the last decade. The powerhouse will be retained but the mechanical and electrical equipment within it will be replaced. The station condition assessment for the GS showed that the headworks infrastructure and water conveyance system (penstock) could be reused with no to minor modifications. Therefore, the overall layout of Bingham Chute GS will not change from its existing or historic conditions, which is still considered to be the optimum configuration for utilization of the resource. Service roads and parking, and other secondary structures on site will remain as is.

Bingham Chute GS is located on the South River in the Municipality of Powassan, Ontario, about 27 kilometres (km) south of North Bay. The South River is a regulated river with several small hydroelectric generating stations and water control structures, some of which have been in place for over one hundred years.

The OWA Class EA 9th and 10th Editions have purposely developed a *Screening Process to Exempt Low-Risk Projects* to enable low-risk projects to be screened and, subject to the screening outcomes, exempt from the *EA Act*, and therefore remaining processes under the Class EA. These low-risk projects would involve very minimal, short term, and localized effects that can be addressed through other legislative mechanisms (e.g., *Lakes and Rivers Improvement Act*, *Fisheries Act*, etc.). According to the 10th Edition, projects that fall within this schedule must meet the following criteria to qualify for the Class EA Screening process:

- "Are associated with existing water management infrastructure, such as a dam, a weir, or a lock. The existing water management infrastructure may be retrofitted or refurbished/upgraded (as defined in Appendix A); and
- Limit any increase in the footprint of the water management infrastructure to 25% or less." (p. 26).

The proposed Bingham Chute Life Extension Project (BCLEP) proposes a modern-day upgrade of the existing Bingham Chute GS. There is no proposed increase to the footprint of the water management infrastructure. The BCLEP does not involve any proposed work on the main dam, sluiceways, spillway, dikes, or other water management infrastructure. Some minor work on the tailrace is expected. The comment period for the Notice of Screening was between April 14 and May 21, 2025. A Notice of Project Screening was issued to the Indigenous communities, local property owners potentially affected by the project, to government agencies and local municipalities. The Notice of Screening can be found in Appendix A.

To successfully screen a project out of the Class EA process the proponent must be able to answer "No" to all seven of the screening criteria questions. Those questions and a short summary of the outcome are described in Table ES-1 below.

Table ES-1 OWA Class EA Screening Criteria and Summary of Results of Bingham Chute

SCREENING CRITERIA	**OUTCOME (YES OR NO)** Please identify any Best Management Practices that will be applied related to each screening criteria. ***After application of appropriate Best Management Practices and mitigation strategies, is the project expected to:***
1. Change the water management regime, including (but not limited to) significant change to water flow, inundated area or, historical mean monthly maximum water level?	**No.** The South River Water Management Plan is already in place for the South River and identifies compliance levels and flows for GSs along the South River. OPG **does not** plan to propose new levels or flows associated with the Bingham Chute GS. No inundation is proposed.
2. Release contaminants into the immediate environment that exceed regulatory thresholds?	After application of site-specific mitigation measures and best management practices there would be **no** release of contaminants into the immediate environment that exceed regulatory thresholds.
3. Cause negative effects on species or their habitat for species listed under the Ontario *Endangered Species Act* (*ESA*)?	**No** ESA species will be negatively affected by the proposed refurbishment of the Bingham Chute GS.
4. Cause negative effects on protected areas, such as Areas of Natural and Scientific Interest (ANSIs), environmentally sensitive areas, or provincially significant wetlands?	The closest protected area to the Bingham Chute is approximately 8 km and all effects of the project are anticipated to occur only at the site or within a few hundred meters of it. Therefore, **no** effect is predicted on protected areas.
5. Cause considerable sedimentation or erosion on or off-site?	After application of site-specific mitigation measures and best management practices there would be **no** anticipated sedimentation and/or erosion off-site.
6. Have negative effects on known (previously recognized) or potential built heritage resources and/or cultural heritage landscapes? (See instructions below)	**No** anticipated negative effects on built heritage and/or cultural heritage landscapes will occur because the overall layout of the GS will remain unchanged, and the existing powerhouse refurbished.
7. Have negative effects on archaeological resources and areas of archaeological potential? (See instructions below)	A Stage 1 and 2 archaeological assessment was completed at the site. The area of the proposed project's footprint was previously disturbed, or the soils tested negative for archaeological resources. Therefore, **no negative effect** is anticipated on archaeological resources or areas of archaeological potential. Furthermore, a marine archaeological assessment also concluded that there would be **no** negative effect on marine archaeological resources and/or areas of archaeological potential.

As the answer to all seven of the screening questions was "no", the proposed refurbishment of the Bingham Chute GS does not need to proceed through the Class EA process. OPG will still be required to comply with all other relevant legislation, and several provincial and federal approvals (e.g., minor amendment to the Water Management Plan, approval from Department of Fisheries and Oceans under the *Fisheries Act*) are still required for the project to proceed.

1 Introduction

Ontario Power Generation Inc. (OPG) is exploring options for extending the life of several of its aging hydroelectric generating stations including the Bingham Chute Generating Station (GS). The Bingham Chute GS is at or approaching its end-of-service life, with about one hundred years of continuous operation for the original generating equipment. The station is also undersized in relation to the current design approach of waterpower generating stations and most of the controls are non-automated, still relying heavily on operator inputs. The life extension of the Bingham GS provides an opportunity to better utilize and manage the available river flows, as well as upgrade the monitoring and control system, and extend the service life of the facility. The life extension project will increase the average annual energy by more than double, adding an important new supply of renewable electricity to the provincial grid.

1.1 Project Location

Bingham Chute GS is located in the Municipality of Powassan, Ontario, about 27 kilometres (km) south of North Bay. Bingham Chute was the original location of the village of Powassan prior to the construction of the Canadian National Railway (CNR) Line.

The South River is a regulated river with several small hydroelectric generating stations and water control structures, some of which have been in place for over one hundred years. The South River has its headwaters located in the western edges of Algonquin Provincial Park and flows in a north-westerly direction through or adjacent to the municipalities of the Village of South River, Powassan and Township of Nipissing and terminating into the South Bay of Lake Nipissing. There are several small lakes in the catchment area that are generally at or near the sources of the various tributaries to the main stem of the river including Craig, Hinsburger, Loxton, Smythe, Twenty-Seven, Bray, and Sausage lakes. The South River Watershed, major waterbodies, and regulated and unregulated rivers of the South River System are depicted in Figure 1-1 below (MNR *et al*., 2012, p. 8).

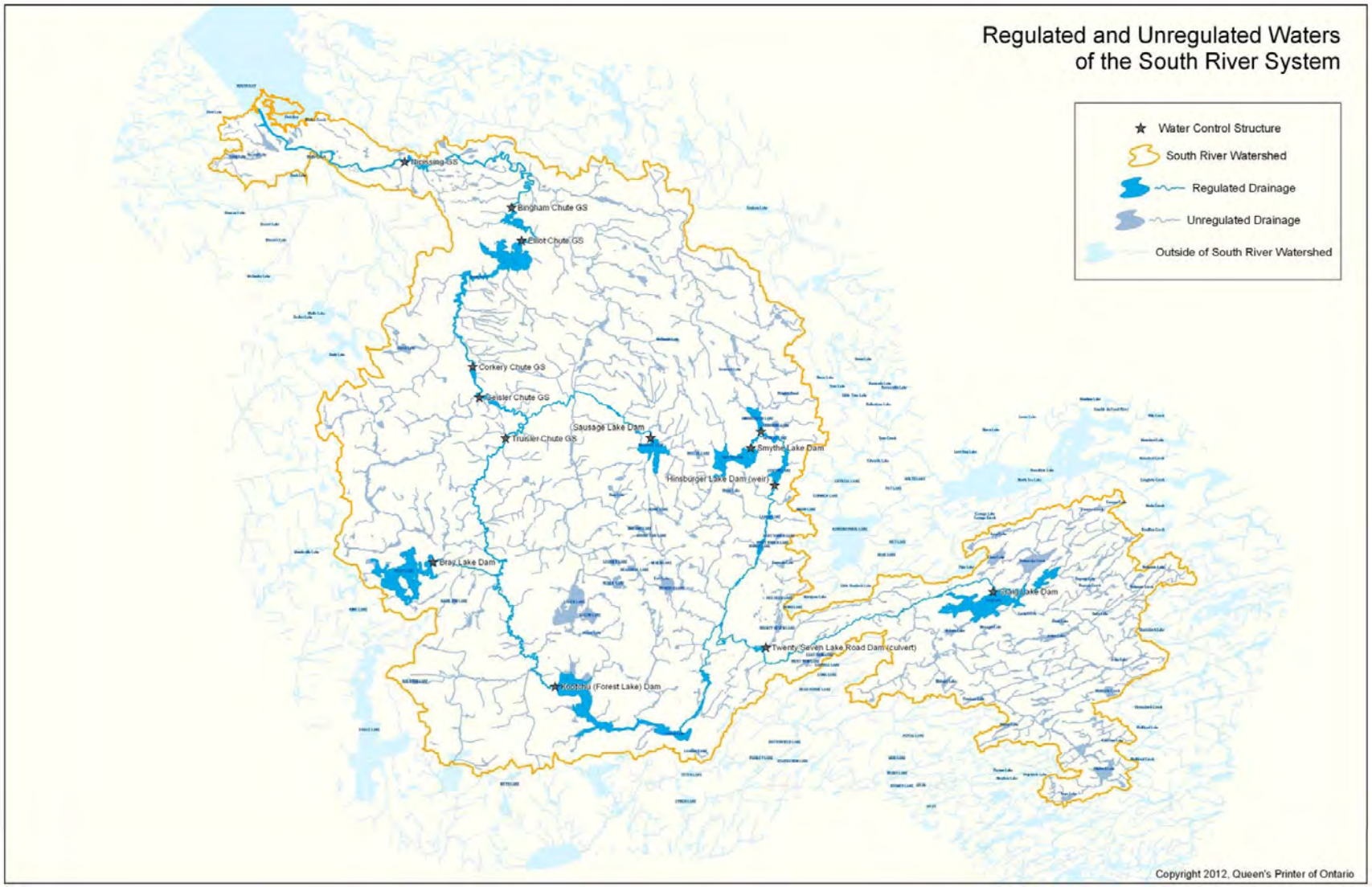

Figure 1-1 Regulated and Unregulated Rivers of the South River System (MNR et al., 2012) (Bingham Chute GS is located near the top of the figure)

As shown in the figure above, Bingham Chute GS is located on the lower section of the South River near Lake Nipissing, downstream of OPG's Elliot Chute GS and upstream of OPG's Nipissing GS and just slightly west of town of Powassan (see Figure 1-2).

Figure 1-2 Location of the Bingham Chute GS (C. Portt and Associates, 2021a)

1.2 OWA Class EA Screening Process

1.2.1 Categorizing Bingham Chute Life Extension Project under the Screening Process to Exempt Low-Risk Projects

According to the OWA Class EA Process 9th Edition, the proposed Bingham Chute Life Extension Project (BCLEP) is a Category B Project. This means it is typically subject to the Class EA process but can be exempted if it meets certain requirements and successfully complete a screening process. This is further described below.

The BCLEP falls into a category of Projects that is characterized as: *Associated with Existing Infrastructure or Increases in Efficiency on Managed Waterways (Category B)*. This category includes waterpower projects that are expansions, modifications, or redevelopments and are proposed at, near, or around existing facilities or water management infrastructure. The Class EA describes these projects as follows:

> "Projects associated with existing infrastructure are less likely to involve new significant effects and are anticipated to have localized interests. In general, this category of projects will involve relatively localized direct effects to the environment and, while project size may vary, the scope of change will often be restricted to the infrastructure itself and the zone of impact resulting from modification. However, these types of facilities may have been in existence for many years and may have built cultural heritage value or interest. These projects, therefore, have the most likelihood to affect buildings or structures of cultural heritage value or interest ("built heritage"). However, the possibility of affecting built heritage is potentially relevant to all categories. In addition to the limitations imposed by changes to existing infrastructure, it is reasonable to expect that water management regimes are already established, either as expressed through a formal water management plan or through the identification of relevant social and environmental values and interests. Projects within the category that involve significant changes in water management regimes are likely to be more complex than those that do not. Projects that meet the following categories would be eligible to go through the screening process:
>
> - expansion or change to an existing facility with an initial nameplate capacity of less than 200 megawatts (MW); and
> - expansion or change to an existing generation facility by less than 25% with an initial nameplate capacity greater than 200 MW." (pp. 24 – 25)

The OWA Class EA 9th Edition (and included in the 10th Edition) purposely developed a *Screening Process to Exempt Low-Risk Projects* that is described below.

> "Noting that, this schedule of projects is anticipated to include projects that involve very minimal, short term and localized effects that can be addressed through other legislative mechanisms (e.g., *Lakes and Rivers Improvement Act*, *Fisheries Act*, etc.), a screening process has been developed to enable those projects to be screened and, subject to that the screening outcomes, exempt from the *Ontario Environmental Assessment Act*, and therefore the Class EA. Projects that fall within this schedule must meet the following criteria to qualify for the Class EA Screening process:
>
> - Are associated with existing water management infrastructure, such as a dam, a weir, or a lock. The existing water management infrastructure may be retrofitted, or refurbished/upgraded (as defined in Appendix A); and
> - Limit any increase in the footprint of the water management infrastructure to 25% or less." (p. 25)

The proposed BCLEP is a modern-day upgrade of the existing Bingham Chute GS. There is no proposed increase to the footprint of the water management infrastructure. The BCLEP does not involve any proposed work on the main dam, sluiceways, spillway, dikes, or other water management infrastructure. Some minor work on the tailrace is expected. The proposed project is described in Chapter 3 of this Report.

The OWA Class EA goes on to note that:

> "In terms of process, the proponents of projects meeting either set of criteria above will qualify to complete a screening to confirm that there are no significant negative environmental effects anticipated from the project." (p. 25)

1.2.2 Screening Process to Exempt Low-Risk Projects

The Screening Process for Low-Risk Projects is described in this section. A flowchart of the OWA Class EA Screening Process is depicted below in Figure 1-3.

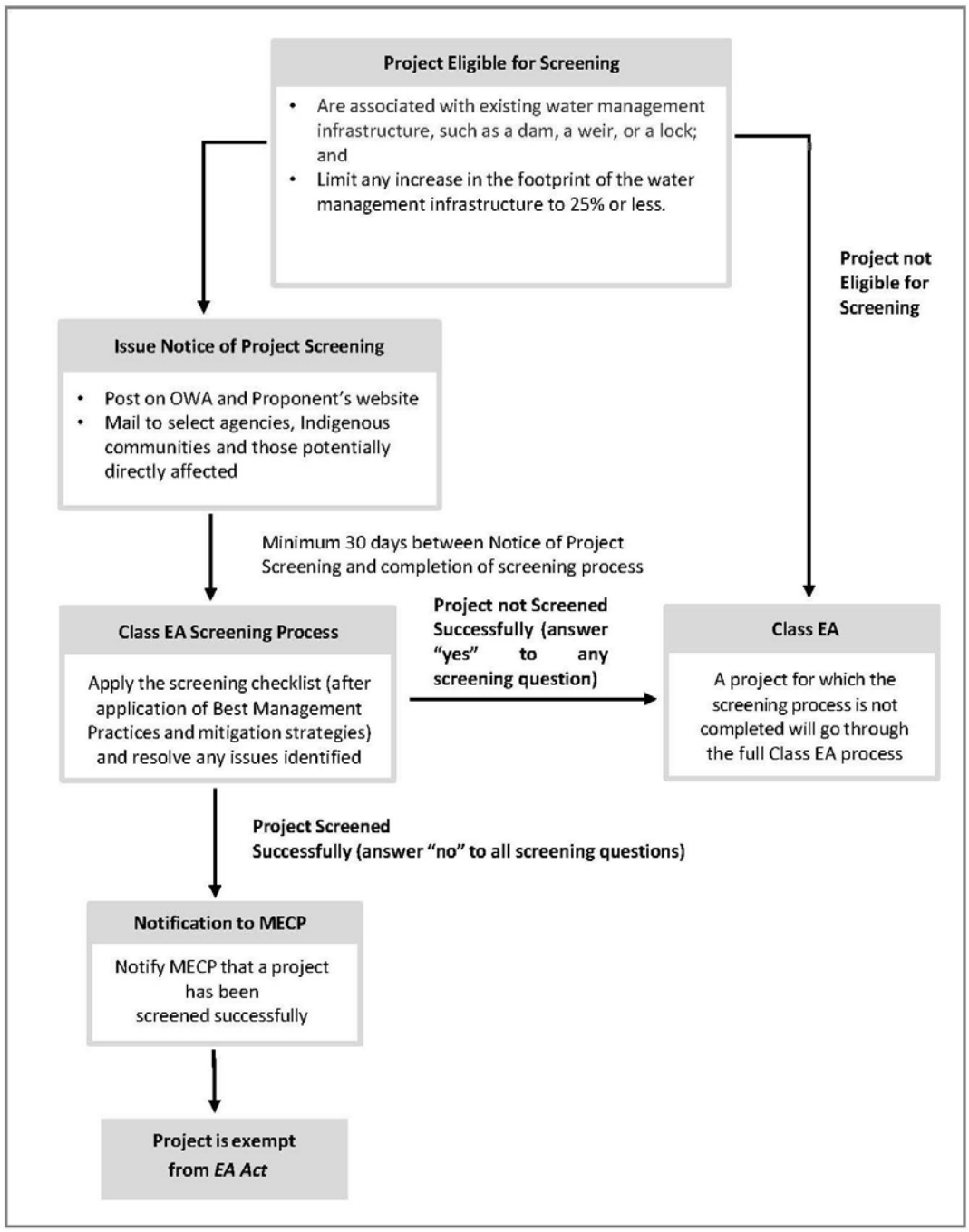

Figure 1-3 Flowchart of OWA Class EA Screening Process

The flowchart boxes or steps in the Screening Process are each described below.

1.2.2.1 Box/Step: Project Eligible for Screening

This box is the preliminary assessment as to whether the project is eligible for the screening process. As already indicated, the criteria is whether the project is associated with the existing infrastructure and the increase of the footprint of the water management infrastructure is 25% or less. The BCLEP meets both of these criteria.

1.2.2.2 Box/Step: Issue Notice of Project Screening

The next step in the Screening Process is to issue a Notice of Project Screening.

According to the OWA Class EA, the Notice of Project Screening to be issued to all of the following provincial Ministries and officials: Ministry of the Environment, Conservation and Parks (MECP) Director of the Environmental Assessment Branch and the Regional Environmental Assessment Coordinator; Ministry of Natural Resources (MNR); Ministry of Energy (ME); and the Ministry of Citizenship and Multiculturalism (MCM).

The Screening is also to be sent to anyone potentially directly affected by the project and potentially affected Indigenous communities.

The Notice of Project Screening will be published on the OWA website and, if available, the proponent's website, and will be provided to anyone directly affected by the project via direct mail outs. The notice must include the following information:

- project title and name of the proponent;
- brief description of the project and tentative schedule;
- map showing project location and anticipated zone of influence;
- project type (retrofit, or refurbishment/upgrade; or efficiency increase);
- watercourse identification;
- current installed capacity and proposed installed capacity;
- anticipated % expansion of infrastructure, if any; and
- statement that: "This project is being screened in accordance with the process outlined in section 3.1.1 of the Class EA for Waterpower Projects. For further information about the proposal, please contact: _____".

1.2.2.3 Box/Step: Class EA Screening Process

Table 1-1 presents the screening checklist that must be completed by the proponent for each project following issuance of the notice. To successfully screen a project out of the Screening process, the proponent must be able to answer "No" to all seven of the screening criteria questions.

Table 1-1 Screening Questions to Exempt Projects Associated with Existing Infrastructure or Increases in Efficiency on Managed Waterways

SCREENING CRITERIA	**OUTCOME (YES OR NO)** Please identify any Best Management Practices that will be applied related to each screening criteria. ***After application of appropriate Best Management Practices and mitigation strategies, is the project expected to:***
1. Change the water management regime, including (but not limited to) significant change to water flow, inundated area or, historical mean monthly maximum water level?	
2. Release contaminants into the immediate environment that exceed regulatory thresholds?	
3. Cause negative effects on species or their habitat for species listed under the Ontario *Endangered Species Act*?	
4. Cause negative effects on protected areas, such as areas of natural and scientific interest (ANSIs), environmentally sensitive areas (ESAs) or provincially significant wetlands?	
5. Cause considerable sedimentation or erosion on or off-site?	
6. Have negative effects on known (previously recognized) or potential built heritage resources and/or cultural heritage landscapes? (See instructions below)	
7. Have negative effects on archaeological resources and areas of archaeological potential? (See instructions below)	

With respect to Questions #6 and #7 the "instructions below" are as follows.

> "To respond to questions 6 and 7, proponents must notify the Ministry of Culture and Multiculturalism Heritage Planning Unit at heritage@ontario.ca for project specific advice on what technical culture heritage studies may be applicable. MCM will provide a letter to the proponent with this advice.
>
> Proponents are encouraged to review MCM's "Template Letter", dated January 2024 as may be amended by MCM from time to time, and posted on the Class EA page of the OWA website."

No further advice with respect to these Instructions is provided in the Class EA but OPG and Arcadis followed up with the then Ministry of Heritage, Sport, Tourism and Culture Industries (now MCM) Heritage Planning Unit on this matter and their advice is discussed in this report under those two questions.

As is indicated above, the purpose of the screening process is to confirm that there are no significant negative environmental effects anticipated from the project.

As indicated in the OWA Class EA:

> "If concerns are raised by an Indigenous community regarding potential adverse impacts on an established or asserted Aboriginal or treaty rights, the Crown's duty to consult may be triggered. In such instances, the proponent will seek guidance from the Ministry of the Environment, Conservation and Parks. It is the expectation of the ministry that the proponent will work with the ministry and Indigenous communities to address issues before the completion of the screening process. The proponent will document its supporting analysis and conclusions, including any mitigation or impact management measures to prevent or reduce the effects the project may have on the surrounding environment (for example, application of the OWA's Best Management Practices). If the response to any of the screening questions is "yes", the project is not successfully screened and the screening process cannot be completed. Instead, the proponent must complete the full Class EA process for the project, which will facilitate further study and analysis. The Class EA process is further described in Section 4.0."

1.2.2.4 Box/Step: Notification to MECP

In this step, if the screening outcome is "No" for all the questions, the proponent will notify the MECP Director of the Environmental Assessment Branch and the Regional Environmental Assessment Coordinator. There must be a minimum 30 days between the circulation of the Notice of Project Screening and the completion of the screening process. Any ministry that received issue of Notice of Project Screening may request a copy of the proponent's supporting documentation.

1.2.2.5 Box/Step: Project is Exempt from Class EA

Upon competition of the screening process, the project is considered to be exempt from further assessment under the *Ontario Environmental Assessment Act*.

1.2.2.6 Box/Step: Class EA

This step in the Screening process if only for projects that do not meet the eligibility criteria for the Screening process or cannot indicate "No" to one or more of the Screening Criteria questions.

2 Project Description

2.1 History

The Bingham Chute GS and associated dams were built by the Hydro-Electric Power Commission of Ontario (later Ontario Hydro) in 1923, primarily to relieve a power shortage caused by depletion of water storage areas. The GS was named after the Bingham family that operated a grist mill in the area. The station has two horizontal double-Francis camelback units, and a sluiceway with 5 bays operated with stoplogs. Unit 1 was placed in service on December 2, 1923, and Unit 2 on March 31, 1924, and was the second station commissioned on the South River. The generators came from the Nipissing plant which had to be outfitted with higher-capacity generators in 1923 (OPG *et al*., 2012).

The Bingham Chute GS is still operating with the original equipment. The equipment has been maintained with some major overhauls over the years of operation, minor upgrades have been made to both the generating equipment and the controls and protection systems.

Approximately 3.5 km upstream of the Bingham Chute GS is the Elliot Chute GS, which was commissioned in 1929, a few years after the Bingham Chute GS, and was the third station commissioned on the South River. This station has one vertical fixed propeller unit and a sluiceway with three bays operated with stoplogs.

Approximately, 15.5 km downstream of the Bingham Chute GS is the Nipissing GS, which was commissioned in 1909, and was the first station commissioned on the South River and is also the first station on the South River upstream of Lake Nipissing. This station has two horizontal double-Francis camelback units, a sluiceway with three bays operated with stoplogs, and one fixed weir. Nipissing GS is currently in safe state and is not in operation, with the river flow bypassing the station.

2.2 Existing Generating Station

The Bingham Chute GS has two generating units with an installed capacity of 0.86 MW at a gross head of about 13.4 m with a maximum flow through the powerhouse of 9.5 m^3/s. The facility consists of the following components (Tetra Tech, 2021), which are shown in Figure 2-1 to Figure 2-10:

- Concrete sluiceway with five bays and concrete gravity walls on each side. All bays are operated with stoplogs by a gas-fuelled log lifter on the deck. The log lifter and deck are being replaced over 2024 and 2025.
- Intake structure with trashrack and isolation stoplog gate, and small wing walls.
- Three earth dykes on the east and west side and a centre dyke connecting the sluiceway to the intake with upstream slopes protected by rip rap and a downstream vegetated slope.
- Above-ground steel penstock, 107 m long, with a combination of 2.3 m and 2.1 m diameter concrete saddles, and a short section buried under the road. The penstock terminates at the powerhouse anchor bock and bifurcation where one unit has a manual intake valve while the other unit is directly connected to the other branch of the bifurcation. The steel penstock was installed in 1974 to replace the original 2.4 m diameter wood stave penstock.

- Powerhouse housing two horizontal 0.43 MW double-Francis camelback units with associated power, control and protection systems. The units discharge back into the South River via a short tailrace channel. The powerhouse is the original masonry building on a concrete foundation.
- Switchyard with one dry-type power transformer and disconnect switch. The switchyard was upgraded in the recent years with a new transformer and disconnect and associated yard fencing and grounding grid.
- 44 kV Transmission Line from the substation to tie in with the Hydro One Networks Inc. (HONI) Feeder M7 from the Trout Lake Substation.

Figure 2-1 Aerial View of Powerhouse and Associated Structures (Tetra Tech, 2022, Google aerial image)

Figure 2-2 Sluiceway

Figure 2-3 Intake and Trashrack

Figure 2-4 West Dyke

Figure 2-5 Forebay/Reservoir and Boom Lines

Figure 2-6 Penstock and Powerhouse

Figure 2-7 Powerhouse

Figure 2-8 Generator Units

Figure 2-9 Tailrace

Figure 2-10 Switchyard, Transformer and Storage Shed

The dam forms a small reservoir with minimal storage capacity situated immediately upstream of the Bingham Chute GS that extends to just downstream of the Elliot Chute GS. Refer to Figure 1-2 for a map of the reservoir for the Bingham Chute GS and other stations. Surrounding the Bingham Chute reservoir is private land that is partially farmed, with a small number of homes.

The Bingham Chute GS sluiceway and dykes currently have a Very High dam safety hazard consequence classification due to the residences in proximity. OPG regularly undertakes dam safety assessments. The following upgrades related to dam safety were completed or planned: new sluiceway stoplogs (2019), sluiceway log lifter replacement (2024 - 2025), and new headworks deck (2024). As previously indicated, the *Lakes and River Improvement Act* (*LRIA*) section 14 or 16 approval falls under OPG Dam Safety Director's purview (see the A Framework for *Lakes and Rivers Improvement Act* agreements for alterations, improvements and repairs to dams | ontario.ca). The Bingham Chute GS has sufficient capacity through its sluiceway (580 m^3/s) to pass the inflow design flood (465 m^3/s as determined by Canadian Dam Association guidelines by which OPG abides). The project will not be impacting the sluiceway, so under the current OPG and MNR governance there are no dam safety concerns. The Bingham Chute sluiceway flows are managed through manual log operations.

A short portage bisects the site and provides access around the GS. Upstream access to the portage occurs outside the upstream boom line. The portage then travels north, crossing Highway 534, before passing along the penstock and around the powerhouse. A trail then leads to the river beyond the tailrace to allow re-entry into the river. Please see the Figure 2-11 and Figure 2-12 below.

Figure 2-11 Portage Trail below Powerhouse

Figure 2-12 Portage Sign

One of OPG's engineering consultants, Tetra Tech completed an assessment of the GS, as well as site investigations (visual inspection, building assessment, concrete coring, and bathymetric survey), and a review of the past Plant Condition Assessments (PCA) completed by OPG in the recent years and found that most of the infrastructure is generally in good condition. As expected, regular and ongoing maintenance works has been identified, of which most are not related to the Project and will be completed regardless. The main issue to be corrected would be occasional station flooding during very high river flow due to water ingress from the main service door and drains. Other than this and the age of the generating units with older technology and the original electrical and control systems, most of the infrastructure will be serviceable after the maintenance works and some equipment upgrades are completed. The current penstock intake is manually operated.

2.3 South River Water Management

The South River originates in Algonquin Provincial Park, and flows approximately 93 km northwest, eventually draining into Lake Nipissing. Lake Nipissing drains into the French River which terminates in Georgian Bay. The Water Management Planning Area for the South River is shown below in Figure 2-13. The South River is about 93 km long and has a drainage area of 829 square km (MNR *et al*., 2012, p. 5).

A total of six generating stations are located along the South River, with a combined capacity of 6-8 MW (MNR *et al*., 2012). Within the upper watershed there are eight lakes that have regulated water levels (i.e., dams/weirs), four of which are managed by the MNR[1], and four of which are managed by OPG (MNR *et al.* 2012). Approximately 3.5 river km upstream of the Bingham Chute GS is the Elliot Chute GS (operated by OPG), while the Nipissing GS (operated by OPG) is located approximately 15.5 river km downstream. The various GSs and the hydraulic travel times between stations is depicted in Figure 2-14 from the South River Water Management Plan (SRWMP).

The SRWMP was prepared in accordance with MNR's *Water Management Planning Guidelines for Waterpower* (May 2002) and was approved by the MNR in 2012. OPG, Trout Creek Power, Carlisle Limited Partnership No. 1, and MNR are the proponents of this plan. The Department of Fisheries and Oceans (DFO) Canada participated as an advisor to that process (MNR *et al.*, 2012). The SRWMP included significant public and Indigenous consultation which is described in the Plan itself.

In Ontario, water management plans (WMPs) regulate the management of in-stream flows and water levels on the rivers, and associated reservoirs, as they are affected by the operation of hydro generators and water control structures owned by their proponents. The SRWMP identified a preferred management option for each control structure that supports sustainable development of water resources for waterpower and other uses, while protecting and enhancing the natural ecosystem. With the implementation of the WMP, those preferred management options became legally enforceable operating limits including operating ranges and where needed specified flows at specific rates (MNR *et al*., 2012).

In general, the South River system is operated to optimize environmental needs, recreation, public safety and, to the extent possible, flood mitigation, as the highest priorities within the watershed. Power generation is considered secondary to the above objectives in the SRWMP. As part of the SRWMP, operating limits for each control and power generation facility in the watershed are legal requirements.

[1] Most of the references to what is now known as the Ontario Ministry of Natural Resources and Forestry (MNRF) are referred to in this document as MNR, which is what the Ministry was known as at the time of the publication of the SRWMP.

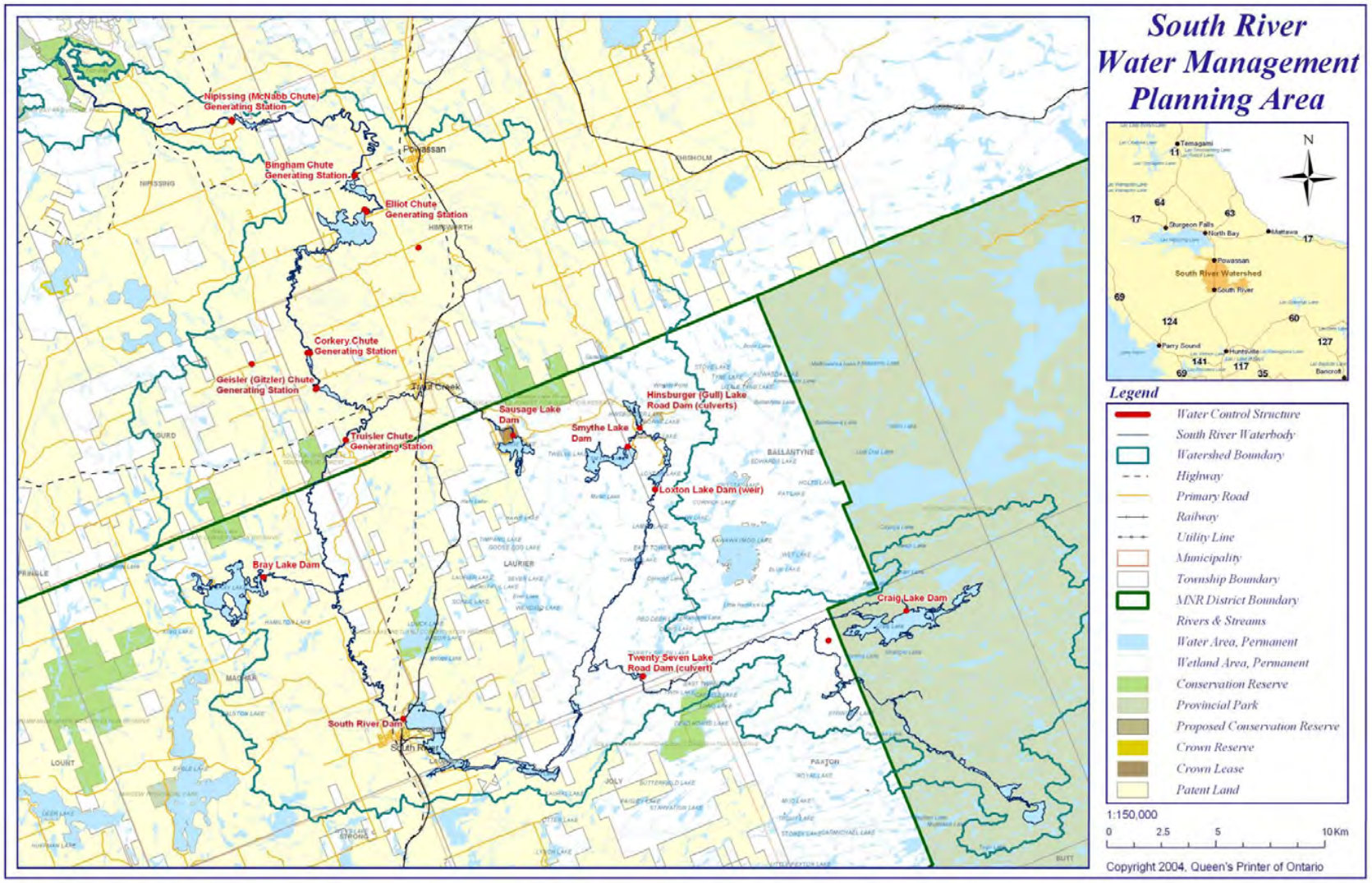

Figure 2-13 South River Water Management Planning Area (MNR, 2012)

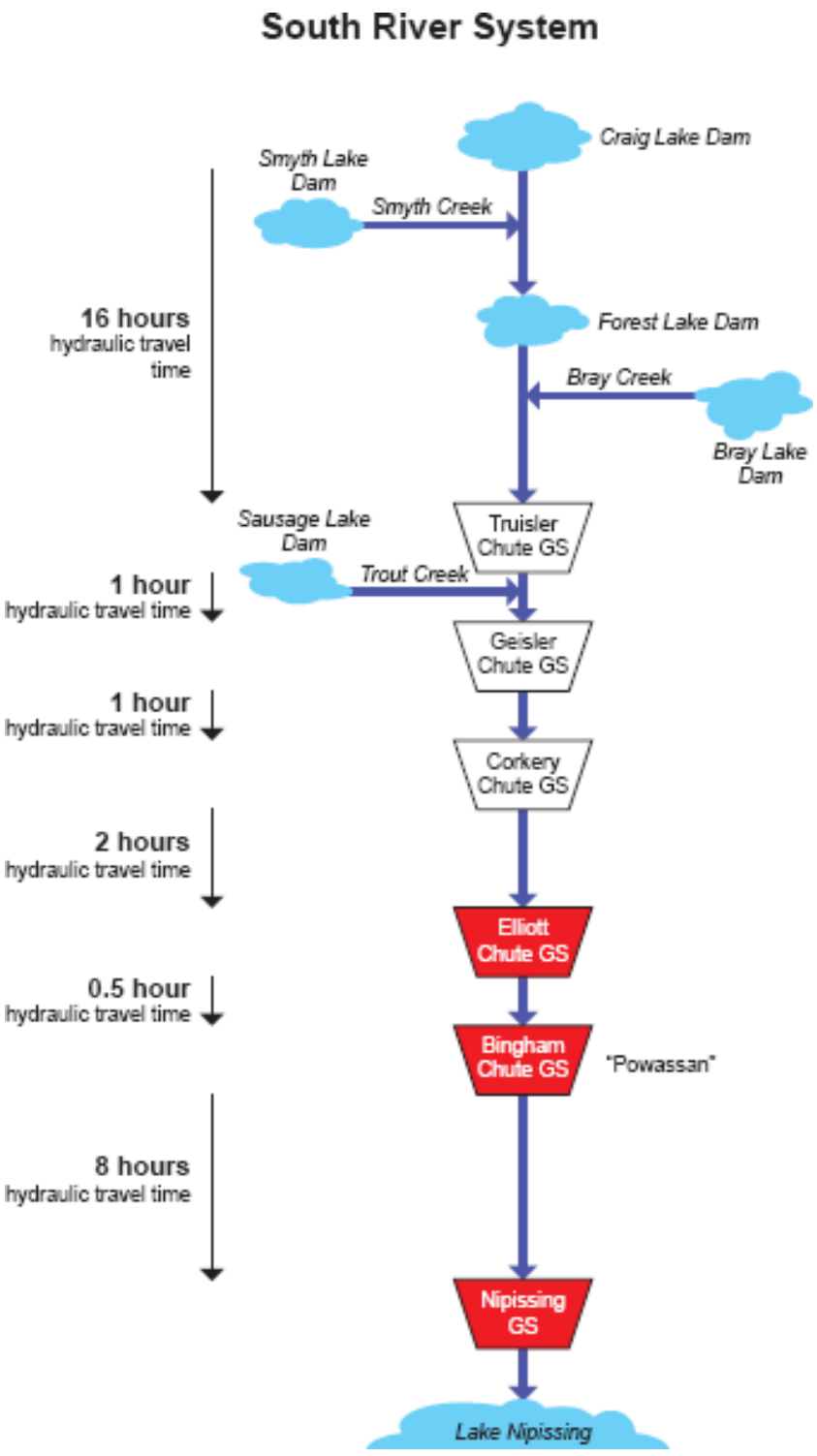

Figure 2-14 South River Dams, GS and Hydraulic Travel Times (MNR, 2012)

2.3.1 Bingham Chute GS Compliance Requirements

There are no environmental water level or flow constraints for Bingham Chute GS (the discovery of Walleye spawning at Bingham Chute in 2021 is discussed in Section 2.5); however, constraints during Walleye spawning exist for both Elliot Chute GS and Nipissing GS, the stations immediately upstream and downstream of Bingham Chute, respectively (Figure 1-2). From April 1 to May 31 Elliot Chute maintains a specific forebay elevation to facilitate spawning upstream of the facility, while Nipissing GS maintains a constant flow during this period to facilitate spawning downstream of the facility (MNR *et al.,* 2012).

Bingham Chute GS has an operating maximum of 250.26 masl and a minimum of 249.02 masl with no seasonal restrictions and no flow requirements. The reservoir for Bingham Chute GS (Figure 2-15) has a capacity of 5.8 cms days[2]. The figure below shows the reservoir of the Bingham Chute GS.

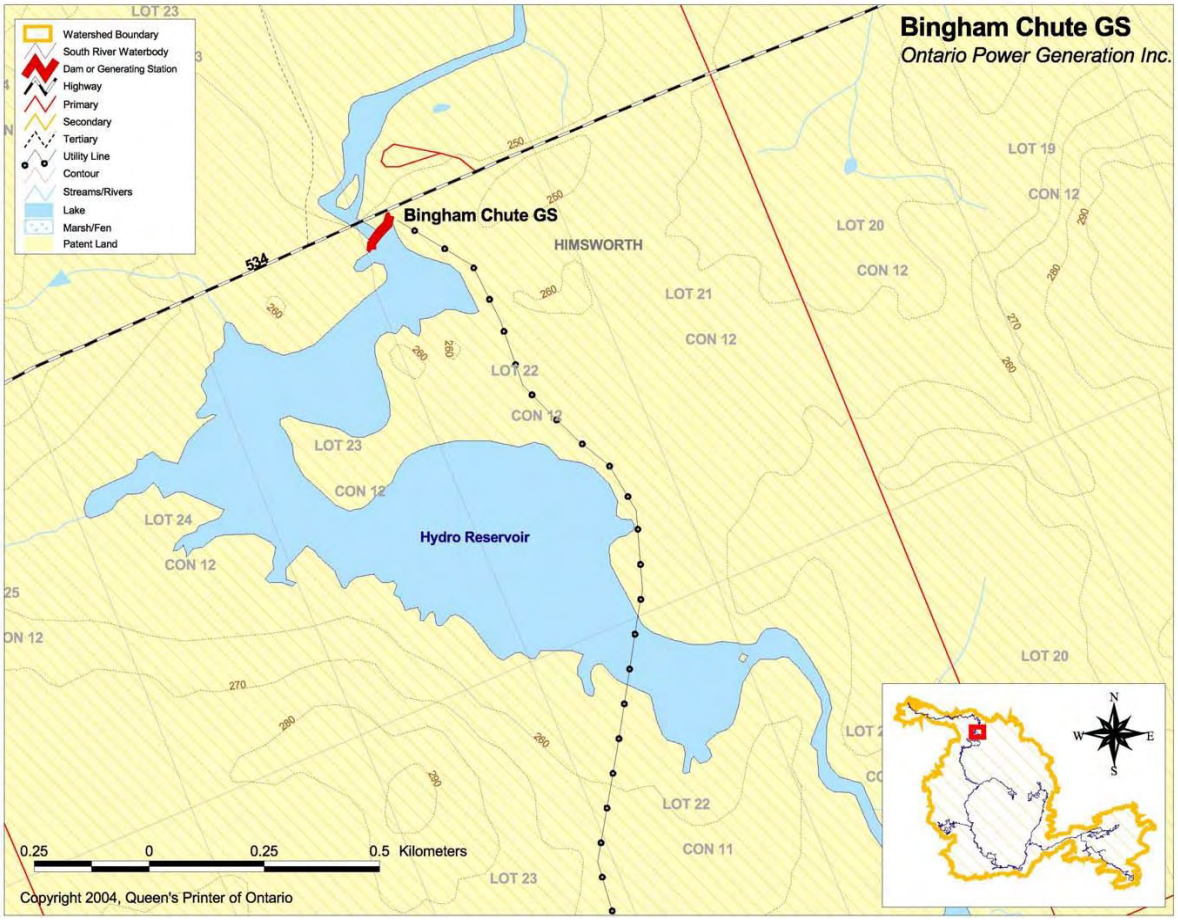

Figure 2-15 Bingham Chute GS Reservoir (MNR, et al., 2012, p. 60)

[2] Cubic Meters per Second (CMS) Day. One cubic meter of water passing a given point every second for one day or 24 hours. Used in the calculation of inflow for storage lakes (MNR, et. al., 2012).

Immediately upstream of Bingham Chute GS is Elliot Chute GS which has an operating maximum of 264.83 masl and a minimum of 263.32 masl. Elliot Chute also has a seasonal restriction from April 1 to May 31 (or as confirmed by MNR), during Walleye spawning for a minimum elevation of 264.11 masl, with no flow requirements.

The Figure 2-16 shows the reservoir of the Elliot Chute GS with the river downstream leading directly into the Bingham Chute GS reservoir.

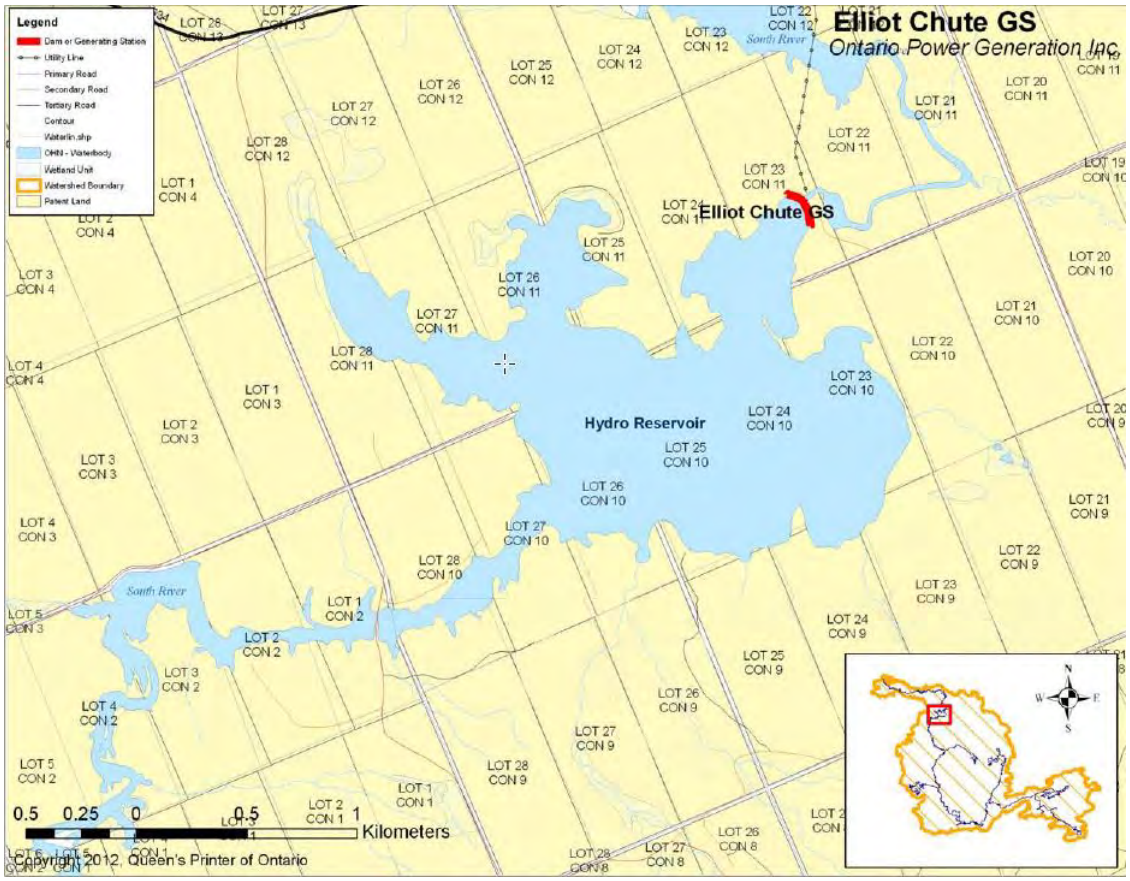

Figure 2-16 Elliot Chute GS Reservoir (MNR, et al., 2012, p. 60)

Fifteen km downstream of Bingham Chute GS, Nipissing GS has an operating maximum of 234.43 masl and a minimum of 232.61 masl, with summer levels normally maintained below spillway level at 234.04 masl. Nipissing GS also has a seasonal restriction from April 1 to May 31 or as confirmed by MNR for a constant flow requirement for Walleye spawning. Two consecutive hours of no flow is considered non-compliance by MNR during the Walleye spawning period. The reservoir for Nipissing GS has a capacity of 8.5 cms days. Figure 2 17 shows the reservoir of the Nipissing GS.

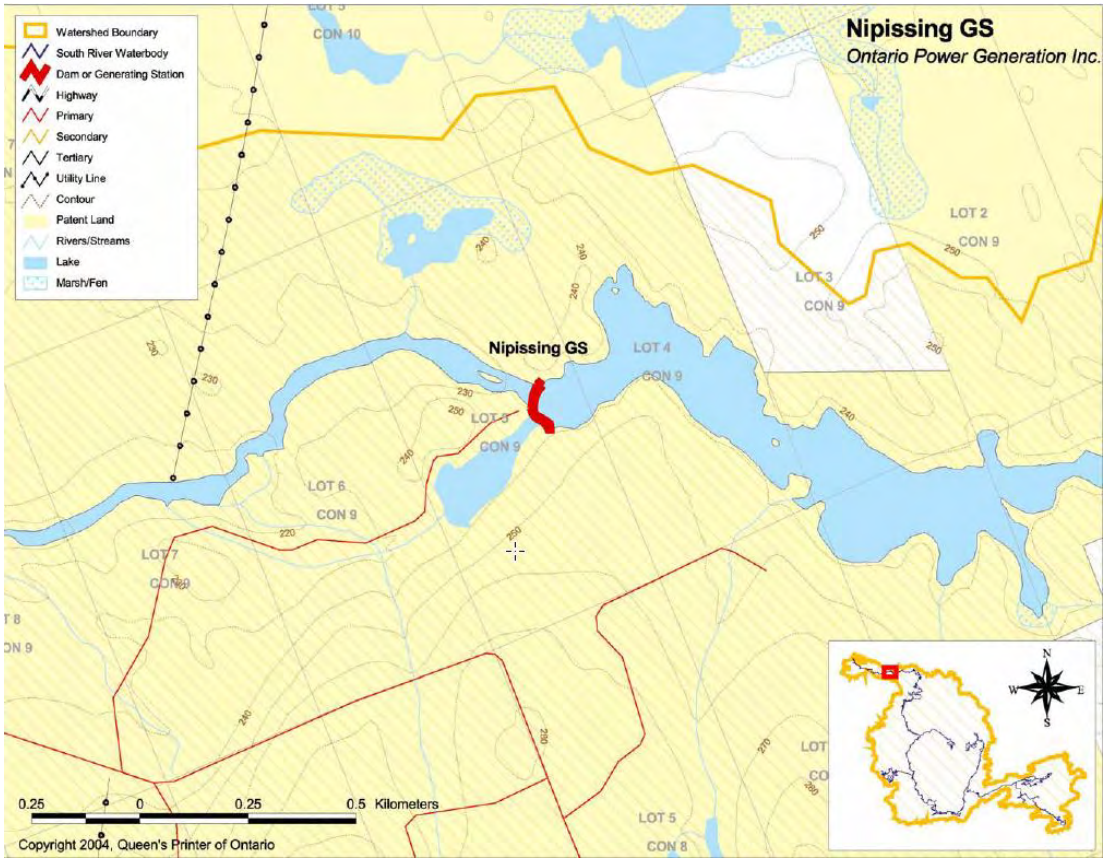

Figure 2-17 Nipissing GS Reservoir (MNR, et al., 2012, p. 60)

2.3.2 Bingham Chute Reasonable Practices

The SRWMP also described some voluntary water management measures that OPG has undertaken.

> "There are a number of reservoirs/generating facilities within the planning area that currently have 'voluntary agreements' in place between local landowners and OPGI, or which recognize recreational or navigational elevations in their current operations. In most of these cases, a very narrow operating band has been identified that OPG has agreed to make reasonable efforts to stay within. The voluntary agreements are considered a social component of compliance and carry a different weight than legal requirements.
>
> The achievement of these bands annually is difficult and does not provide any flexibility to OPG or MNR if applied as a compliance requirement; however, the proponents agree that they are accountable to the public to make a reasonable effort to achieve these constraints." (MNR *et al.*, 2012, p. xvii).

The above are defined in the SRWMP as "Reasonable Practices". There are no Reasonable Practices identified for the Bingham Chute GS but one is identified for the Elliot Chute GS for the summer period.

Within the Reasonable Practices section of the SRWMP it is indicated that, if possible, the Elliot Chute reservoir should be maintained above 264.26 masl from May 15 to October 14 (Victoria Day to Thanksgiving Day weekend) for recreational use. The reservoir is drawn down prior to freshet in the spring based on the snow, soil saturation, ambient condition, and weather forecast. The reservoir for Elliot Chute GS has a capacity of 53 cms days.

While the SRWMP has only been in place since 2012, OPG has operated its facilities for decades in consideration for the many varied environmental, economic and social values in the watershed. It was noted in the SRWMP that:

> "Level and flow operating strategies for the South River Watershed have been developed using historical data compiled over a period of more than half a century, taking into consideration many resource values and uses. As a result, OPGI has, for many years, had an operating plan, with constraints on water levels and flows that voluntarily recognize the multiple uses of the river." (MNR *et al.,* 2012, p. 2).

2.3.3 Existing Operations

Bingham Chute GS is generally operated as a run-of-the-river[3] plant and is considered by OPG to be the power generation "bottleneck" (or narrowing) on the South River. Bingham Chute GS has roughly half the turbine discharge capability at 9.5 m³/s (SRWMP flow) compared to Elliot Chute GS at 18.5 m³/s, and as such, the output at Elliot Chute is often curtailed to the flow capacity of Bingham Chute whenever the available storage at Elliot Chute permits.

Prior to spring freshet, the reservoir at Elliot Chute GS is drawn down to allow inflow to refill the reservoir and mitigate flood potential downstream, while the Bingham Chute GS reservoir is generally not drawn down since the minimal storage capacity would provide little value in this regard.

No ramping requirements are in place for Elliot Chute GS and Bingham Chute GS, and therefore the stations are brought to minimum operation flow immediately after synchronisation and then ramped up to operating flow based on the unit minimal ramping rate. Shutdown is done in reverse of ramping up.

Sluice discharge tables for a wide-open situation have not been produced for the Bingham Chute GS. The discharge capacity is an estimate of discharge for all sluices with no stop logs in place (MNR *et al*., 2012).

2.4 Proposed Project

2.4.1 Rationale and Options (Alternatives)

The Bingham Chute GS requires a major turbine-generator overhaul, most of the electrical and controls requires replacement for safety and operational reasons, and the powerhouse is subject to flooding during very high river flows. As such, OPG undertook a comprehensive review of life extension options for the station.

OPG has considered various factors in its evaluation for the life extension of the Bingham Chute GS. These factors have included cost, energy production, constructability, reliability, environment (including heritage), legal

[3] Run-of-the-river is a term used and defined in the SRWMP. Run-of-the-river generating stations "refers to a mode of operation in which the generating station has a minimal forebay storage that passes some or all of the inflow through one or more turbines on a continuous basis with the remainder, if any, going over an existing falls or spillway".

requirements, and more. OPG has only considered options that comply with the SRWMP and can be constructed solely on OPG tenure lands.

The hydrology of the South River supports increasing the capacity of the units. The station is undersized relative to the available river flow, and the station discharge capacity is considerably less than that of the upstream and downstream stations. OPG reported flows at Bingham Chute GS for 1999 to 2019 (21 years). These data were analysed for flow availability, turbine flows, and spillway discharges, and results appear reasonable with the record long enough to characterize the long-term flow conditions. The flow duration curve below shows that the current turbine flow capacity is exceeded over 40% of the time. Based on industry experience, optimum run-of-the-river development targets are between 15% and 25%. Elliot Chute is at 25% (Tetra Tech, 2021).

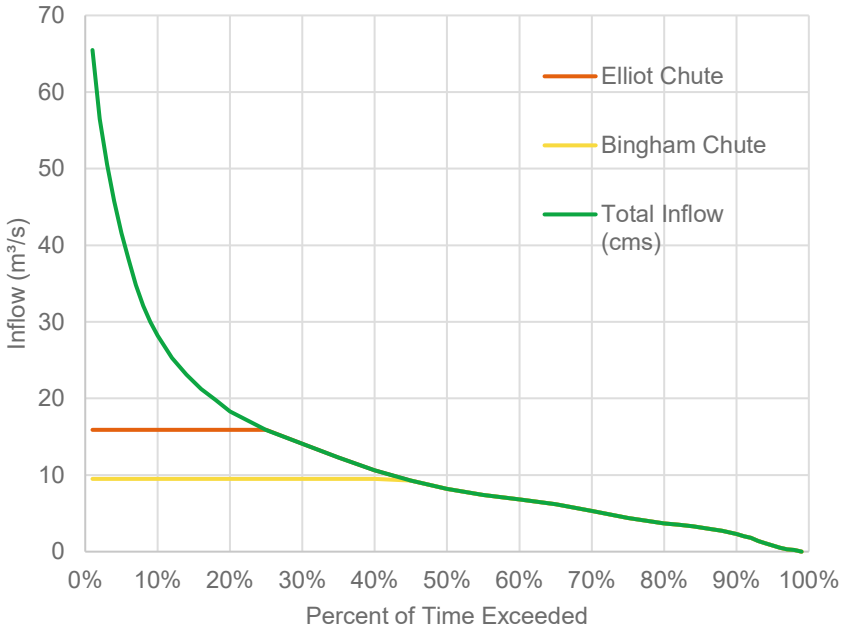

Figure 2-18 South River Flow Duration Curve at Bingham Chute

Based on Tetra Tech's experience analyzing long term flow records in Ontario and various climate change analyses, climate change (non-stationarity) is not expected to significantly affect the long-term flow regime to the extent that it would affect decisions on station refurbishment or redevelopment. Recent studies have shown that mean annual runoff is trending upwards over the last several decades with lower spring runoff and higher winter runoff, which agrees with Tetra Tech's experience.

The life extension options that were explored for Bingham Chute GS were either overhaul of the existing units or replacement with larger units.

The option to overhaul the units involves essentially the minimum necessary capital works for continued operation and would include powerhouse repairs, concrete repairs, and electrical and controls upgrades. Given the age of the units, this option would result in not maximizing the use of the available water resource, remaining at half the flows of the upstream generating station. This option would also only extend the life of the station by approximately 15 years until additional major work would be required. The overhaul option is not the preferred alternative.

OPG's preferred option is to refurbish the facility by maintaining the existing powerhouse and replacing the two existing generating units with new units. This option would: 1) provide an opportunity to match more closely the flow of the other generating stations on the South River, 2) better utilize the available river flows in nearly doubling the green energy generation, 3) extend the service life of the facility by another 80 years, and 4) make use of most of the existing infrastructures.

2.4.2 Proposed Refurbishment Option

The preferred option is to refurbish the facility. The station condition assessment showed that the headworks infrastructure and water conveyance system (penstock) could be reused with no to minor modifications to limit the impact and reduce the project scope. Therefore, the overall layout of Bingham Chute GS will not change from its existing condition, which is still considered to be the optimum configuration for utilization of the resource. The project is to be environmentally and publicly acceptable with minimal difference from the perspective of the public and comply with the SRWMP. Service roads and parking, and other secondary structures on site will remain as is.

Table 2-1 Existing and Proposed GS Characteristics

Characteristics	Existing Station	New Station
Turbine-Generator Capacity (MW)	0.86	2
Estimated Average Annual Energy Generation of (MWh)	3,617	8,063
# of Units	2	2
Station Flow (m^3/s) (maximum)	9.5	16.7
Maximum Operating Flow per unit – (m^3/s)	4.8	8.4
Minimum Operating Flow (m^3/s) (One unit Operating)	1.1	0.84
Average Annual Flow of the River (m^3/s)	15.0	

2.4.2.1 Layout of the Project

A Site Plan of the project showing both construction stage features and the final layout is shown below.

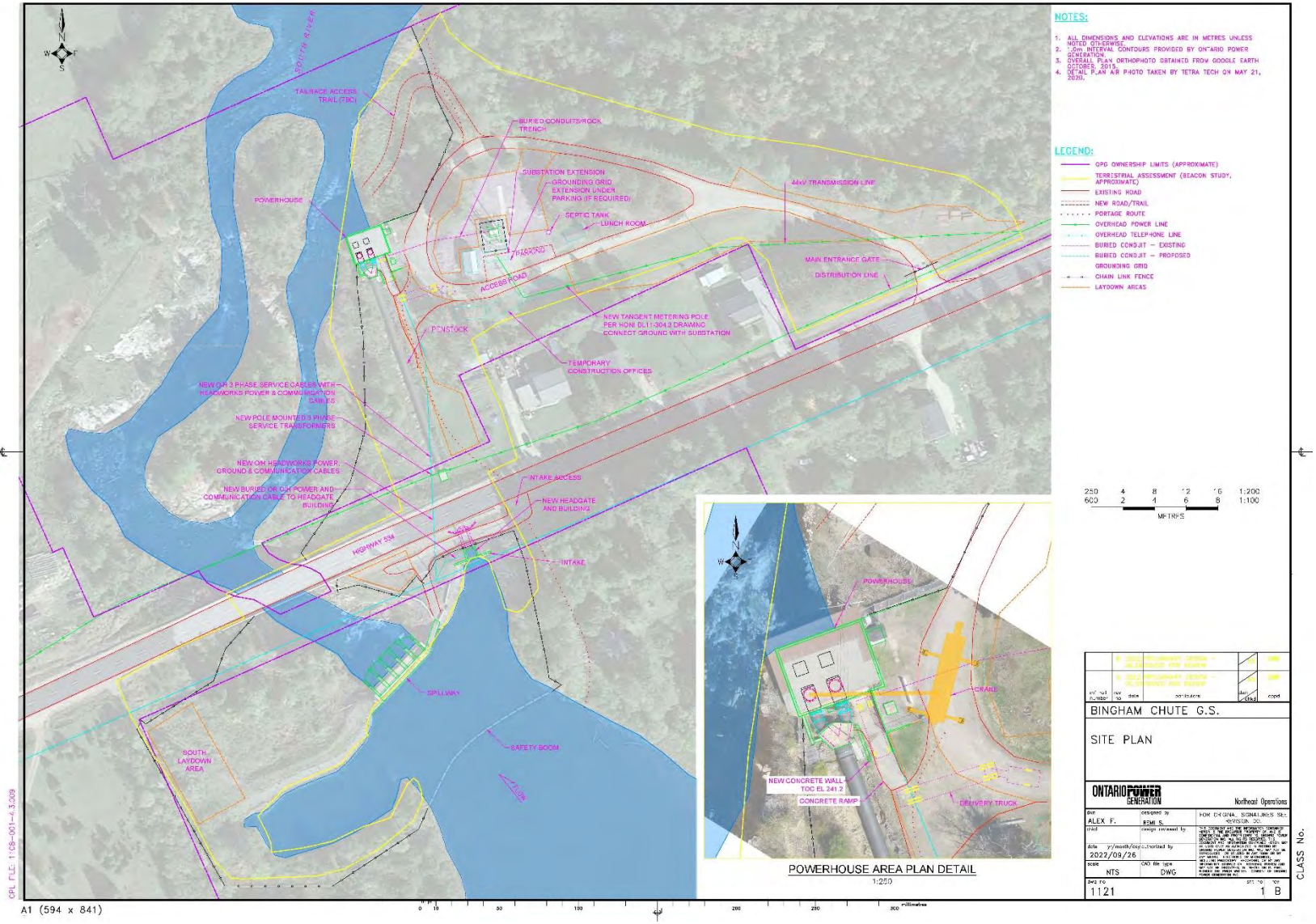

Figure 2-19 Site Plan for Bingham Chute Generating Station

As is shown in Figure 2-19, the overall layout and organization of the GS site will remain unchanged following completion of the re-development. The only modification to the siteworks will be some rework to the parking area by the lunchroom due to the slight enlargement of the substation.

Most of the individual components of the GS refurbishment and the construction stage features are described below.

2.4.2.2 Turbine-Generators

The two existing units will be replaced with two new higher flow and capacity units to generally match the flows of the other stations on the river. The unit capacity will be increased from 0.43 MW up to a capacity of about 1.0 MW for a total station capacity of 2.0 MW. For the head and flow at the site, axial flow turbines are more efficient, which were not commercially available at the time of the original development. These modern high-efficiency units will pass about double the flow than the older camelback Francis-style units for the same intake and draft tube sizes. The site is most conducive to vertical DIVE propeller turbine units.

DIVE Turbines are Fit for Purpose and greatly reduce civil work in comparison to Kaplan or SAXO type turbines. The general features of the DIVE turbines and their benefits for the project are as follows:

- Fit in current powerhouse footprint and can utilize the existing draft tubes.
- Civil work below the floor of the current powerhouse will be limited.
- No downstream cofferdam will be required.
- No permanent tailrace gates are required.
- Turbines are more fish friendly versus SAXO type turbines.

Based on preliminary engineering design from the turbine-generator manufacturer (DIVE Turbine), the existing powerhouse will accommodate turbines with a combined flow capacity of 16.7 m^3/s similar to that of the upstream Elliot Chute GS (18.5 m^3/s) with limited modifications; the turbine casings and draft tubes will fit into the existing tailrace chamber at an appropriate runner elevation setting, and the turbine inlet will match with the existing penstock bifurcation entries.

The two DIVE units will allow maintaining a minimum continuous operating flow commensurate with river low flows. This will avoid having to cycle Bingham Chute GS on and off during low flow periods as is the case for Elliot Chute. The minimum continuous operating flow for a single DIVE unit is 0.8m^3/s.

2.4.2.3 Intake

Since the intake was recently refurbished and replacement would be complex given the proximity to the road, the Life Extension Project plan is to use the existing intake as the required higher flows can be accommodated.

The General Arrangement of the Intake is shown in Figure 2-20 below. In particular the Upper and Lower Water Operating Levels of 250.26 and 249.02 MASL are depicted in the cross-sections.

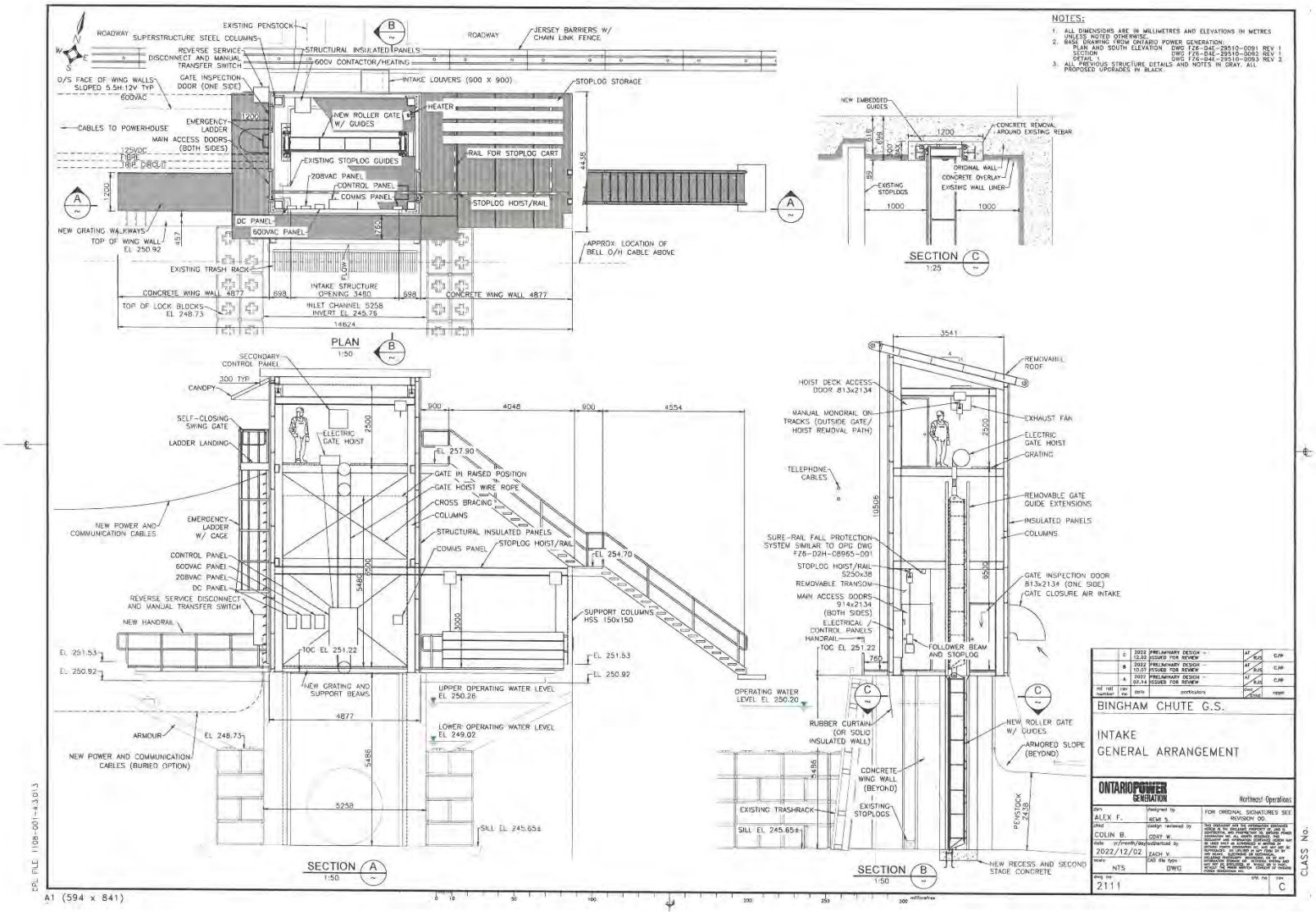

Figure 2-20 Intake General Arrangement

The intake has the capacity to convey a design flow approximately matching the Elliot Chute capacity (18.5 m^3/s). There is a low likelihood of vortex formation due to the increased velocity. If vortex formation is observed during commissioning and start up, a vortex suppression grid will be installed on the water surface behind the trashrack.

The topic of fish entrainment and impingement is beyond the scope of this Screening Assessment but will be assessed by DFO in their review of the proposed Request for Review (RfR) for operations. That being said, a short summary of the proposed flows and impacts is summarized below.

OPG contracted Tetra Tech to prepare the Bingham Chute Generating Station Intake Flow Simulation and Impact Assessment (2024). OPG requested an analysis of the higher flow at the intake structure to determine whether the velocity from the higher flow would cause fish to be impinged on the trashrack, and how to avoid this. The generally accepted maximum flow velocity is between 0.7 m/s to 0.9 m/s for most fish to be able to avoid entrainment or impingement at the trashrack, and to be able to swim away from the intake.

The results of the study indicated that after the Bingham Chute refurbishment, at maximum plant flow and maximum headpond elevation, velocities will not exceed 0.9 m/sec beyond 0.25 metres upstream of the trashrack and this condition will exist approximately 20% of the time. The area between the trashrack and 0.25 m upstream of the trashrack that will experience velocities higher than 0.9 m/s occurs over approximately 2% of the intake channel. The velocities in this area are less than 0.9 m/s for the remaining 80% of the time. Given the results, redesigning the approach channel and the intake for higher plant flows is not considered necessary. Trashrack modifications, such as a shallower angle to affect a lower perpendicular approach velocity, may be appropriate and could be considered at a later time.

2.4.2.4 Penstock

The penstock condition assessment concluded that the penstock does not require replacement. New external coating was applied in 2020. As part of the life extension project, during the extended outage of the station, the inside of the penstock will be examined to determine if any localized repairs are required to extend serviceable life.

2.4.2.5 Powerhouse

The existing powerhouse will be refurbished to be reused as part of the life extension of the facility. The existing powerhouse foundation and superstructure are in good condition and are expected to provide at least another 90 years of serviceable life provided some maintenance works are undertaken.

The refurbishment strategy is to fit the new turbines and equipment in the existing powerhouse with some minor modifications. The following are the key considerations and aspects of the new layout design and associated modifications to the existing works.

- Turbine Alignment – The turbines shall be connected directly to the existing penstock wall penetrations.
- Draft Tubes – The existing draft tube cones (replaced in 2008) shall be re-used with the new DIVE Turbines.
- Other modifications will include the installation of new electrical equipment and upgrades to the switchyard.

A series of figures depicting the general arrangement of the powerhouse are shown below.

The Powerhouse General Arrangement New Layout Plans (Figure 2-21) depicts the two new units within the existing powerhouse, re-using the existing draft tube cones.

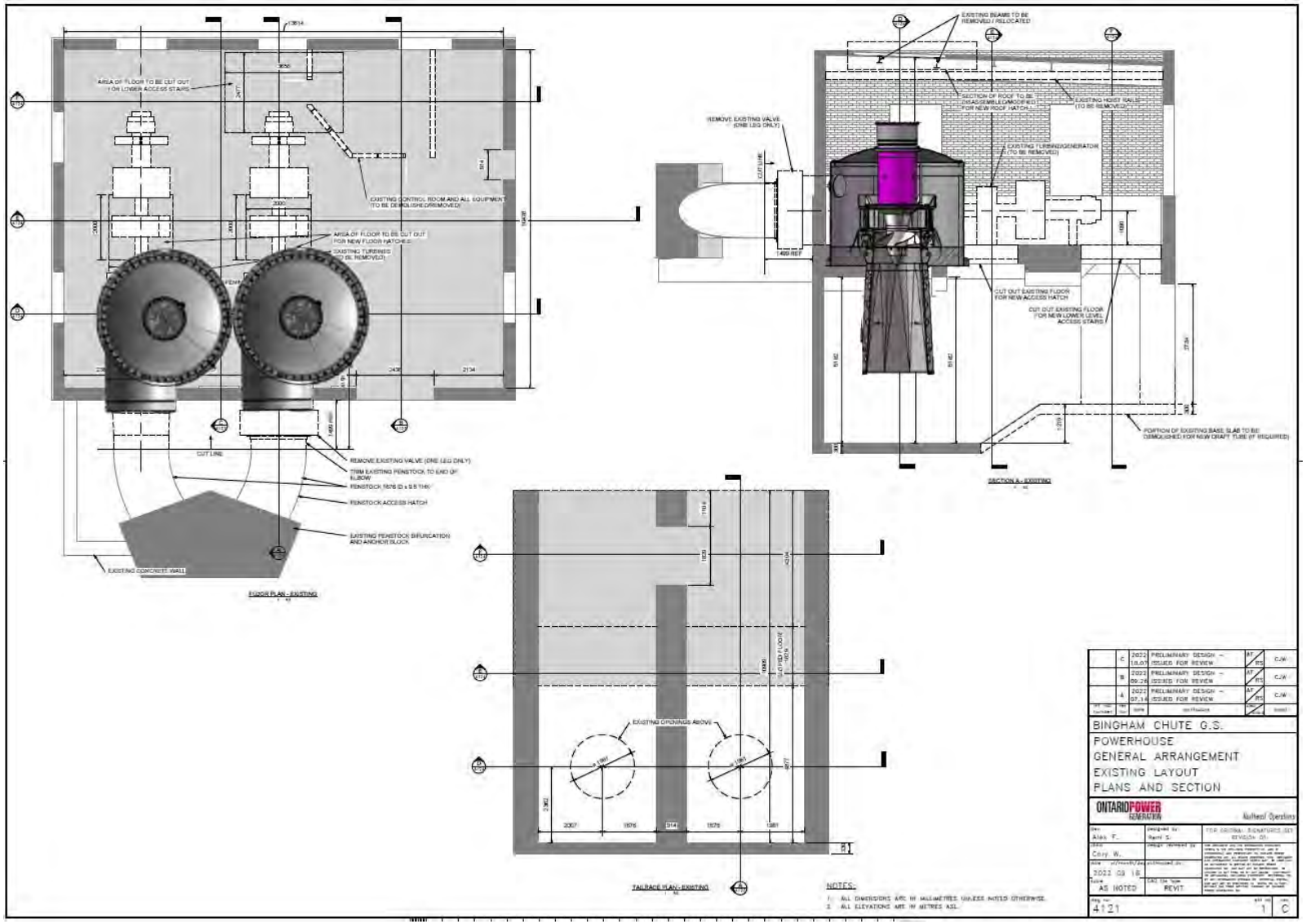

Figure 2-21 Powerhouse General Arrangement New Layout Plans

2.4.2.6 Tailrace

No changes to the tailrace channel are required. The existing shorelines and spillway channel beside the powerhouse are also not affected. No downstream cofferdams are required for the project.

2.4.2.7 Headworks

No changes to the headworks dykes and sluiceway are required or planned as part of the life extension project. No upstream cofferdams are required for the project.

2.4.2.8 Controls and Electrical

In addition to replacing the units, new controls and protection systems will be implemented such that the station operation can be remotely monitored and, in most part, automated with either flow, power, or reservoir control regulation.

The entire old power systems associated with the units and station service systems the powerhouse will be replaced. The new generating units will also require new auxiliary systems such as hydraulic power units (HPU) system. The proposed DIVE units do not require external water-cooling systems.

The larger generation capacity will require upgrading and slightly expanding the existing substation to accommodate a new transformer and protection equipment. The new transformer will be dry type (oil free); installation of a secondary containment will not be required.

The transmission line conductor has sufficient capacity and will not require any modification except possibly new terminations at the substation. All existing poles between the substation and the pole at the highway, which has the Bingham Chute GS conductors overbuilt, are not suitable because they are too small or without guywires. Therefore, a new tangent pole will be installed in the straight section to mount the metering. It is possible that a new roadside in-line switch with fault indicators will be required on the line side of the metering pole.

2.4.2.9 Other Features

Dam safety features are not part of the proposed undertaking and were discussed in section 2.2.

Other features of the Bingham Chute GS, such as safety devices including buoys, signage and booms, will remain unchanged from the current situation.

2.4.3 Construction

The Project will be executed using a Design – Bid – Build contracting strategy. Per this strategy the Owner's Engineer is responsible to provide engineering, detailed design and construction cost and schedule estimates for the preferred option for Bingham Chute GS. If the project is approved for construction an Owner's Engineer will

provide oversight services throughout the overall construction phase of the Bingham Chute GS life extension project. A constructor to build the project has not yet been retained but is expected to be so by July 2025.

At this point the project is expected to go into execution phase in August 2025 and be completed by December 2026.

The stages of construction and various components are presented below.

2.4.3.1 Construction Stages

In general, the project will be sequenced as follows.

Pre-Construction

In the pre-construction phase, the construction contractor will be working with OPG, the Owner's Engineer, and Arcadis to finalize the construction sequence and approaches and apply for any construction stage permits and approvals.

Stage #1 – Site Mobilization and Preparation

Stage #1 of construction will involve site mobilization and preparation. Areas to be utilized for construction such as laydown and parking areas and access roads will be demarcated and prepared for use. Trailers will be moved to the site and installed, and necessary equipment will arrive at site. Environmental protection measures such as erosion fencing will be prepared.

It is at this stage that the station power will be disconnected from the grid to allow for construction. Temporary power will be in place to ensure key monitoring and flow control functions at the dam, as well as to supply power to the construction trailer and powerhouse for construction.

Stage #2 – Civil Works and Embedded Components

Stage #2 will involve construction of the civil works including necessary repairs to the powerhouse and removal of existing turbine/generator equipment inside the powerhouse. Existing isolation gates will be installed at the intake to drain the penstock.

With the penstock isolated, new butterfly valves will be installed outside of the powerhouse at the current penstock bifurcation to allow for remote unit isolation of the new units.

The two existing units will be fully removed as will the balance of plant mechanical and electrical systems. Floor modification will be carried out to install the required substructure support to transfer loads from the units to the foundation piers. This work might require the existing draft tube cones to be supported from under the powerhouse using a floating barge for a period of time. Other structural work in the powerhouse will also be completed including replacing the original barn doors with a rollup door, installing a control room mezzanine, and possibly a self-supporting crane for unit installation and maintenance.

Stage #3 – Installation of Mechanical, Electrical, Power and Control Systems, etc.

Stage #3 will involve the installation of the DIVE units, auxiliary systems, as well as power and control systems such as switchgear, power packs (rectifier/inverter), and all associated wiring.

The switchyard will also be upgraded by replacing the main power transformer with the larger unit and installing the new circuit-switcher and associated protection equipment. The new revenue metering will be installed at site just outside of the substation on a new tangent pole. Cabling to the powerhouse will be completed.

Stage #4 –Commissioning and Demobilization

Commissioning will involve a sequential and planned electrical energization to a fully operational plant. Equipment will first be tested in the dry with the station back fed from the grid through the substation. Commissioning will then proceed through wet testing of all equipment, starting with safety requirements before proceeding to operation procedures and power generation of each unit at a time. Complete protection and control system testing will then proceed from local to remote control until all systems are confirmed to be operating as planned. Commissioning will then be completed by operating the plant for a continuous period under supervision before transferring the plant to remote operation.

Demobilization will involve removing all the construction stage equipment, materials and supplies from the site and returning the site to the current condition except for the changes already described in this document.

2.4.3.2 Site Access, Roads, Parking Areas and Offices/Trailers

The existing onsite roads may require some limited upgrading and widening to facilitate construction and improve access to the site for semi-trailers. These can be reclaimed post-construction. As a minimum, minor road regrading and landscaping adjacent to roads is likely required to repair disturbances from heavy equipment and materials.

There is no anticipated harvesting of any forest patches that remain on the Bingham Chute GS site access, roads, and parking areas.

To the extent possible, construction offices, crew trailers, and associated vehicle parking should be on the powerhouse side of the highway to minimize personnel crossing the highway. Construction offices and crew trailers can be located along the powerhouse access road. Contractors should share the same office to limit the required space. There will be no construction accommodations on site with all construction staff accommodated offsite in nearby communities (either as residents or visitors).

2.4.3.3 Laydown and Storage Areas

Sufficient space for material and equipment laydown is available at the Bingham site within OPG lands. These areas include:

- the space along the powerhouse access road,
- the area along the intake access road, and
- the area on the west side of the spillway (on the south side of the Highway).

If additional space is required, the yard and warehouse at the OPG North Bay Centre, or other OPG lands, could also be used for offsite storage.

2.4.3.4 Cofferdams

No cofferdams are planned for the project construction.

2.4.3.5 Safety and Environmental Protections

Given the close proximity of the Bingham Chute GS to adjacent neighbours, fencing will be utilized to prevent any encroachments on to residential lands and for safety purposes. Roads will be monitored for the production of dust and treated if necessary. Stockpiles of materials that may produce dust or other airborne emissions will be sited away from these homes and managed to reduce and eliminate any negative effects. OPG and the contractor will have regular visits with the local neighbours to address any concerns. OPG will also adhere to the noise by-laws in the municipality of Powassan.

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

A Hazardous Materials Management Plan, Waste Management Plan, and a Spills Emergency Preparedness and Response Plan will be developed for the BCLEP as part of a broader Environmental Management Plan for the construction period. These would be prepared by the contractor.

While this section of the river is not well travelled, OPG will ensure that the Bingham Chute GS can be portaged during the construction phase of the Project. If there happen to be canoeists or kayakers who are travelling along the river and wish to portage at the Bingham Chute GS site, they will be permitted to do so in a managed way. The constructor will be asked to put up a sign and identify a portage trail. When construction is active at the site, the contractor would accompany any boaters as they traverse the portage to the other end of the site.

2.4.3.6 Site Grading and Re-Vegetation

As the refurbishment project is not intrusive on the landscape no site grading will be required following construction. As already indicated some re-vegetation is likely going to be required on the trail to the tailrace. Re-seeding or plant with native species will be the preferred option for these areas to prevent the spread of invasives.

2.5 Operations

The upgraded Bingham Chute station will continue to operate on the same principles in accordance with the SRWMP. The primary change will be that more water will pass through the plant and consequently, there will be less spill flow. Spill periods will also generally be less frequent and of shorter duration. The only change to operations at Elliot Chute will be that the flow will no longer need to be curtailed to the capacity of Bingham Chute during the initial filling of the reservoir during the spring freshet. There will be no operational changes at the Nipissing GS, located approximately 15.5 river km downstream.

The figures below provide a comparison of existing reservoir levels and flows to the proposed conditions based on operational modelling using the river flows recorded by OPG for the period 1999 to 2019.

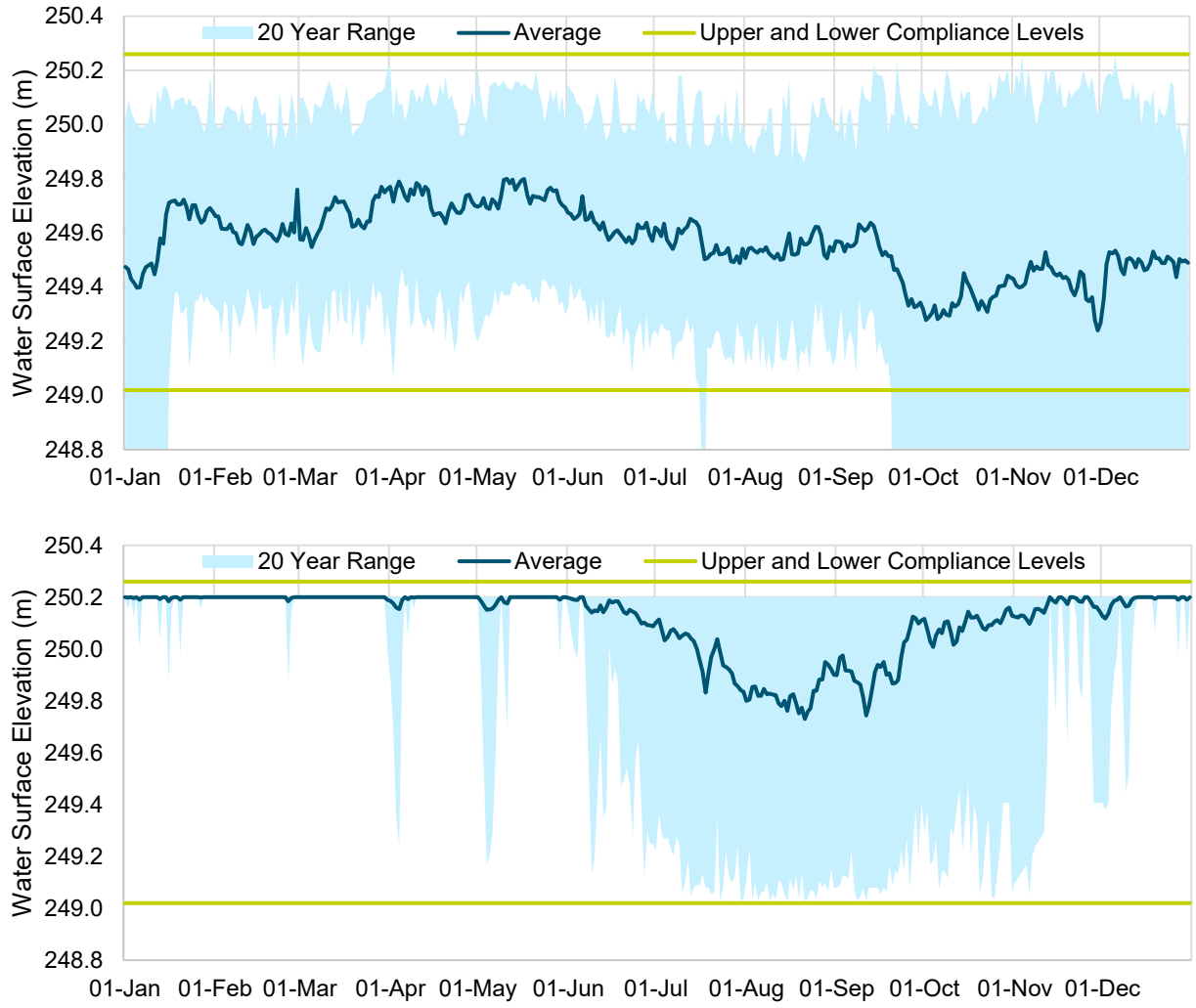

Figure 2-22 Historic (Top) and Simulated New Dual Unit (Bottom) Proposed Bingham Chute Reservoir Daily Water Levels (1999-2009) with Current Water Management Plan Compliance Levels

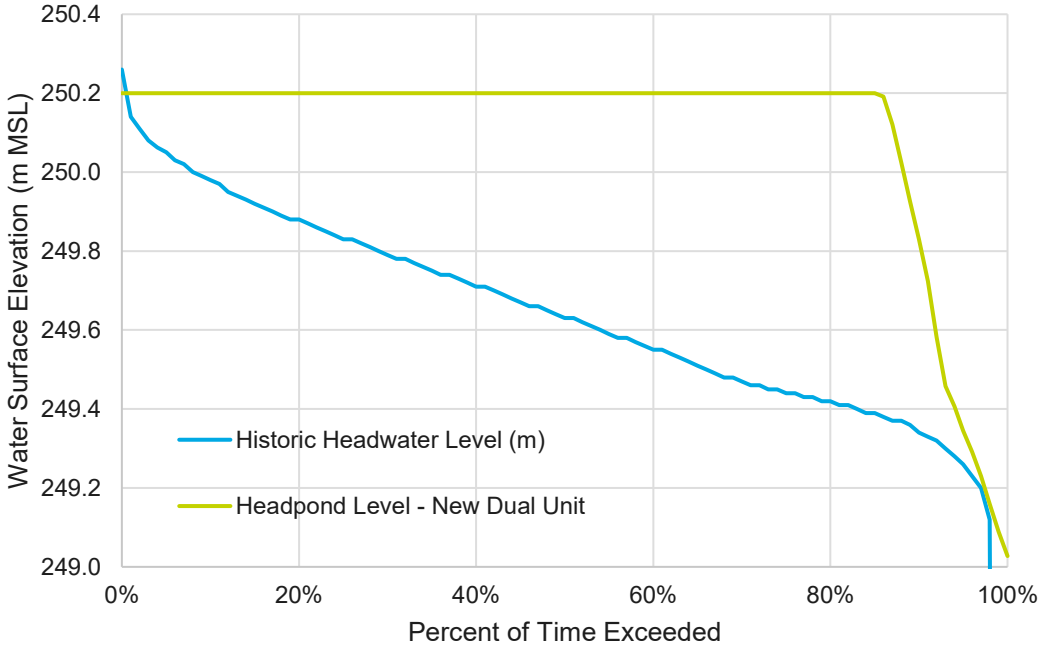

Figure 2-23 Historic and Proposed Bingham Chute Daily Reservoir Water Level Exceedance Curves

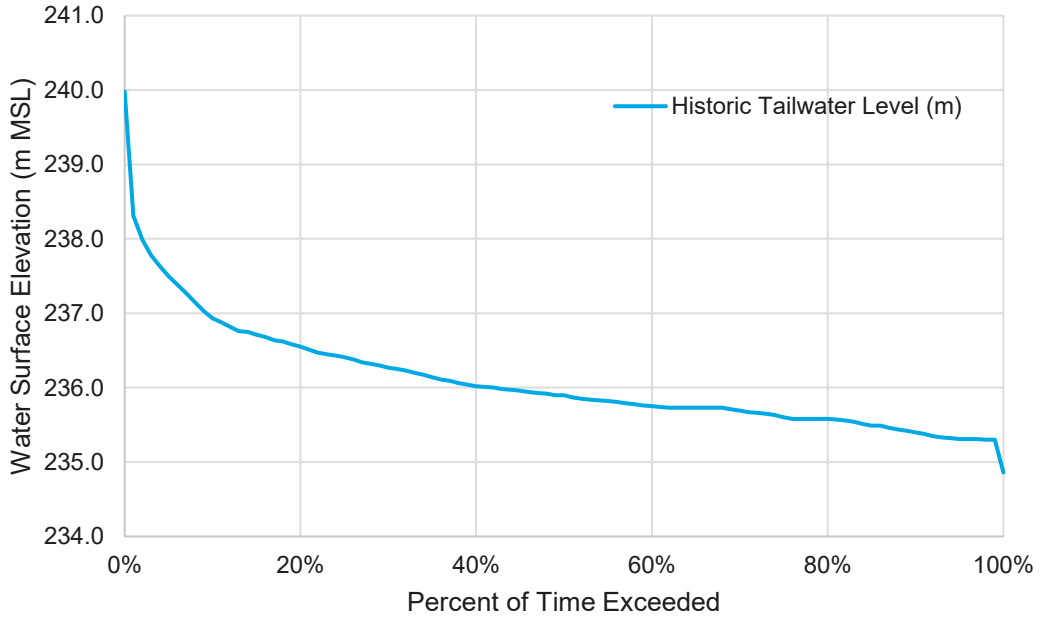

Figure 2-24 Bingham Chute Daily Tailwater Level Exceedance Curves (Historic and Proposed are the Same)

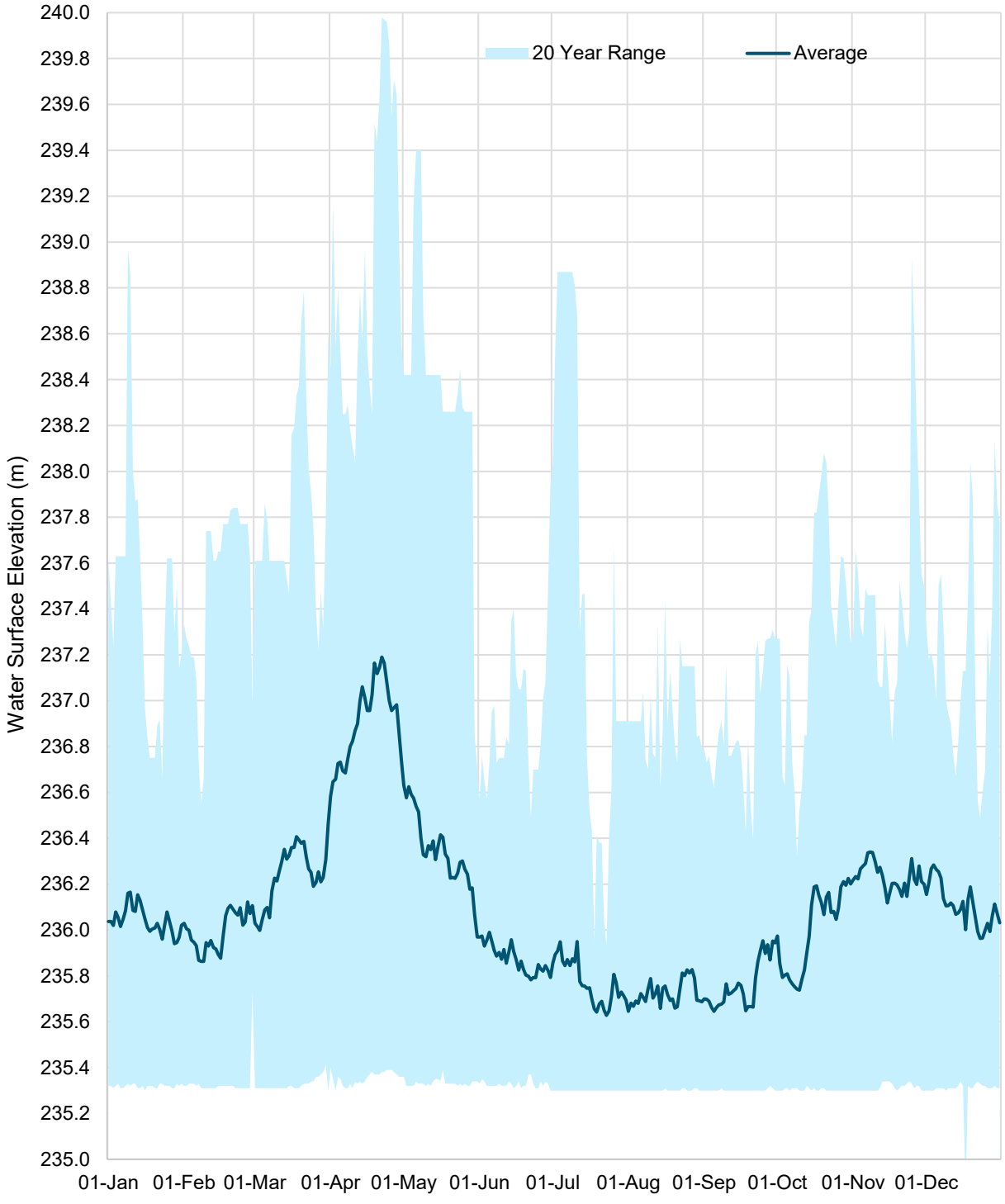

Figure 2-25 Historic and Proposed (No Change) Bingham Chute Tailwater Daily Water Levels (1999 to 2019)

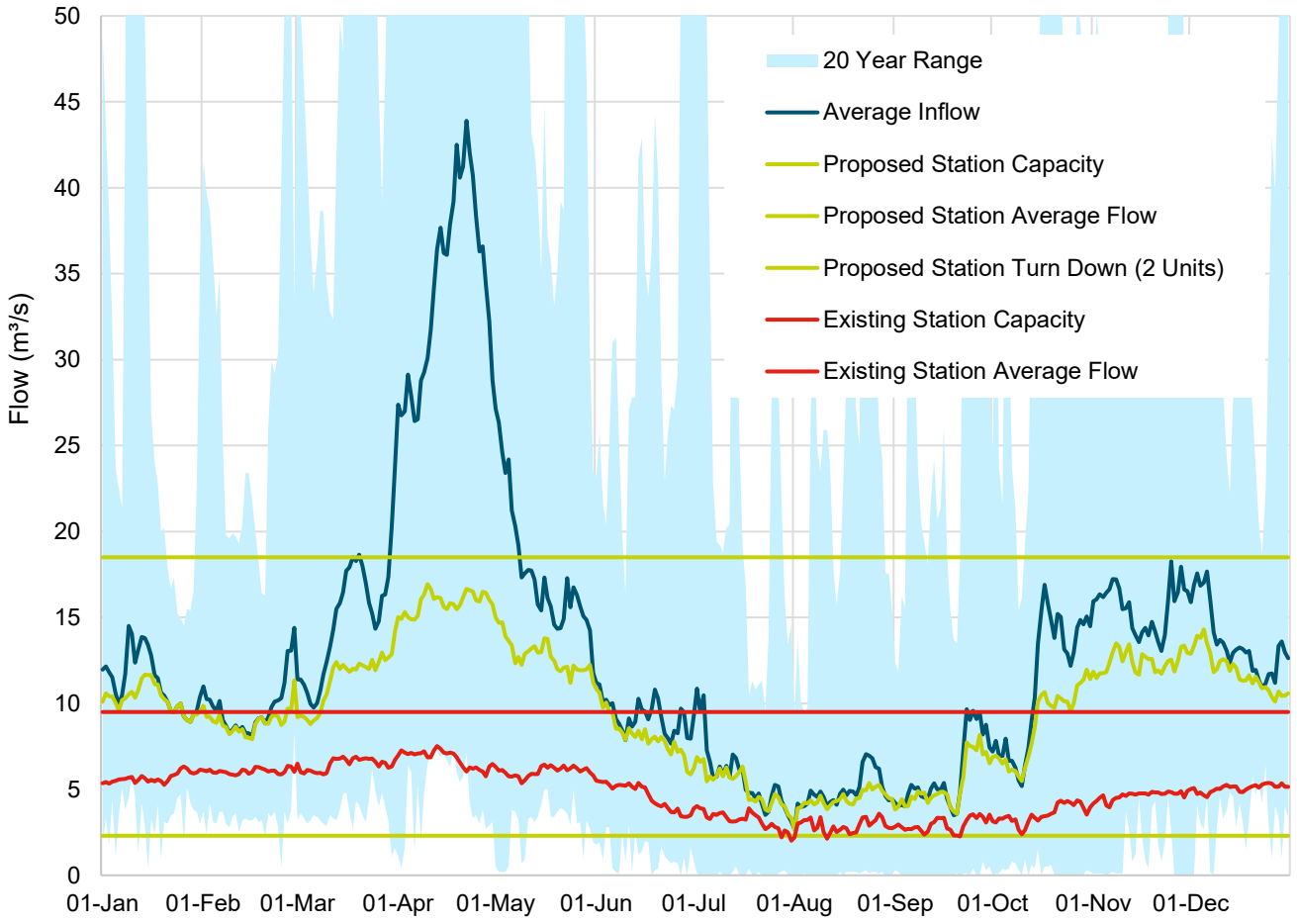

Figure 2-26 Historic South River Daily Flows at Bingham Chute (1999 to 2019) with Existing and Proposed Station Discharges

(Note: Turn Down refers to the minimum flow proposed at which the units / plant would operate efficiently. With the proposed station capacity, this defines the flow ranges for operation)

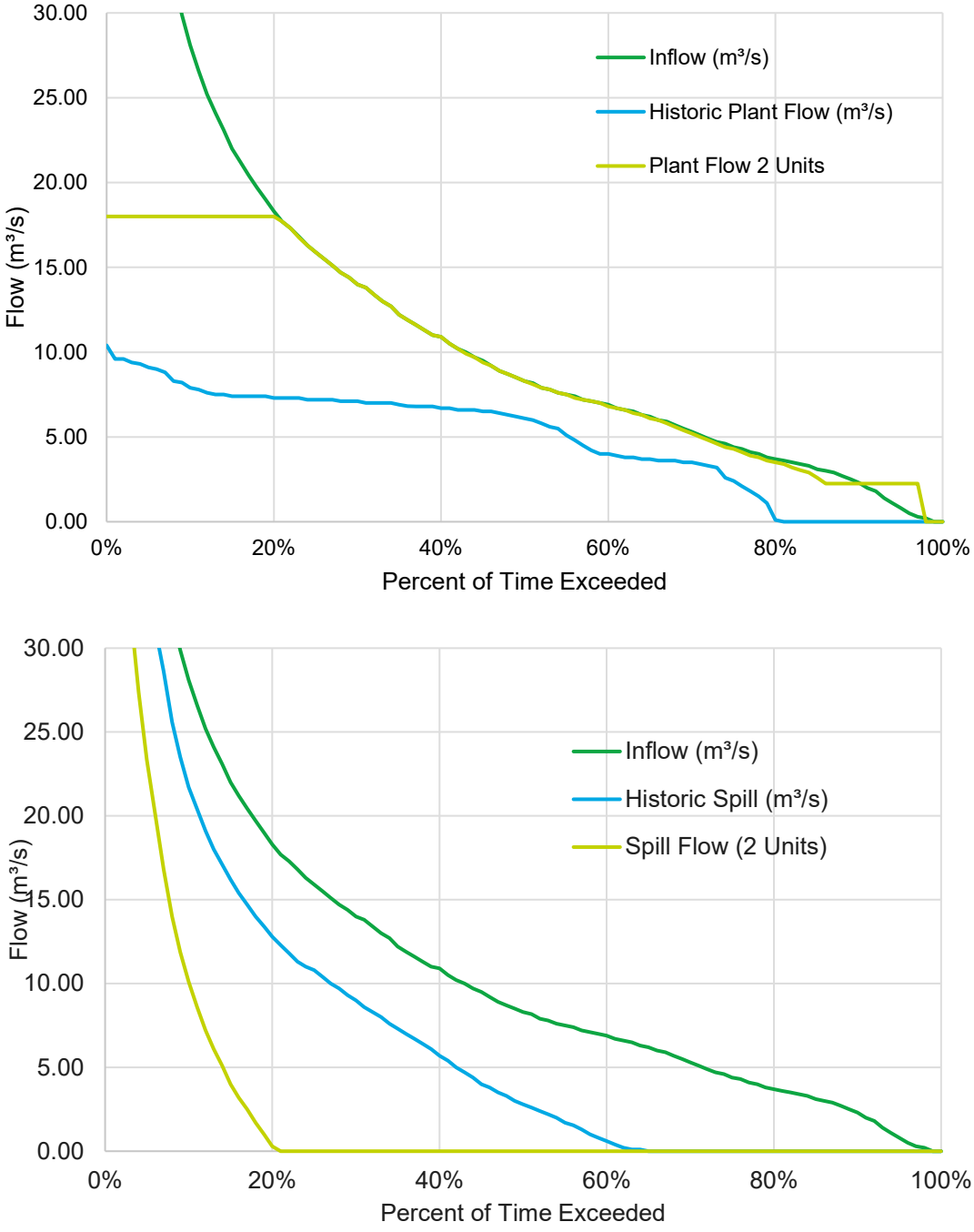

Figure 2-27 Plant (Top) and Spill (Bottom) Historic versus Proposed Daily Flow Duration Curves (1999 to 2019). Inflow Duration Curve Shown for Reference.

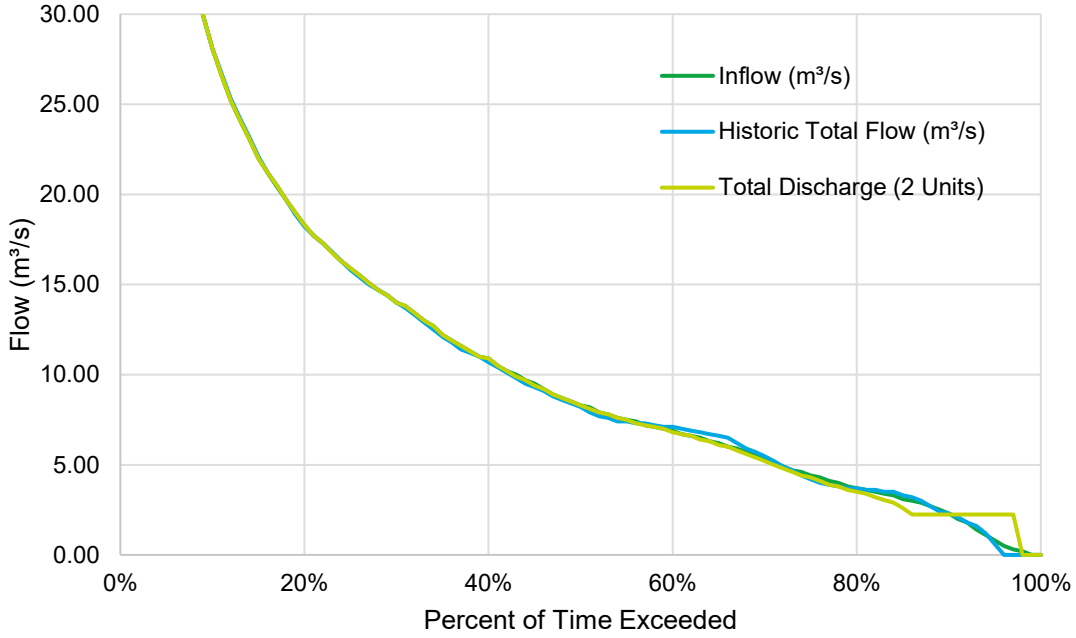

Figure 2-28 Inflow Duration Curve compared to Historic and Proposed Total Flow Downstream of Bingham Chute

With a new control system, it is assumed that turbine flow will automatically be adjusted to maintain the reservoir at 250.20 m, just below the upper compliance limit of 250.26 m to provide some operating margin. During low flow periods, if the minimum continuous operating point for one turbine is reached, then the live storage range would automatically be used to attempt to keep one unit online. If the lower compliance level of 249.02 m is reached while the unit is operating at minimum output, the plant would automatically shut down until flows increase and permit an automatic restart. The unit would then operate at minimum output until the reservoir is refilled and the level control setpoint is reached.

A Walleye spawning habitat investigation conducted in 2021 identified that Walleye spawning occurs downstream of the sluiceway in the channel at Bingham Chute. While the topic of Walleye spawning is beyond the scope of this Screening Assessment OPG, and its consultant team have collaborated to recognize and address the need for a minimum flow for the Walleye spawning and incubation period. As part of a WMP amendment and the DFO RFR for operations a minimum flow will be proposed. OPG contracted Tetra Tech to prepare the report, Bingham Chute Generating Station Modeling of Walleye Spawning Suitability.

The study assessed the effects of various flow releases on Walleye spawning habitat in the spillway by considering substrate, depth and velocity during the spawning period. Depths and velocities for various flows were evaluated using a 2D hydraulic model of the channels and tailrace pool area downstream of the spillway. Several flow exceedance levels were considered. On average, all new flow management scenarios provide more walleye habitat for spawning than the current Bingham Chute GS operation. Furthermore, the results also indicate that power generation increases the walleye spawning habitat area during high flows, compared to spilling all the river flow, i.e., 'No Generation' scenario.

2.6 Decommissioning

Decommissioning involves the permanent removal of the hydroelectric facilities, with the resultant loss of the site as a renewable source of electricity generation. Rather than decommissioning, another option could be the refurbishment or redevelopment of a facility that is at the end of its designed service life. Several OPG-owned hydroelectric facilities that were built in the early 1900s have been refurbished or redeveloped in the last 15 years, e.g., Wawaitin GS, Sandy Falls GS and Lower Sturgeon GS on the Upper Mattagami River, and Hound Chute GS on the Montreal River.

Once the Bingham Chute GS Life Extension Project has reached the end of its service life approximately 90 years from now, additional life extension activities, rather than decommissioning, would be an option that should be considered again to further extend the life of this plant.

3 Screening Assessment

3.1 Screening Tool

As indicated in Chapter 2, there are seven screening questions to exempt projects associated with existing infrastructure or increases in efficiency on managed waterways. To exempt a project each question is to be answered "No" or in the "negative". The Screening assessment asks with respect to each question:

> "After application of appropriate Best Management Practices and mitigation strategies, is the project expected to:"

The Screening Assessment outlines that the reviewer or review team is to:

> "Please identify any Best Management Practices that will be applied related to each screening criteria."

Each of these seven questions is assessed below in separate sections.

3.2 Question #1 – Water Management Regime

Question #1 of the Screening Assessment is: Will the proposed project change the water management regime, including (but not limited to) significant change to water flow, inundated area, or historical mean monthly maximum water level?"

The answer to this question is "No". OPG does not plan to change the water management regime and will remain consistent with the existing approved South River Water Management Plan (SRWMP). There are no plans to alter the proposed compliance flows or levels and there will be no impact on inundation.

The Bingham Chute GS is located on the South River, which originates in Algonquin Provincial Park, and flows approximately 93 km northwest, eventually draining into Lake Nipissing. The Water Management Planning Area for the South River is shown below in Figure 3-1. Lake Nipissing drains into the French River which terminates in Georgian Bay. The South River is about 93 km long and has a drainage area of 829 km^2 (MNR *et al.,* 2012, p. 5).

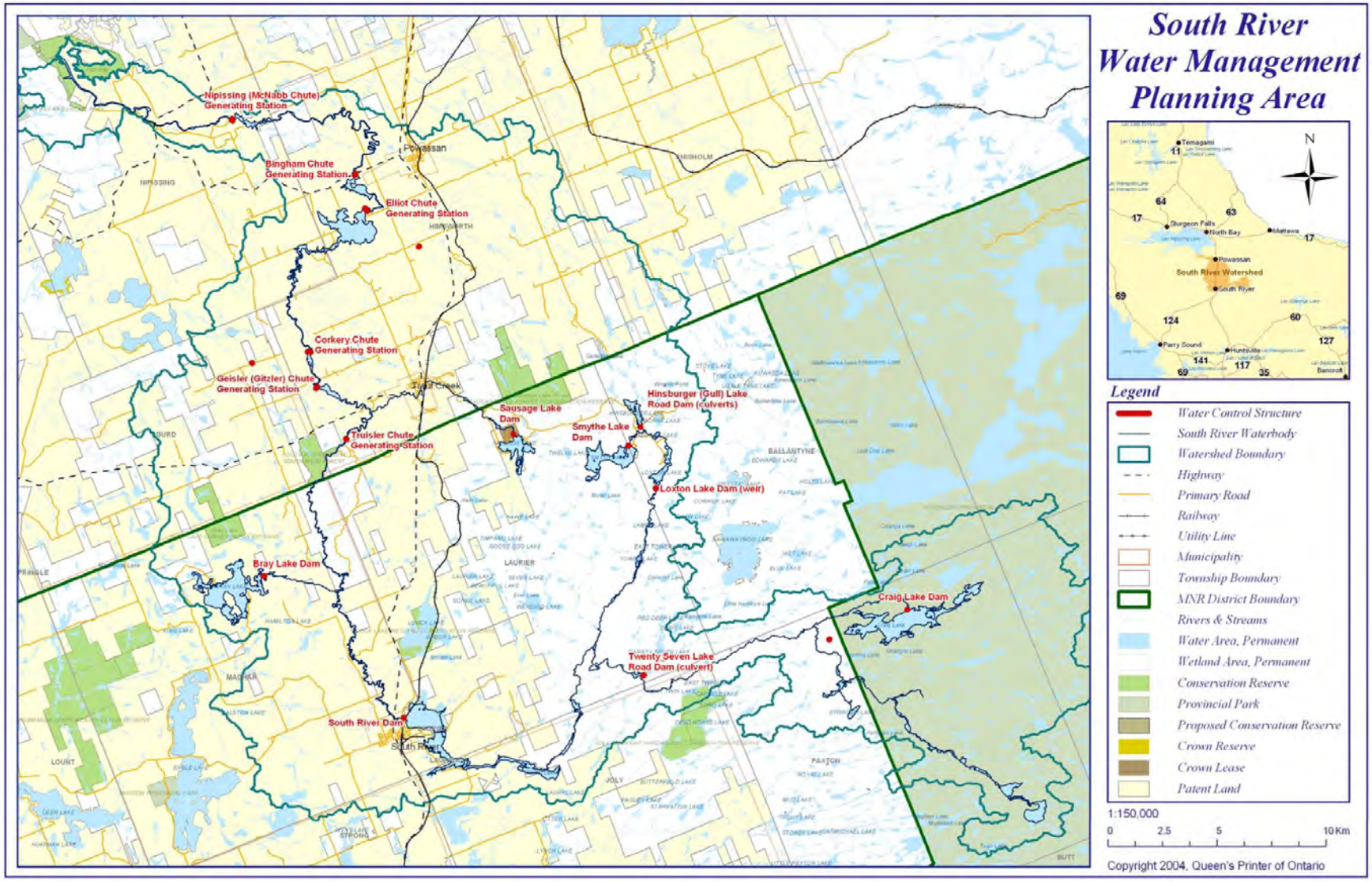

Figure 3-1 South River Water Management Planning Area (MNR, 2012)

The existing SRWMP relevant to Bingham Chute is described in Section 2.3 of this Report.

Questions about the existing operating levels compliance and compliance operating should be directed to OPG or the MNR.

In summary, OPG does not plan to change the water management regime, including (but not limited to) significant change to water flow, inundated area, or historical mean monthly maximum water level. OPG has decided to work within the already existing and approved water management regime.

3.3 Question #2 – Release of Contaminants

Question #2 of the Screening Assessment is: Will the proposed project, "Release contaminants into the immediate environment that exceed regulatory thresholds?"

The Ontario *Environment Protection Act* (*EPA*) defines a **contaminant** very broadly, to include any solid, liquid, gas, odour, heat, sound, vibration, and combination thereof, resulting directly or indirectly from human activities that cause an adverse effect.

The answer to this question is "No". The project does not plan on creating conditions in which contaminants could be released into the immediate environment that would exceed regulatory thresholds. A more fulsome answer to this question is provided below and broken up into three parts.

First, as indicated in the response to Question #1 above, the proposed project will not alter the existing water management regime for South River at Bingham Chute GS. This includes no alterations to the reservoir maximum levels. New inundation of a reservoir can result in a release of methylmercury associated with soils and decomposition of vegetation in a newly flooded area. In turn, this can ultimately increase mercury levels in fish. But as this proposed project does not involve in any new inundation there will not be the potential for this occurring.

Second, OPG carries out its normal operations of managing and maintaining GSs in an environmentally sound fashion. The potential contaminants within a powerhouse include oils and greases for the mechanical equipment. These substances are contained within a powerhouse and are managed according to OPG's Environmental Management System. Any contaminants within pieces of equipment such as transformers are designed with internal protection to prevent the release of oils and other deleterious substances. OPG GSs are also equipped with an oil-water separator that captures any potential oily substances for proper disposal. An oil-water separator will be included in the design of the new facility.

Third, the activity with the greatest potential for release of contaminants into the environment would be the refurbishment of the GS itself. In order to avoid this from happening, a large number of measures will be taken to protect the environment. These are described below.

OPG has identified several mitigation measures to prevent the release of contaminants during the construction period of the Project. OPG considers best industry practices and various sources such as OWA (2012b) "*Best Management Practices Guide for the Mitigation of Impacts of Waterpower Facility Construction*", standard

environmental construction guidelines, e.g., Cheminfo (2005), DFO Ontario Operational Statements, as well as government agency and other organization consultation.

Some of the best management practices (BMPs) from the *Guide for the Mitigation of Impacts of Waterpower Facility Construction* that are relevant to the prevention of the release of contaminants are: BMP-024– Demolition; BMP-033– Hazardous Materials Management; BMP-034 – Spill Response; BMP-035– Regulated Waste Transportation; BMP-036– Material Storage Handling; and, BMP-037 – Control of Fugitive Dust. The contractor is expected to implement such BMPs as appropriate relevant to the stage of construction and activity.

3.3.1 General Planning for the Construction Period

OPG will require its DBC for the project to prepare a site-specific environmental management plan (EMP) for the construction period of the project. The EMP will include component sections or separate plans including: an erosion and sediment control plan; a hazardous materials handling and storage plan; a waste management plan; and a spills prevention and emergency response plan.

With respect to noise and vibration the project will adhere to any local noise by-laws. As previously indicated, most of the work associated with the refurbishment will occur within the powerhouse itself, which will mitigate those noise and vibration effects.

3.3.2 Demolition

Demolition will be fairly limited with the proposed refurbishment project as the powerhouse will be retained. But some demolition to minor parts of the building (e.g., parts of the concrete floor) will occur.

For demolition activities associated with the existing powerhouse, the constructor must consider the incorporation of the OWA Best Management Practices, Demolition section (6.2.12). The constructor will need to assess the facility for all existing contaminants and propose a strategy to prevent their release into the environment as well as for their safe removal (if required). Any contaminants identified in the existing facility or on the site will be isolated to prevent their release into the environment.

As OPG intends to retain the powerhouse and only remove internal mechanical and electrical equipment the removal of any equipment and materials can occur within a controlled environment which will assist in preventing any deleterious materials from being released to the environment.

3.3.3 Erosion and Sedimentation

Erosion and sediment loadings could potentially occur during the construction phase of the project if not appropriately managed. The prevention and management of erosion and sedimentation on-site helps to protect the site itself, minimizes the impact to the local aquatic environment, and helps prevent any contaminants from moving beyond the immediate construction site. High total suspended sediment loadings can have a negative effect on the environment. Therefore, there is a risk to the South River from sediment loadings due to accelerated soil erosion

during construction. Till and gully erosion caused by channelized overland flow can also be a major source of soil erosion to the watercourse. Sheet erosion can be an additional source of sediment.

Details about erosion and sediment control planning and management of the site can be found in Section 3.6.

3.3.4 Management and Control of Hazardous Materials

All materials and equipment used for the purpose of site preparation and proposed Project completion should be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, debris, etc.) from entering the water. Incidental spills of oil, gas, diesel fuel and other liquids to the environment could occur during construction. Fuelling and lubrication of construction equipment should be carried out in a manner that minimizes the possibility of releases to the environment. Measures for containment and cleanup of contaminant releases should be followed to minimize contamination of the natural environment, e.g., placement of fuel tanks and generators on an appropriate form of containment where possible, monitoring and other measures documented in the Environmental Management Plan. At all times where spills are a risk, appropriate materials for cleanup and approved disposal locations should be available. Spills or other discharges should be reported to the MECP as required by provincial legislation. Interim sanitary waste collection should be arranged for the duration of the construction period. All construction waste, washwater, and wastewater should be disposed of in accordance with regulatory requirements.

A Hazardous Materials Management Plan, Waste Management Plan, and a Spills Emergency Preparedness & Response Plan will be developed as part of the broader Environmental Management Plan. The implementation of these pollution prevention plans will obviate or minimize the environmental effects of accidental releases to the natural environment that have the potential to affect surface water and groundwater quality in the proposed Project area.

3.3.5 Air Quality

The construction of the proposed project will result in typical combustion and dust emissions.

Construction activities have the potential for short-term effects on air quality in the vicinity of the site. Emissions will be primarily exhaust emissions (and associated odour) from construction equipment and fugitive dust due to disturbance of dry fine-grained soils. As with any construction site, these emissions will be of relatively short duration and unlikely to have any effect on the surrounding airshed.

During construction, exhaust emissions from construction equipment and fugitive dust emissions will have localized, short-term and transitory effects on the surrounding airshed. During construction, the practices and procedures outlined in the Cheminfo (2005) document “Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities”, prepared in conjunction with the Construction and Demolition Multi-Stakeholder Working Group for Environment Canada, will be followed, including:

- plans to minimize dust generation through planning, site layout and the proper use of materials, tools and equipment;

- use of wind fencing;
- compacting disturbed soil;
- activity scheduling;
- storage piles management;
- minimization of drop heights;
- barriers to prevent dispersion of materials;
- work practices for loading debris;
- avoidance of prolonged storage of debris; and
- proper techniques for the use of materials that include volatile organic compounds (VOCs).

The contractor will be required to maintain equipment in good working condition to minimize combustion emissions to the extent practicable (Cheminfo, 2005). The contractor will also be asked to ensure vehicles and equipment are not idling unnecessarily. To reduce fugitive dust emissions, effective dust suppression techniques, such as on-site and road watering could be used.

The application of the recommended mitigation measures should minimize combustion emissions and limit fugitive dust emissions to the work area. Reseeding or replanting (if necessary) will be undertaken as soon as conditions permit after construction to reduce potential dust generation.

A concrete batch plant will not be required as concrete can be sourced by local suppliers.

There will be no atmospheric emissions from the proposed powerhouse during operation, except for the very rare use of backup generators as well as staff using vehicles to travel to and from the site. As ambient air quality will not be affected during the operation of the Project and monitoring is not deemed necessary.

3.4 Question #3 – Endangered Species

Question #3 of the Screening Assessment is whether the project would, "Cause negative effects on species or their habitat for species listed under the Ontario *Endangered Species Act*?"

3.4.1 Terrestrial Species

OPG has retained Arcadis Canada and Northern Bioscience to prepare this screening report and carry out other environmental services for the Bingham Chute Life Extension Project. OPG had also previously retained Beacon Environmental in 2020 and 2021 to carry out a *Terrestrial Environmental Assessment for Potential Redevelopment of Bingham Chute Generating Station* and a *Terrestrial Technical Support Memo Bingham Chute Generating Station*. The main purpose of the studies was to provide OPG with an understanding of the risks associated with redeveloping and/or refurbishing facilities at the Bingham Chute GS, specifically with regard to terrestrial species at risk that are subject to prohibitions under the provincial *Endangered Species Act* (*ESA*). These studies are provided in Appendix B and summarized below, with any relevant updates.

An initial site visit and preliminary assessment of potential for species regulated under the ESA to be at the site or their habitat were conducted in 2020 (Beacon Environmental 2020). Based on those findings, the following studies were then carried out in 2021 (Beacon Environmental 2021):

- early morning breeding bird surveys;
- turtle basking surveys;
- acoustic surveys for bats; and
- vegetation mapping and botanical inventory.

An Ecological Land Classification of the site was undertaken by Beacon Environmental (2020). The site was described by them as consisting of the following ecological communities.

- Forest Communities:
  - FOD1-1: Dry - Fresh Red Oak Deciduous Forest.
- Rock Barren Communities:
  - RBO3: Acidic Open Rock Barren.
- Cultural Communities:
  - CUP3-1: Red Pine Coniferous Plantation;
  - CUW: Cultural Woodland;
  - CUT1: Cultural Thicket;
  - CUM1: Cultural Meadow; and
  - ANT: Anthropogenic.
- Anthropogenic Communities.

As demonstrated by the ecological land communities above, most of the site has been altered by historic work and operations at the site.

There were 90 vascular plant species identified within the study area during the site visits. One plant Species at Risk (SAR) was identified on the site, Black Ash (*Fraxinus nigra*). Black Ash was listed as Endangered under the provincial *Endangered Species Act* in January 2022 (MECP 2022). Beacon Environmental noted in their 2020 Report that the Black Ash at the Project site is located along the river's edge away from any possible redevelopment activities. Black Ash trees were identified within a cultural woodland complex (CUW) near the spillway and south of Highway 534 and are therefore not located where proposed work for the refurbishment of the Bingham Chute GS is to occur. While an adjacent cultural meadow may be used as a potential parking or laydown area, OPG will ensure there is no encroachment into the cultural woodland where the Black Ash are located. As such, no potential effects are expected to occur on the Black Ash trees. To meet the objectives of the provincial Black Ash recovery strategy (Catling *et al*. 2022), individual Black Ash trees within the current presumed climatic range of Emerald Ash Borer (*Agrilus planipennis*) should be protected to maximize the chances of protecting resistant individuals. Ground disturbance within the maximum rooting area of any Black Ash individuals (i.e., three times the diameter of a tree's

canopy) should be minimized to protect the tree's root systems (Catling *et al*. 2022). Where possible, laydown areas at the Project site will therefore be sited accordingly. Per O.Reg. 832/21, Black Ash habitat is defined as the area within 30 m of any healthy Black Ash tree at least 8 cm diameter at 1.37 m height (MECP 2024a). Prohibitions against damaging or destroying said habitat apply in much of southern Ontario, including the Project, under Section 10 of the ESA.

Blanding's Turtle (*Emydoidea blandingii*), a provincially Endangered turtle species, has the potential to occur in the study area, but no individuals were observed during the basking surveys. This species occurs at low densities in this part of its geographic range and the study area provides limited basking opportunities (i.e., floating woody debris and hummocks are uncommon in the river) (Beacon Environmental 2021). Two adult Common Snapping Turtle (*Chelydra serpentina*) and one Midland Painted Turtle (*Chrysemys picta marginata*) were observed basking in the open water community south of Highway 534 and several nests belonging to either Common Snapping Turtle or Midland Painted Turtle were also observed west of the sluiceway. Blanding's Turtle was not observed within the study area during the 2021 basking surveys, but they have been documented approximately 3 km farther downstream along the South River (MNR 2025). Given the presence of other turtle species and the area's physical characteristics, this suggests that Blanding's Turtles could move through the area or be present at other times of the year. Blanding's Turtles typically travel amongst several wetlands throughout the year and are known to regularly make overland movements of hundreds to thousands of metres (COSEWIC 2016; ORAA 2024 and references therein). The potential of Blanding's Turtle to occur within the study area, combined with the documented presence of other turtle species of Special Concern, therefore warrant mitigation measures to reduce the likelihood of adverse effects on turtles. As such the following mitigation measures are proposed:

- Daily morning visual check for turtles in and near the work area by the Environmental Advisor.
- Worker training and education on appropriate response/actions if turtles are detected on or near the Project.
- Use of Erosion and Sediment Control Fencing consistent with provincial guidance regarding reptile and amphibian exclusion fencing (https://www.ontario.ca/page/reptile-and-amphibian-exclusion-fencing).
- Maintaining speeds at less than 10 km/hour on site and warning signs (MNRF 2018).

There were 45 species of birds documented during the breeding bird surveys. Based on the habitat types present, as well as observations of bird behaviour, 37 of these species can be expected to breed or potentially breed on the subject property. Observations were relatively well distributed throughout the property and were generally composed of commonly occurring species of rural and urbanizing landscapes.

No Endangered or Threatened bird species were documented breeding within the study area in 2021. Threatened Chimney Swift (*Chaetura pelagica*) have been observed aerially foraging near a large barn located approximately 200 m west of the GS, and it is possible that they could forage above the Project site. Given that all critical habitat identified for this species are anthropogenic structures (e.g., chimneys) used for breeding (ECCC, 2023; MECP 2024b) and that no suitable breeding habitat is present at the Project site, no impacts on breeding individuals are expected to occur from the Project. Chimney swifts forage on aerial insects, generally at heights that range from 20-150 m in the air (COSEWIC 2018; Steeves *et al*. 2014) and are therefore likely to be unaffected by the Project. Although not observed at the Project site, both Eastern Meadowlark (*Sturnella magna*) and Bobolink (*Dolichonyx oryzivorus*) have been documented in the 1 km x 1 km square (17PM2403) overlapping the Project site (MNR 2025; Birds Canada 2025). Both of these Threatened bird species prefer grassland habitat such as prairies, savannahs,

pastures, hayfields, and weedy meadows (COSEWIC 2010, 2011; McCracken *et al*. 2013). Such open grassland habitats are found on farmland west and north of Bingham Chute but are lacking at the Project site. No impacts are therefore anticipated on these two species from Project activities.

Passive acoustic surveys indicated that the Endangered bat species, Little Brown Myotis (*Myotis lucifugus*), was present in the study area. The data showed that the species was most likely foraging and/or regularly moving through the study area. The data further indicated that there was a low likelihood that trees or buildings close to the acoustic detectors were being used as roost habitat. It is possible, however, that roosts were used elsewhere within the study area and as such restricted timing windows for tree removal may be required depending on the development activities proposed. Clearing of trees should avoid the active bat window, which is April 1 to September 30 in southern Ontario. Although not listed as a SAR at the time of Beacon's 2021 field survey, Eastern Red Bat (*Lasiurus borealis*), Hoary Bat (*Lasiurus cinereus*), and Silver-haired Bat (*Lasionycteris noctivagans*), have recently been assessed as Endangered federally (COSEWIC 2023) and provincially (COSSARO 2024a,b,c), and it is expected that they will be listed as Endangered under the provincial ESA in 2025. Given the site conditions and the presence of other foraging bats at Bingham Chute, it is likely that these species may also forage at or near the Project area.

As per the regulations under the federal *Migratory Birds Convention Act* it is necessary to ensure that breeding birds and/or their nests, eggs or young are not disturbed, damaged or destroyed. Therefore:

- vegetation clearing should be avoided during the migratory bird nesting season (April to the end of August) (it is OPG's intention to clear trees between October 1 and April 1 to meet the bat cavity tree window suggested above); and
- if minor vegetation clearing needs to occur during the migratory bird nesting season or if clearing needs to occur in highly disturbed areas with simple vegetative structure, then a qualified avian biologist will examine the area to be affected to ensure that no nests, eggs or nestlings or indications of nesting are present. However, it should be recognized that in almost all circumstances a high risk of nesting birds will occur from May to July inclusive.

All traffic associated with the Project on OPG's site will be limited to a speed of 10 km/hour both for environmental and health and safety reasons. The low speeds reduce the likelihood of vehicular-animal incidents.

With the above proposed mitigation measures, no impacts on terrestrial Species at Risk are anticipated.

3.4.2 Aquatic Species

During background data collection for the SRWMP, the MNR indicated that only limited fisheries data on the South River were available (OMNR *et al.* 2012). Information on the fish community in the South River system was generally limited to lake data collected in the 1970's, creel survey data, bycatch data from specific studies, and anecdotal reports of species presence gathered from MNR fisheries biologists (MNR *et al.* 2012). Table 3-1 lists the fish species, reported in the SRWMP (MNR *et al.* 2012), that occur within a portion of the South River extending from the Nipissing GS to immediately upstream of the Elliot Chute GS.

All of the species identified are warmwater or coolwater species except for Brook Trout (*Salvelinus fontinalis*), which is a coldwater species. The Public Consultation Appendix to the SRWMP contains the following statement.

> "McNab (Nipissing GS) to Bingham Chutes GS (is) considered a warmwater fishery although Brook Trout are found in the river. The brook trout are usually associated with a coldwater feeder streams [sic], for example Genisee [sic] Creek."

The confluence of Genesee Creek and the South River is approximately 4.2 km downstream from the Bingham Chute GS. This statement suggests that Brook Trout undertake foraging forays into the South River when the water temperature is cool enough and/or occur within cold water refugia at the mouths of tributaries during the summer.

Table 3-1 also presents the fish species and number of individuals relocated when the Elliot Chute GS headpond was drawn down so that repairs could be made to the dam in October 2014. It should be noted that these were individuals stranded in isolated areas; the river channel continued to flow during the repairs and fish that remained in it were not sampled. The catch was dominated by centrarchids, Golden Shiner (*Luxilus cornutus*), Yellow Perch (*Perca flavescens*) and Brown Bullhead (*Ameiurus nebulosus*).

Table 3-1 Fish Species Reported to occur in the South River, between Nipissing GS and Elliot Chute GS (MNR et al., 2012), and Fish Species and Number of Individuals Captured During a Fish Relocation Upstream of Elliot Chute GS in October, 2014 (OPG, unpublished data)

Group	**Common name (*Scientific name*)**	**Species Presence / Count**	
		Reported to occur between Nipissing GS and Elliot Chute GS (OMNR, 2012)	**Captured during fish relocation upstream from Elliot Chute GS (OPG, unpublished data)**
Suckers	White Sucker (*Catostomus commersonii*)	X	321
Trouts and Salmons	Brook Trout (*Salvelinus fontinalis*)	X	-
Catfishes	Brown Bullhead (*Ameiurus nebulosus*)	-	1,229
Pikes	Northern Pike (*Esox lucius*)	X	148
Perches and Darters	Walleye (*Sander vitreus*)	X	-
	Yellow Perch (*Perca flavescens*)	X	2,561
	Iowa Darter (*Etheostoma exile*)	-	6
Trout Perches	Trout Perch (*Percopsis omiscomaycus*)	X	-
Smelts	Rainbow Smelt (*Osmerus mordax*)	X	-
Sunfishes	Rock Bass (*Ambloplites rupestris*)	X	1,025
	Largemouth Bass (*Micropterus salmoides)*	-	3,080
	Smallmouth Bass (*Micropterus dolomieu*)	X	37
	Bluegill (*Lepomis macrochirus*)	X	-
	Pumpkinseed (*Lepomis gibbosus*)	X	8,000
Sticklebacks	Brook Stickleback (*Culaea inconstans)*	-	5
Minnows	Common Shiner (*Luxilus cornutus*)	-	22
	Golden Shiner (*Notemigonus crysoleucas*)	X	6,637
	Bluntnose Minnow (*Pimephales notatus*)	X	1
	Fathead Minnow (*Pimephales promelas*)	-	118

None of the fish species within this section of the South River are considered at-risk in Ontario (MECP 2025) or federally (ECCC 2025).

Three fish Species at Risk (SAR) are present within the lower reach of the South River, between Lake Nipissing and Chapman's Chute. Great Lakes-Upper St. Lawrence populations of Lake Sturgeon (*Accipenser fulvescens*) are Endangered in Ontario (COSSARO 2017; MECP 2025). The main Lake Sturgeon spawning location for Lake Nipissing is at the base of Chapman's Chute (Tremblay pers. comm. 2020) located approximately 21 km downstream from the Bingham Chute GS and below an impassable barrier to non-jumping fish. Both Northern Brook Lamprey and Silver Lamprey also occur downstream from Chapman's Chute and both are listed as a species of Special Concern in both Ontario and Canada (ECCC 2025; MECP 2025), and do not have habitat protection under the provincial ESA.

As the effects of the proposed project will be localized to the immediate site, no anticipated effects after mitigation are identified. The most important mitigation measures to prevent any downstream effects would be to prevent any downstream erosion and sedimentation from occurring.

3.5 Question #4 – Protected Areas

Question #4 of the Screening Assessment is: Will the proposed project, "Cause negative effects on protected areas, such as areas of natural and scientific interest (ANSIs), environmentally sensitive areas (ESAs) or provincially significant wetlands?"

Arcadis has prepared the map below showing the Bingham Chute GS in relative proximity to various protected areas in Ontario. Arcadis examined provincial databases to identify any potential protected areas. These include:

- National Parks;
- Provincial Parks;
- Conservation Reserves;
- Areas of Natural and Scientific Interest (or ANSIs);
- Environmentally Sensitive Areas (ESAs); and,
- Provincially Significant Wetlands (PSWs).

The map was prepared utilizing the MNRF's "Make a Map Natural Heritage Areas" interactive web mapping tool that can be found at: Make A Map: Natural Heritage Areas (gov.on.ca)(MNR 2025). Along with mapping assessed through geowarehouse, Arcadis also assessed the proximity to protected areas using the MNR's Ontario Crown Land Use Policy Atlas Crown Land Use Policy Atlas (gov.on.ca).

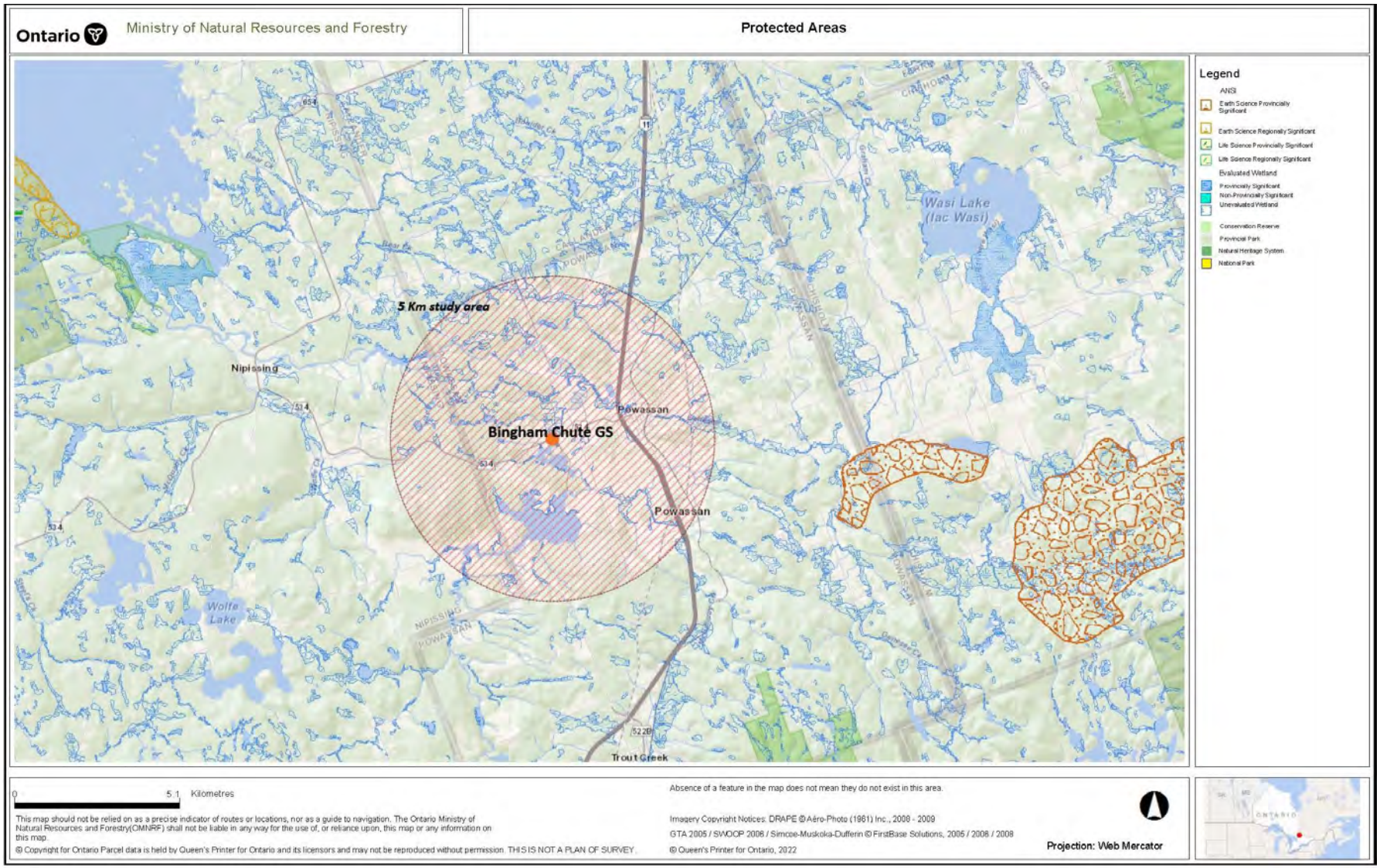

Figure 3-2 Protected Areas Near Bingham Chute

As the proposed project is merely a refurbishment of the existing site and OPG plans to manage the GS consistent with the SRWMP approved levels and flows the potential area of influence or impact of the project is located to the immediate site and potentially areas within a few hundred meters of the proposed project.

The above map does not show any protected areas within a 5 km study area for Bingham Chute GS. The closest protected areas to the site are:

- Graham Lake Hill Earth Science ESA located slightly under 10 km to the east of the Bingham Chute GS.
- Fish Bay Conservation Reserve (C152) located over 10 km from the site on the shore of Lake Nipissing. The project would not have any negative effects on it.
- South Bay Provincial Park (P1928) is also located on the shore of Lake Nipissing and near Fish Conservation Reserve. As such, it is slightly over 10 km from the Bingham Chute GS site and the project would have no negative effects on it.
- Other protected areas slightly further from Bingham Chute GS include the Sausage Lake Forest (at the very bottom of the map in a darker shade of green) and the Genesse Earth Science ANSI which is the larger Earth Science ANSI located immediately to the east of the Graham Lake Earth Science ESA.

In summary, the proposed Bingham Chute GS Life Extension Project would not have any negative effects on protected areas because all of the expected effects of the project are anticipated to occur on site or within a few hundred meters of the site.

3.6 Question #5 – Sedimentation and Erosion

Question #5 of the Screening Assessment is “Will the Project cause considerable sedimentation or erosion on or off-site?”

While there is the potential risk for soil erosion and sedimentation to occur as a result of the proposed project, in general and as outlined in the Project Description the project only proposes a minimum amount of civil work. Most of the work associated with refurbishment will occur within the inside of the powerhouse and therefore the risk of erosion and sedimentation is very limited. No in-water work is proposed. No shoreline alteration work is proposed.

The risk is likely to come in the form of construction equipment moving around the site and the establishment and use of laydown areas for the project.

OPG will require its DBC to develop and implement a site-specific Erosion and Sediment Control Plan for the construction period. The site-specific Erosion and Sediment Control Plan will be part of a broader Environmental Management Plan. That Plan would be implemented as required prior to work that could result in erosion and sedimentation and be maintained during the work phase until the risk of it occurring is eliminated. All personnel involved with the proposed works will be briefed on erosion and sediment control including engineers, contractors, inspectors, and environmental staff.

Soils on the proposed Project site are disturbed from previous work at the site that has occurred during the last one hundred years of operation. During construction, soil erosion generally results from precipitation and runoff, or wind action on the disturbed terrain surfaces as a result of the removal of vegetative cover, alteration of topography and improper restoration. All construction work should be conducted so as to avoid unnecessary disturbance of the ground by the placement or excavation of materials, the disruption of established natural surface and subsurface drainage, or the disturbance of natural vegetation cover that is to be preserved. During periods of excessive rainfall or saturated soil conditions, construction activities will be monitored to ensure that gullying does not occur on the any slopes near the South River and that excavated soils do not migrate off the work area. Exposed areas will be stabilized as soon as sufficiently dry conditions prevail and, where appropriate, excavated soils will be stabilized by the use of silt fencing enhanced with straw bales, stockpile covers, berms, controlled compaction, etc. Erosion associated with high winds, resulting in soil loss, will be reduced or eliminated by stabilizing spoil piles with straw mulch or more stable materials. Erosion and sediment control will be an integral component of the construction planning process. All personnel involved with the proposed works will be briefed on erosion and sediment control. In general, the following guidelines will be applied in the development of the Erosion and Sediment Control Plan:

- fitting of proposed works to the terrain (i.e., using the natural topography of the land in the placement and organization of the construction site);
- timing of grading and construction activities to minimize soil exposure;
- retention of existing vegetation (if anything) where feasible;
- restriction of the use of heavy construction equipment to within the approved work areas to minimize soil disturbance and vegetation destruction;
- if required storage of stripped soil (soil stripping is expected to be minimal) at upland locations with a minimum of 5 m from the edge of the South River;
- implementation of erosion control measures, e.g., rip-rap berms underlain by filter geotextile, straw bales used as filters, silt fencing along the shoreline and/or mulching for interim stabilization;
- diversion of runoff away from exposed areas;
- maintenance of low runoff velocities;
- design of drainage works (if required), such as ditches and outfalls, to handle concentrated runoff;
- retention of sediment on site;
- routine inspection and maintenance of erosion and sediment control measures;
- revegetation of disturbed areas by seeding and/or planting following construction as soon as seasonal conditions permit.

The use of settling ponds (which will unlikely be needed), if required, will require Environmental Compliance Approvals under the *Ontario Water Resources Act* (*OWRA*). The DBC will be responsible for the final design of the settling ponds, including locations of such works, treatment options, volumes, discharges to the environment, proposed monitoring plans, and effluent criteria for parameters of concern (e.g., pH, TSS, turbidity, hydrocarbons, total ammonia).

As already indicated, the site-specific Erosion and Sediment Control Plan will be part of a broader Environmental Management Plan for the proposed project. After construction, the disturbed sites will be rehabilitated. A Site Rehabilitation Plan including planning considerations, soil stabilization and re-vegetation (using only native vegetation and planting of tree species typical of the specific ecosite) will be prepared for the proposed Project.

The implementation of the Erosion and Sediment Control Plan and the Site Rehabilitation Plan during construction and rehabilitation will obviate or minimize potential effects on soils.

3.7 Question #6 – Built Heritage Resources and Cultural Heritage Landscapes

Question #6 of the Screening Assessment is, after application of appropriate Best Management Practices and mitigation strategies, is the project expected to, "Have negative effects on known (previously recognized) or potential built heritage resources and/or cultural heritage landscapes? (See instructions below)"

As already indicated, the OWA Class EA document stated the following:

> "To respond to questions 6 and 7, proponents must notify the Ministry of Heritage, Sport, Tourism and Culture Industries[4] Heritage Planning Unit at heritage@ontario.ca for project specific advice on what technical culture heritage studies may be applicable. Ministry of Heritage, Sport, Tourism and Culture Industries will provide a letter to the proponent with this advice.
>
> Proponents are encouraged to review the following checklists to understand existing conditions.
>
> - **Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes**
> - Criteria for Evaluating Archaeological Potential
> - Criteria for Evaluating Marine Archaeological Potential, if your project is located in or adjacent to a body of water"

No further advice with respect to these Instructions is provided in the Class EA but OPG and Arcadis followed up with the Heritage Planning Unit within the Ministry on this matter and their advice is presented below based on a letter from the Ministry dated June 22, 2022 (which can be found in Appendix C):

> "Built Heritage Resources and Cultural Heritage Landscapes
>
> Section 4.5 of the Project Description for Agency Review (dated February 2022) states that in 2021 Unterman McPhail on behalf of OPG, completed a Preliminary Assessment: Potential for Cultural Heritage Value or Interest for Bingham Chute Generating Station. The Preliminary Assessment determined that the facility has the potential to meet the criteria of Ontario Regulations (O. Reg.) 9/06 and/or 10/06 under the *Ontario Heritage Act* (*OHA*) and has the potential for cultural heritage value or interest.

[4] The Province's Heritage Unit is now within the Ministry of Culture and Multiculturalism.

A Cultural Heritage Evaluation Report (CHER), undertaken by a qualified person, should be undertaken to fully understand the property's cultural heritage value or interest and level of significance. Since OPG does not yet have an approved Evaluation process under the S&Gs, we recommend using the Cultural Heritage Evaluation Methodology in the MHSTCI Heritage Identification and Evaluation Process (2014). We recommend referring to Sections 4.6.1 and 4.7, which provide explanations of how to apply the evaluation criteria in Ontario Regulation 9/06 and 10/06. Additionally, given the project timelines, please send the draft CHER to MHSTCI for review and comment as soon as it is available.

If the property (or project area) is found to have cultural heritage value or interest, then a Heritage Impact Assessment (HIA), prepared by a qualified person, should be completed to assess potential project impacts and recommend appropriate mitigation measures. Please send the HIA to MHSTCI and the local municipality as appropriate for review and comment and make it available to local organizations or individuals who have expressed interest in review.

Proponents that are subject to the S&Gs, including OPG, should refer to Information Bulletin 3 - Heritage Impact Assessments for Provincial Heritage Properties (attached).

We recognize that under the S&Gs, ministries and public bodies prescribed under regulation, including OPG, are required to prepare a Strategic Conservation Plan (SCP) for provincial heritage properties under its ownership or control. However, given the project timelines, we recommend that, if technical cultural heritage studies are required after completion of the CHER, that the HIA be prioritized over the SCP.

The response to the **screening question 6** (Table 2, Class Environmental Assessment for Waterpower Projects May 2022) should be based on the CHER and HIA. Although the project may have negative effects on the built heritage resource and/or cultural heritage landscape, the mitigation measures recommended in the HIA are to be followed."

Based on the above a CHER was prepared by Andrew Hinshelwood of Northwest Archaeological Assessments Ltd., *OPG Heritage Review Process Cultural Heritage Evaluation Report Bingham Chute Generating Station Redevelopment Project South River, Municipality of Powassan District of Parry Sound, Ontario CHER Report*, dated January 25, 2023. That Report found that:

"Based on the application of the Criteria for Determining Cultural Heritage Value or Interest under Ontario Regulation 9/06, the conclusion of this Cultural Heritage Evaluation is that Bingham Chute GS holds cultural heritage value or interest based on design, associative and contextual values, and therefore *Bingham Chute GS is a Provincial Heritage Property* (PHP) as defined by the *Standards and Guidelines*.

However, Bingham Chute GS does not meet the criteria for provincial significance set out in Ontario Regulation 10/06. For this reason, *Bingham Chute GS is not a Provincial Heritage Property of Provincial Significance* (PHPPS) as defined by the *Standards and Guidelines." (p. 12)*

Unrelated to the completion of the CHER, OPG undertook a more detailed engineering assessment of the Bingham Chute project throughout the latter part of 2023 and 2024. That work culminated in the Project as it is described in section 2.4 of this Report. As described in 2.4, there are no changes to the overall layout of the existing GS and a refurbishment of the existing powerhouse is proposed. The focus of the project is on replacing the turbines, other

mechanical equipment and electrical equipment inside the powerhouse. As such the overall appearance of the site is not altered.

Once the above design changes were made and confirmed, OPG and Arcadis requested to Dr Hinshelwood that a CHIA be prepared. The CHER and the CHIA appear as Appendices D and E to this Report.

The Executive Summary of the CHIA indicates the following:

> "OPG has proposed refurbishment as the preferred option for Bingham Chute GS. Under the proposal, the existing powerhouse structure will be retained with minimal modifications to the exterior. No work is proposed on the main dam, sluiceways, spillway, dikes, or other water management infrastructure, although some minor work on the tailrace is expected. Most of the interior generating equipment will be replaced, with two new turbine/generator units installed and most of the powerhouse mechanical and electrical equipment.
>
> This CHIA assesses potential impacts to the Bingham Chute GS resulting from the proposed refurbishment project. Identified direct impacts for the project include removal of identified heritage attributes of the PHP (powerhouse equipment including the generators and turbines), and minor modifications to the powerhouse exterior (replace service door, mezzanine extension). No indirect impacts are identified resulting from the work. Positive impacts to refurbishment include the retained configuration of the component features of the facility and its continued use for hydro-electric power generation purposes on the South River. This maintains and continues an over 100-year identifiable and defining cultural heritage landscape and its retention for hydro-electric power generation reinforces the significant physical, functional, and visual connections among the GS facility's built heritage attributes."

As the overall layout of the GS and component features remain the same and the powerhouse is refurbished, OPG, Arcadis and Northwest Archaeological Assessments are of the opinion that there will not be negative effects on known (previously recognized) or potential built heritage resources and/or cultural heritage landscapes. Furthermore, there will be no alterations to how the public can view the facility, which is visible from Highway 534. The CHIA goes on to identify five recommendations that OPG will carry out.

3.8 Question #7 – Archaeological Resources

3.8.1 Stage 1 and 2 Archaeological Resource Assessment

Question #7 of the Screening Assessment is will the project, "Have negative effects on archaeological resources and areas of archaeological potential? (See instructions below)".

OPG retained Woodland Heritage Services Northwest Inc. to carry out a Stage 1 and 2 Archaeological Assessment of the proposed Bingham Chute GS Life Extension Project.

A Stage 1 background assessment was first undertaken to determine the historical and archaeological context of the property followed by a property inspection to locate areas or features of archaeological potential that may be impacted by the proposed redevelopment / rehabilitation of the generating station. The background research determined that a dam, sawmill, and grist mill were constructed on the property in the 1880s, during the first wave

of settlement into the area. The Town of Powassan would develop around these mills, although its development would later be redirected towards the railway. In 1906, the grist mill owner began to produce electricity for the Town of Powassan using a powerhouse installed near the site of the former grist mill. The property was later acquired by the Hydro-Electric Power Commission of Ontario who would dismantle the former mills and construct the Bingham Chute Generating Station in 1923.

The following was the key Stage 1 Recommendation (Woodland Heritage Northeast, 2021).

> "Areas of archaeological potential were located within the study area at the Bingham Chute Generating Station (Map 11). As such, a Stage 2 archaeological resource assessment is recommended in advance of any redevelopment or rehabilitation activities. The Stage 2 assessment strategy should include a test pit survey, with test pits dug a minimum of 30 centimetres in diameter, every five metres in all areas of archaeological potential. Test pits should be excavated by hand and of a sufficient depth to penetrate and investigate the sterile mineral soils, with the soil screened through six-millimetre hardware mesh, and backfilled. The Stage 2 assessment strategy should be consistent with Sections 2.1.2 of the MHSTCI 2011 Standard and Guidelines for Consultant Archaeologists."

The property assessment confirmed that many of the areas within the study area had been extensively disturbed during the removal of the structures and the construction of the generating station. Despite these disturbances, several areas were considered to have archaeological potential and were tested during the Stage 2 portion of the assessment. Then the Stage 2 assessment occurred in the field.

The following was the Recommendation from the Stage 1 and 2 Report (Woodland Heritage Northeast, 2021).

> "As no archaeological resources were located during the test pit survey of the area of archaeological potential in the study area (Map 11), no further archaeological resource assessment work is recommended in advance of the redevelopment or rehabilitation of the Bingham Chute Generating Station in in Lot 23, Concession 12, and Lots 22 and 23, Concession 13, Himsworth Township, District of Parry Sound, Ontario."

The Stage 1 and 2 Archaeological Assessment was submitted to MHSTCI for review on August 19, 2021 (under Project Information Form number P208-0218-2020). In a letter (Appendix C) from the Ministry to Ms. Gillian MacLeod at OPG, dated June 22, 2022, regarding the Bingham Chute Life Extension Project the Ministry recommended that the Report be sent in for expedited approval. Expedited approval was obtained from the Ministry in a letter dated August 21, 2022. The Ministry letter indicated that:

> "Based on the information contained in the report, the ministry is satisfied that the fieldwork and reporting for the archaeological assessment are consistent with the ministry's 2011 *Standards and Guidelines for Consultant Archaeologists* and the terms and conditions for archaeological licences. This report has been entered into the Ontario Public Register of Archaeological Reports."

All approved archaeological assessments include statements on "Advice on Compliance with Legislation". These statements which are similar to possible mitigation measures are included here in order to ensure that during construction the project is always managed utilizing best practices. The two relevant potential mitigation measures are as follows (Woodland Heritage Northeast, 2021).

c. Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act.* The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.

d. The *Cemeteries Act*, R.S.O. 1990 c. C.4 and the *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services."

Given that the Stage 2 archaeological assessment identified that no further archaeological resource assessment work required at the site and OPG will carry out the best practices with respect to the potential discovery of artifacts or human remains, OPG and Arcadis can state that the proposed Bingham Chute Life Extension Project will not have negative effects on archaeological resources and areas of archaeological potential.

3.8.2 Potential for Marine Archaeology

As already indicated, the OWA Class EA document with respect to Screening Questions #6 and #7 stated the following (the bold is our emphasis):

"To respond to questions 6 and 7, proponents must notify the Ministry of Heritage, Sport, Tourism and Culture Industries Heritage Planning Unit at heritage@ontario.ca for project specific advice on what technical culture heritage studies may be applicable. Ministry of Heritage, Sport, Tourism and Culture Industries will provide a letter to the proponent with this advice.

Proponents are encouraged to review the following checklists to understand existing conditions.

- Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes
- Criteria for Evaluating Archaeological Potential
- **Criteria for Evaluating Marine Archaeological Potential, if your project is located in or adjacent to a body of water**"

No further advice with respect to these Instructions is provided in the Class EA but OPG and Arcadis followed up with the Ministry of Heritage, Sport, Tourism and Culture Industries Heritage Planning Unit on this matter. In a letter from the Ministry to Ms. Gillian MacLeod at OPG, dated June 22, 2022, regarding the Bingham Chute Life Extension Project (Appendix C), the Ministry provided guidance with respect to marine archaeology. That letter indicated the following (the bold is our emphasis).

"The Project Description indicates the project may have underwater impacts to the tailrace channel (may require deepening of 1.0 to 2.0 m), and future dykes and sluiceway works. The project should be screened using the MHSTCI Criteria for Evaluating Marine Archaeological Potential to determine if a marine archaeological assessment is needed. **We recommend that OPG review its records to determine whether any previous excavation e.g., deepening or dredging, of the tailrace has ever taken place. If so, the area may be considered to be previously disturbed**. Please note, if a marine archaeological

assessment is required, it shall be undertaken by an archaeologist with a specialized marine archaeological license. Please be aware that archaeological concerns have not been fully addressed until reports have been entered into the Ontario Public Register of Archaeological Reports where those reports recommend that: 1. the archaeological assessment of the project area is complete and 2. all archaeological sites identified by the assessment are either of no further cultural heritage value or interest (as per Section 48(3) of the *Ontario Heritage Act*) or that mitigation of impacts has been accomplished through excavation or an avoidance and protection strategy. Proponents should wait to receive the MHSTCI's review letter indicating that the report(s) has been entered into the Register before issuing a decision or proceeding with any ground disturbing activities.

The response to the screening question 7 (Table 2, Class Environmental Assessment for Waterpower Projects May 2022) should be based on the archaeological assessment(s). Although File #0013025 -OPG – Bingham Chute GS MHSTCI Letter/Comments 4 the project may have negative effects on archaeological resources, the mitigation measures recommended in the archaeological assessments are to be followed. Please notify MHSTCI (at archaeology@ontario.ca) if archaeological resources are impacted by EA project work. All activities impacting archaeological resources must cease immediately, and a licensed archaeologist is required to carry out an archaeological assessment in accordance with the *Ontario Heritage Act* and the Standards and Guidelines for Consultant Archaeologists."

As the Project Description in Chapter 2 indicates, the original facility was constructed over one hundred years ago and was extensively disturbed from the original construction. The South River is small River that is generally only navigable by canoe and small recreational boats and OPG has had no knowledge or evidence of the presence of marine archaeology at the site. That being said, OPG retained Woodland Heritage Northeast to undertake *A Background Review of the Requirement for Future Marine Archaeological Work – The Bingham Generating Station – Proposed In-Water Works*, 2023. That Report found the following:

"OPG retained Woodland Heritage Northeast to assess the project under the Criteria for Evaluating Marine Archaeological Potential checklist and to provide an overview of the potential for impacts to unknown underwater archaeological resources. As part of this assessment, several considerations were made, including the early impacts the development of the generating station had to the river bottom environment, the nature and rate of flow through the generating station and over the falls, and the nature of the development work to be undertaken.

After these various considerations were evaluated, it was determined that no marine assessment should be required as part of the proposed Bingham Generating Station work. The MCM's Criteria for Evaluating Marine Archaeological Potential (form 0503E) was used as part of this summary evaluation." (p. 2)

"Overall, given the well-documented disturbances on land and in the water, as well as the high, variable water velocity through the falls and the artificial nature of the intake channel, tailrace, and built up area below the powerhouse, it is highly unlikely that archaeological remains would be located within the areas to be impacted by the proposed work at the Bingham Generating Station." (p. 4)

The final conclusion of the Report is as follows:

> "The conclusion of this analysis with contributions from a licenced archaeologist qualified to undertake marine archaeological work is that a marine archaeological assessment should not be required. Supporting documentation is retained by OPG and is available should be the Ministry be interested in reviewing it."

In summary and with respect to Question #7 of the Screening Assessment is will the project, "Have negative effects on archaeological resources and areas of archaeological potential?" The answer is No.

3.9 Summary Assessment

As per Sections 3.2 to 3.8, after application of appropriate Best Management Practices and mitigation strategies, the project is expected to have no effect on all seven of the screening criteria questions. Based on that no environmental assessment is required.

If anyone has questions on the above assessment, they are requested to speak to OPG by June 28 with their specific reasoning as to what their specific concerns are with respect to the answers to the screening questions. If no responses are received by that date OPG will be sending the letter to the Ministry of the Environment, Conservation and Parks (MECP) Director of the Environmental Assessment Branch and the Regional Environmental Assessment Coordinator indicating that the project has been successfully screened out of the OWA Class EA process.

3.10 Additional Environmental Measures

OPG is required to comply with a variety of other laws and regulations including the obtaining of several permits and other approvals for the project. The purpose of this report is not to go into those details but rather the OPG Bingham Chute team will be meeting with specific ministries, departments, and other bodies to obtain those approvals. OPG anticipates reaching out to the various ministries regarding any approvals as required.

As well, OPG wants to ensure its projects are protective of the environment and therefore requires its constructors to carry out construction of its projects in such a manner. As was demonstrated in this report, a wide variety of best management practices and mitigation measures will need to be implemented at the site during construction to ensure the project meets its various commitments. Furthermore, OPG has other expectations for its constructors on environmental performance.

4 Consultation

As was indicated in Chapter 1, according to the OWA Class EA, the Notice of Project Screening is to be issued to all of the following provincial ministries and officials: MECP, Director of the Environmental Assessment Branch and the Regional Environmental Assessment Coordinator; MNR; MCM; and, Ministry of Energy (ME). The Screening is also to be sent to anyone potentially directly affected by the project and potentially affected Indigenous communities.

The Notice of Project Screening was published on the OWA website and, the proponent's website, and was provided to anyone directly affected by the project via direct mail outs.

The Notice of Screening appears in Appendix A of this Report. It was distributed as follows.

- The Notice of Screening was placed on the project's website.
- The Notice of Screening was sent to the following Indigenous communities by e-mail with follow-up phone calls.
    - Nipissing First Nation.
    - Dokis First Nation.
    - Métis Nation of Ontario.
- The Notice of Screening was hand delivered to local adjacent property owners and a Canada Post maildrop from the Powassan post office which was provided to a couple hundred homes and businesses.
- The Notice of Screening was also posted to the OWA website (CLASS EA - OWA) and sent to the following government department and agencies:
    - MECP Director of the Environmental Assessment Branch (Kathleen O'Neil).
    - MECP Regional Environmental Assessment Coordinator.
    - MNR, Heidi Etzel (District Manager).
    - Ministry of Energy (Joerg Wittenbrinck).
    - Ministry of Tourism Culture and Sport, Karla Barbosa.
    - Ministry of Transportation, Diane Villneff.
    - Department of Fisheries and Oceans, Rich Rudolph.
    - Department of Transport, Navigable Waters Branch, Jeremy Craigs.
    - Township of Nipissing, Municipal Administrator-Clerk-Treasurer, Kristin Linklater.
    - Municipality of Powassan, Maureen Lang, Mark Martin and Kim Bester.

To the date of this Report, no member of the general public has raised a concern nor requested to see the Screening Report. One Indigenous community has requested to see the Screening Report but expressed no concern with the project.

5 Summary and Conclusions

As already indicated, as per sections 3.2 to 3.8 of this Report, after application of appropriate Best Management Practices and mitigation strategies, the project is expected to have no effect on all seven of the screening criteria questions. Based on that no environmental assessment is required.

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7 Acronyms/Abbreviations

Acronyms

ANSI	Areas of National and Scientific Interest
BCLEP	Bingham Chute Life Extension Project
Beacon	Beacon Environmental
BMPs	Best Management Practices
CHER	Cultural Heritage Evaluation Report
CHIA	Cultural Heritage Impact Assessment
CNR	Canadian National Railway
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COSSARO	Committee on the Status of Species at Risk in Ontario
CUW	Cultural Woodland Complex
DBC	Design Build Contractor
DFO	Fisheries and Oceans Canada (formerly Department of Fisheries and Oceans)
e.g.	for example (*exempli gratia*)
EA	Environmental Assessment
EA Act	*Environmental Assessment Act*
ECCC	Environment and Climate Change Canada
EMP	Environmental Management Plan
EPA	*Environmental Protection Act*
ER	Environmental Report
ESA	*Endangered Species Act*
ESAs	Environmentally Sensitive Areas
et al.	And others (et alia)
etc.	And so on (et cetera)
FA	*Fisheries Act*
GS	Generating Station
HIA	Heritage Impact Assessment
HONI	Hydro One Networks Inc.

HPU	Hydraulic Power Units
i.e.	that is (*id est*)
LRIA	*Lakes and Rivers Improvement Act*
Masl	Metres Above Sea Level
MCM	Ministry of Culture and Multiculturalism
ME	Ministry of Energy
MECP	Ontario Ministry of Environment, Conservation and Parks
MHTSCI	Ontario Ministry of Heritage, Tourism, Sport and Cultural Industries
MNR	Ministry of Natural Resources
MNRF	Ministry of Natural Resources of Forestry
O. Reg.	Ontario Regulation
OPG	Ontario Power Generation Inc.
OHA	*Ontario Heritage Act*
OWA	Ontario Waterpower Association
OWA Class EA	Class Environmental Assessment for Waterpower Projects
OWRA	*Ontario Water Resources Act*
PCA	Plant Condition Assessment
pers. comm.	Personal communication
PHP	Provincial Heritage Property
PHPPS	Provincial Heritage Property of Provincial Significance
PSW	Provincially Significant Wetland
RFR	Request for Review
SAR	Species at risk
SCP	Strategic Conservation Plan
SRWMP	South River Water Management Plan
WMP	Water Management Plan

Measurement Units

cms	cubic metres per second
km	kilometre
km^2	square kilometre
kV	kilovolt
m	metre
m/s	metre per second
m^3/s	cubic metres per second
MW	megawatt
MWh	Megawatt-hour
%	percent

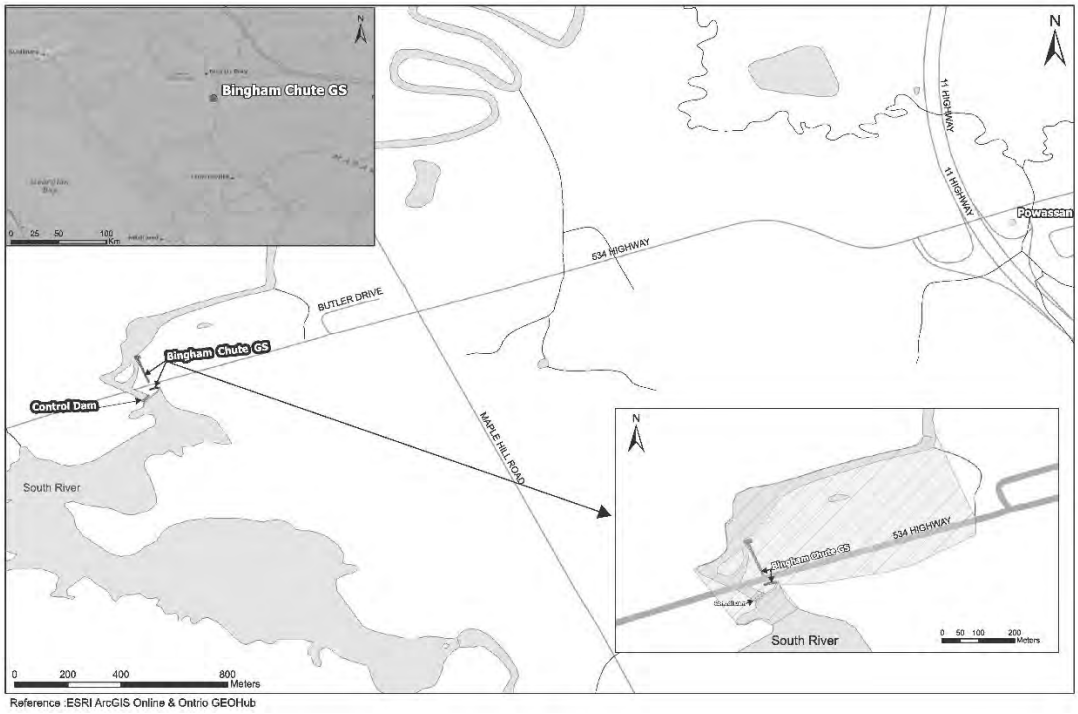
Appendix A

Notice of Project Screening

NOTICE OF PROJECT SCREENING UNDER THE ONTARIO WATERPOWER ASSOCIATION CLASS EA FOR WATERPOWER PROJECTS: BINGHAM CHUTE LIFE EXTENSION WATERPOWER PROJECT

Ontario Power Generation (OPG) is planning to undertake a project screening for the proposed Bingham Chute Life Extension Waterpower Project. The project is subject to the provisions of the Ontario Waterpower Association (OWA) Class Environmental Assessment (Class EA) for Waterpower Projects for *Projects Associated with Existing Infrastructure or Increases in Efficiency on Managed Waterways*.

As detailed on the map below, the existing Bingham Chute Generating Station (GS) is on the South River within the Town of Powassan, Ontario, approximately 27 kilometers south of North Bay, Ontario. OPG does not plan to alter the approved water levels and flows as described in the *South River Water Management Plan* (WMP). As such, the anticipated zone of influence for the project is limited to the immediate area around the station where effects from construction may be experienced (and is shown as a hatched area below). A minor amendment to the WMP will be required under the *Lakes and Rivers Improvement Act*. This notice for the project under the Class EA is intended to coordinate and meet the notification requirements relevant to the planning stage of the project under both the *Environmental Assessment Act* and *Lakes and Rivers Improvement Act* statutes.



OPG is proposing to refurbish the existing Bingham Chute GS and re-use the existing powerhouse.

The Bingham Chute GS is at or approaching its end-of-service life with about one hundred years of continuous operation with the original generating equipment. The station is also undersized to the current design approach of waterpower generating stations, and most of the controls are non-automated, still relying heavily on operator inputs. The life extension of the Bingham Chute GS provides an opportunity to better utilize and manage the available river flows, as well as upgrade the monitoring and control system, and extend the service life of the facility. The Bingham Chute GS currently has two small turbines with an installed capacity of 0.43 megawatts (MW) per turbine. The proposed refurbished facility would also have two turbines with a proposed installed capacity of 1.0 MW each - for a total station capacity of 2.0 MW. Therefore, the life extension project will increase the average annual energy

generation by more than double, adding an important new supply of renewable electricity to the provincial grid. Along with the newly installed turbines the old control, mechanical, electrical and other systems internal to the powerhouse will be replaced with new equipment. However, the overall layout of the Bingham Chute GS site and its civil works such as the main dam, dykes, sluiceway, parking and other general areas will remain largely unchanged. The site will not be expanded and there is no predicted increase to the footprint of the water management infrastructure. As such, the proposed undertaking is consistent with the Class EA screening process of limiting water management infrastructure to 25% or less.

OPG anticipates that this screening process will occur from April 14 to May 9 2025. If you wish to receive the Screening Report please contact Edward Naval as indicated below. An early construction commencement date has been identified for August 2026.

This project is being screened in accordance with the process outlined in section 3.1.1 of the Class EA for Waterpower Projects. For further information about the proposal, please contact:

Edward Naval
Senior Environmental Advisor
Ontario Power Generation
800 Kipling Avenue
Toronto, ON
M8Z 5G4
Phone: (416)231-4111 ext. 4137
Email: edward.naval@opg.com

Phil Shantz
Environmental Planning Leader
Arcadis Canada
8133 Warden Ave. Unit 300
Markham, ON
L6G 1B3
905-764-9380 or 647-542-2186
E-mail: phil.shantz@arcadis.com

The Class EA process requires OPG to complete a screening to confirm that there are no significant negative environmental effects anticipated from the project. As a first step in the screening process, this Notice of Project Screening is being publicly posted and sent directly to: key provincial Ministries; anyone potentially directly affected by the project; and potentially affected Indigenous communities. Projects that are screened out of the Class EA remain subject to applicable provincial and federal legislation as outlined in Table 1 of the Class EA. Following the completion of the Screening process and during the construction phase of the project a few other permits and/or approvals may be required for the project.

You are invited to provide comments on the key considerations to be addressed. For information on the project proposal, contact Edward Naval or Phil Shantz as above.

For more detail, please visit http://opgprojects.com/binghamchute/.

All personal information included in a submission – such as name, address, telephone number and property location – is collected, maintained and disclosed by the Ministry of the Environment, Conservation and Parks for the purpose of transparency and consultation. The information is collected under the authority of the *Environmental Assessment Act* or is collected and maintained for the purpose of creating a record that is available to the general public as described in s.37 of the *Freedom of Information and Protection of Privacy Act* (FIPPA). Personal information you submit will become part of a public record that is available to the general public unless you request that your personal information remain confidential. For more information, please contact the Ministry of the Environment Conservation and Parks's Freedom of Information and Privacy.

Appendix B

Beacon Environmental Reports - Terrestrial Environmental Assessment for Potential Redevelopment of Bingham Chute Generating Station and a Terrestrial Technical Support Memo Bingham Chute Generating Station

BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Terrestrial Environment Assessment for Potential Redevelopment of Bingham Chute Generating Station

Prepared For:

Ontario Power Generation

Prepared By:

Beacon Environmental Limited

Date: *Project:*

December 2020 **220224.1**

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Figures

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Appendices

1. Introduction

Beacon Environmental Limited (Beacon) has been retained by Ontario Power Generation (OPG) to complete a preliminary review of the terrestrial environment at the Bingham Chute Generating Station (GS). The purpose of the review was to provide OPG with an understanding of the risks associated with redeveloping and/or refurbishing facilities at the Bingham Chute GS, specifically with regard to terrestrial species at risk that are subject to prohibitions under the provincial *Endangered Species Act* (ESA). For example, species that are classified as endangered or threatened under regulations of the ESA are subject to prohibitions on killing and habitat damage/destruction. In contrast, species provincially classified as special concern are not subject to these same prohibitions.

Regarding the federal *Species at Risk Act*, this legislation generally only applies to lands or habitats that are under federal government jurisdiction, or that are already subject to other federal Acts such as the *Migratory Bird Convention Act* (MBCA) or *Fisheries Act*. For example, on private property the federal Act only applies to birds to the extent that the MBCA does. As such, the following assessment focuses on provincially endangered and threatened terrestrial species (i.e., those species subject to prohibitions under the ESA) and Beacon refers to these species as regulated. It should be recognized that turtles, which are semi-aquatic, fall under this terrestrial assessment. Finally, Beacon also examined other natural heritage features that may be of interest to regulating agencies and thus could influence the timing and/or location of proposed activities.

Bingham Chute GS is a hydroelectric station located on the South River, approximately 2 km west of Powassan (**Figure 1**). The station lies within the North Bay administrative district of the Ministry of Natural Resources and Forestry (MNRF).

As described in the *Bingham Chute Hydroelectric Generation Station Life Extension Study, Initiation Phase* (Tetra Tech October 2020), the Bingham Chute GS facility includes the following structures:

- Headworks and Dam;
- Five sluice concrete sluiceway w/concrete gravity walls on each side;
- Concrete headworks structure with small wing walls;
- Centre earth fill dyke connecting the sluiceway to the headworks;
- East and west earth dykes;
- Steel penstock 107 m long;
- Powerhouse containing two horizontal Francis camelback units at 0.43 MW each for total; and
- 0.83 MW installed capacity.

Due to the number of structures as well as spatial extent of the lands owned by OPG associated with the Bingham Chute GS, Beacon's review focused on the study area shown in **Figure 1**. As indicated to Beacon by OPG's project study team, the study area contains the likely locations where infrastructure would be added or altered as part of a redevelopment or refurbishment of the Bingham Chute GS.

An overhead view of the powerhouse, sluiceway and associated structures is shown in **Photograph 1**.

Photograph 1. Oblique Aerial View of Powerhouse and Associated Structures (from Tetra Tech Life Extension Report)

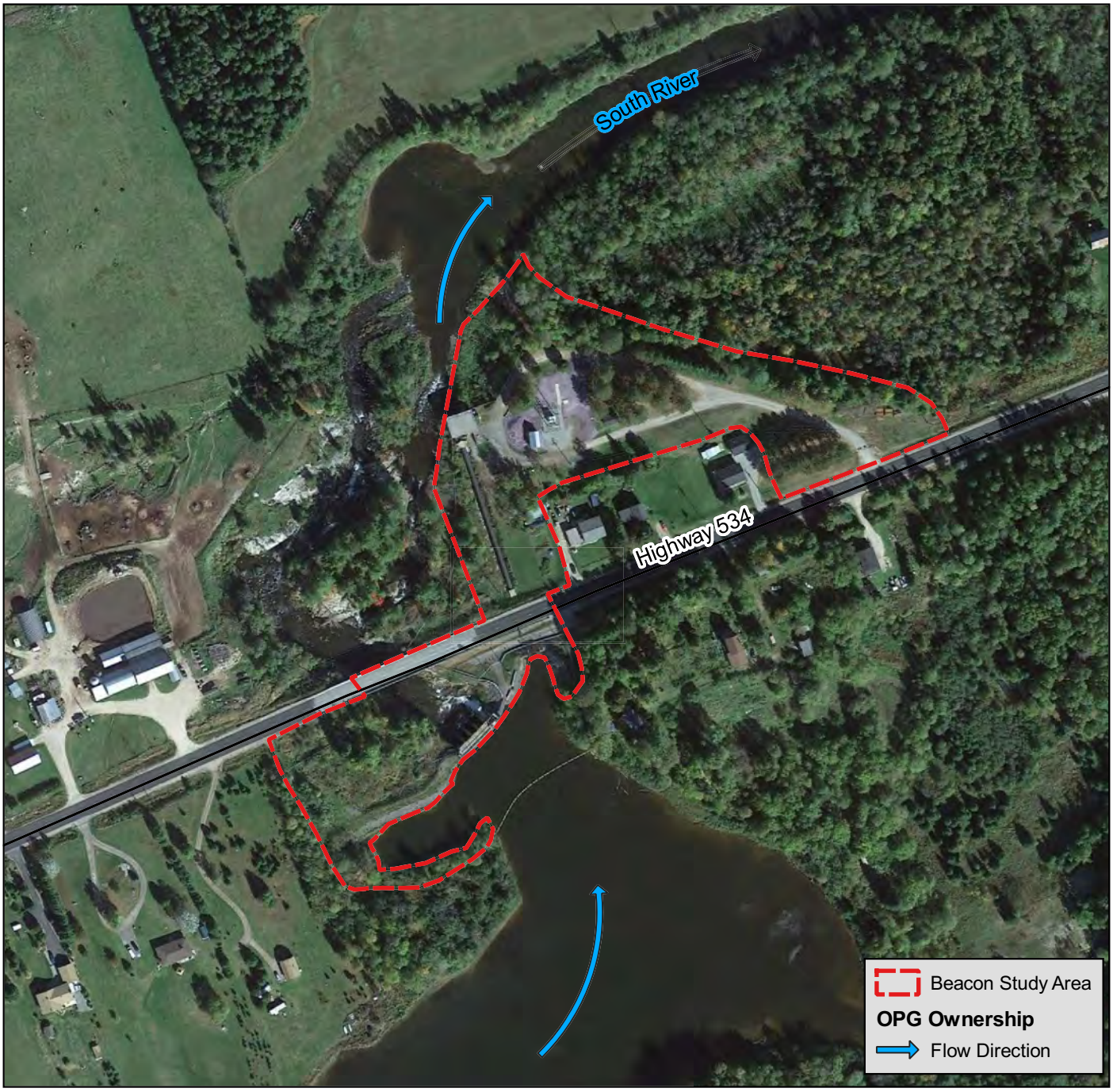
2. Methods

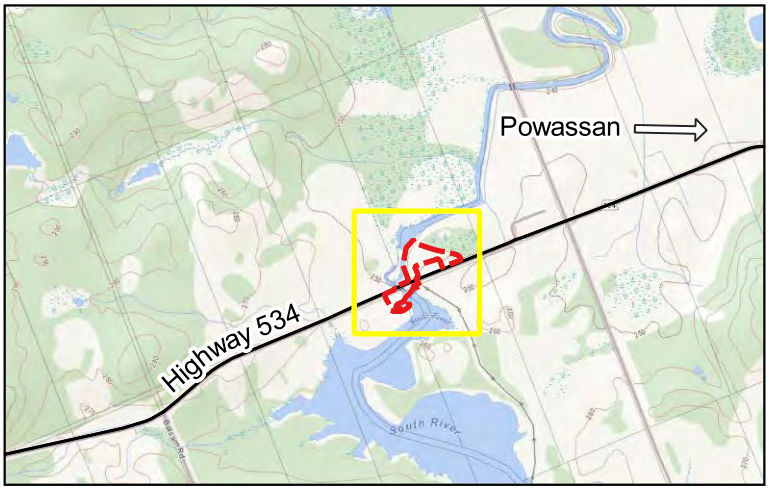
2.1 Desktop Assessment

The following information sources were reviewed as part of the desktop assessment:

- Provincially Tracked Species Layer (1 km grid) from the Natural Heritage Information Centre (NHIC) *via* Land Information Ontario (LIO);
- Ontario Reptile and Amphibian Atlas (ORAA);
- Ontario Breeding Bird Atlas (OBBA);
- Species at risk range maps https://www.ontario.ca/environment-and-energy/species-risk-ontario-list;
- High-resolution aerial photography (digital orthoimagery); and
- Natural and physical feature layers from LIO—these geospatial layers include wetlands (provincially significant and un-evaluated wetlands), and watercourses with thermal regime.

The information sources referenced above were reviewed in a Geographic Information System (GIS) mapping environment that assesses the likelihood that species at risk and other significant natural heritage features and functions are present in an area of interest. This system combines the most current information provided by MNRF through the LIO portal with GIS layers from provincial floral and faunal atlases. All relevant layers can then be overlaid on the most recent high resolution orthoimagery. The screening process helps Beacon identify areas that can then be targeted (for example, potential habitat) during field assessment to maximize the efficiency and effectiveness of on-site investigations.





Site Location	Figure 1
Bingham Chute GS	
BEACON ENVIRONMENTAL	Project: 220224 Last Revised: December 2020
Client: OPG	Prepared by: RW Checked by: BH
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2.2 Field Assessment

On June 15, 2020, Beacon staff conducted a site visit along with staff from OPG and staff from Tetra Tech.

Based on the desktop review for terrestrial and semi-aquatic species that had been conducted prior to attending the site, Beacon staff focused the risk-based assessment on regulated species that had the highest likelihood of occurring, set against those that had the highest potential of being affected by activities typically associated with redevelopment and/or refurbishment of OPG infrastructure.

During the site visit, Beacon staff walked throughout the study area. At this time, the approximate boundaries of the ecological communities were delineated using recent aerial photography following Lee *et al*. (1998).

3. Results

3.1 Existing Conditions

The Bingham Chute GS lies within Ecodistrict 5E-5 and tertiary watershed 2DD-French (Phair *et al.*, 2005). Ecodistrict 5E-5 is largely underlain by undifferentiated igneous and metamorphic rock, which is exposed at the surface or covered by a discontinuous, thin layer of drift (Henson and Brodribb 2005). Approximately 92% of the ecodistrict remains as natural cover, primarily forest.

3.1.1 Ecological Communities

The ecological communities present within the study area are shown in **Figure 2**. This figure also includes photographs of features of interest, including representative views of ecological communities. Descriptions of the ecological communities within these study areas are provided below and a list of the vascular plants documented within these communities is provided in **Appendix A**.

3.1.1.1 Forest Communities

FOD1-1: Dry - Fresh Red Oak Deciduous Forest

The extent of this forest community is limited to the northern boundary of the study area. Dominant tree species in the canopy include Northern Red Oak (*Quercus rubra*), Red Maple (*Acer rubrum*) and Paper Birch (*Betula papyrifera*). Red Pine (*Pinus resinosa*), Eastern White Pine (*Pinus strobus*), Eastern White Cedar (*Thuja occidentalis*) and Sugar Maple (*Acer saccharum*) are also present in the canopy and sub-canopy. Balsam Fir (*Abies balsamea*), Trembling Aspen (*Populus tremuloides*), and Large-toothed Aspen (*Populus grandidentata*) are occasional tree species in this community. Species in the shrub and ground layer include Mountain Maple (*Acer spicatum*), Bunchberry (*Cornus canadensis*), Wild Sarsaparilla (*Aralia nudicaulis*), Bracken Fern (*Pteridium aquilinum*) and North American Red Raspberry (*Rubus idaeus* ssp. *strigosus*).

3.1.1.2 Rock Barren Communities

RBO3: Acidic Open Rock Barren

Open rock barren communities are present along South River. These communities are dominated by scrubby vegetation with intermittent shrub cover, including Choke Cherry (*Prunus virginiana*) and Staghorn Sumac. Spreading Dogbane (*Apocynum androsaemifolium*), Sheep Sorrel (*Rumex acetosella*), Poverty Oat Grass (*Danthonia spicata*), Canada BlackBerry (*Rubus canadensis*), and Canada Horseweed (*Erigeron canadensis*) were present.

3.1.1.3 Cultural Communities

CUP3-1: Red Pine Coniferous Plantation

Planted Red Pine dominant these communities with Eastern White Pine and White Spruce (*Picea glauca*) also present. There is no shrub layer and the ground layer within these communities is sparse primarily consisting of pine needles and grasses such as Quackgrass (*Elymus repens*) and Annual Bluegrass (*Poa annua*). Occasional herbaceous species are also present such as Red Clover (*Trifolium pratense*) and Meadow Hawkweed (*Pilosella caespitosa*).

CUW: Cultural Woodland

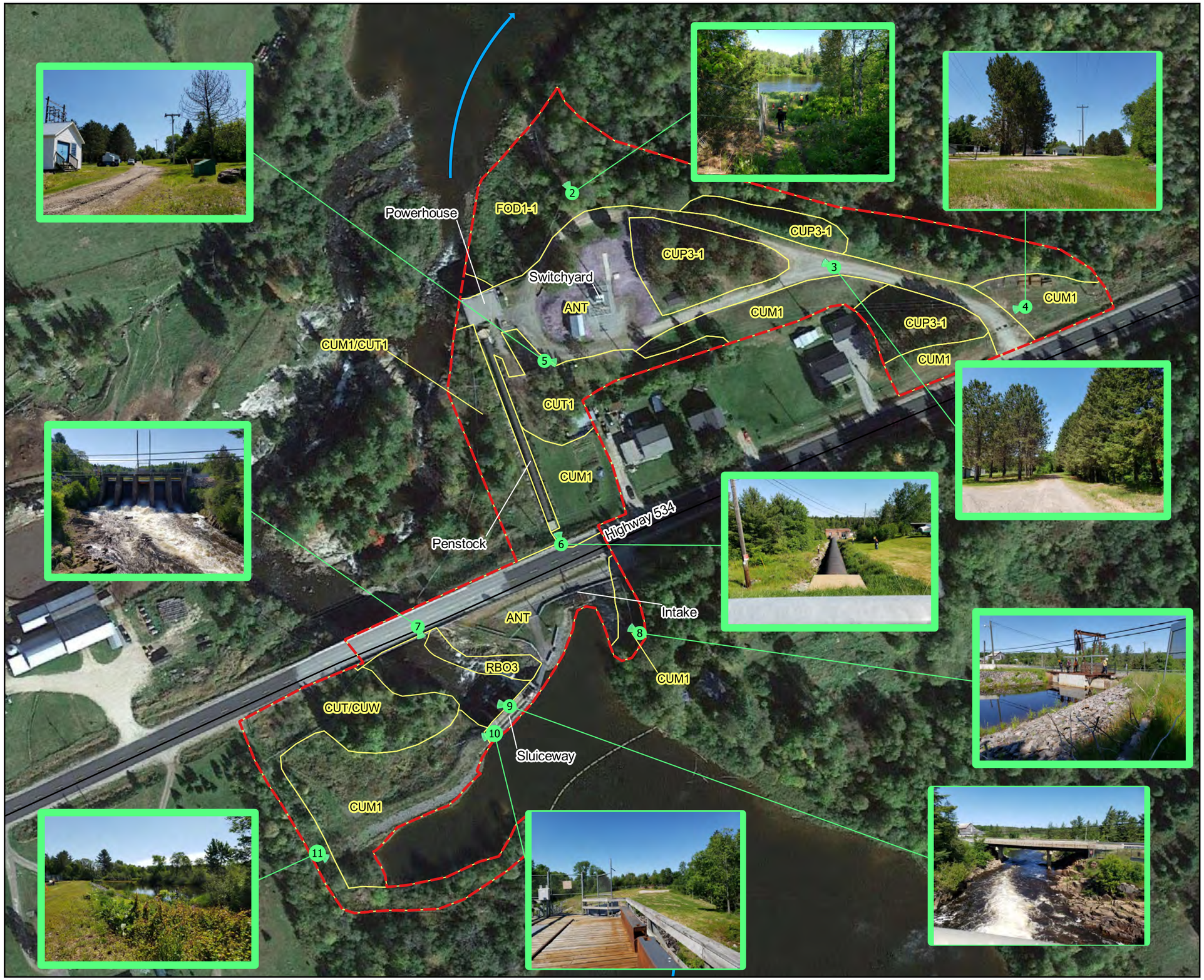
Tree species present in this community in the canopy and sub-canopy include Eastern White Pine, Paper Birch, White Ash (*Fraxinus americana*), Manitoba Maple (*Acer negundo*), Black Cherry (*Prunus serotina*), Balsam Poplar (*Populus balsamifera*), Balsam Fir, Red Maple and Trembling Aspen. Shrub species include Staghorn Sumac, Wild-raisin (*Viburnum nudum*), Alternate-leaved Dogwood (*Cornus alternifolia*) and Choke Cherry. Closer to the river's edge are Black Ash (*Fraxinus nigra*), Speckled Alder (*Alnus incana* ssp. *rugosa*), Red-osier Dogwood (*Cornus sericea*) and Sweet Gale (*Myrica gale*).

CUT1: Cultural Thicket

Shrub species include Staghorn Sumac, Wild-raisin, Choke Cherry and North American Red Raspberry. Species present in the ground layer includes Large-leaved Aster (*Eurybia macrophylla*), Northern Bush-honeysuckle (*Diervilla lonicera*) and Orange Hawkweed (*Pilosella aurantiaca*).

CUM1: Cultural Meadow

These cultural meadow communities are highly disturbed and are regularly mown. A mixture of commonly planted turf grass species, such as Kentucky Bluegrass and Quackgrass are present along with Red Clover (*Trifolium pratense*). In the areas less frequently mown are Common Dandelion (*Taraxacum officinale*), Meadow Hawkweed Oxeye Daisy (*Leucanthemum vulgare*), Common Viper's Bugloss (*Echium vulgare*), Wild Carrot (*Daucus carota*), Common Tansy (*Tanacetum vulgare*), Common Yarrow (*Achillea millefolium*), Field Sow-thistle (*Sonchus arvensis*) and Garden Bird's-foot Trefoil (*Lotus corniculatus*) are also present.



Existing Conditions

Figure 2

Bingham Chute GS

Legend

- Beacon Study Area
- Ecological Community
- # Photo Location and Direction
- Flow Direction

Code	Community Description
	Forest Communities
FOD1-1	Dry - Fresh Red Oak Deciduous Forest
	Rock Barren Communities
RBO3	Acidic Open Rock Barren
	Cultural Communities
CUM1	Mineral Cultural Meadow
CUM1/CUT1	Cultural Meadow/Cultural Thicket Complex
CUP3-1	Red Pine Coniferous Plantation
CUT/CUW	Cultural Thicket/Cultural Woodland Complex
	Other Communities
ANT	Anthropogenic

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Project: 220224
Last Revised: December 2020

Client: OPG

Prepared by: RW
Checked by: BH

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3.1.1.4 Other Communities

ANT: Anthropogenic

Areas where vegetation has been completely removed and/or cannot grow because of impervious substrates (i.e., roads, parking lots and infrastructure) are classified as anthropogenic.

3.1.2 Flora

A total of 63 vascular plant species were identified within the study area during the site visit (**Appendix A**). None of the plants are provincially regulated, and although the Black Ash has a national status of threatened and has a provincial rarity rank (SRANK) of S3 in Ontario, it is located along the river's edge away from any possible redevelopment activities. All of the other species have SRANKs of S5 (common, secure) or S4 (Common) in Ontario. The species richness is consistent with the ecological communities present. Native species accounted for 67% of the species recorded indicating a high level of disturbance to the site's vegetation.

3.1.3 Regulated Species

As described in the preceding sections, Beacon staff conducted desktop and on-site investigations to assess whether habitat was present for regulated species likely to occur in the Bingham Chute area. **Table 1** provides Beacon's final assessment based on the results of those field investigations combined with knowledge of the habitat preferences and natural history of the species being considered.

Table 1. Regulated Species Assessment

Common Name	Scientific Name	Provincial Status (SARO)	National Status (COSEWIC)	Were Species and/or Habitat Documented During on-site Assessment? If Yes, Carried Forward Status Indicated
Amphibians and Reptiles				
Blanding's Turtle	*Emydoidea blandingii*	THR	END	**Yes,** suitable habitat is present and it is not possible to rule out species presence without surveys. Carried forward because surveys and mitigation potentially required).
Birds				
Bank Swallow	*Riparia riparia*	THR	THR	**No**, nesting habitat for this species is not present within the study area.
Barn Swallow	*Hirundo rustica*	THR	THR	**Yes**, suitable habitat is present and it is not possible to rule out species presence without breeding season surveys. Carried forward because surveys and mitigation potentially required).
Bobolink	*Dolichonyx oryzivorus*	THR	THR	**No**, nesting habitat for this species is not present within the study area.
Eastern Meadowlark	*Sturnella magna*	THR	THR	**No**, nesting habitat for this species is not present within the study area.
Chimney Swift	*Chaetura pelagica*	THR	THR	**No**, nesting habitat for this species is not present within the study area.

Common Name	Scientific Name	Provincial Status (SARO)	National Status (COSEWIC)	Were Species and/or Habitat Documented During on-site Assessment? If Yes, Carried Forward Status Indicated
Eastern Whip-poor-will	*Antrostomus vociferus*	THR	THR	**No**, nesting habitat for this species is not present within the study area.
Mammals				
Little Brown Myotis	*Myotis lucifugus*	END	END	**Yes**, targeted surveys for species or habitat were not conducted and maternity roosting habitat may be present. Carried forward because surveys and mitigation potentially required).
Northern Myotis	*Myotis septentrionalis*	END	END	**Yes**, targeted surveys for species or habitat were not conducted and maternity roosting habitat may be present. Carried forward because surveys and mitigation potentially required).
Tri-colored Bat	*Perimyotis subflavus*	END	END	**Yes**, targeted surveys for species or habitat were not conducted and maternity roosting habitat may be present. Carried forward because surveys and mitigation potentially required).
Eastern Small-footed Myotis	*Myotis leibii*	END	END	**Yes**, targeted surveys for species or habitat were not conducted and maternity roosting habitat may be present. Carried forward because surveys and mitigation potentially required).

SARO: Species at Risk in Ontario List
COSEWIC: Committee on the Status of Endangered Wildlife in Canada
END: Endangered
THR: Threatened

Based on the evaluation provided in **Table 1**, six species (one turtle, one bird and four bats) were carried forward for further discussion.

4. Proposed Activities

It is Beacon's understanding that various options are being considered as part of a potential redevelopment and/or refurbishment of Bingham Chute GS. Based on Beacon's experience completing terrestrial reviews for OPG at other generating stations, we understand that details can and will change as the project progresses. As such, the assessment of risk and recommendations provided in the next section takes into account this uncertainty as much is possible, with the important caveat that there are many scenarios that Beacon would not necessarily anticipate.

As much as possible the site was evaluated for the possibility that infrastructure and particularly lay down areas for equipment could affect vegetation and structural conditions within the study area. The study area was considered to be the development and site alteration footprint for the purposes of determining potential impacts on terrestrial and semi-aquatic regulated species.

According to Tetra Tech's Life Extension report, the options at the Bingham Chute GS could include overhaul, refurbishment or redevelopment (see Tetra Tech [October 2020] for further details). The currently recommended options include: (1) refurbishment of the existing powerhouse by replacing the

turbine/generator units with new units, or (2) redevelopment of the site with a new powerhouse in the approximate location of the existing GS with all new equipment including a new penstock and auxiliary building to house electrical equipment.

It can be anticipated that the project as described could potentially have effects on the ecological features and functions of the project location in the following ways:

- Inadvertent mortality of terrestrial or semi-aquatic species such as turtles from motorized vehicles;
- Removal of trees, shrubs and other vegetation;
- Removal of buildings and or building components such as roofs;
- Increased erosion and sedimentation potential;
- Change in surface water drainage;
- Disturbance of wildlife from noise generated during the construction phase; and
- Introduction or spread of invasive or non-native species.

5. Assessment of Risk and Recommendations

5.1 Risk Assessment

5.1.1 Regulated Species

Based on the evaluation provided in **Table 1**, six species (one turtle, one bird and four bats) were carried forward for further discussion. To facilitate an assessment of the risk the potential presence of these species may have on the proposed redevelopment being considered by OPG, they have been inserted into an assessment matrix (**Figure 3**). For the purposes of this assessment, the magnitude of effect assigned to the species in **Figure 3** is based on Beacon's understanding of the activities being proposed to support the redevelopment of the Bingham Chute GS.

Magnitude of Effect (on Proposed Activity)					
	Very High				
	High			Blanding's Turtle	
	Low		Barn Swallow Eastern Small-footed Myotis Tri-colored Bat	Little Brown Myotis Northern Myotis	
	Very Low				
		Not likely	Possible	Likely	Very Likely
		Likelihood of Species and/or Habitat (occurring in the area of interest)			

Colour code: Red—very high risk (i.e., very likely to occur and for which the probability that the proposed activity(s) will be affected is very high, e.g., extensive mitigation, project delays, permitting); Yellow—moderate risk; No colour—neutral risk; Light green—low risk, Green—very low risk (i.e., species not likely to occur and for which the probability that the proposed activity(s) will be affected is very low).

Figure 3. Risk Assessment Matrix

The assessment shows a moderate risk to the project from Blanding's Turtle; a low risk to the project from Barn Swallow, Eastern Small-footed Myotis and Tri-colored Bat; and neutral risks from Little Brown Myotis and Northern Myotis.

Based on the assessment reflected in **Figure 3**, as well as the options available to mitigate potential adverse effects on the regulated species being considered here, it is Beacon's opinion that any of the issues pertaining to these species can be managed.

The mitigative options available, including under the ESA are highly variable depending on the particular species, the extent of habitat use at a site, as well as the potential for interaction with a project. For example, if Barn Swallow habitat was being affected it would be possible to construct a Barn Swallow nesting house nearby or offsite, under the existing regulations.

As indicated previously the site-specific characteristics on and adjacent to the study area indicate there is the potential for seven regulated species to be present. The following commentary has been included to provide a more thorough understanding of why the species are classified as endangered or threatened in Ontario, and also to help explain why they have been considered to be potentially present at the site.

Blanding's Turtle

Blanding's Turtle was already classified as threatened when the ESA took effect in 2008. A reassessment in May 2017 confirmed this status. Habitat loss and road mortality are two of the primary reasons for its threatened status. The species is more mobile than other turtles, often moving between several wetlands and/or waterbodies over the course of an active season or between years. These overland movements, including long-distance movements by females to and from nest sites, make the species susceptible to being killed on roads and railroads, as well as by other motorized vehicles.

Under the ESA, killing, harm or harassment of the species is prohibited (Section 9) as is damage or destruction of habitat (Section 10). Although all habitat of the species is subject to the general habitat regulation, the level of prohibition is dependent on the category of the habitat which ranges from one (most restrictive) to three (highest tolerance to alteration).

The proximity of known records of the species as well as the physical characteristics within the study area assessed indicate that the presence of Blanding's Turtle is possible and hence it has been considered in the risk assessment matrix.

Barn Swallow

Barn Swallow was classified as threatened on the province's SARO List in January 2012. In common with Eastern Whip-poor-will, the Barn Swallow is an aerial insectivore and it is likely that this has contributed to its at-risk status in Ontario.

Under the ESA, killing, harm or harassment of the species is prohibited (Section 9) as is damage or destruction of habitat (Section 10). Although all habitat of the species is subject to the habitat regulation, prohibition of activities is usually restricted to the nest (including old nests\) and prescribed distances around nests. Barn Swallows often build cup-shaped mud nests on human-made structures such as open barns, under bridges and in culverts. The nests are often but not always re-used from year to year.

The physical characteristics within the study area assessed indicate that the presence of Barn Swallow is possible and hence it has been considered in the risk assessment matrix.

Little Brown Myotis

This species was formerly referred to as the Little Brown Bat and it was classified as endangered on the province's SARO List in January 2013. The primary reason for its endangered status is that its populations in North America have been decimated by white nose syndrome. This condition is caused by a fungus that grows in humid cold environments and it is in these types of environments that the species hibernates (for example, caves and mines). The negative effects on populations of Little Brown Myotis have been severe and thus there has been a concerted effort to identify and protect habitat for the species in Ontario. Habitat is not limited to those features where the bats hibernate, but also includes

features used by pregnant females during the breeding season (i.e., maternity roosts) and day roosts used by individual males or non-pregnant females. This species is nocturnal, feeding on insects during the night, and roosting in trees and buildings during the day. Selected locations for maternity colonies or roosts include attics, abandoned buildings, barns, rock fractures, exfoliating tree bark, tree cavities and other types of overhanging features. Use of maternity and roosting habitat is seasonal and thus bats will only be present during a few months of the year (roughly May to August, but day roosts can be used from March to October).

Under the ESA, killing, harm or harassment of the species is prohibited (Section 9) as is damage or destruction of habitat (Section 10). Given the importance of detecting bats and bat habitat for the purposes of species recovery, the MNRF have developed survey methodology to detect bats and also assess potential bat habitat.

The physical characteristics within the study area assessed indicate that the presence of Little Brown Myotis is likely and hence it has been considered in the risk assessment matrix.

Northern Myotis

This species was formerly referred to as the Northern Long-eared Bat and it was classified as endangered on the province's SARO List in January 2013. The primary reason for its endangered status is also severe population declines caused by white nose syndrome. This condition is caused by a fungus that grows in humid cold environments and it is in these types of environments that the species hibernates (for example, caves and mines). The negative effects on populations of Northern Myotis have been severe and thus there has been a concerted effort to identify and protect habitat for the species in Ontario.

As with the Little Brown Myotis, habitat is not limited to hibernacula but extends to maternity and day roosts. The species is generally active from late April through September. Relative to the Little Brown Myotis, the Northern Myotis less frequently uses buildings for maternity and day roosts; instead, preferring cavity trees that can be living or dead (snags).

Under the ESA, killing, harm or harassment of the species is prohibited (Section 9) as is damage or destruction of habitat (Section 10). Given the importance of detecting bats and bat habitat for the purposes of species recovery, the MNRF have developed survey methodology to detect bats and also assess potential bat habitat.

The physical characteristics within the study area assessed indicate that the presence of Northern Myotis is "possible" and hence it has been considered in the risk assessment matrix.

Tri-colored Bat

This species was formerly referred to as the Eastern Pipistrelle and it was classified as endangered on the province's SARO List in June 2016. The primary reason for its endangered status is also severe population declines caused by white nose syndrome. This condition is caused by a fungus that grows in humid cold environments and it is in these types of environments that the species hibernates (for example, caves). The negative effects on populations of Tri-colored Bat have been severe and thus there has been a concerted effort to identify and protect habitat for the species in Ontario.

As with the Little Brown Myotis, habitat is not limited to hibernacula but extends to maternity and day roosts. The species is generally active from late April through September. Relative to the Little Brown Myotis, the Tri-colored Bat uses buildings less frequently for maternity and day roosts; instead, preferring trees in older forests.

Under the ESA, killing, harm or harassment of the species is prohibited (Section 9) as is damage or destruction of habitat (Section 10). Given the importance of detecting bats and bat habitat for the purposes of species recovery, the MNRF have developed survey methodology to detect bats and also assess potential bat habitat.

The physical characteristics within the study area assessed indicate that the presence of Tri-colored Bat is "possible" and hence it has been considered in the risk assessment matrix.

Eastern Small-footed Myotis

This species was classified as endangered on the province's SARO List in June 2014. The primary reason for its endangered status is also severe population declines caused by white nose syndrome. This condition is caused by a fungus that grows in humid cold environments and it is in these types of environments that the species hibernates (for example, caves). The negative effects on populations of Eastern Small-footed Myotis have been severe and thus there has been a concerted effort to identify and protect habitat for the species in Ontario.

As with the Little Brown Myotis, habitat is not limited to hibernacula but extends to maternity and day roosts. The species is generally active from late April through September. Relative to the Little Brown Myotis, the Eastern Small-footed Myotis uses buildings less frequently for maternity and day roosts; instead, preferring trees in older forests.

Under the ESA, killing, harm or harassment of the species is prohibited (Section 9) as is damage or destruction of habitat (Section 10). Given the importance of detecting bats and bat habitat for the purposes of species recovery, the MNRF have developed survey methodology to detect bats and also assess potential bat habitat.

The physical characteristics within the study area assessed indicate that the presence of Eastern Small-footed Myotis is "possible" and hence it has been considered in the risk assessment matrix.

5.1.2 Other Potential Issues: Non-regulated Species and/or Natural Heritage Features

In addition to Blanding's Turtle (a regulated species discussed above), the following two turtle species of special concern are also likely to occur in the area: Snapping Turtle (*Chelydra serpentina*) and Northern Map Turtle (*Graptemys geographica*). These turtle species have the potential to be negatively impacted by construction activities. If mitigation is required by regulatory agencies for Blanding's Turtle (e.g., barrier fencing, species at risk training), these measures will also benefit these two turtle species.

With the exception of the timing restrictions for vegetation clearing under the MBCA (see recommendations below), no other non-regulated terrestrial species or natural heritage feature is expected to affect the redevelopment being considered at Bingham Chute GS.

5.2 Recommendations

The following recommendations specific to the terrestrial environment are provided to support OPG's environmental program should the Bingham Chute GS project be selected to go forward:

1. Early morning breeding bird surveys should be conducted (June) to determine if Barn Swallows and/or nests are present;
2. Turtle basking surveys should be conducted during May and June to determine whether Blanding's Turtles are present;
3. Targeted surveys for bats should be conducted during the active season (May through August) when detection probabilities are highest to determine whether any of the buildings or trees are being used for roosting; and
4. Removal of vegetation should always be outside of the general breeding season for birds (mid-April through end of August) to avoid potential delays to project timing as most active nests are protected.

Report prepared by:
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Report reviewed by:
Beacon Environmental

Brian E. Henshaw
CEO, Senior Ecologist

6. References

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Appendix A

Vascular Plants

Appendix A

Vascular Plants

Family	Scientific Name	Common Name	SRank	Nat Status
Aceraceae	*Acer negundo*	Manitoba Maple	S5	N
Aceraceae	*Acer rubrum*	Red Maple	S5	N
Aceraceae	*Acer saccharum*	Sugar Maple	S5	N
Aceraceae	*Acer spicatum*	Mountain Maple	S5	N
Anacardiaceae	*Rhus typhina*	Staghorn Sumac	S5	N
Apiaceae	*Daucus carota*	Wild Carrot	SE5	I
Apocynaceae	*Apocynum androsaemifolium*	Spreading Dogbane	S5	N
Asteraceae	*Achillea millefolium*	Common Yarrow	SE5?	I
Asteraceae	*Erigeron canadensis*	Canada Horseweed	S5	N
Asteraceae	*Eurybia macrophylla*	Large-leaved Aster	S5	N
Asteraceae	*Leucanthemum vulgare*	Oxeye Daisy	SE5	I
Asteraceae	*Pilosella aurantiaca*	Orange Hawkweed	SE5	I
Asteraceae	*Pilosella caespitosa*	Meadow Hawkweed	SE5	I
Asteraceae	*Solidago canadensis*	Canada Goldenrod	S5	N
Asteraceae	*Sonchus arvensis*	Field Sow-thistle	SE5	I
Asteraceae	*Tanacetum vulgare*	Common Tansy	SE5	I
Asteraceae	*Taraxacum officinale*	Common Dandelion	SE5	I
Asteraceae	*Tragopogon pratensis*	Meadow Goatsbeard	SE5	I
Asteraceae	*Tussilago farfara*	Coltsfoot	SE5	I
Betulaceae	*Alnus incana* ssp. *rugosa*	Speckled Alder	S5	N
Betulaceae	*Betula papyrifera*	Paper Birch	S5	N
Boraginaceae	*Echium vulgare*	Common Viper's Bugloss	SE5	I
Caprifoliaceae	*Diervilla lonicera*	Northern Bush-honeysuckle	S5	N
Caprifoliaceae	*Lonicera canadensis*	Canada Fly Honeysuckle	S5	N
Caprifoliaceae	*Sambucus canadensis*	Common Elderberry	S5	N
Caprifoliaceae	*Sambucus racemosa*	Red Elderberry	S5	N
Cornaceae	*Cornus alternifolia*	Alternate-leaved Dogwood	S5	N
Cornaceae	*Cornus sericea*	Red-osier Dogwood	S5	N
Cupressaceae	*Thuja occidentalis*	Eastern White Cedar	S5	N
Dennstaedtiaceae	*Pteridium aquilinum*	Bracken Fern	S5	N
Equisetaceae	*Equisetum arvense*	Field Horsetail	S5	N
Ericaceae	*Gaultheria procumbens*	Eastern Teaberry	S5	N
Fabaceae	*Lotus corniculatus*	Garden Bird's-foot Trefoil	SE5	I
Fabaceae	*Trifolium pratense*	Red Clover	SE5	I
Fabaceae	*Vicia cracca*	Tufted Vetch	SE5	I
Liliaceae	*Clintonia borealis*	Yellow Clintonia	S5	N
Myricaceae	*Myrica gale*	Sweet Gale	S5	N
Oleaceae	*Fraxinus americana*	White Ash	S4	N
Oleaceae	*Fraxinus nigra*	Black Ash	S3	N
Oleaceae	*Fraxinus pennsylvanica*	Red Ash	S4	N
Orchidaceae	*Epipactis helleborine*	Broad-leaved Helleborine	SE5	I
Pinaceae	*Abies balsamea*	Balsam Fir	S5	N
Pinaceae	*Picea glauca*	White Spruce	S5	N
Pinaceae	*Pinus resinosa*	Red Pine	S5	N
Pinaceae	*Pinus strobus*	Eastern White Pine	S5	N

Family	Scientific Name	Common Name	SRank	Nat Status
Plantaginaceae	*Plantago major*	Common Plantain	SE5	I
Poaceae	*Elymus repens*	Quackgrass	SE5	I
Poaceae	*Poa annua*	Annual Bluegrass	SE5	I
Polygonaceae	*Fallopia cilinodis*	Fringed Black Bindweed	S5	N
Polygonaceae	*Rumex acetosella*	Sheep Sorrel	SE5	I
Polygonaceae	*Rumex crispus*	Curled Dock	SE5	I
Rosaceae	*Amelanchier alnifolia*	Saskatoon	S4?	N
Rosaceae	*Amelanchier arborea*	Downy Serviceberry	S5	N
Rosaceae	*Prunus serotina*	Black Cherry	S5	N
Rosaceae	*Prunus virginiana*	Chokecherry	S5	N
Rosaceae	*Rubus canadensis*	Canada Blackberry	S5	N
Rosaceae	*Rubus idaeus* ssp. *strigosus*	North American Red Raspberry	S5	N
Rosaceae	*Sorbus decora*	Showy Mountain-ash	S5	N
Salicaceae	*Populus balsamifera*	Balsam Poplar	S5	N
Salicaceae	*Populus grandidentata*	Large-toothed Aspen	S5	N
Salicaceae	*Populus tremuloides*	Trembling Aspen	S5	N
Scrophulariaceae	*Verbascum thapsus*	Common Mullein	SE5	I
Ulmaceae	*Ulmus americana*	White Elm	S5	N

Nomenclature follows the Natural Heritage Information Centre (NHIC) and are current to February 2020
Nat Status: N = Native; I = Introduced
SRank: Subnational Rank for Ontario as per NHIC February 2020
SRanks for introduced species are indicated by an “E” for exotic species and are not considered in analyses of species rarity

BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Terrestrial Technical Support Memo Bingham Chute Generating Station

Prepared For:

Ontario Power Generation

Prepared By:

Beacon Environmental Limited

Date: **December 2021**

Project: **221193**

Table of Contents

Figures

Tables

Appendices

1. Introduction

Beacon Environmental Limited (Beacon) has been retained by Ontario Power Generation (OPG) to complete a review of the terrestrial environment at the Bingham Chute Generating Station (GS). Bingham Chute GS is a hydroelectric station located on the South River, approximately 2 km west of Powassan (**Figure 1**). The station lies within the North Bay administrative district of the Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF).

The purpose of the review was to provide OPG with an understanding of the risks associated with redeveloping and/or refurbishing facilities at the Bingham Chute GS, specifically with regard to terrestrial species at risk that are subject to prohibitions under the provincial *Endangered Species Act* (ESA). For example, species that are classified as endangered or threatened under regulations of the ESA are subject to prohibitions on killing and habitat damage/destruction. In contrast, species provincially classified as special concern are not subject to these same prohibitions. Regarding the federal *Species at Risk Act*, this legislation generally only applies to lands or habitats that are under federal government jurisdiction, or that are already subject to other federal Acts such as the *Migratory Bird Convention Act* (MBCA) or *Fisheries Act*. For example, on private property the federal Act only applies to birds to the extent that the MBCA does. As such, the Terrestrial Environment Assessment Beacon completed for OPG in 2020 (Beacon 2020) focused on provincially endangered and threatened terrestrial species (i.e., regulated species subject to prohibitions under the ESA). Turtles, which are semi-aquatic, were included in this terrestrial assessment. Although the 2020 assessment focused on regulated species, Beacon also considered other natural heritage features that could be of interest to regulating agencies and thus influence the timing and/or location of re-development activities. Note that the ESA is now under the jurisdiction of the provincial Ministry of the Environment, Conservation and Parks (MECP).

Based on the assessment provided in Beacon's 2020 report the following investigations were recommended:

- Early morning breeding bird surveys (June) to determine if Barn Swallows and/or nests are present (and other breeding birds);
- Turtle basking surveys during May and June to determine whether Blanding's Turtles are present;
- Targeted surveys for bats during the active season (May through August) when detection probabilities are highest to determine whether any of the buildings or trees are being used for roosting; and
- Updated vegetation mapping and inventory.

This report provides the results of the above investigations.

2. Methods

2.1 Desktop Assessment

The following information sources were reviewed as part of the desktop assessment:

- Provincially Tracked Species Layer (1 km grid) from the Natural Heritage Information Centre (NHIC) *via* Land Information Ontario (LIO);
- Ontario Reptile and Amphibian Atlas (ORAA);
- Ontario Breeding Bird Atlas (OBBA);
- Species at risk range maps https://www.ontario.ca/environment-and-energy/species-risk-ontario-list;
- High-resolution aerial photography (digital orthoimagery); and
- Natural and physical feature layers from LIO—these geospatial layers include wetlands (provincially significant and un-evaluated wetlands), and watercourses with thermal regime.

The information sources referenced above were reviewed in a Geographic Information System (GIS) mapping environment that assesses the likelihood that species at risk and other significant natural heritage features and functions are present in an area of interest. This system combines the most current information provided by MNRF through the LIO portal with GIS layers from provincial floral and faunal atlases. All relevant layers can then be overlaid on the most recent high resolution orthoimagery. The screening process helps Beacon identify areas that can then be targeted (for example, potential habitat) during field assessment to maximize the efficiency and effectiveness of on-site investigations.

2.2 Field Investigations

In 2021, Beacon staff completed their terrestrial fieldwork at Bingham Chute in collaboration with Randy Restoule, community member and Community Consultation Coordinator at Dokis First Nation. Nipissing First Nation was also invited to participate in the field investigations, but due to COVID restrictions at the time were unable to participate in the field work. OPG staff accompanied the field team during the site visits.

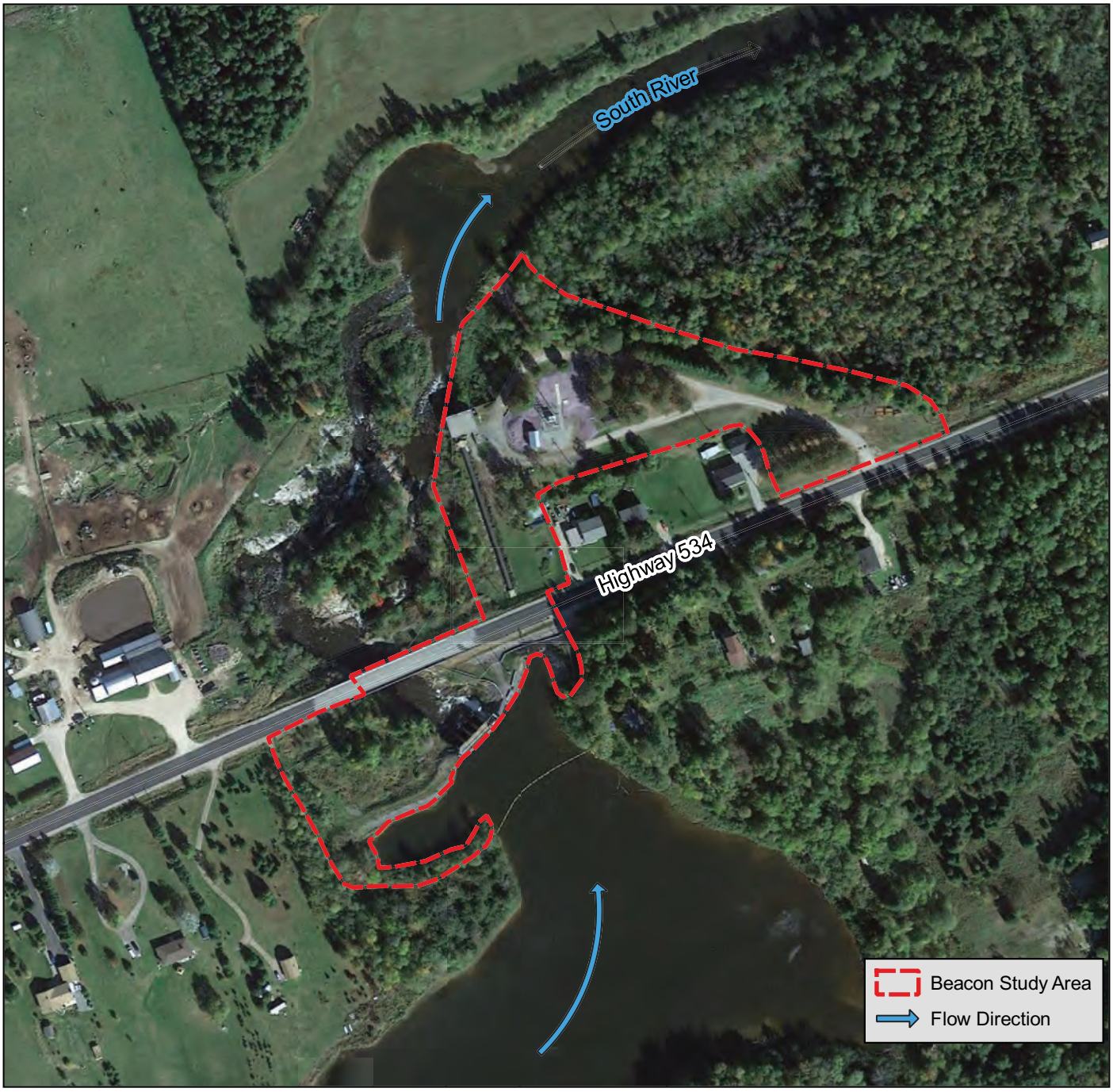
Based on the desktop review for terrestrial and semi-aquatic species that had been conducted prior to attending the site, site investigations were focused on regulated species that had the highest likelihood of occurring, set against those that had the highest potential of being affected by activities typically associated with redevelopment and/or refurbishment of OPG infrastructure. A description of the field investigations follows below, and a summary of the timing is provided in **Table 1.**

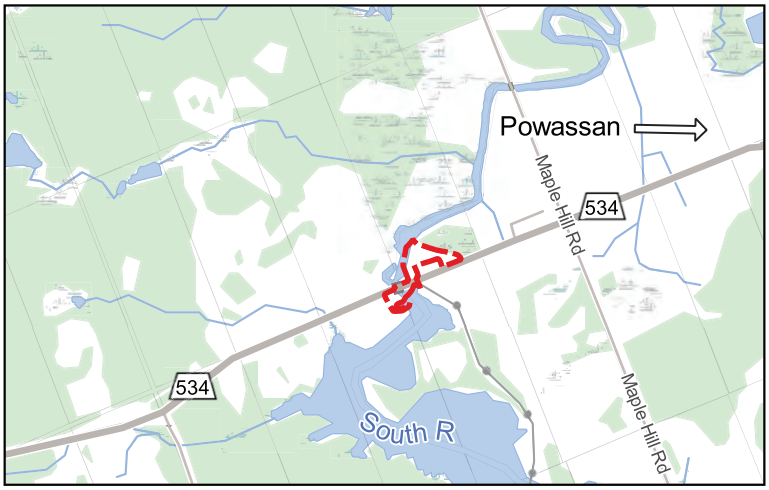
Table 1. Summary of 2021 Field Investigations

Survey Type	Date (2021)
Ecological Land Classification and Floral Surveys	June 1and 30
Turtle Basking Surveys (Visual)	May 12, 19, and June 1
Dawn Breeding Bird Surveys (Visual and Auditory)	June 1 and 30
Acoustic Surveys for Bats	June 1 to 30

2.2.1 Ecological Land Classification and Floristic Inventory

Ecological communities were mapped and described according to Lee *et al.* (1998). For each community, data was collected on the dominant species cover, community structure, level of disturbance, presence of indicator species, and other notable features. Floristic surveys were completed during the site visits and a list of vascular plant species observed was compiled.





Site Location	Figure 1
Bingham Chute GS	
BEACON ENVIRONMENTAL	Project: 221193 Last Revised: October 2021
Client: OPG	Prepared by: RW Checked by: BH
N 1:4,500	Inset Map: 1:50,000

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2.2.2 Turtle Basking Surveys

Given the potential for Blanding's Turtle (*Emydoidea blandingii*) to occur in the study area, three basking surveys were conducted on May under appropriate conditions (MNRF, 2015). Basking surveys were completed north of the powerhouse and south of the sluiceway. Basking surveys were conducted using binoculars from onshore vantage points that provided good views of the limited number of potential basking areas. Survey details are presented in **Table 2**.

Table 2. Turtle Basking Surveys

	Survey 1	Survey 2	Survey 3
Date:	May 12, 2021	May 19, 2021	June 1, 2021
Time (start–finish):	09:30–12:00	08:40–12:00	07:30–09:30
Temperature (°C; start–finish):	10–14	16-23	15–24
Wind (Beaufort scale; start–finish):	1–1	0–1	1–1
Cloud cover (%; start–finish):	0–0	0–10	75–50
Precipitation:	None	None	None

2.2.3 Breeding Birds

Surveys for breeding birds took place in the early morning on days with low winds (1 or less on the Beaufort scale), temperatures within 5 °C of normal and no precipitation. Roving surveys were used to cover all of the habitat types within 50 m, and all birds seen or heard were documented. Survey details are presented in **Table 3**.

Table 3. Breeding Bird Surveys

	Survey 1	Survey 2
Date:	June 1, 2021	June 30, 2021
Time (start–finish):	06:00–09:30	06:15–09:45
Temperature (°C; start–finish):	15–24	23–26
Wind (Beaufort scale; start–finish):	1–1	0–1
Cloud cover (%; start–finish):	75-50	50–50
Precipitation:	None	None

2.2.4 Acoustic Surveys for Bats

Four provincially endangered bat species were considered to have potential to occur in the study area: Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), Tri-colored Bat (*Perimyotis subflavus*) and Eastern Small-footed Myotis (*Myotis leibii*). To assess the likelihood of adversely affecting these species, two passive, ultrasonic detectors were deployed in areas where tree clearing could be required to support the proposed redevelopment. The remote detectors used were Wildlife Acoustics SM4BAT units equipped with SMM-U1 ultrasonic microphones. The detectors were mounted on trees and set to record at sunset for five hours over approximately two weeks in June 2021. This deployment period provided more than ten nights of data recorded under suitable weather conditions (i.e., air temperature ≥10°C, less than 5.4 m/sec, and minimal precipitation) and thus satisfies the requirements laid out in the relevant MNRF protocols (MNRF 2017).

Recordings from the detectors were analyzed by a trained Beacon staff member and completed using Kaleidoscope Pro software. A combination of auto-identification and manual analysis was applied to make species determinations. All unclassified files (No ID Files) were manually reviewed for call frequency to determine if unclassified calls fell within the 40 kHz *Myotis* species and Tri-Coloured Bat range. If the call did not fall within the approximate 40 kHz range, it was not analyzed further as it is unlikely that the call was made by one of the endangered bats. Furthermore, a random selection of noise files was reviewed to ensure that the batch filters applied had functioned as intended.

2.2.5 Incidental Wildlife

Incidental observations of wildlife species, including mammals were made during field investigations that were primarily for other purposes. Evidence for the presence of a species or use of an area was determined from visual and/or auditory observation (e.g., song, call) and observation of nests, tracks, burrows, browse, skins, and scats.

3. Results

3.1 Existing Conditions

The Bingham Chute GS lies within Ecodistrict 5E-5 and tertiary watershed 2DD-French (Phair *et al.*, 2005). Ecodistrict 5E-5 is largely underlain by undifferentiated igneous and metamorphic rock, which is exposed at the surface or covered by a discontinuous, thin layer of drift (Henson and Brodribb 2005). Approximately 92% of the ecodistrict remains as natural cover, primarily forest.

Photograph 1. Oblique Aerial View of Powerhouse and Associated Structures (from Tetra Tech Life Extension Report)

3.1.1 Ecological Communities

The ecological communities present within the study area are shown in **Figure 2**. This figure also includes photographs of features of interest, including representative views of ecological communities. Descriptions of the ecological communities within these study areas are provided below and a list of the vascular plants documented within these communities is provided in **Appendix A**.

3.1.1.1 Forest Communities

FOD1-1: Dry - Fresh Red Oak Deciduous Forest

The extent of this forest community is limited to the northern boundary of the study area. Dominant tree species in the canopy include Northern Red Oak (*Quercus rubra*), Red Maple (*Acer rubrum*) and Paper Birch (*Betula papyrifera*). Red Pine (*Pinus resinosa*), Eastern White Pine (*Pinus strobus*), Eastern White Cedar (*Thuja occidentalis*) and Sugar Maple (*Acer saccharum*) are also present in the canopy and sub-canopy. Balsam Fir (*Abies balsamea*), Trembling Aspen (*Populus tremuloides*), and Large-toothed Aspen (*Populus grandidentata*) are occasional tree species in this community. Species in the shrub and ground layer include: Mountain Maple (*Acer spicatum*), Bunchberry (*Cornus canadensis*), Wild Sarsaparilla (*Aralia nudicaulis*), Bracken Fern (*Pteridium aquilinum*) and North American Red Raspberry (*Rubus idaeus* ssp. *strigosus*).

3.1.1.2 Rock Barren Communities

RBO3: Acidic Open Rock Barren

Open rock barren communities are present along South River. These communities are dominated by scrubby vegetation with intermittent shrub cover, including Choke Cherry (*Prunus virginiana*) and Staghorn Sumac. Spreading Dogbane (*Apocynum androsaemifolium*), Sheep Sorrel (*Rumex acetosella*), Poverty Oat Grass (*Danthonia spicata*), Canada BlackBerry (*Rubus canadensis*), and Canada Horseweed (*Erigeron canadensis*) are present.

3.1.1.3 Cultural Communities

CUP3-1: Red Pine Coniferous Plantation

Planted Red Pine dominate these communities with Eastern White Pine and White Spruce (*Picea glauca*) also present. There is no shrub layer and the ground layer within these communities is sparse primarily consisting of pine needles and grasses such as Quackgrass (*Elymus repens*) and Annual Bluegrass (*Poa annua*). Occasional herbaceous species are also present such as Red Clover (*Trifolium pratense*) and Meadow Hawkweed (*Pilosella caespitosa*).

CUW: Cultural Woodland

Tree species present in this community in the canopy and sub-canopy include Eastern White Pine, Paper Birch, White Ash (*Fraxinus americana*), Manitoba Maple (*Acer negundo*), Black Cherry (*Prunus serotina*), Balsam Poplar (*Populus balsamifera*), Balsam Fir, Red Maple and Trembling Aspen. Shrub species include Staghorn Sumac, Wild-raisin (*Viburnum nudum*), Alternate-leaved Dogwood (*Cornus alternifolia*) and Choke Cherry. Closer to the river's edge are Black Ash (*Fraxinus nigra*), Speckled Alder (*Alnus incana* ssp. *rugosa*), Red-osier Dogwood (*Cornus sericea*) and Sweet Gale (*Myrica gale*).

CUT1: Cultural Thicket

Shrub species include Staghorn Sumac, Wild-raisin, Choke Cherry and North American Red Raspberry. Species present in the ground layer includes Large-leaved Aster (*Eurybia macrophylla*), Northern Bush-honeysuckle (*Diervilla lonicera*) and Orange Hawkweed (*Pilosella aurantiaca*).

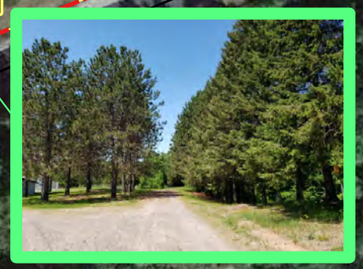
CUM1: Cultural Meadow

These cultural meadow communities are highly disturbed and are regularly mown. A mixture of commonly planted turf grass species, such as Kentucky Bluegrass and Quackgrass are present along with Red Clover (*Trifolium pratense*). In the areas less frequently mown are Common Dandelion (*Taraxacum officinale*), Meadow Hawkweed Oxeye Daisy (*Leucanthemum vulgare*), Common Viper's Bugloss (*Echium vulgare*), Wild Carrot (*Daucus carota*), Common Tansy (*Tanacetum vulgare*), Common Yarrow (*Achillea millefolium*), Field Sow-thistle (*Sonchus arvensis*) and Garden Bird's-foot Trefoil (*Lotus corniculatus*) are also present.

Existing Conditions

Figure 2

Bingham Chute GS



Powerhouse
FOD1-1
Switchyard
ANT
CUM1/CUT1
CUT1
CUM1
Penstock
Highway 534
Intake
ANT
RBO3
CUT/CUW
CUM1
Sluiceway
CUM1
CUP3-1
CUP3-1
CUM1
CUP3-1
CUM1
Bat Detector (#80)
Bat Detector (#79)
1
2
3
4
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8
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10
11

Legend

- Beacon Study Area
- ELC
- # Photo Location and Direction
- Flow Direction

Code	Community Description
	Forest Communities
FOD1-1	Dry - Fresh Red Oak Deciduous Forest
	Rock Barren Communities
RBO3	Acidic Open Rock Barren
	Cultural Communities
CUM1	Mineral Cultural Meadow
CUM1/CUT1	Cultural Meadow/Cultural Thicket Complex
CUP3-1	Red Pine Coniferous Plantation
CUT/CUW	Cultural Thicket/Cultural Woodland Complex
	Other Communities
ANT	Anthropogenic

BEACON ENVIRONMENTAL

Project: 221193
Last Revised: October 2021

Client: OPG

Prepared by: SZ
Checked by: RW

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3.1.1.4 Other Communities

ANT: Anthropogenic

Areas where vegetation has been completely removed and/or cannot grow because of impervious substrates (i.e., roads, parking lots and infrastructure) are classified as anthropogenic.

3.1.2 Flora

There were 90 vascular plant species identified within the study area during the site visits (**Appendix A**). Black Ash is located close to the river and not likely to be affected by redevelopment activities. The provincial status of the species was recently up-listed to endangered by the Committee on the Status of Species at Risk in Ontario (COSSARO); however, it has not yet been added to the SARO list and the province is seeking a "Minister's Order for temporary suspension of protection upon the listing of Black Ash under the *Endangered Species Act*". Other than Black Ash which has a SRANK) of S3 in Ontario, all of the other species have SRANKs of S5 (common, secure) or S4 (Common) in Ontario. Native species accounted for 72% of the species recorded indicating a high level of disturbance to the site's vegetation.

3.1.3 Turtle Surveys

Blanding's Turtle, a provincially endangered turtle, has the potential to occur in the study area, but no individuals were observed during the basking surveys. This species occurs at low densities in this part of its geographic range and the study area provides limited basking opportunities (i.e., floating woody debris and hummocks are uncommon in the river. Two adult Snapping Turtle (*Chelydra serpentina*) and one Midland Painted Turtle (*Chrysemys picta marginata*) were observed basking in the open water community south of Highway 534 and several nests belonging to either Snapping Turtle or Midland Painted Turtle were also observed west of the sluiceway.

3.1.4 Breeding Birds

There were 45 species of birds documented during the breeding bird surveys. Based on the habitat types present, as well as observations of bird behaviour, 37 of these species can be expected to breed or potentially breed on the subject property (**Appendix B**). Observations were relatively well distributed throughout the property and were generally composed of commonly occurring species in rural and urbanizing landscapes.

The most numerous species were Song Sparrow (*Melospiza melodia*), Yellow Warbler (*Setophaga petechia*) and American Robin (*Turdus migratorius*) with multiple pairs of other species such as Gray Catbird (*Dumetella carolinensis*), White-throated Sparrow (*Zonotrichia albicollis*), Eastern Kingbird (*Tyrannus tyrannus*) and Spotted Sandpiper (*Actitis macularia*). Less abundant species were noted such as Chestnut-sided Warbler (*Setophaga pennsylvanica*), Red-eyed Vireo (*Vireo olivaceus*), Mourning Warbler (*Geothlypis philadelphia*) and Killdeer (*Charadrius vociferus*).

Area-sensitive birds are those that require larger tracts of suitable habitat in which to breed or are those that have a higher breeding success in larger areas of suitable habitat. Five such species were recorded, all of which are considered by MNRF to be forest-associated area sensitive species: Hairy Woodpecker (*Leuconotopicus villosus*), Red-breasted Nuthatch (*Sitta canadensis*), Pine Warbler

(*Setophaga pinus*), American Redstart (*Setophaga ruticilla*) and Veery (*Catharus fuscescens*). In our experience only the Veery and the woodpecker are area sensitive.
No endangered or threatened bird species were documented breeding within the study area in 2021. No evidence of Barn Swallow (*Hirundo rustica*) nests were observed in the study area. Individuals were observed foraging in the area. OPG staff observed Barn Swallows congregating west of the study area, where a large barn is situated off site and likely offers a breeding location. Chimney Swift (*Chaetura pelagica*), a regulated species, and an Olive-sided Flycatcher (*Contopus cooperi*) were also observed foraging at this location.

No species considered S1 through S3 using the provincial ranks were recorded. All species are either S4 (Apparently Secure) or S5 (Secure).

3.1.5 Acoustic Surveys for Bats

Table 4 provides the results of the analyses at each of the detector locations.

Table 4. Acoustic Bat Monitoring Results Summary

Detector #	Eastern Small-footed Myotis	Little Brown Myotis	Northern Myotis	Tri-coloured Bat	Unidentified >34 kHz Call (likely Myotis)
79		X			X
80		X			X

The analysis showed that there was Little Brown Myotis activity at both detectors. Based on the time of day of detections and limited number of detections (known as hits or passes) within one hour of sunset at both detectors, there is a low likelihood that trees located nearby were being used as roosts. The number and regular occurrence of the calls indicate that while the detectors may not have been deployed near active roosts, the ecological communities within which they were deployed were being used by Little Brown Myotis as foraging habitat and/or while moving between foraging areas.

3.1.6 Incidental Wildlife

Any wildlife species observed within the study area during field investigations not considered within the preceding sections of this report were recorded as incidental observations.

Mammal species documented from the property include: Porcupine (*Erethizon dorsatum*), Eastern Cottontail (*Sylvilagus floridanus*), Red Squirrel (*Tamiasciurus hudsonicus*), Groundhog (*Marmota monax*), Red Fox (*Vulpes vulpes*) and Gray Squirrel (*Sciurus carolinensis).* Evidence of River Otter (*Lontra canadensis*), Eastern Coyote (*Canis* X *latrans*) and White-tailed Deer (*Odocoileus virginianus*) was also observed.

One adult Eastern Gartersnake (*Thamnophis sirtalis sirtalis*) was observed road-killed adjacent to the property and amphibians were observed including Green Frog (*Lithobates clamitans*), American Toad (*Anaxyrus americana*) and Leopard Frog (*Lithobates pipiens*).

3.1.7 Regulated Species

As described in the preceding sections, Beacon staff conducted desktop and on-site investigations to assess whether regulated species were likely to occur in the Bingham Chute area. **Table 1** provides Beacon's final assessment based on the results of those field investigations combined with knowledge of the habitat preferences and natural history of the species being considered.

Table 5. Regulated Species Assessment

Common Name	Scientific Name	Provincial Status (SARO)	National Status (COSEWIC)	Were Species and/or Habitat Documented During on-site Assessment? If Yes, Carried Forward Status Indicated
Amphibians and Reptiles				
Blanding's Turtle	*Emydoidea blandingii*	THR	END	**Yes,** although species was not observed during basking surveys, suitable habitat is present. Carried forward because mitigation potentially required).
Eastern Hog-nosed Snake	*Heterodon platirhinos*	THR	THR	**No,** although there are observations of Eastern Hog-nosed Snake in the general area (Curtis Avery, Nipissing First Nation, pers. comm.), the study area is at the northeastern boundary of the species' range in Ontario and thus the likelihood of occurrence within or adjacent to the study area is too low to warrant mitigation.
Birds				
Bank Swallow	*Riparia riparia*	THR	THR	**No**, nesting habitat for this species is not present within the study area.
Barn Swallow	*Hirundo rustica*	THR	THR	**No**, species not observed breeding during surveys and no signs of nesting documented within study area. Individuals observed foraging within study area that were potentially nesting west of the property.
Bobolink	*Dolichonyx oryzivorus*	THR	THR	**No**, nesting habitat for this species is not present within the study area and species not observed during breeding surveys.
Eastern Meadowlark	*Sturnella magna*	THR	THR	**No**, nesting habitat for this species is not present within the study area and species not observed during breeding surveys.
Chimney Swift	*Chaetura pelagica*	THR	THR	**No**, nesting habitat for this species is not present within the study area; however, foraging birds were observed.
Eastern Whip-poor-will	*Antrostomus vociferus*	THR	THR	**No**, nesting habitat for this species is not present within the study area.
Mammals				
Little Brown Myotis	*Myotis lucifugus*	END	END	**Yes**, species documented with passive acoustic detectors. Species likely foraging within or moving through study area. Carried forward because mitigation potentially required.
Northern Myotis	*Myotis septentrionalis*	END	END	**No**, species was not documented with passive acoustic detectors.
Tri-colored Bat	*Perimyotis subflavus*	END	END	**No**, species was not documented with passive acoustic detectors.

Common Name	Scientific Name	Provincial Status (SARO)	National Status (COSEWIC)	Were Species and/or Habitat Documented During on-site Assessment? If Yes, Carried Forward Status Indicated
Eastern Small-footed Myotis	*Myotis leibii*	END	END	**No**, species was not documented with passive acoustic detectors.
Black Ash	*Fraxinus nigra*	*	THR	**Yes**, species documented along river. Carried forward because of uncertain status under ESA).

SARO: Species at Risk in Ontario List
COSEWIC: Committee on the Status of Endangered Wildlife in Canada
END: Endangered
THR: Threatened
*The provincial status of the species was recently up-listed to Endangered by the Committee on the Status of Species at Risk in Ontario (COSSARO); however, it has yet to be added to the SARO list and the province is seeking a "Minister's Order for temporary suspension of protection upon the listing of Black Ash under the *Endangered Species Act*".

4. Summary

Based on the recommendations in the Terrestrial Environment Assessment completed by Beacon in 2020, the following investigations were completed during the spring and summer of 2021:

- Early morning breeding bird surveys;
- Turtle basking surveys;
- Acoustic surveys for bats; and
- Vegetation mapping and floral inventory.

As described in the preceding sections, no evidence of nesting by Barn Swallow was observed, and no other provincially regulated bird species were documented nesting or roosting within the study area.

Blanding's Turtle was not observed within the study area during the basking surveys; however, the proximity of known records of the species, as well as the area's physical characteristics indicate that the species could move through the area or be present at other times of the year. The potential of Blanding's Turtle to occur within the study area, combined with the documented presence of other turtle species of special concern will likely warrant mitigation measures to reduce the likelihood of adverse effects on these species.

Passive acoustic surveys indicated that the regulated bat species, Little Brown Myotis, was present in the study area. The data showed that the species was most likely foraging and/or regularly moving through the study area. The data further indicated that there was a low likelihood that trees or buildings close to the acoustic detectors were being used as roost habitat. It is possible, however, that roosts were used elsewhere within the study area and as such restricted timing windows for tree removal may be required depending on the development activities proposed.

Black Ash was documented along the river in locations unlikely to be affected by redevelopment activities. However, the provincial status of the species was recently up-listed to Endangered by COSSARO. The species has not yet been added to the SARO list and the province is seeking a "Minister's Order for temporary suspension of protection upon the listing of Black Ash under the *Endangered Species Act*".

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Appendix A

Vascular Plants

Appendix A

Vascular Plants

Scientific Name	Common Name	SRank	Nat Status
Acer negundo	Manitoba Maple	S5	N
Acer rubrum	Red Maple	S5	N
Acer saccharum	Sugar Maple	S5	N
Acer spicatum	Mountain Maple	S5	N
Rhus typhina	Staghorn Sumac	S5	N
Daucus carota	Wild Carrot	SE5	I
Apocynum androsaemifolium	Spreading Dogbane	S5	N
Asclepias incarnata	Swamp Milkweed	S5	N
Achillea millefolium	Common Yarrow	SE5?	I
Cirsium vulgare	Bull Thistle	SE5	I
Erigeron canadensis	Canada Horseweed	S5	N
Eurybia macrophylla	Large-leaved Aster	S5	N
Leucanthemum vulgare	Oxeye Daisy	SE5	I
Pilosella aurantiaca	Orange Hawkweed	SE5	I
Pilosella caespitosa	Meadow Hawkweed	SE5	I
Solidago canadensis	Canada Goldenrod	S5	N
Sonchus arvensis	Field Sow-thistle	SE5	I
Tanacetum vulgare	Common Tansy	SE5	I
Taraxacum officinale	Common Dandelion	SE5	I
Tragopogon pratensis	Meadow Goatsbeard	SE5	I
Tussilago farfara	Coltsfoot	SE5	I
Alnus incana ssp. rugosa	Speckled Alder	S5	N
Betula papyrifera	Paper Birch	S5	N
Corylus cornuta	Beaked Hazelnut	S5	N
Echium vulgare	Common Viper's Bugloss	SE5	I
Myosotis laxa	Small Forget-me-not	S5	N
Barbarea vulgaris	Bitter Wintercress	SE5	I
Diervilla lonicera	Northern Bush-honeysuckle	S5	N
Lonicera canadensis	Canada Fly Honeysuckle	S5	N
Sambucus canadensis	Common Elderberry	S5	N
Sambucus racemosa	Red Elderberry	S5	N
Cornus alternifolia	Alternate-leaved Dogwood	S5	N
Cornus sericea	Red-osier Dogwood	S5	N
Thuja occidentalis	Eastern White Cedar	S5	N
Carex bebbii	Bebb's Sedge	S5	N
Carex crinita	Fringed Sedge	S5	N
Carex deweyana	Dewey's Sedge	S5	N
Carex intumescens	Bladder Sedge	S5	N
Scirpus atrovirens	Dark-green Bulrush	S5	N
Pteridium aquilinum	Bracken Fern	S5	N
Matteuccia struthiopteris	Ostrich Fern	S5	N
Equisetum arvense	Field Horsetail	S5	N
Gaultheria procumbens	Eastern Teaberry	S5	N
Lotus corniculatus	Garden Bird's-foot Trefoil	SE5	I
Trifolium pratense	Red Clover	SE5	I

Scientific Name	Common Name	SRank	Nat Status
Vicia cracca	Tufted Vetch	SE5	I
Ribes glandulosum	Skunk Currant	S5	N
Iris versicolor	Harlequin Blue Flag	S5	N
Sisyrinchium montanum	Strict Blue-eyed-grass	S5	N
Clintonia borealis	Yellow Clintonia	S5	N
Trillium grandiflorum	White Trillium	S5	N
Myrica gale	Sweet Gale	S5	N
Fraxinus americana	White Ash	S4	N
Fraxinus nigra	*Black Ash	S3	N
Fraxinus pennsylvanica	Red Ash	S4	N
Oenothera biennis	Common Evening-primrose	S5	N
Epipactis helleborine	Broad-leaved Helleborine	SE5	I
Oxalis stricta	Upright Yellow Wood-sorrel	S5	N
Abies balsamea	Balsam Fir	S5	N
Picea glauca	White Spruce	S5	N
Pinus resinosa	Red Pine	S5	N
Pinus strobus	Eastern White Pine	S5	N
Plantago lanceolata	English Plantain	SE5	I
Plantago major	Common Plantain	SE5	I
Elymus repens	Quackgrass	SE5	I
Phalaris arundinacea	Reed Canarygrass	S5	N
Poa annua	Annual Bluegrass	SE5	I
Fallopia cilinodis	Fringed Black Bindweed	S5	N
Rumex acetosella	Sheep Sorrel	SE5	I
Rumex crispus	Curled Dock	SE5	I
Claytonia caroliniana	Carolina Spring Beauty	S5	N
Pyrola elliptica	Shinleaf	S5	N
Clematis virginiana	Virginia Clematis	S5	N
Ranunculus sceleratus	Cursed Buttercup	S5	N
Thalictrum dioicum	Early Meadow-rue	S5	N
Thalictrum pubescens	Tall Meadow-rue	S5	N
Amelanchier alnifolia	Saskatoon	S4?	N
Amelanchier arborea	Downy Serviceberry	S5	N
Prunus serotina	Black Cherry	S5	N
Prunus virginiana	Chokecherry	S5	N
Rubus canadensis	Canada Blackberry	S5	N
Rubus idaeus ssp. strigosus	North American Red Raspberry	S5	N
Sorbus decora	Showy Mountain-ash	S5	N
Populus balsamifera	Balsam Poplar	S5	N
Populus grandidentata	Large-toothed Aspen	S5	N
Populus tremuloides	Trembling Aspen	S5	N
Tiarella cordifolia	Heart-leaved Foamflower	S5	N
Verbascum thapsus	Common Mullein	SE5	I
Solanum dulcamara	Bittersweet Nightshade	SE5	I
Ulmus americana	White Elm	S5	N

Nomenclature follows the Natural Heritage Information Centre (NHIC) and are current to February 2020
Nat Status: N = Native; I = Introduced
SRank: Subnational Rank for Ontario as per NHIC February 2020
SRanks for introduced species are indicated by an “E” for exotic species and are not considered in analyses of species rarity
*Black Ash is assigned a status of threatened by the Committee on the Status of Endangered Wildlife in Canada and an endangered status by the Committee on the Status of Species at Risk in Ontario, but is not currently on the Species at Risk in Ontario List

Appendix B

Breeding Birds

Appendix B

Breeding Birds

Common Name	Scientific Name	Conservation Status
Great Blue Heron	*Ardea herodias*	
Mallard	*Anas platyrhynchos*	
Common Merganser	*Mergus merganser*	
Turkey Vulture	*Cathartes aura*	
Killdeer	*Charadrius vociferus*	
Spotted Sandpiper	*Actitis macularia*	
Rock Pigeon	*Columba livia*	
Mourning Dove	*Zenaida macroura*	
Chimney Swift	*Chaetura pelagica*	Threatened (SARO and COSEWIC)
Belted Kingfisher	*Ceryle alcyon*	
Hairy Woodpecker	*Dryobates villosus*	
Olive-sided Flycatcher	*Contopus cooperi*	Special Concern (SARO and COSEWIC)
Eastern Wood-Pewee	*Contopus virens*	Special Concern (SARO and COSEWIC)
Eastern Phoebe	*Sayornis phoebe*	
Great Crested Flycatcher	*Myiarchus crinitus*	
Eastern Kingbird	*Tyrannus tyrannus*	
Tree Swallow	*Tachycineta bicolor*	
Barn Swallow	*Hirundo rustica*	Threatened (SARO and COSEWIC)
Blue Jay	*Cyanocitta cristata*	
Common Raven	*Corvus corax*	
Black-capped Chickadee	*Poecile atricapillus*	
Red-breasted Nuthatch	*Sitta canadensis*	
House Wren	*Troglodytes aedon*	
Eastern Bluebird	*Sialia sialis*	
Veery	*Catharus fuscescens*	
American Robin	*Turdus migratorius*	
Gray Catbird	*Dumetella carolinensis*	
Cedar Waxwing	*Bombycilla cedrorum*	
European Starling	*Sturnus vulgaris*	
Warbling Vireo	*Vireo gilvus*	
Red-eyed Vireo	*Vireo olivaceus*	
Yellow Warbler	*Setophaga petechia*	
Chestnut-sided Warbler	*Setophaga pensylvanica*	
Pine Warbler	*Setophaga pinus*	
American Redstart	*Setophaga ruticilla*	
Mourning Warbler	*Geothlypis philadelphia*	
Northern Cardinal	*Cardinalis cardinalis*	
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	
Indigo Bunting	*Passerina cyanea*	
Song Sparrow	*Melospiza melodia*	
White-throated Sparrow	*Zonotrichia albicollis*	

Common Name	Scientific Name	Conservation Status
Red-winged Blackbird	*Agelaius phoeniceus*	
Common Grackle	*Quiscalus quiscula*	
American Goldfinch	*Spinus tristis*	
House Sparrow	*Passer domesticus*	

SARO: Species at Risk in Ontario List
COSEWIC: Committee on the Status of Endangered Wildlife in Canada

Appendix C

Ministry of Heritage, Sport, Tourism and Culture Industries Heritage Planning Unit Letter dated June 22, 2022

Ministry of Heritage, Sport, Tourism and Culture Industries

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Ministère des Industries du Patrimoine, du Sport, du Tourisme et de la Culture

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Ontario

June 22, 2022 EMAIL ONLY

Gillian MacLeod, Sr. Environmental Advisor
Ontario Power Generation
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Toronto, Ontario
gillian.macleod@opg.com

MHSTCI File	**:**	**0013025**
Proponent	**:**	**Ontario Power Generation**
Subject	**:**	**Ontario Waterpower Class EA - Screening Process**
Project	**:**	**Bingham Chute Generating Station – Life Extension Project**
Location	**:**	**Municipality of Powassan, Parry Sound District**

Dear Gillian MacLeod:

Thank you for providing the Ministry of Heritage, Sport, Tourism and Culture Industries (MHSTCI) with the Project Description for Agency Review (dated February 2022) and OPG's formal request for project-specific advice regarding the technical cultural heritage requirements under the Ontario Waterpower Association (OWA) Class Environmental Assessment (EA) (May 2022 edition) for the above-referenced project. MHSTCI's interest in this OWA Class EA project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- archaeological resources, including land and marine;
- built heritage resources, including bridges and monuments; and
- cultural heritage landscapes.

Under the OWA Class EA, low-risk projects may be exempted from the Class EA process, but proponents are required to consider whether its project could have potential negative effects on the environment, including cultural heritage resources. OPG has advised that it will be seeking MECP decision on its EA exemption in late Fall 2022, with construction stating in September 2023.

This letter provides advice on how to incorporate consideration of cultural heritage in the above EA screening process, and also outlines the technical studies required to address cultural heritage resources within the project area.

Project Summary

Having considered various factors in its life extension of Bingham Chute GS, OPG's preferred option is to refurbish the facility. This will involve:

- Turbine-Generators: replacing two existing turbines with new higher flow capacity units.
- Powerhouse: fit the new turbines into the existing powerhouse. This will require minor modifications to the powerhouse sub-structure and floor.

- Tailrace: the channel may require deepening of 1.0 to 2.0 m, with the potential for minimal modifications to the riverbed outside the tailrace channel.
- Penstock: will not be replaced in the near term. However, the inside of the penstock will be refurbished with lining to prolong its serviceable life.
- Headworks: no changes to the headworks dykes and sluiceway are required or planned as part of the life extension project. Any alterations to the dykes and sluiceway would occur as a part of normal sustaining capital projects or as required for dam safety purposes.
- Controls and Electrical: The entire old power systems associated with the units and station service systems (power distribution, HVAC, sump pumps, etc.) at the powerhouse would be replaced with new ones. The new generating units will also require new auxiliary systems such as HPU and cooling water system.

MHSTCI Comments:

Please note that the *Standards and Guidelines for Conservation of Provincial Heritage Properties* (S&Gs), prepared pursuant to Section 25.2 of the *Ontario Heritage Act* (*OHA*), came into effect on July 1, 2010. All Ontario government ministries and public bodies that are prescribed under Ontario Regulation 157/10, including OPG, must comply with the S&Gs. They apply to property that is owned or controlled by the Crown in right of Ontario or by a prescribed public body.

Identifying Cultural Heritage Resources
While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation.

Municipal Heritage Committees, historical societies and other local heritage organizations may also have knowledge that contributes to the identification of cultural heritage resources.

Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to them.

We also encourage OPG to share all technical studies, e.g., archaeological assessment(s), Cultural Heritage Evaluation Report (CHER), Heritage Impact Assessment (HIA), with Indigenous communities. While not, strictly speaking, a requirement, it may assist with OPG's consultation requirements.

Built Heritage Resources and Cultural Heritage Landscapes
Section 4.5 of the Project Description for Agency Review (dated February 2022) states that in 2021 Unterman McPhail on behalf of OPG, completed a *Preliminary Assessment: Potential for Cultural Heritage Value or Interest* for Bingham Chute Generating Station. The Preliminary Assessment determined that the facility has the potential to meet the criteria of Ontario Regulations 9/06 and/or 10/06 under the *Ontario Heritage Act* and has the potential for cultural heritage value or interest.

A Cultural Heritage Evaluation Report (CHER), undertaken by a qualified person, should be undertaken to fully understand the property's cultural heritage value or interest and level of significance. Since OPG does not yet have an approved Evaluation process under the S&Gs, we recommend using the Cultural Heritage Evaluation Methodology in the MHSTCI Heritage Identification and Evaluation Process (2014). We recommend referring to Sections 4.6.1 and 4.7, which provide explanations of how to apply the evaluation criteria in Ontario Regulation 9/06 and 10/06. Additionally, given the project timelines, please send the draft CHER to MHSTCI for review and comment as soon as it is available.

If the property (or project area) is found to have cultural heritage value or interest, then a Heritage Impact Assessment (HIA), prepared by a qualified person, should be completed to assess potential project impacts and recommend appropriate mitigation measures. Please send the HIA to MHSTCI and the local municipality as appropriate for review and comment and make it available to local organizations or individuals who have expressed interest in review.

Proponents that are subject to the S&Gs, including OPG, should refer to Information Bulletin 3 - Heritage Impact Assessments for Provincial Heritage Properties (attached).

We recognize that under the S&Gs, ministries and public bodies prescribed under regulation, including OPG, are required to prepare a Strategic Conservation Plan for provincial heritage properties under its ownership or control. However, given the project timelines, we recommend that, if technical cultural heritage studies are required after completion of the CHER, that the HIA be prioritized over the SCP.

The response to the **screening question 6** (Table 2, Class Environmental Assessment for Waterpower Projects May 2022) should be based on the CHER and HIA. Although the project may have negative effects on the built heritage resource and/or cultural heritage landscape, the mitigation measures recommended in the HIA are to be followed.

Archaeological Resources

Land/Terrestrial

Our records indicate that a Stage 1 and 2 Archaeological Assessment (under Project Information Form number P208-0218-2020) has been undertaken for the proposed project. The report was submitted to MHSTCI for review on August 19, 2021, but it is still awaiting review. We recommend having your archaeologist request an expedited review.

Marine/Underwater

The Project Description indicates the project may have underwater impacts to the tailrace channel (may require deepening of 1.0 to 2.0 m), and future dykes and sluiceway works. The project should be screened using the MHSTCI *Criteria for Evaluating Marine Archaeological Potential* to determine if a marine archaeological assessment is needed. We recommend that OPG review its records to determine whether any previous excavation e.g., deepening or dredging, of the tailrace has ever taken place. If so, the area may be considered to be previously disturbed.

Please note, if a marine archaeological assessment is required, it shall be undertaken by an archaeologist with a specialized marine archaeological license.

Please be aware that archaeological concerns have not been fully addressed until reports have been entered into the Ontario Public Register of Archaeological Reports where those reports recommend that:

1. the archaeological assessment of the project area is complete and
2. all archaeological sites identified by the assessment are either of no further cultural heritage value or interest (as per Section 48(3) of the Ontario Heritage Act) or that mitigation of impacts has been accomplished through excavation or an avoidance and protection strategy.

Proponents should wait to receive the MHSTCI's review letter indicating that the report(s) has been entered into the Register before issuing a decision or proceeding with any ground disturbing activities.

The response to the **screening question 7** (Table 2, Class Environmental Assessment for Waterpower Projects May 2022) should be based on the archaeological assessment(s). Although

the project may have negative effects on archaeological resources, the mitigation measures recommended in the archaeological assessments are to be followed. Please notify MHSTCI (at archaeology@ontario.ca) if archaeological resources are impacted by EA project work. All activities impacting archaeological resources must cease immediately, and a licensed archaeologist is required to carry out an archaeological assessment in accordance with the Ontario Heritage Act and the Standards and Guidelines for Consultant Archaeologists.

If human remains are encountered, all activities must cease immediately, and the local police and coroner must be contacted. In situations where human remains are associated with archaeological resources, MHSTCI should also be notified (at archaeology@ontario.ca) to ensure that the site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.

Environmental Reporting
The proponent should summarize the findings of the above-mentioned studies and/or screening checklists and add all the documentation to the project files as part of the Project Screening. The outcomes and recommendations of the technical studies should be included in the project file and will form the basis for any future commitments.

Thank you for consulting MHSTCI on this project and please continue to do so, as necessary, throughout the EA Screening process. If you have any questions or require clarification, please do not hesitate to contact me.

Sincerely,

Rosi Zirger
A/ Heritage Advisor
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Copied to: Phil Shantz, Arcadis
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It is the sole responsibility of proponents to ensure that any information and documentation submitted as part of their EA report or file is accurate. MHSTCI makes no representation or warranty as to the completeness, accuracy or quality of the any checklists, reports or supporting documentation submitted as part of the EA process, and in no way shall MHSTCI be liable for any harm, damages, costs, expenses, losses, claims or actions that may result if any checklists, reports or supporting documents are discovered to be inaccurate, incomplete, misleading or fraudulent.

Appendix D

Northwest Archaeological Assessments Ltd. 2022. OPG Heritage Review Process. Cultural Heritage Research Report and Cultural Heritage Evaluation Report. Bingham Chute Generating Station Life Redevelopment Project. South River, Municipality of Powassan, District of Parry Sound, Ontario

OPG Heritage Review Process
Cultural Heritage Research Report
Bingham Chute Generating Station Redevelopment Project,
South River, Municipality of Powassan,
District of Parry Sound, Ontario.

CHRR Report
September 30, 2022

Prepared for:

Ontario Power Generation
700 University Ave.
Toronto, ON M5G 1X6

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Prepared by:

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Northwest Archaeological Assessments Ltd.

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Executive Summary

ARCADIS Canada Inc. (Arcadis) has retained Northwest Archaeological Assessments (Andrew Hinshelwood, PhD, CAHP) and Unterman McPhail Associates (UMcA) to undertake a cultural heritage evaluation of the Bingham Chute Generating Station (GS). Ontario Power Generation (OPG), owner of the property, is considering the refurbishment or redevelopment of the Bingham Chute GS to increase capacity at the site by better utilizing the available river flows.

Bingham Chute GS is located on the South River within the geographic township of South Himsworth, Municipality of Powassan, District of Parry Sound. It is situated approximately three (3) kilometres west of Powassan on Highway 534. There are two other OPG generating stations on the South River, Nipissing GS downstream and Elliott Chute GS, upstream.

Bingham Chute GS was built by the public utility Hydro Electric Power Commission of Ontario (HEPCO) in 1923 to augment the capacity of Nipissing GS, built in 1909. The facility comprises the main dam and sluiceways, headworks and penstock, powerhouse and tailrace. The brick powerhouse contains two generators transferred from Nipissing GS following an upgrade there, with an installed capacity of approximately 0.90 MW.

OPG is undertaking the Ontario Waterpower Association Class Environmental Assessment (OWA Class EA) process and more specifically the *Screening Process to Exempt Low-Risk Projects* in order to support a life extension decision for this existing hydroelectric generating station. The project is being carried out under the Class EA for Waterpower Projects prepared by the Ontario Waterpower Association (OWA) (2022, Ninth Edition).

A cultural heritage evaluation for the Bingham Chute GS has been prepared in compliance with the Ministry of Tourism, Culture and Sport (MTCS) *Standards & Guidelines for Conservation of Provincial Heritage Properties* (April 28, 2010). The purpose of the evaluation is to determine the cultural heritage value or interest of the property in relation to the criteria set out under the *Ontario Heritage Act* (OHA). This report comprises the research component of the cultural heritage assessment.

Based on the application of the Criteria for Determining Cultural Heritage Value or Interest under Ontario Regulation 9/06, the conclusion of this Cultural Heritage Evaluation is that Bingham Chute GS is holds cultural heritage value or interest based on design, associative and contextual values. For this reason, Bingham Chute GS is a Provincial Heritage Property (PHP) as defined by the Standards and Guidelines. However, Bingham Chute GS does not meet the criteria for provincial significance set out in Ontario Regulation 10/06. For this reason, Bingham Chute GS is not a Provincial Heritage Property of Provincial Significance (PHPPS) as defined by the Standards and Guidelines.

Given that Bingham Chute GS is evaluated to be a PHP, decisions regarding future operation, maintenance, refurbishment or redevelopment work at the property should be based on appropriate studies and research, with an awareness the potential impact of the proposed activities on the cultural heritage value and heritage attributes of the property, and take measures to mitigate direct and indirect impacts. To conform to the requirements of the S&G process, any work proposed for the Bingham Chute GS "site, buildings, structures and original equipment that includes demolition, removal, and relocation of disposal of any heritage attributes" will require OPG to maintain a record of the heritage attributes of the Bingham Chute GS to be considered for mitigation of direct and indirect impacts as part of any redevelopment plan, and prepare a Strategic Conservation Plan (SCP) and/or Cultural Heritage Impact Assessment (CHIA) in accordance with the S&Gs. Depending on decisions made for the redevelopment / refurbishment of the site, a Cultural Heritage Documentation Report (CHDR) may also be required.

1.0 Introduction

Ontario Power Generation (OPG) Bingham Chute GS is located on the South River within the geographic township of South Himsworth, Municipality of Powassan, District of Parry Sound. It is situated approximately three (3) kilometres west of Powassan on Highway 534 (Figure 1). The South River headwaters rise in the western edges of Algonquin Provincial Park and flow northwesterly through or adjacent to the municipalities of the Village of South River, Powassan and Township of Nipissing before terminating at South Bay on Lake Nipissing. Bingham Chute GS is positioned between the Elliott Chute GS upstream, and Nipissing GS lower down on the South River.

Specifically, the GS is situated at Lot 22, Concession 12 and Lot 22, Concession 13, Township of Himsworth. Highway 534 forms the boundary between Concessions 12 and 13. Bingham Chute GS is accessible from Highway 11 via Highway 534, running east from Powassan. The water control structure is visible from the highway to the south, while the penstock, powerhouse and ancillary structures are visible from the highway to the north. The penstock runs beneath the highway (Figure 2).

Bingham Chute GS was built by the public utility Hydro Electric Power Commission of Ontario (HEPCO) in 1923 to augment the capacity of Nipissing GS, built in 1909. The facility comprises the main dam and sluiceways, headworks and penstock, powerhouse and tailrace. The brick powerhouse contains two generators transferred from Nipissing GS following an upgrade there, with an installed capacity of approximately 0.90 MW.

OPG, owner of the property, is considering the refurbishment or redevelopment of the Bingham Chute GS, which is at or approaching its end-of-service life and is undersized when compared to potential output using more modern equipment. Redevelopment / refurbishment provides an opportunity to better utilize the available river flows, as well as extend the service life of the facility. OPG is undertaking the Ontario Waterpower Association Class Environmental Assessment (OWA Class EA) process and more specifically the *Screening Process to Exempt Low-Risk Projects* in order to support a life extension decision for this existing hydroelectric generating station. The project is being carried out under the Class EA for Waterpower Projects prepared by the Ontario Waterpower Association (OWA) (February 2022, Ninth Edition).

1.1 Purpose of Study

Cultural heritage resources are protected under the *Ontario Heritage Act* (OHA). All Ontario government ministries and prescribed public bodies such as OPG must comply with the Ministry of Tourism, Culture and Sport (MTCS; now Ministry of Heritage, Sport, Tourism and Culture industries [MHSTCI]), *Standards & Guidelines for Conservation of Provincial Heritage Properties* (S&Gs) approved in April 2010. The S&Gs provide guidance to government ministries and prescribed public bodies in the management of provincially owned properties or properties under their control. Guidance contained in the S&Gs addresses the identification, evaluation, protection, maintenance, use and disposal of provincially-owned or leased cultural heritage properties.

This Cultural Heritage Research Report (CHRR) report addresses the identification and historical context of the built heritage resources and associated cultural heritage landscape features at Bingham Chute GS. This report provides a summary review of the development history, built heritage resources, and cultural heritage landscape currently present at Bingham Chute GS, and identifies any known heritage status or recognition for the property at the municipal, provincial, federal and/or international level. This research supports the evaluation of the GS against the criteria set out in O. Reg. 9/06 and/or O. Reg. 10/06 of the OHA. This review includes consideration of alterations to the cultural heritage landscape and alterations and replacements 40 years and older to the built heritage as potential cultural heritage resources.

As part of the cultural heritage evaluation, the proposed redevelopment / refurbishment is considered in terms of the potential for this work negatively impact cultural heritage landscape and built heritage resources associated with Bingham Chute GS. Recommendations made address the requirement to potentially complete two additional reports, including a Strategic Conservation Plan (SCP) and/or a Cultural Heritage Impact Assessment (CHIA) to guide future development at the GS.

This report has been prepared by Andrew Hinshelwood, PhD, CAHP, partner at Northwest Archaeological Assessments, Ltd. and a member in good standing of the Canadian Association of Heritage Professionals (CAHP). The report relies on a preliminary assessment of the potential cultural heritage value or interest of the Bingham Chute GS

in 2021 (Unterman MacPhail 2021). The earlier report was prepared by Richard Unterman, MA, CAHP, and Barbara McPhail. MA, CAHP, principals of Unterman McPhail Associates, Heritage Resource Management Consultants. Unterman MacPhail Associates. Richard Unterman participated in the review of the report content and conclusions.

1.2 Location and Description

Bingham Chute GS is located on the South River within the geographic township of South Himsworth, Municipality of Powassan, District of Parry Sound. The GS is situated approximately three (3) kilometres west of the community of Powassan on Highway 534 (Map 1). Bingham Chute was the original location of the village of Powassan prior to the construction of the Canadian National Railway (CNR), when it was relocated. Built heritage and cultural landscape elements associated with the GS exist to the north and south of the highway.

The South River headwaters rise in the western edges of Algonquin Provincial Park and flows in a northwesterly direction through or adjacent to the municipalities of the Village of South River, Powassan and Township of Nipissing and before terminating at South Bay on Lake Nipissing. The river is a regulated river with several small hydroelectric stations and water control structures, some of which have been in place for over one hundred years. Bingham Chute GS is positioned between the Elliott Chute GS upstream, and Nipissing GS lower down on the South River (Map 2).

Specifically, the GS is situated at Lot 22, Concession 12 and Lot 22, Concession 13, Township of Himsworth. Highway 534 forms the boundary between Concessions 12 and 13 (Map 3). Bingham Chute GS is accessible from Highway 11 via Highway 534, running east from Powassan. The water control structure is visible from the highway to the south, while the penstock, powerhouse and ancillary structures are visible from the highway to the north. The penstock runs beneath the highway (Map 4a).

1.3 Methodology

This report reviews the development history, built heritage and cultural landscape resources found at the Bingham Chute GS to provide background to the evaluation of cultural heritage value or interest of the site, and to assist OPG in the planning of future work. Additionally, this report identifies any known heritage recognition or status at the municipal, provincial, federal and/or international level.

The methodology followed in this CHER is consistent with other OPG project reports previously prepared by Unterman MacPhail on behalf of OPG to provide consistency. A Research Report and an Evaluation Report will be prepared. The methodology, as set out below, follows from this earlier work.[1]

The *Ontario Heritage Act* (OHA) sets out the framework for provincial and municipal responsibilities and powers in the conservation of cultural heritage resources in the province. The OHA allows that individual properties may be designated of cultural heritage value under Part IV of the OHA by a municipality or the Minister of the Ministry of Tourism, Culture and Sport (MTCS). Municipalities may also designate Heritage Conservation Districts under Part V of the legislation. Properties owned or controlled by the Government of Ontario are not subject to designation by municipalities or the Minister.

The OHA has also enabled the preparation of the MTCS *Standards & Guidelines for Conservation of Provincial Heritage Properties* (2010). The Standards & Guidelines (S&Gs) address the identification, evaluation, protection, maintenance, use and disposal of provincially owned or leased cultural heritage properties. All Ontario government ministries and prescribed public bodies, including OPG, are required to comply with the S&Gs in the management of properties they own or control.

[1] Text adapted from Unterman MacPhail 2017 (Coniston GS CHER).

Ministries and prescribed public bodies are required to develop an evaluation process to identify provincial heritage properties in their ownership and/or control. Where a body has not developed an identification and evaluation process for properties within its jurisdiction, the MHSTCI S&Gs guide the evaluation and report.

The preliminary information contained in this report is based on OPG staff input and secondary source information including, but not limited to, Hydro-Electric Power Commission of Ontario (HEPCO) annual reports, articles and consultant reports. The basic data requirements for the application of the "Criteria for Determining Cultural Heritage Value or Interest" as set out in the Ontario Regulation (O. Reg.) 9/06 of the OHA has been reviewed. The data includes:

- an overview history of the Bingham Chute GS,
- current heritage recognition at the municipal, provincial, federal and/or international level,
- a list, provided by OPG, related to the age of existing GS buildings, structures and equipment,

Requirements for mitigating direct or indirect impacts to the Bingham Chute GS built heritage resources and cultural heritage landscape features due to proposed OPG work are discussed in this report. A complete discussion of the evaluation of cultural heritage value or interest under O. Reg. 9/06 and, if required, O. Reg. 10/06, is set out in a separate Cultural Heritage Evaluation Report (CHER).

1.4 Project Personnel

For Northwest Archaeological Assessments	Andrew Hinshelwood, PhD, CAHP Heather Hopkins, PhD
For Unterman McPhail Associates	Richard Unterman, MA, CAHP
For ARCADIS Canada Inc.	Phil Shantz, MES, MCIP, RPP

2.0 Cultural Heritage Resource Evaluation

OPG has previously retained UMcA to complete a preliminary assessment of the potential *Cultural Heritage Value or Interest* of Bingham Chute.[2] The preliminary assessment includes detailed review of the historical context of the GS. This information has been summarised in Section 3.0, following.

The Preliminary Assessment also provided a useful description of the potential cultural heritage value or interest of Bingham Chute, as follows:

> *"It is the conclusion of this preliminary assessment for potential cultural heritage value or interest that Bingham Chute GS has potential to be of "Cultural Heritage Value or Interest" and to be identified as a PHP under the O. Reg. 9/06 of the OHA. Prior to undertaking any proposed OPG maintenance, refurbishment and/or redevelopment work to the site and buildings/structures, as an OPG requirement under the MHSTCI S&G's, a CHER should be completed to determine the PHP status of the Bingham Chute GS. The CHER provides a Statement of Cultural Heritage Value (SCHV) and list of significant heritage attributes that will provide guidance to the OPG on cultural heritage resource conservation matters when planning change/alterations to the cultural heritage landscape and its buildings and structures of the GS property. If the Bingham Chute GS is considered to be a PHP, a Strategic Conservation Plan (SCP) is required under the S&Gs. A Heritage Impact Assessment (HIA) may be required to address impacts to the facility as a result of any proposed OPG work.*

2.1 Current Heritage Recognition

The earlier Unterman MacPhail Associates report also reviewed the current heritage recognition status of Bingham Chute GS at the municipal, provincial, federal and international scale. This information is summarised, below.

[2] Unterman MacPhail Associates. 2021. Preliminary Assessment: Potential for Cultural Heritage Value or Interest, Bingham Chute Generating Station, Geographic Township of South Himsworth, Municipality of Powassan, District of Parry Sound, Ontario. Prepared for Ontario Power Generation.

Municipal - Bingham Chute GS is a provincially-owned property and is not recognized under the *Ontario Heritage Act* (OHA) as a municipal listed/registered or designated cultural heritage resource.

Provincial – The cultural heritage evaluation of the Bingham Chute GS has been completed and a CHER produced. The CHER indicates that the property *is a provincial heritage property* under O.Reg. 9/06, but *is not a provincial heritage property or provincial significance* under O.Reg. 10/06.

UMA also note that a Ministry of Citizenship and Culture (now MHSTCI) report titled Planning of Hydroelectrical Generating Stations as a Cultural Resource (1984) provided a preliminary heritage ranking of all generating stations in the Ontario Hydro system. Bingham was ranked Category C, defined as stations "whose main attribute is that of age, and may have undergone extensive alteration". The report adds that Bingham could be moved to Category B on the basis of the equipment, reused from Nipissing GS and dating to about 1909.

Federal – Bingham Chute GS has not been advanced as a federal heritage property, nor has it been recognized as a federally recognized heritage site, monument or landscape. No national historical site with a commemorative plaque has been declared.

International – The United Nations Educational, Scientific and Cultural Organization (UNESCO) does not recognize the Bingham Chute GS as a heritage site, monument or landscape or World Heritage Site under the applicable directions.

3.0 Historical Overview

Bingham Chute GS is a compact industrial facility, visible from Highway 537 and dating to 1923.

3.1 Development overview

Himsworth Township[3] was surveyed in 1876. Settlement of the township commenced by 1879, inhibited by a general lack of roads, requiring travel primarily on bush trails. A township council was established in 1886 for the Township of Himsworth and, in 1890, the Township of South Himsworth was created as a separate municipal government (Unterman MacPhail Associates 2021).

The South River was an important element in regional logging operations during these early years. In the 1880s, pine was being floated to the Fraser Lumber Company sawmill at Lake Nipissing. A number of dams and log chutes were built along the river, and a base was established near Powassan. The 1876 survey had identified potential water powered mill sites along the South River. At Bingham Chute, the Bingham family established a grist mill at one of these sites in the 1890s. With the construction of the Grand Trunk Railway through the present site of Powassan, settlers who were resident near Bingham Chute moved to the new community centre. Powassan was incorporated as a town in 1904.

Hydroelectric development in Ontario is a 20th century phenomenon, although many of the early 'breakthrough' developments in generation and transmission took place in the late 19th century. Between 1900 and 1920, hydroelectric development expanded in Ontario supported by an emerging domestic engineering industry to support this growth.[4] As part of the expansion of power grids and generating stations across Ontario, the provincial government created the Hydro Electric Power Commission of Ontario (HEPCO), which was formed as a public entity in 1906. Now, public and private interests were active in the construction of larger hydroelectric generating facilities and transmission lines. HEPCO also grew through this period by acquiring private stations to extend their capacity. On the South River, HEPCO bought the Nipissing GS in 1916, but overall, their expansion into northern Ontario was restricted by the existing networks of privately owned facilities.

[3] The township was named after William Alfred Himsworth, Assistant Clerk of the Privy Council (1867 to 1872) and Clerk of the Queen's Privy Council for Canada (1872 to 1880).
[4] Simonton. J. 1984. *Planning for Hydroelectric Generating Stations as a Cultural Resource.* Prepared for the Ministry of Citizenship and Culture in co-operation with Ontario Hydro.

Bingham Chute GS on the South River was built by HEPCO in 1923 to augment the capacity of Nipissing GS. This positions Bingham at an early point in the expansion of the 1920s and 1930s. Part of this trend was a move to larger generating units, increased efficiency and greater automation, including the remote control of generating stations. Unterman McPhail (2021) note that the 1920s saw the general adoption of the vertical single runner Francis turbines and fixed propeller and Kaplan turbines, with earlier horizontal, double or quadruple runner Francis turbines being considered obsolete by the mid 1920s. Generation was devolved to Ontario Power Generation (OPG) and transmission to Hydro One, with the restructuring of Ontario Hydro, the successor to Ontario Hydro in 1999.

3.2 Bingham Chute GS

The Bingham Chute GS may be viewed as an assemblage of built heritage resources and as a cultural landscape (Maps 4a and 4b). The current configuration of buildings and equipment at the site are the result of an evolution of construction, demolition and equipment changeouts over time. Steel stop logs have replaced wood logs in the sluice gates. The steel penstock, installed in 1974, replaced an earlier wood stave structure. A hydro colony dating to 1923 and consisting of three houses, a garage and an icehouse, was razed about 1970. The storage building and lunchroom were constructed after 1975. A breaker yard was formerly located southeast of the power house between 1923 and 1997. Historically, six transformers were located on the property, later replaced by the three existing transformers. An older log winch mechanism is also stored on the property.

3.2.1 Built Heritage

The S&Gs define built heritage resources as "*one or more significant buildings including fixtures or equipment located in or forming part of a building), structures, earthworks, monuments, installations, or remains that have cultural heritage value*". At Bingham Chute GS, built heritage resources include a range of constructions and equipment present on site and relating to the operation and maintenance of the facility.

Built heritage resources present at Bingham include:

- Main dam (concrete) with five sluices with concrete gravity walls to each side (Figure 1)
- Concrete headworks structure with small wing walls and trashrack on upstream side (Figure 2)
- Earth fill dykes from river banks connecting to sluiceway and headworks
- Penstock of rivetted steel on concrete saddles (Figure 3)
- Penstock splits at powerhouse within concrete case, valves and cleanouts at lower end
- Powerhouse with concrete foundations and roof (flat) (Figure 4)
    - Exterior is brick walls of two brick thickness, constructed using a common bond and a soldier course above window level on all walls (Figure 5). The bond course is absent on parts of the east wall. Three window bays on north and south, two bays east and west. South wall modified to have oversized access door on east end of wall (Figure 6). East wall modified with shed entry at access door. North wall includes wooden panels across the tailrace outlets in the concrete foundation (Figure 7).
    - Interior includes full height generator floor, with a partitioned area in northeast corner for circuit equipment (Figure 8).
    - Equipment includes two Wm. Kennedy and Sons (Owen Sound) turbines (Figure 9), two alternating current Canadian Westinghouse (Hamilton) generators (Figure 10).
- Tailrace
- Switchyard (Figure 11)
- Storage building (Figure 12)
- Office / Lunchroom (Figure 13)

Equipment located within the powerhouse includes:

- 1909 Canadian Westinghouse Co. generators (2)
- 1923 double horizontal Francis turbines (2)
- 1923 rotating exciters (2)
- Draft tubes

- Scroll cases (2)
- Actuators (2)

A number of built heritage resources have been removed when their function was no longer supported, or replaced when upgrades were necessary for continued operation of the facility. Modifications to the built heritage resource assemblage include:

- 1923 Hydro colony consisting of three houses, a garage and an icehouse, razed about 1970
- steel penstock to replace an earlier wood stave penstock in 1974
- Steel stop logs to replace wood stop logs, date unknown
- 1923 breaker yard removed in 1997
- storage building added 1984/1985
- lunchroom building added 1984/1985
- six early transformers (inside powerhouse) replaced by three transformers (outside powerhouse to east), removed after 2007
- log lifter replaced, date unknown. Original mechanism on site (Figure 14).

Unterman MacPhail (2021) have provided a summary of the built heritage resources and cultural heritage landscape components present on the site in 2020. This table, with minor modifications to update information, is included as Appendix I to this report.

3.2.2 Cultural Heritage Landscape

The S&Gs define cultural heritage landscapes as "*a defined geographical area that human activity has modified and that has cultural heritage value. Such an area involves one or more groupings of individual heritage features, such as structures, spaces, archaeological sites, and natural elements, which together form a significant type of heritage form distinct from that of its constituent elements or parts*". At Bingham Chute GS, cultural heritage landscape is defined based on the assemblage of structures, equipment and uses associated with and extending beyond the operation and maintenance of the facility.

Elements of the Bingham Chute GS cultural heritage landscape include:

- Dam, sluices, headstock
- Penstock, powerhouse, switchyard and tailrace
- Highway 537, site access roads, and the portage trail (Figure 15)
- Lawn area, as the site of the former hydro colony (Figure 16)
- South River and the chute

The Bingham Chute GS was developed between 1923 to 1925. The site of the GS had been occupied by a grist mill, of which no trace remains. Prior to that the South River was an undeveloped travel route to Lake Nipissing. The former grist mill is signified in the continued use of hydraulic energy to produce hydroelectricity. The travel route is preserved in the portage that is maintained through the property.

The hydroelectric facility defines the cultural heritage landscape. The site is revealed when driving on Highway 537 as a clearing and road bridge, with main components of the GS visible to the south (dam, sluices and headstock) and to the south (penstock, powerhouse, switchyard and transmission lines). The site is marked by fencing and gates on access roads. Buildings, including the storage and office / lunchroom building can be glimpsed from the highway as well. An open stand of pine, spruce and cedar, estimated to be about 70 years old, occupies an area of managed lawn, the site of the former colony. Along the periphery of the ring road providing access to the powerhouse and related structures is a piece of machinery that was observed, on inspection, to be an early log lifter, presumably one that had been used on the dam prior to 1990. Older wood stoplogs with steel reinforced ends are in secondary reuse as traffic barriers near the main entrance to the site.

From the highway, the process of generating electricity from water can be visualised in the compact arrangement of the individual elements. To the south, the control dam and sluiceway is visible from the highway bridge, while the intake and headstock are less pronounced. North of the highway, the striking black penstock runs directly from the

highway to the powerhouse. The South River channel is visible beyond the powerhouse. Access to the site by way of the portage trail has allowed the north side of the powerhouse and the tailrace to be observed. This is evidenced by graffiti etched into the red brick on the north wall.

Bingham Chute GS retains a strong sense of its 1923-1925 contextual and physical character. Changes to equipment and the removal of the employee buildings have not been overwritten; rather they have been replaced by open space. Generally, changes dating to more than 40 years are considered to form attributes of the cultural heritage landscape. Early changes to the Bigham Chute GS cultural heritage landscape primarily includes the removal of the hydro colony buildings and transformer and switch equipment.

4.0 Conclusions and Recommendations

OPG had previously retained Unterman McPhail to complete a preliminary assessment the potential cultural heritage value or interest (CHVI) of Bingham Chute GS. The preliminary assessment concluded that "Bingham Chute GS has potential to be of 'Cultural Heritage Value or Interest' and to be identified as a PHP under the O. Reg. 9/06 of the OHA."

Based on the application of the Criteria for Determining Cultural Heritage Value or Interest under Ontario Regulation 9/06, the conclusion of this Cultural Heritage Evaluation is that Bingham Chute GS holds cultural heritage value or interest based on design, associative and contextual values. For this reason, *Bingham Chute GS is a Provincial Heritage Property* (PHP) as defined by the *Standards and Guidelines* (Map 5).

However, Bingham Chute GS does not meet the criteria for provincial significance set out in Ontario Regulation 10/06. For this reason, *Bingham Chute GS is not a Provincial Heritage Property of Provincial Significance* (PHPPS) as defined by the *Standards and Guidelines*.

Decisions regarding future operation, maintenance, refurbishment or redevelopment work at Bingham Chute GS should be based on appropriate studies and research, with an awareness the potential impact of the proposed activities on the cultural heritage value and heritage attributes of the property, and take measures to mitigate impacts. For clarity, impacts include both direct impacts and indirect impacts. Direct impacts include, for example, demolition, removal, relocation or disposal of built heritage resources including buildings, structures and equipment. Indirect impacts include, for example, changes or alterations to the character and setting of the cultural heritage resource, replacement of secondary structures, or operating processes.

To conform to the requirements of the S&G process, any work proposed for the Bingham Chute GS "site, buildings, structures and original equipment that includes demolition, removal, and relocation of disposal of any heritage attributes" will require the completion of the following:

- Maintain a record of the heritage attributes of the Bingham Chute GS to be considered for mitigation of direct and indirect impacts as part of any redevelopment plan.
- Prepare a SCP (Strategic Conservation Plan) in accordance with the S&Gs that details how heritage attributes will be conserved, and/or
- Prepare a CHIA (Cultural Heritage Impact Assessment) in accordance with the S&Gs to identify the anticipated impacts to the cultural heritage resources as a result of any proposed work, and provide appropriate conservation mitigation actions.
- If determined to be necessary, a Cultural Heritage Documentation Report (CHDR) may also be required.

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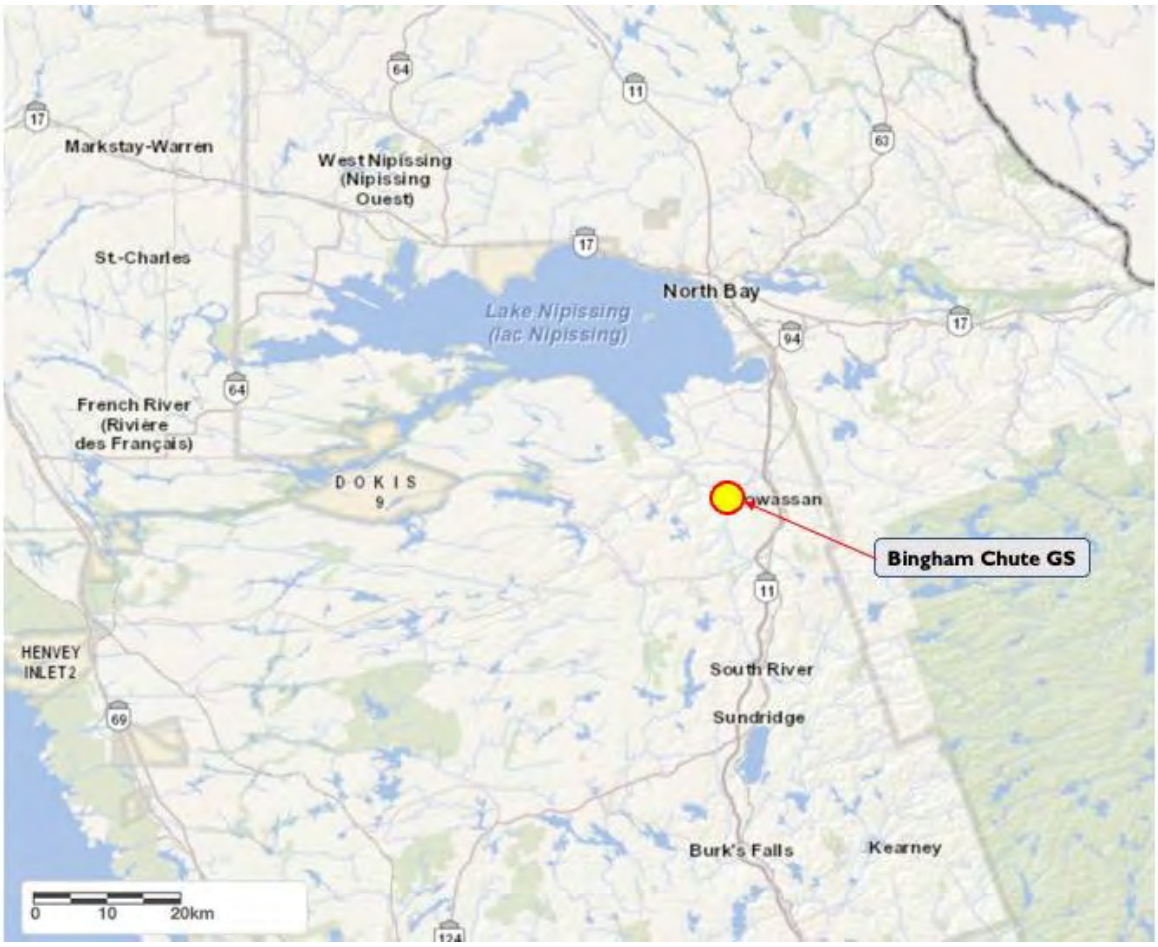
Maps



Map 1: Regional location of Bingham Chute Generating Station.

Map 2: Bingham Chute Generating Station position on the South River.

Map 3: Bingham Chute Generating Station, locale features.

Map 4a: Built Heritage and Cultural Heritage Landscape elements, north of Highway 537.

Map 4b: Built Heritage and Cultural Heritage Landscape elements, south of Highway 537.

Map 5: Bingham Chute Generating Station, Provincial Heritage Property.

Figures

Figure 1: Bingham Chute GS, main dam.

Figure 2: Bingham Chute GS, intake, headworks.

Figure 3: Bingham Chute GS, penstock.

Figure 4: Bingham Chute GS, view of powerhouse.

Figure 5: Bingham Chute GS, view of powerhouse. Note faint image of shed over penstock entry.

Figure 6: Bingham Chute GS, view of powerhouse, south wall entry door.

Figure 7: Bingham Chute GS, view of powerhouse, north wall with tailrace. Wood panels in openings.

Figure 8: Bingham Chute GS, powerhouse interior showing partition and transformers.

Figure 9: Bingham Chute GS, powerhouse interior, Unit 6G1 turbine and actuator.

Figure 10: Bingham Chute GS, Unit 6G2 generator, with Unit 6G1 in background.

Figure 11: Bingham Chute GS, switchyard.

Figure 12: Bingham Chute GS, storage building.

Figure 13: Bingham Chute GS, office / lunchroom.

Figure 14: Bingham Chute GS, log lifting crane.

Figure 15: Bingham Chute GS, portage trail marker.

Figure 16: Bingham Chute GS, area of former Hydro colony.

Appendix I

Inventory of built heritage and equipment assets at Bingham Chute GS (Unterman MacPhail Associates 2021), confirmed through field visit, 2022.

TABLE 1: BINGHAM CHUTE GS: CURRENT LIST OF BUILT HERITAGE RESOURCES AND CULTURAL HERITAGE LANDSCAPE ELEMENTS OF POTENTIAL CULTURAL HERITAGE VALUE OR INTEREST

EQUIPMENT	DESCRIPTION	PRELIMINARYASSESSMENT: POTENTIAL CULTURAL HERITAGE VALUE OR INTEREST
OPG information as of August 2020		
Governor	N/A	Little to no potential for cultural heritage value or interest
Generator	Pre 1975: Canadian Westinghouse Co. (1909) and moved to Bingham Chute in 1923.	High potential for cultural heritage value or interest as a fixture/equipment of 40 years of age and older of the power house.
Turbine	Pre 1975: Double horizontal Francis (1923), Manufacturer: William Kennedy	High potential for cultural heritage value or interest as a fixture/equipment of 40 years of age and older of the power house.
Scroll Case	Pre-1975: Pressure case	High potential for cultural heritage value or interest as a fixture/equipment of 40 years of age and older of the power house.
Draft Tube(s)	Yes, no date provided.	High potential for cultural heritage value or interest as a fixture/equipment of 40 years of age and older of the power house.
Rotating Exciter	Pre 1975: Installed 1923	Some potential for cultural heritage value or interest.
Actuator	Yes, no date provided.	Little to no potential for cultural heritage value or interest.
Switches/ Switch Gear	Yes, 2015	Little to no potential for cultural heritage value or interest.
Probes?	Yes, no date provided.	Little to no potential for cultural heritage value or interest.
Data loggers	SCADA	Little to no potential for cultural heritage value or interest.
Sluice gates	N/A	Little to no potential for cultural heritage value or interest.
Log lifter	Post 1975; about 1990	Little to no potential for cultural heritage value or interest.
Stop logs	Yes, no date provided.	Little to no potential for cultural heritage value or interest.
Switchyard	Post 1975: Built in 2016.	Little to no potential for cultural heritage value or interest.
Aqueduct	N/A	N/A
Surge Tank	N/A	N/A
Penstock	Pre 1975: Replaced in 1974	High potential for cultural heritage value or interest as a CHL element of 40 years and older in age and as a significant component in understanding the GS operation.
Trash racks	Post 1975: Replaced in 2010.	Little to no potential for cultural heritage value or interest.
Overhead crane	Yes, no date provided.	Little to no potential for cultural heritage value or interest.

TABLE 1: BINGHAM CHUTE GS: CURRENT LIST OF BUILT HERITAGE RESOURCES AND CULTURAL HERITAGE LANDSCAPE ELEMENTS OF POTENTIAL CULTURAL HERITAGE VALUE OR INTEREST

EQUIPMENT	DESCRIPTION	PRELIMINARYASSESSMENT: POTENTIAL CULTURAL HERITAGE VALUE OR INTEREST
Main Dam(s) & Intake, Forebay	Pre 1975: Main Dam (1923)	Review OPG document, *Review of OPG's Dam: Proposed Screening Guidelines/ Procedures/Criteria*[23] as a screening process to assist in determining the heritage potential of OPG dam structures.
Headworks (Headrace Canal Spillway)	Pre 1975: Headworks	High potential for cultural heritage value or interest as a CHL element of 40 years and older in age and as a significant component in understanding the GS operation.
Main Structures/ Buildings:	Pre-1975: Power House (1924)	High potential for cultural heritage value or interest as a BHR of 40 years and older in age and as a significant component in understanding the GS operation.
Tailrace	Pre-1975: Built 1924	High potential for cultural heritage value or interest as a CHL element of 40 years and older in age and as a significant component in understanding the GS operation.
Transformer Building	Post 1975: 2015	Little to no potential for cultural heritage value or interest.
Bridge(s)	N/A	N/A
Switchyard	Post 1975: 2016	Little to no potential for cultural heritage value or interest.
Maintenance/Storage Buildings	Post 1975	Little to no potential for cultural heritage value or interest.
Office /Lunch Room	Post 1975: 1982-83	Little to no potential for cultural heritage value or interest.

OPG Heritage Review Process

Cultural Heritage Evaluation Report

Bingham Chute Generating Station Redevelopment Project

South River, Municipality of Powassan

District of Parry Sound, Ontario

CHER Report
January 25, 2023

Prepared for:

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Executive Summary

ARCADIS Canada Inc. (Arcadis) has retained Northwest Archaeological Assessments (Andrew Hinshelwood, PhD, CAHP) and Unterman McPhail Associates (UMcA) to undertake a cultural heritage evaluation of the Bingham Chute Generating Station (GS). Ontario Power Generation (OPG), owner of the property, is considering the refurbishment or redevelopment of the Bingham Chute GS to increase capacity at the site by better utilizing the available river flows.

Bingham Chute GS is located on the South River within the geographic township of South Himsworth, Municipality of Powassan, District of Parry Sound. It is situated approximately three (3) kilometres west of Powassan on Highway 534. There are two other OPG generating stations on the South River, Nipissing GS downstream and Elliott Chute GS, upstream.

Bingham Chute GS was built by the public utility Hydro Electric Power Commission of Ontario (HEPCO) in 1923 to augment the capacity of Nipissing GS, built in 1909. The facility comprises the main dam and sluiceways, headworks and penstock, powerhouse and tailrace. The brick powerhouse contains two generators transferred from Nipissing GS following an upgrade there, with an installed capacity of approximately 0.90 MW.

OPG is undertaking the Ontario Waterpower Association Class Environmental Assessment (OWA Class EA) process and more specifically the *Screening Process to Exempt Low-Risk Projects* in order to support a life extension decision for this existing hydroelectric generating station. The project is being carried out under the Class EA for Waterpower Projects prepared by the Ontario Waterpower Association (OWA) (2022, Ninth Edition).

The cultural heritage evaluation for the Bingham Chute GS is prepared in compliance with the Ministry of Tourism, Culture and Sport (MTCS) *Standards & Guidelines for Conservation of Provincial Heritage Properties* (April 28, 2010). The purpose of the evaluation is to determine the cultural heritage value or interest of the property in relation to the criteria set out under the *Ontario Heritage Act* (OHA). This report comprises the evaluation component of the cultural heritage assessment.

1.0 Introduction

Ontario Power Generation (OPG) Bingham Chute GS is located on the South River within the geographic township of South Himsworth, Municipality of Powassan, District of Parry Sound. It is situated approximately three (3) kilometres west of Powassan on Highway 534 (Figure 1). The South River headwaters rise in the western edges of Algonquin Provincial Park and flow northwesterly through or adjacent to the municipalities of the Village of South River, Powassan and Township of Nipissing before terminating at South Bay on Lake Nipissing. Bingham Chute GS is positioned between the Elliott Chute GS upstream, and Nipissing GS lower down on the South River.

Specifically, the GS is situated at Lot 22, Concession 12 and Lot 22, Concession 13, Township of Himsworth. Highway 534 forms the boundary between Concessions 12 and 13. Bingham Chute GS is accessible from Highway 11 via Highway 534, running east from Powassan. The water control structure is visible from the highway to the south, while the penstock, powerhouse and ancillary structures are visible from the highway to the north. The penstock runs beneath the highway (Figure 2).

Bingham Chute GS was built by the public utility Hydro Electric Power Commission of Ontario (HEPCO) in 1923 to augment the capacity of Nipissing GS, built in 1909. The facility comprises the main dam and sluiceways, headworks and penstock, powerhouse and tailrace. The brick powerhouse contains two generators transferred from Nipissing GS following an upgrade there, with an installed capacity of approximately 0.90 MW.

OPG, owner of the property, is considering the refurbishment or redevelopment of the Bingham Chute GS, which is at or approaching its end-of-service life and is undersized when compared to potential output using more modern equipment. Redevelopment / refurbishment provides an opportunity to better utilize the available river flows, as well as extend the service life of the facility. OPG is undertaking the Ontario Waterpower Association Class Environmental Assessment (OWA Class EA) process and more specifically the *Screening Process to Exempt Low-Risk Projects* in order to support a life extension decision for this existing hydroelectric generating station. The project is being carried out under the Class EA for Waterpower Projects prepared by the Ontario Waterpower Association (OWA) (February 2022, Ninth Edition).

2.0 Methodology

The ***Ontario Heritage Act*** (OHA) sets out the framework for provincial and municipal responsibilities and powers in the conservation of cultural heritage resources in the province. The OHA allows that individual properties may be designated of cultural heritage value under Part IV of the OHA by a municipality or the Minister of the Ministry of Tourism, Culture and Sport (MTCS). Municipalities may also designate Heritage Conservation Districts under Part V of the legislation. Properties owned or controlled by the Government of Ontario are not subject to designation by municipalities or the Minister.

The OHA has also enabled the preparation of the MTCS ***Standards & Guidelines for Conservation of Provincial Heritage Properties*** (2010). The Standards & Guidelines (S&Gs) address the identification, evaluation, protection, maintenance, use and disposal of provincially owned or leased cultural heritage

properties. All Ontario government ministries and prescribed public bodies, including OPG, are required to comply with the S&Gs in the management of properties they own or control.

The S&Gs Section B.2 set out a general process to identify provincial heritage properties. The process relies, in the first instance on the "Criteria for Determining Cultural Heritage Value or Interest" set out in the Ontario Regulation 9/06 to determine the cultural heritage value or interest of a property, followed by application of the "Criteria for Determining Cultural Heritage Value or Interest of Provincial Significance" set out in Ontario Regulation 10/06. Properties meeting the criteria in O. Reg. 9/06 are considered provincial heritage properties (PHP). If the property meets the criteria in O. Reg. 10/06, it is determined to be a provincial heritage property of provincial significance (PHPPS).

Ministries and prescribed public bodies are required to develop an evaluation process to identify provincial heritage properties in their ownership and/or control. Where a body has not developed an identification and evaluation process for properties within its jurisdiction, the MHSTCI S&Gs guide the evaluation and report.

3.0 Cultural Heritage Resource Evaluation

Cultural heritage resource evaluation for the Bingham Chute GS follows the direction of the MTCS S&Gs. OPG does not currently have an evaluation process, approved by MHSTCI under the Standards and Guidelines, to identify provincial heritage properties under their ownership and/or control. As a result, the Standards and Guidelines is the guiding document for the preparation of this report.

3.1 Evaluation under *Criteria for Determining Cultural Heritage Value or Interest,* Ontario Regulation 9/06.

The "Criteria for Determining Cultural Heritage Value or Interest" set out in Ontario Regulation 9/06 under the OHA, as amended in 2005, were developed to assist in the evaluation of properties considered for designation and assess the value of a cultural heritage resource to the community. These evaluation criteria were applied to Bingham Chute GS to determine its cultural heritage value or interest to Municipality of Powassan. Table 1 reflects the identified cultural heritage value of the subject property for each of the evaluation criterion. The commentary is based upon background information contained in a Research Report prepared by UMcA, and the professional opinion of the consultant.

The text of Ontario Regulation 9/06 are found in Appendix I.

Table 1, Evaluation of Bingham Chute GS under the Criteria for Determining Cultural Heritage Value or Interest, O. Reg. 9/06

Criterion	Response	Comments
Design or Physical Value		
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	Yes	Publicly owned hydro-electric power generation in northern Ontario initially came through the acquisition of existing generating stations that had been constructed by private interests to serve the needs of specific industries, such as mining. Initially the Hydro Electric Power Commission of Ontario (HEPCO) focused on the acquisition of facilities built in the first two decades of the 20th century. Through the 1920s and 1930s HEPCO developed and expanded their network by constructing a few large, and a number of smaller facilities to augment production at the larger, usually acquired, facilities. Generating capacity was supported by advances in turbine technology, and increased automation and remote control of the facility operations. Bingham Chute GS therefore stands near the transition of hydro-electric generation capacity from privately constructed stations to those built and maintained by the public utility. Bingham Chute GS is an example of the first hydroelectric generating stations built by the Hydro Electric Power Commission of Ontario (HEPCO) in northern Ontario. Dating to 1923/24, the GS is the second of three stations to be constructed on the South River, following Nipissing (1909) and preceding Elliot Chute (1929). The layout of the facility represents characteristic elements of power plant design from the first part of the 20th century, and marks a period of expansion of hydro-electric generating capacity in Ontario during this time. Bingham Chute GS was constructed by the Hydro Electric Power Commission of Ontario (HEPCO) to augment generation capacity on the South River and to meet local demand following the purchase of the nearby Nipissing GS in 1916. The plant was furnished with two generators and a bank of transformers repurposed from the redesigned Nipissing GS. The straightforward configuration of the dam and headworks, penstock, and brick clad powerhouse is typical of hydro-

		electric facilities of the period and demonstrates a confidence in the design and construction of small facilities. The plain powerhouse currently contains some original equipment, including two Canadian Westinghouse Co. (1909) generators, and two double horizontal Francis turbines (1923, manufactured by Wm. Kennedy). Continuous upgrades, such as the replacement of the wood stave penstock with steel, and changes made to the transformer and switching equipment, have not altered the layout or overall impression of the GS. Despite changes to the transmission equipment, and demolition of the original Hydro colony buildings in the 1970s, Bingham Chute GS continues to be representative of the style and expression of early HEPCO generating facility planning, construction and operation. Therefore, Bingham GS is a representative example of a hydro-electric station from the first quarter of the 20th century.
ii, displays a high degree of craftsmanship or artistic merit	No	The compact layout of the Bingham Chute GS reflects the confidence that HEPCO engineers and builders had developed by the early 1920s. The dam, headworks, penstocks, powerhouse and tailrace follow a simple plan, and provide for a direct flow of water between the upper and lower sections of the river. The dam, penstock and unadorned brick clad powerhouse are architecturally unremarkable and follow a plan that HEPCO engineers applied to a number of other contemporary facilities in the system. The quality of the execution of the construction of the major components of the Bingham GS is reflected in their structural soundness after nearly a century of operation.
iii, demonstrates a high degree of technical or scientific achievement	No	Bingham Chute GS was constructed at the onset of a period of expansion by HEPCO; however, the facility was built after the early developments that made electricity generation and transmission practical had been achieved. No particular technical or scientific achievements appear to be demonstrated at the Bingham GS.

Historical or Associative Value		
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	No	Bingham Chute GS was built to provide additional capacity to the hydro-electric system in the northeast, augmenting output from Nipissing GS. HEPCO crews built the Bingham Chute GS, with J. C. McClelland responsible for building the power house. Bingham Chute GS was a project developed as a means of increasing generating capacity on the South River. The work was conceived and completed by HEPCO crews. Construction was undertaken to augment Nipissing GS production, and the project utilized repurposed equipment from that facility. Increased capacity was desired for a variety of reasons, primarily to address local demand. The new HEPCO station was named after the local Bingham family who had previously operated a grist mill at the chute. Beyond this, Bingham Chute GS has no other direct associations with any theme, event, belief, person, activity, organization or institution that is significant to the local community.
ii, yields, or has the potential to yield, information that contributes to an understanding of a community or culture	No	No aspects of the generating station have been identified that would contribute to the understanding of a community or culture.
iii, demonstrates or reflects the work or ideas of an architect, artist, builder, designer or theorist who is significant to a community	No	Bingham Chute GS was a project designed and developed by HEPCO engineers, with the construction mostly undertaken by HEPCO crews, with J. C. McClelland responsible for building the power house. It is likely the construction of the facility was carried out by staff transferred from outside of the local area that were experienced in industrial construction, augmented by local labourers.

Contextual Value		
3. The property has contextual value because it,		
i, is important in defining, maintaining or supporting the character of an area	Yes	Bingham Chute GS is composed of a small number of key elements; the main dam with sluiceways, penstock, powerhouse, and tailrace. These elements, plus the portage trail and the open area of lawn where the former Hydro colony was situated, form a cultural heritage landscape that defines the character of the Bigham Chute locale while providing a concise overview of how hydroelectric power is generated.
ii, is physically, functionally, visually or historically linked to its surroundings	Yes	Bingham Chute GS is physically, functionally, visually and historically linked to its surroundings. The GS has operated for nearly a century, and is one of three generating stations on the South River. It has continued in use as an active generating station on its original site for more than 100 years, and contributes to the understanding of the history of hydroelectric generation in the area. It is also of interest the GS replaced an earlier water powered grist mill, built and operated by the Bingham family in the late 1890s. This provides a continuity of historical appreciation for the role of water power, and specifically the water power provided at Bingham Chute, in the settlement and development of the Township of South Himsworth and Municipality of Powassan.
iii, is a landmark	Yes	All vehicles travelling west of Powassan on Highway 534 will observe Bingham Chute GS. South of the roadway is the dam and headstock, which rises above the level of the roadway. To the north, following the clear line of the black steel penstock, is the brick clad powerhouse. Viewed in this way, the GS serves not only as a visual landmark in the region, but provides a clear and concise visual expression of OPG/HEPCO hydroelectric generation and the capacity of small rivers to support renewable energy production.

3.2 Evaluation under *Criteria for Determining Cultural Heritage Value or Interest of Provincial Significance,* Ontario Regulation 10/06.

The "Criteria for Determining Cultural Heritage Value or Interest of Provincial Significance" as set out in Ontario Regulation 10/06 were applied to Bingham Chute GS to determine its cultural heritage value or interest to the province. Table 2 reflects the identified cultural heritage value of the subject property in respect to each of the evaluation criterion. The commentary is based upon background information contained in a Research Report prepared by UMcA, and the professional opinion of the consultant.

The text of Ontario Regulation 10/06 are found in Appendix II.

Table 2: Evaluation of Bingham Chute GS under the Criteria for Determining Cultural Heritage Value or Interest of Provincial Significance, O. Reg. 10/06.

Criterion	Response	Comments
1. The property represents or demonstrates a theme or pattern in Ontario's history.	No	Bingham Chute GS is associated with the early expansion of provincial hydroelectric power generation capacity in Ontario. Ontario, through HEPCO, financed, built and operated the plant. There are a number of hydroelectric generating stations from the early 20th century in operation in the province. The modest size of Bingham Chute GS suggests that it is of moderate importance to the province as a tangible expression of this important historical theme, nor is it the only or last remaining example of a facility of this type.
2. The property yields, or has the potential to yield, information that contributes to an understanding of Ontario's history.	No	The property is not considered to have the potential to yield information that contributes to an understanding of Ontario's history.
3. The property demonstrates an uncommon, rare or unique aspect of Ontario's cultural heritage.	No	Bingham Chute GS is one of approximately 120 hydroelectric generating stations that are over 40 years old and still operating in Ontario. The small number of hydroelectric generating stations built in Ontario renders them relatively rare compared to other building types. Bingham Chute GS relates to the initial expansion of hydroelectric power capacity under HEPCO, and is notable for the re-use of two turbines from Nipissing GS dating to 1909, coupled with turbines dating to 1923. However, the relatively plain exteriors and modest scale of the facility suggest that Bingham Chute GS is

		viewed as representative of this uncommon aspect of Ontario's cultural heritage at a local, not provincial level.
4. The property is of aesthetic, visual or contextual importance to the province.	No	Bingham Chute GS is considered to demonstrate its aesthetic, visual and contextual importance at a local rather than a provincial level.
5. The property demonstrates a high degree of excellence or creative, technical or scientific achievement at a provincial level in a given period.	No	Bingham Chute GS was built after the key inventions in large-scale generation and transmission. Therefore, the generating station is not considered to demonstrate a high degree of excellence or creative, technical or scientific achievement at a provincial level in a given period.
6. The property has a strong or special association with the entire province or with a community that is found in more than one part of the province. The association exists for historic, social, or cultural reasons or because of traditional use.	No	Bingham Chute GS does not have any known strong or special association with the entire province or with a community that is found in more than one part of the province.
7. The property has a strong or special association with the life or work of a person, group or organization of importance to the province or with an event of importance to the province.	No	Bingham Chute GS does not have any strong or special association with the life or work of a person, group or organization of importance to the province.

8. The property is located in unorganized territory and the Minister determines that there is a provincial interest in the protection of the property.	No	Bingham Chute GS is not located in unorganized territory.

4.0 Conclusions

Based on the application of the Criteria for Determining Cultural Heritage Value or Interest under Ontario Regulation 9/06, the conclusion of this Cultural Heritage Evaluation is that Bingham Chute GS holds cultural heritage value or interest based on design, associative and contextual values, and therefore ***Bingham Chute GS is a Provincial Heritage Property*** (PHP) as defined by the *Standards and Guidelines*.

However, Bingham Chute GS does not meet the criteria for provincial significance set out in Ontario Regulation 10/06. For this reason, ***Bingham Chute GS is not a Provincial Heritage Property of Provincial Significance*** (PHPPS) as defined by the *Standards and Guidelines.*

Sources

Ministry of Tourism, Culture and Sport. 2010. *Standards & Guidelines for Conservation of Provincial Heritage Properties*. April 28, 2010.

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Unterman McPhail Associates. 2021. Preliminary Assessment: Potential for Cultural Heritage Value or Interest, Bingham Chute Generating Station, Geographic Township of South Himsworth, Municipality of Powassan, District of Parry Sound, Ontario. Prepared for Ontario Power Generation.

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Figures

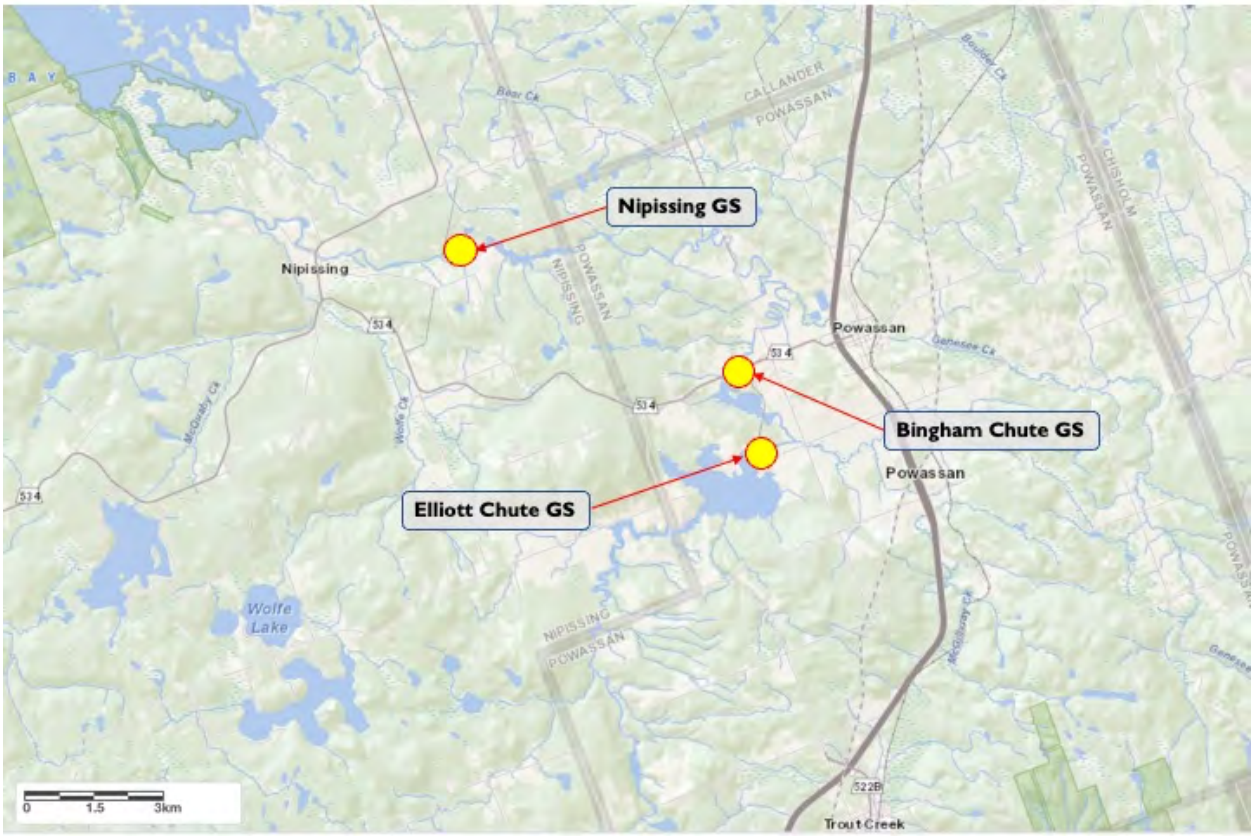

Figure 1: Bingham Chute Generating Station position on the South River.

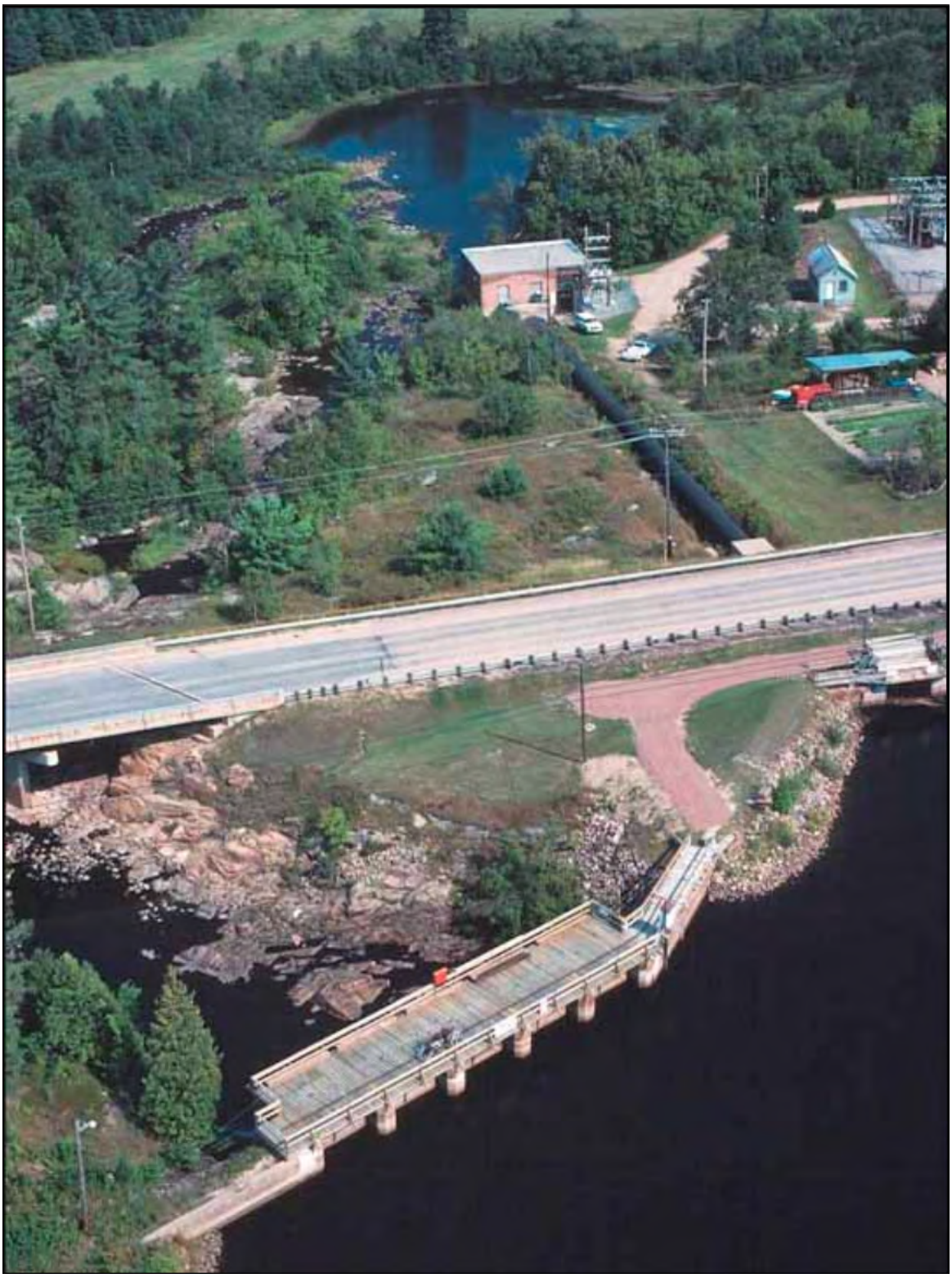

Figure 2: Bingham Chute Generating Station, local features. Note how Highway 537 separates the dam and water intake from the generating facility.

Appendix I

ONTARIO REGULATION 9/06

CRITERIA FOR DETERMINING CULTURAL HERITAGE VALUE OR INTEREST

Criteria

1. (1) The criteria set out in subsection (2) are prescribed for the purposes of clause 29 (1) (a) of the Act. O. Reg. 9/06, s. 1 (1).

(2) A property may be designated under section 29 of the 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. O. Reg. 9/06, s. 1 (2).

Appendix II

ONTARIO REGULATION 10/06

CRITERIA FOR DETERMINING CULTURAL HERITAGE VALUE OR INTEREST OF PROVINCIAL SIGNIFICANCE

Criteria

1. (1) The criteria set out in subsection (2) are prescribed for the purposes of clause 34.5 (1) (a) of the Act. O. Reg. 10/06, s. 1 (1).

(2) A property may be designated under section 34.5 of the Act if it meets one or more of the following criteria for determining whether it is of cultural heritage value or interest of provincial significance:

1. The property represents or demonstrates a theme or pattern in Ontario's history.
2. The property yields, or has the potential to yield, information that contributes to an understanding of Ontario's history.
3. The property demonstrates an uncommon, rare or unique aspect of Ontario's cultural heritage.
4. The property is of aesthetic, visual or contextual importance to the province.
5. The property demonstrates a high degree of excellence or creative, technical or scientific achievement at a provincial level in a given period.
6. The property has a strong or special association with the entire province or with a community that is found in more than one part of the province. The association exists for historic, social, or cultural reasons or because of traditional use.
7. The property has a strong or special association with the life or work of a person, group or organization of importance to the province or with an event of importance to the province.
8. The property is located in unorganized territory and the Minister determines that there is a provincial interest in the protection of the property. O. Reg. 10/06, s. 1 (2).

Appendix E

Cultural Heritage Impact Assessment Bingham Chute Generating Station Life Extension Project, South River, Municipality of Powassan, District of Parry Sound, Ontario

Cultural Heritage Impact Assessment
Bingham Chute Generating Station Life Extension Project
South River, Municipality of Powassan
District of Parry Sound, Ontario.

CHIA Report
May 8, 2025

Cultural Heritage Impact Assessment

Prepared for:

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and

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Prepared by:

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Executive Summary

ARCADIS Canada Inc. (Arcadis) has retained Northwest Archaeological Assessments (Andrew Hinshelwood, PhD, CAHP) and Unterman McPhail Associates (UMcA) to undertake a Cultural Heritage Impact Assessment (CHIA) for the proposed refurbishment of Bingham Chute Generating Station (GS) on behalf of Ontario Power Generation (OPG).

OPG has proposed refurbishment as the preferred option for Bingham Chute GS. Under the proposal, the existing powerhouse structure will be retained with minimal modifications to the exterior. No work is proposed on the main dam, sluiceways, spillway, dikes, or other water management infrastructure, although some minor work on the tailrace is expected. Most of the interior generating equipment will be replaced, with two new turbine/generator units installed and most of the powerhouse mechanical and electrical equipment.

According to the OWA Class EA Process 9th Edition, the proposed Bingham Chute Life Extension Project is a Category B Project. This means it is typically subject to the Class EA process but can be exempted if it meets certain requirements and successfully complete a screening process. The OWA Class EA 9th Edition has purposely developed a *Screening Process to Exempt Low-Risk Projects*. to qualify for the Class EA Screening process where a project: (a) is associated with existing water management infrastructure, such as a dam, a weir, or a lock. The existing water management infrastructure may be retrofitted or refurbished/upgraded and (b) limit any increase in the footprint of the water management infrastructure to 25% or less. The proposed project is a modern-day upgrade of the existing Bingham Chute GS. There is no proposed increase to the footprint of the water management infrastructure and does not involve any proposed work on the main dam, sluiceways, spillway, dikes, or other water management infrastructure. Some minor work on the tailrace is expected. The OWA Screening process to exempt low level projects involves a process and seven questions that need to be answered in the negative to be successfully screened out. One of those questions pertains to built heritage resources and the cultural landscape:

> *Have negative effects on known (previously recognized) or potential built heritage resources and/or cultural heritage landscapes?*

That answer to that question is logically informed by this CHIA. As such, the screening process and the CHIA development have been undertaken concurrently along with the engineering for the project. The MCM will be involved with the review of the project under both processes. OPG and Arcadis are of the view that the project can be screened out of the Class EA process (Arcadis, forthcoming; Shantz, personal communication).

Bingham Chute GS was evaluated against Ontario Regulation 9/06 and Ontario Regulation 10/06 and documented in a CHER in October 2022. Through the application of the "Criteria for Determining Cultural Heritage Value or Interest" under O. Reg. 9/06, Bingham Chute GS is of cultural heritage value or interest, due to its design, associative and contextual values. Therefore, it is a provincial heritage property (PHP) as defined by the MTCS Standards and Guidelines for the Conservation of Provincial Heritage Properties. The Bingham Chute GS does not fulfill the evaluation criteria for provincial significance as set out in O. Reg. 10/06 and is not considered to be a provincial heritage property of provincial significance (PHPPS) as defined by the MTCS Standards and Guidelines for the Conservation of Provincial Heritage Properties.

This CHIA assesses potential impacts to the Bingham Chute GS resulting from the proposed refurbishment project. Identified direct impacts for the project include removal of identified heritage attributes of the PHP (powerhouse equipment including the generators and turbines), and minor modifications to the powerhouse exterior (replace service door, mezzanine extension). No indirect impacts are identified resulting from the work. Positive impacts to refurbishment include the retained configuration of the component features of the facility and its continued use for hydro-electric power generation purposes on the South River. This maintains and continues an over 100-year identifiable and defining cultural heritage landscape and its retention for hydro-electric power generation reinforces the significant physical, functional, and visual connections among the GS facility's built heritage attributes.

The following conservation recommendations are provided to OPG to address the effects of the identified impacts to the Bingham Chute GS.

1. Powerhouse

It is recommended that all exterior work be completed in a manner that is sympathetic to the cultural heritage value or interest of the property. This includes ensuring that the proposed replacement steel service door is painted a subdued or 'heritage' colour, such as a dark matte green. The shape and exterior finishing of the proposed addition on the south wall of the powerhouse should match the form and style of the addition that was previously present and occupy the same footprint. Figures 8 and 16 provide a visual indication of the original form and will ensure that the alteration recalls an earlier stage in the building's history. Reconstruction of the wood frame entry on the east wall should be designed to match the south wall addition. Plans for proposed exterior modifications should be reviewed by a heritage building professional in advance of the work.

2. Equipment

It is recommended that Documentation of the heritage attributes of the facility should include the recovery and archival retention of all nameplates from the existing equipment (Figure 16 and 17). This will address OWA Mitigation Option 6, *Retain built heritage attributes as a monument or remnant for viewing purposes only*. These nameplates include information of value to future researchers such as manufacturer identification, part or series numbers, and information on capacity or function. In addition, the distinctive black Westinghouse electrical controls should be removed and retained either as a static display, or in archived storage. The controls reflect an earlier, pre-automation operational environment and as such provided valuable insight into the technological challenges of early hydro-electric power generation. We note that the control units may need to be treated for residual asbestos. This work should be completed by qualified hazardous material personnel who are made aware of the heritage value of the equipment.

3. Cultural Landscape

   It is recommended that the cultural landscape be documented, and that overall configuration of built and cultural landscape elements at Bingham Chute GS be protected from adverse alteration. Addressing this recommendation is largely passive, with sympathetic planning that maintains the general arrangement of elements and protects overall visibility from the public road. Introducing permanent signage or structures that may obscure the site from Highway 537 should be evaluated for adverse impact to the cultural landscape in advance of work.

4. Documentation

   It is recommended that a Cultural Heritage Documentation Report (CHDR) is prepared for the built heritage resources of the Bingham Chute GS property, focussed on the powerhouse (exterior and interior). This will address the substance of the OWA Mitigation Option 8 (b), *Undertake full recording and documentation of existing building*, even though the property was not subject to an Environmental Assessment. The documentation will take place prior to the commencement of work at the site, and may include additional documentation of the work in progress and on completion.

   The (CHDR), which will require additional fieldwork and draw on the information contained in the CHER and CHIA, will be prepared for OPG under supervision by a professional heritage consultant in good standing with the Canadian Association of Heritage Professionals (CAHP) and with demonstrated experience in the preparation of heritage documentation reports. The heritage consultant may convene an interdisciplinary team to support aspects of documentation and to ensure the completeness of the documentation report. The CHDR should include an historical summary of the development of the Bingham Chute GS, historical photographs, site plans, contemporary photographs of the structures, photographic key plans and available design drawings of the refurbished facility.

5. Allocation of Cultural Heritage Reports

   OPG will retain copies of all cultural heritage reports prepared (CHER, CHIA and CHDR) within the OPG official document repository system. Additionally, OPG will provide digital or hard copies of the reports to libraries in the Municipality of Powassan. Consideration should be given to supporting the library for the work associated with accessioning and cataloguing the reports.

1.0 Introduction

Ontario Power Generation (OPG) Bingham Chute GS is located on the South River approximately three (3) kilometres west of Powassan on Highway 534 (Figure 1). Specifically, the GS is situated at Lot 22, Concession 12 and Lot 22, Concession 13, Township of Himsworth. Highway 534 forms the boundary between Concessions 12 and 13. Bingham Chute GS is accessible from Highway 11 via Highway 534, running east from Powassan (Figure 2).

The South River flows from headwaters in western Algonquin Provincial Park northwesterly to South Bay on Lake Nipissing. Bingham Chute GS was built by the public utility Hydro Electric Power Commission of Ontario (HEPCO) in 1923 to augment the capacity of Nipissing GS (1909). Bingham Chute GS is located downstream from Nipissing GS and upstream from Elliott Chute GS.

1.1 Purpose of Study

Ontario Power Generation (OPG) OPG, owner of the property, is proposing the refurbishment of the Bingham Chute GS, which is at or approaching its end-of-service life and is undersized in comparison to potential output using more modern equipment. Refurbishment provides an opportunity to better utilize the available river flows, as well as extend the service life of the facility. ARCADIS Canada Inc. (Arcadis) retained Northwest Archaeological Assessments (Andrew Hinshelwood, PhD, CAHP) with technical report review by Unterman McPhail Associates (UMcA) to complete a Cultural Heritage Impact Assessment (CHIA) for the proposed refurbishment for OPG.

According to the OWA Class EA Process 9th Edition, the proposed Bingham Chute Life Extension Project is a Category B Project. This means it is typically subject to the Class EA process but can be exempted if it meets certain requirements and successfully complete a screening process. The OWA Class EA 9th Edition has purposely developed a *Screening Process to Exempt Low-Risk Projects*. to qualify for the Class EA Screening process where a project: (a) is associated with existing water management infrastructure, such as a dam, a weir, or a lock. The existing water management infrastructure may be retrofitted or refurbished/upgraded and (b) limit any increase in the footprint of the water management infrastructure to 25% or less. The proposed project is a modern-day upgrade of the existing Bingham Chute GS. There is no proposed increase to the footprint of the water management infrastructure and does not involve any proposed work on the main dam, sluiceways, spillway, dikes, or other water management infrastructure. Some minor work on the tailrace is expected. The OWA Screening process to exempt low level projects involves a process and seven questions that need to be answered in the negative to be successfully screened out. One of those questions pertains to built heritage resources and the cultural landscape:

> *Have negative effects on known (previously recognized) or potential built heritage resources and/or cultural heritage landscapes?*

That answer to that question is logically informed by this CHIA. As such, the screening process and the CHIA development have been undertaken concurrently along with the engineering for the project. The MCM will be involved with the review of the project under both processes. OPG and Arcadis are of the view that the project can be screened out of the Class EA process (Arcadis, forthcoming; Shantz, personal communication).

Bingham Chute GS was evaluated against the 2010 Ministry of Tourism, Culture and Sport (MTCS) *Standard and Guidelines for Conservation of Provincial Heritage Properties* (*Standards & Guidelines*). Northwest Archaeological Assessments undertook the cultural heritage evaluation of the property on behalf of OPG. The Cultural Heritage Evaluation Report (CHER) was finalized in October 2022.

The CHER concluded that, based on the application of the Criteria for Determining Cultural Heritage Value or Interest under Ontario Regulation 9/06, Bingham Chute GS holds cultural heritage value or interest based on design, associative and contextual values, and therefore Bingham Chute GS is a Provincial Heritage Property (PHP) as defined by the *Standards and Guidelines*. The CHER further concluded that Bingham Chute GS does not meet the criteria for provincial significance set out in Ontario Regulation 10/06. For this reason, Bingham Chute GS is not a Provincial Heritage Property of Provincial Significance (PHPPS) as defined by the *Standards and Guidelines*. As a PHP the provisions of the MTCS *Standards & Guidelines* apply to the subject property. Background research for the CHER did not identify any formally recognized heritage properties in proximity to Bingham Chute GS.

This CHIA provides an assessment of the impacts to Bingham Chute GS as a result of the proposed redevelopment. It sets out conservation recommendations that summarize how the Bingham Chute GS Life Extension Project should proceed in order to best protect and enhance the cultural heritage value and the heritage attributes of the identified cultural heritage resources. The report draws upon a site review undertaken in June 2022, to collect data for the preparation of the CHER. No new community input was solicited during preparation of the CHIA; however, the Ministry of Culture and Multiculturalism (MCM) were contacted during the preparation of the CHIA to ensure the information is current. The facility is not included on any list of designated or listed heritage sites.

1.2 Description of the Property

Ontario Power Generation (OPG) Bingham Chute GS is located on the South River within the geographic township of South Himsworth, Municipality of Powassan, District of Parry Sound (Figure 1). Specifically, the GS is situated at Lot 22, Concession 12 and Lot 22, Concession 13, Township of Himsworth. Highway 534 forms the boundary between Concessions 12 and 13. Bingham Chute GS is accessible from Highway 11 via Highway 534, approximately three (3) kilometres east of Powassan (Figure 2). The water control structure is visible from the highway to the south, while the penstock, powerhouse and ancillary structures are visible from the highway to the north. The penstock runs beneath the highway.

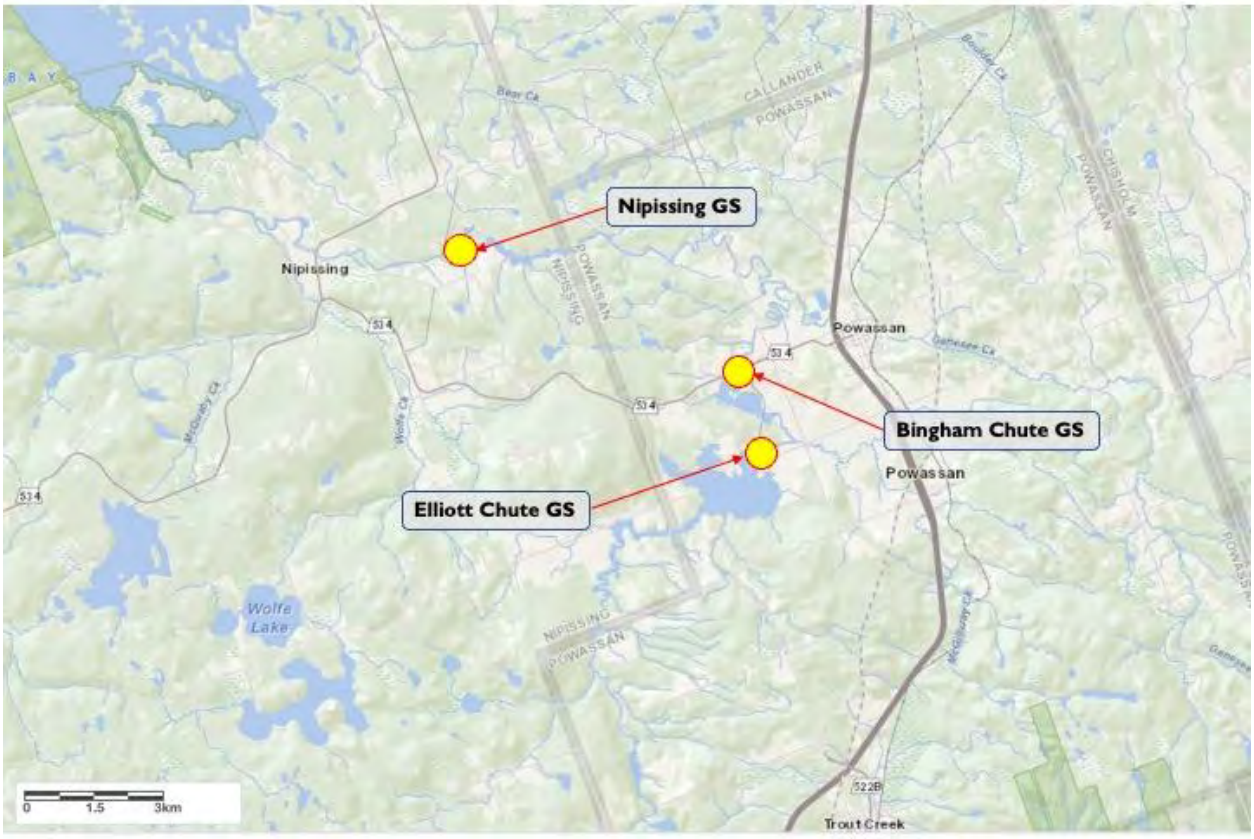

Figure 1: Regional location of the Bingham Chute GS.

Figure 2: Location and access of Bingham Chute GS.

The Provincial Heritage Property (PHP) at the Bingham Chute GS includes a range of structures and equipment present on site and relating to the operation and maintenance of the facility.

Built heritage resources present at Bingham Chute GS include the main (concrete) dam, earth fill dikes and wing walls, headworks, penstock, powerhouse, and tailrace. Also included among the built heritage resources at the site are the switchyard, storage building, and office/lunchroom. Within the powerhouse, heritage resources include two 1909 Canadian Westinghouse generators (sourced from Nipissing GS) connected to two 1923 double-Francis turbines, and associated power, control, and protection systems.

Hydro-electric power is supplied to the Hydro One feeder M7 from the Trout Lake substation through a 44 kV transmission line through a switchyard located at the GS. The two facilities are operated as separate entities, following the separation of the generation facilities from the distribution and transmission facilities, as required under the *Energy Competition Act, 1998*.

1.3 Report Format

This CHIA follows the Ministry of Tourism, Culture and Sport (MTCS – now MCM) *Information Bulletin 3: Heritage Impact Assessments for Provincial Heritage Properties* (January 31, 2017). This CHIA also draws upon experience of the consultants in the preparation of HIAs for provincial ministries, prescribed public bodies, and municipalities.

The report includes the following information:

- Introduction (Section 1)
- Statement of cultural heritage value or interest (Section 2)
- Description of the existing conditions (Section 3)
- Description and purpose of the proposed activity (Section 4)
- Assessment of the impacts from the proposed activity (Section 5)
- Considered alternatives and mitigation measures (Section 6)
- Discussion of community engagement (Section 7) and,
- Recommendations or preferred conservation strategies (Section 8)

Figures are included in the report in the manner best suited to supporting the text. Photographs are credited in the associated caption and collected at the end of the report. For the purposes of this report, the South River is considered to flow from south to north through the study area.

1.4 Project Personnel

For Northwest Archaeological Assessments	Andrew Hinshelwood, PhD, CAHP Heather Hopkins, PhD
For Unterman McPhail Associates	Richard Unterman, MA, CAHP
For ARCADIS Canada Inc.	Phil Shantz, MES, MCIP, RPP

2.0 Cultural Heritage Value or Interest

2.1 Heritage Recognition

Bingham Chute GS is recognized as a PHP as set out under the MTCS *Standards & Guidelines* (2010). The description of the PHP, the statement of cultural heritage value or interest, and the identification of heritage attributes as set out in Sections 2.2, 2.3 and 2.4, respectively were developed initially for the October 2022 CHER prepared by Northwest Archaeological Assessments 2023.

Bingham Chute GS has not been evaluated for federal heritage value and is not recognized as a federal government heritage resource. Furthermore, the facility is not commemorated through a local, provincial, or federal plaque program. The facility is not municipally listed and is not designated under the OHA. No formally recognized heritage properties are identified in proximity to the subject property.

Stage 1 and 2 archaeological assessment of Bingham Chute GS was completed by Woodland Heritage Northeast Ltd. The assessment included an evaluation of archaeological potential and test pit survey. No archaeological resources were identified as a result of the assessment and no further archaeological work was recommended in the corresponding. An evaluation of the potential for marine archaeological resources was also completed by Woodland Heritage Northeast Ltd. in 2023. Marine archaeological potential was evaluated as low.

2.2 Description of the PHP

Bingham Chute GS is located on the South River near the community of Powassan within the District of Parry Sound. At the time the CHER was completed (2022), the Provincial Heritage Property comprised the main (concrete) dam, earth fill dikes and wing walls, headworks, penstock, powerhouse, and tailrace. Also included among the built heritage resources at the site are the switchyard, storage building, and office/lunchroom. As a cultural heritage landscape, the PHP also includes the South River, a portage trail bypassing the dam and powerhouse, and an area identified as the site of the former operators' colony. Ancillary features including the switchyard and transmissions lines, are not within the ownership of OPG, and do not form part of the Provincial Heritage Property.

2.3 Statement of Cultural Heritage Value or Interest

Public ownership of hydro-electric power generation in northern Ontario in the first two decades of the 20th century began with the acquisition of existing generating stations by the Hydro Electric Power Commission of Ontario (HEPCO). Through the 1920s and 1930s HEPCO developed and expanded their network by constructing a number of small generating stations to augment production at larger, mostly acquired, facilities. Bingham Chute GS is an example of the first wave of hydro-electric generating stations built by HEPCO in northern Ontario. Dating to 1923/24, the GS is the second of three stations to be constructed on the South River, following Nipissing (built 1909, purchased by HEPCO 1916) and preceding Elliot Chute (1929). The facility therefore stands at the transition of hydro-electric generation capacity in northern Ontario from privately constructed stations to those built and maintained by the public utility.

The compact layout of the Bingham Chute GS reflects the confidence that HEPCO engineers and builders had developed by the early 1920s. The dam, headworks, penstocks, powerhouse, and tailrace follow a simple plan, and provide for a direct flow of water between the upper and lower sections of the river. The dam, penstock and unadorned brick clad powerhouse are architecturally unremarkable; however, the assemblage of individual elements allows for an accessible appreciation of the facility and its purpose. The powerhouse currently contains the original equipment, including two Canadian Westinghouse Co. (1909) generators (repurposed from Nipissing GS), and two double horizontal Francis turbines (1923; manufactured by Wm. Kennedy). Continuous upgrades, such as the replacement of the wood stave penstock with steel, and changes made to the transformer and switching equipment, have not altered the layout or overall impression of the facility (Figure 3).

Bingham Chute GS is physically, functionally, visually, and historically linked to the surrounding landscape. The GS has operated for over a century and its continued use as an active generating station on its original site contributes to our collective understanding of the history of hydro-electric generation in the north. It is also of interest that the GS replaced an earlier water powered grist mill built and operated by the Bingham family in the late 1890s. This

provides a continuity of historical appreciation for the role of waterpower, and specifically the waterpower provided at Bingham Chute, in the settlement and development of the Township of South Himsworth and Municipality of Powassan.

All vehicles travelling west of Powassan on Highway 534 will observe Bingham Chute GS. To the south, the dam and headstock rise above the level of the roadway. To the north, following the clear line of the black steel penstock, is the brick clad powerhouse. Viewed in this way, the GS serves not only as a visual landmark in the region but provides a clear and concise visual expression of OPG/HEPCO hydro-electric generation and the capacity of small rivers to support renewable energy production.

Figure 3a: Built Heritage and Cultural Heritage Landscape elements, north of Highway 537.

Figure 3a: Built Heritage and Cultural Heritage Landscape elements, south of Highway 537.

2.4 Description of Heritage Attributes

The S&Gs define built heritage resources as "*one or more significant buildings including fixtures or equipment located in or forming part of a building), structures, earthworks, monuments, installations, or remains that have cultural heritage value*". At Bingham Chute GS, built heritage resources include a range of constructions and equipment present on site and relating to the operation and maintenance of the facility.

Heritage attributes, or character defining elements of Bingham Chute GS include, but are not limited to, the following details (Figure 3):

- Main dam (concrete) with five sluices with concrete gravity walls to each side
- Concrete headworks structure with small wing walls and trashrack on upstream side
- Earth fill dikes from river banks connecting to sluiceway and headworks
- Penstock of rivetted steel on concrete saddles
- Penstock splits at powerhouse within concrete case, valves and cleanouts at lower end
- Powerhouse with concrete foundations and roof (flat)
    - Exterior is brick walls of two brick thickness, constructed using a common bond and a soldier course above window level on all walls. The bond course is absent on parts of the east wall. Three window bays on north and south, two bays east and west. South wall modified to have oversized access door on east end of wall. East wall modified with shed entry at access door. North wall includes wooden panels across the tailrace outlets in the concrete foundation.
    - Interior includes full height generator floor, with a partitioned area in northeast corner for circuit equipment.
    - Equipment includes two Wm. Kennedy and Sons (Owen Sound) turbines, two alternating current Canadian Westinghouse (Hamilton) generators.
- Tailrace
- Switchyard
- Storage building
- Office / Lunchroom

Equipment located within the powerhouse includes:

- 1909 Canadian Westinghouse Co. generators (2)
- 1923 double horizontal Francis turbines (2)
- 1923 rotating exciters (2)
- Draft tubes
- Scroll cases (2)
- Actuators (2)

A number of built heritage resources have been removed when their function was no longer supported, or replaced when upgrades were necessary for continued operation of the facility. Modifications to the built heritage resource assemblage include:

- 1923 Hydro colony consisting of three houses, a garage, and an icehouse, razed about 1970
- steel penstock to replace an earlier wood stave penstock in 1974
- Steel stop logs to replace wood stop logs; date unknown
- 1923 breaker yard removed in 1997
- storage building added 1984/1985
- lunchroom building added 1984/1985
- six early transformers (inside powerhouse) replaced by three transformers (outside powerhouse to east), removed after 2007
- log lifter replaced, date unknown. Original mechanism on site.

Unterman McPhail (2021) have provided a summary of the built heritage resources and cultural heritage landscape components present on the site in 2020. This table is included as Appendix I to this report.

3.0 Assessment of Existing Conditions

A cultural heritage assessment of Bingham Chute GS was carried out in 2022 on behalf of OPG by Andrew Hinshelwood, Northwest Archaeological Assessments Ltd., with support from Richard Unterman, Unterman McPhail Associates, Heritage Resource Management Consultants. Research completed at the time supported the preparation of two reports: a Cultural Heritage Research Report, and a Cultural Heritage Evaluation Report (CHER). Fieldwork completed in June 2022 included a review of the heritage attributes of the property, and to review the property relative to feasible redevelopment options.

3.1 Site Conditions

The development of the South River for hydro-electric generation purposes has altered the natural characteristics of the waterway. The primary difference is water level changes associated with the water control structures, and construction of generating facilities. Water control structures have been constructed to divert some water to the GS, while maintaining flow levels in a westerly trending bend in the river containing a series of rapids, or 'chutes'.

3.2 Built Heritage Resource Description

Bingham Chute GS contains the following built heritage resources:

- dam, dikes and sluiceways,
- headworks,
- penstock,
- powerhouse, and,
- tailrace,
- ancillary buildings.

Together these structures make up the generating station. The wider OPG property at Bingham Chute GS comprises a cultural landscape that includes the former hydro colony, portage trail and other intangible features.

The facility has a normal operating head of 13.4 metres. The powerhouse contains two Allis-Chalmers horizontal Frances turbines, two alternating current Canadian General Electric generators with a rated capacity of about 0.43 MW. The station has a total installed capacity of just under 0.9 MW.

A more detailed discussion of the heritage attributes is presented in Table 1.

Table 1: Property description, investigation, and condition.

Heritage Attribute	Site investigation	Condition
Dams and sluiceways. A visually striking concrete dam controls the flow of the South River at Bingham Chute GS, diverting flow from the main river channel toward the headworks. The main dam (built 1923) includes 6 piers and 5 sluice gates. The dam is supported to the west and east by wing walls and earth dikes to control elevated water levels upstream from the dam. Outflow from the sluices is to the original South River channel. The dam replaces at least two earlier log structures, originally built to direct flow to a sawmill built in the 19th century, and an earlier dam at Bingham Chute GS. A rail mounted log winch services the dam. No alterations are proposed as part of the refurbishment.	June 2022, A. Hinshelwood examined the property on foot accessing the structure from the sides and top. Figure 5 (end of report)	Good

Headworks. The headworks control the flow of water to the penstock. The headworks lie to the east of the dam at a former bend in the river above the portage. The headworks include one outlet leading to the penstock. The steel headgate is controlled locally with an electric hoists to isolate the penstock. No alterations are proposed as part of the refurbishment.	June 2022, A. Hinshelwood examined the property on foot accessing the structure from the access road. Figure 6 (end of report)	Good
Penstocks. The above-ground steel penstock is 107 m long, rests on a series of concrete saddles. The penstock runs directly north to the powerhouse, with a short section running beneath the road at the upper end. The penstock terminates at the powerhouse and is bifurcated to provide flow to the two turbines. The steel penstock was installed in 1974 to replace the original 2.4m diameter wood stave penstock. No alterations are proposed as part of the refurbishment.	June 2022, A. Hinshelwood examined the property on foot observing the structures from the access road and adjacent lawn area. Figures 7 (end of report)	Good
Powerhouse. The powerhouse dates to 1923 and is original to the site. Minor alterations to the powerhouse have been completed and are generally undated. Some windows and doors may have been replaced, and a wood framed extension covering the western part of the south wall has been removed. The 15m by 12m structure is a fairly plain utilitarian structure. The exterior is comprised of two brick wythe thickness walls constructed using a common bond and a soldier course above window level on all walls (Figure 8). The bond course is absent on parts of the east wall. Three window bays on north and south, two bays east and west. South wall modified to have oversized access door with transom windows on east end of the wall (Figure 9). East wall modified with shed entry at access door. North wall includes wooden panels across the tailrace outlets in the concrete foundation (Figure 10). The powerhouse rests on a concrete foundation and base, extending over the tailraces. The tailraces exit the building on the north side through concrete archways to a short tailrace channel. The proposed refurbishment of the Bingham Chute GS includes the replacement of interior generating and control equipment in the interior of the building. Exterior alterations will be limited to the replacement of the wooden 'barn-style' service doors on the south wall with a metal door. The wood framed shed structure over the east wall entry may be rebuilt or updated to match the existing form. It is also possible that an extension to the mezzanine to accommodate operations may be completed. The extension would be contained within a new wood frame extension matching the earlier structure in size and exterior finish.	June 2022, A. Hinshelwood examined the property on foot accessing the structure directly from the south and east. Figures 8 to 10 (end of report)	Good
Powerhouse Interior: The powerhouse interior includes a full height generator floor and a narrow mezzanine along the south wall. Circuit equipment and controls are located in the northeast corner of the main floor and consist of early, possibly original equipment (Figure 11), updated to match current requirements.	June 2022, A. Hinshelwood examined the property on foot with access to all parts of the interior area and mezzanine. Figures 11 and 12 (end of report)	Good

Large equipment in the powerhouse includes two Wm. Kennedy and Sons (Owen Sound) turbines, two alternating current Canadian Westinghouse (Hamilton) generators (Figure 12), actuators and ancillary equipment. The generators have sequential serial numbers (11546 and 11547) and rated capacity of 450 KW each. Proposed refurbishment will include the replacement of all of the equipment within the powerhouse, replacing the existing generating equipment. In the place of the horizontal Francis turbines, vertical DIVE turbines, vertical-axis propeller turbines with electronic regulation, will be installed. Installation will not require significant alterations to the existing powerhouse intake, foundation, or tailraces. Use of two 1MW turbines will increase the GS capacity from under 1 MW to 2 MW, ensuring continued operation of the station.		
Switchyard: The switchyard is positioned to the east of the powerhouse near the storage building. The switchyard is a recent installation. Alterations proposed as part of the refurbishment will include upgrades compatible to the new generating capacity of the GS.	June 2022, A. Hinshelwood examined the property on foot. Figure 13 (end of report)	Good
Other structures: Two small buildings are present at Bingham Chute GS. The older of the two is a wood frame storage building sited on the edge of the former Hydro colony, and which is seen in photographs from the 1920s, suggesting it is contemporary with the GS. This building should be considered a built heritage value within the cultural landscape of Bingham Chute GS. A small frame office / lunchroom building dating to the 1970s or later holds no cultural heritage value or interest. An early log lifting crane is also preserved in poor condition on the property. The crane offers a view of how dam operations were conducted in the period before automation and significant mechanical inputs. No alterations are proposed as part of the refurbishment.	June 2022, A. Hinshelwood examined the property on foot. Figures 14 to 16 (end of report)	Good
Access Roads: Access to Bingham Chute GS from Highway 537 includes entrances to the generating facility to the north and the headworks and dam to the south. The northern access is located about 275m from the South River bridge. The southern access is located about 75m from the bridge. Both access roads are gravel. The northern access is contemporary to the original construction and the later Hydro colony. The road is gravel and is regularly maintained. No alterations are proposed as part of the refurbishment.	June 2022, A. Hinshelwood examined the property on foot.	Good

4.0 Description and Purpose of the Proposed Activity

4.1 Introduction

The following description and purpose of the proposed activity at the Bingham Chute GS is based on the material provided by OPG and Arcadis to the consultant.

Bingham Chute GS was brought into service in 1925. OPG has determined that the GS has reached the end of its expected service life, normally considered to be 90 years, and is exploring measures to extend the life of the GS as a source of hydro-electricity. It has been determined that the most effective means of achieving this is to refurbish the facility by, among other inputs, installing two new turbine units.

4.2 Alternatives

An alternatives assessment was undertaken by OPG resulting in the selection of refurbishment.

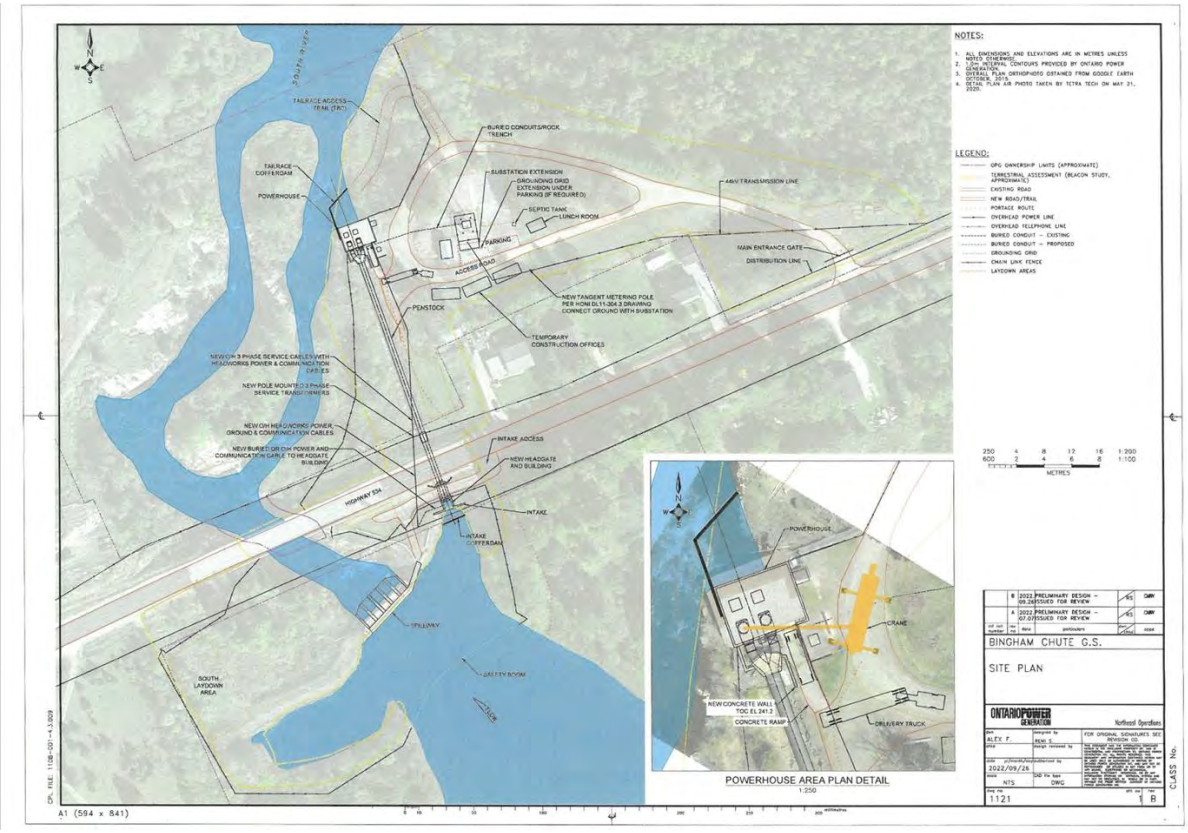

Figure 4: Proposed refurbishment plan for Bingham Chute GS.

4.3 Draft Final Site Plan

A plan for the proposed refurbishment has been prepared (Figure 4). This plan proposes the reconfiguration of the service access doors on the south side of the powerhouse to allow for the installation of two new DIVE turbines. Interior work at the GS will include removal of the existing equipment and the installation of the new turbines and related electrical equipment. OPG has selected a station configuration with two vertical turbine units rated at a total of 2 MW. Installation will not create a significant alteration in the overall configuration of the GS.

5.0 Impact Assessment

5.1 Introduction

This section provides an assessment of the potential effects of the proposed redevelopment.

The conservation of cultural heritage resources is considered to be a matter of public interest. Adverse impacts, as outlined in the MTCS *Information Bulletin 3: Heritage Impact Assessments for Provincial Heritage Properties* (January 31, 2017) can be described as 'direct' when there is a permanent and irreversible impact on the cultural heritage value or interest of a property or result in the loss of a heritage attribute on all or part of the provincial heritage property or 'indirect' when an activity adversely affects a property's cultural heritage value or interest and/or heritage attributes. A discussion of impacts should also consider positive outcomes that may affect a property by conserving or enhancing its cultural heritage value or interest and/or heritage attributes.

Examples of direct adverse impacts on a provincial heritage property may include, but are not limited to:

- Removal or demolition of all or part of any heritage attribute.
- Removal or demolition of any building or structure on the provincial heritage property whether or not it contributes to the cultural heritage value or interest of the property (i.e. non-contributing buildings).
- Any land disturbance, such as a change in grade and/or drainage patterns that may adversely affect a provincial heritage property, including archaeological resources.
- Alterations to the property in a manner that is not sympathetic, or is incompatible, with cultural heritage value or interest of the property. This may include necessary alterations, such as new systems or materials to address health and safety requirements, energy-saving upgrades, building performance upgrades, security upgrades or servicing needs.
- Alterations for access requirements or limitations to address such factors as accessibility, emergency egress, public access, security.
- Introduction of new elements that diminish the integrity of the property, such as a new building, structure or addition, parking expansion or addition, access or circulation roads, landscape features.
- Changing the character of the property through removal or planting of trees or other natural features, such as a garden, that may result in the obstruction of significant views or vistas within, from, or of built and natural features.
- Change in use for the provincial heritage property that could result in permanent, irreversible damage or negates the property's cultural heritage value or interest.
- Continuation or intensification of a use of the provincial heritage property without conservation of heritage attributes.

Examples of indirect adverse impacts on a provincial heritage property may include, but are not limited to:

- Shadows that alter the appearance of a heritage attribute or change the viability of an associated natural feature or plantings, such as a tree row, hedge, or garden.
- Isolation of a heritage attribute from its surrounding environment, context, or a significant relationship.
- Vibration damage to a structure due to construction or activities on or adjacent to the property.
- Alteration or obstruction of significant view of or from the provincial heritage property from a key vantage point.

Examples of positive impacts may include, but are not limited to:

- Changes or alterations that are consistent with accepted conservation principles, such as those articulated in MTCS's *Eight Guiding Principles in the Conservation of Historic Properties*, *Heritage Conservation Principles for Land Use Planning*, Parks Canada's *Standards and Guidelines for the Conservation of Historic Places in Canada*.
- Adaptive re-use of a property – alteration of a provincial heritage property to fit new uses or circumstances of the property in a manner that retains its cultural value or interest.
- Public interpretation or commemoration of the provincial heritage property.

5.2 Identification of Potential Impacts

Discussion of potential impact at Bingham Chute GS addresses the potential and adverse effects associated with the proposed refurbishment. The potential impacts of this project are principally associated with replacing the power generating equipment within the existing powerhouse.

5.2.1 Direct Impacts

Equipment removal
All equipment will be removed from the powerhouse. Elements of the equipment, such as the generators and turbines that date to 1909 and 1923, are identified as heritage attributes of the PHP that contribute to the cultural heritage value or interest of the property.

Powerhouse modifications
Possible modifications to the exterior of the powerhouse include reconstructing an earlier wood frame shed-type extension on the south wall of the powerhouse. This would support the extension of the mezzanine. Access would be through an existing, but currently sealed, door opening in the exterior of the building.

5.2.2 Indirect Impacts

No other heritage attributes of the PHP that that contribute to the cultural heritage value or interest of the property are proposed for alteration in the refurbishment.

5.2.3 Positive Impacts

Character

The retention of the powerhouse and continued use of the Bingham Chute GS property for hydro-electric power generation will retain the overall cultural landscape value and historical context of the property. Minor modification of the powerhouse exterior and replacement of the generating equipment inside the powerhouse create no significant exterior alterations, providing visual continuity at the site. The facility will continue the legacy of hydro-electric power generation at the site into the next century.

6.0 ALTERNATIVES AND MITIGATION MEASURES

As noted, an alternatives assessment was undertaken by OPG resulting in the selection of a refurbishment option by OPG. While the refurbishment is likely not subject to the OWA Class EA (as it is expected that the project will not be subject to the Class EA process but will be screened), we have referenced the Class EA mitigation measures for heritage resources as guidance (OWA 2022, Appendix B, Section 3.2).

6.1 Evaluation of Alternatives

The MTCS *Information Bulletin 3*, which provides guidance on the preparation of the HIA of Provincial Heritage Properties states:

> *The Heritage Impact Assessment must describe the alternative options and mitigation measure that were assessed in order to avoid or reduce any negative impacts to the property's cultural heritage value or interest. Further, these should be consistent with the relevant conservation strategies established in the adopted Strategic Conservation Plan where one exists*

An approved Strategic Conservation Plan is not in place for the Bingham Chute GS.

The evaluation of alternatives is not reviewed. In general, OPG are aware that proposed site alterations should seek to minimize or avoid adverse effect to cultural heritage resources. Interventions should be managed to be sympathetic with the value of the resources. Unavoidable adverse impacts should be mitigated such that deleterious effects to the cultural heritage resource are alleviated. The principal heritage philosophy for the protection of cultural heritage resources is retention *in situ* and the preservation of the material integrity to the maximum extent possible, consistent with public safety. Mitigation measures lessen or negate anticipated adverse impacts to cultural heritage resources.

6.2 Assessment of Conceptual Design

Bingham Chute GS is physically, functionally, visually, and historically linked to its surroundings. The GS is composed of a small number of key elements: the main dam with sluiceways, penstock, powerhouse, and tailrace. These elements, plus the portage trail and the open area of lawn where the former Hydro colony was situated, form a cultural heritage landscape that defines the character of the Bigham Chute locale while providing a concise overview of how hydro-electric power is generated. The footprint and exterior visual appearance of the facility will be unchanged from the present configuration. The focus of the refurbishment is the replacement of the 1909/1923 power generation equipment.

We note here as well that the facility is highly visible to the public travelling Highway 537.

Powerhouse
Removal of the existing, and installation of new generating equipment will require modifications to the service doors on the south side of the powerhouse. Modifications will include removal of the existing wooden, barn-style doors and the transom windows above and their replacement with a rolling metal door. In consideration of the heritage appearance of the building, it is recommended that the steel door be painted a subdued or 'heritage' colour, such as a dark matte green.

Also on the south wall, extension of the mezzanine level may require the reconstruction of a wood frame shed style extension. The shape and exterior finishing of the addition will match the form and style of the additional that was previously present and will occupy the same footprint. This will mark an alteration to the exterior, but one that recalls and earlier stage in the building's history.

Mitigation beyond sympathetic design in any exterior modifications to the powerhouse are not recommended at this time.

Equipment

The equipment currently in the powerhouse is obsolete. All equipment is scheduled to be removed from the existing powerhouse as part of the refurbishment. The equipment in the powerhouse is approaching 100 years old and does not meet contemporary design standards and requirements of hydropower equipment. The equipment is among the oldest equipment in service currently but does not reflect a unique or novel installation or technology. In that the equipment is not specifically indicated as possessing unique heritage attributes, no specific mitigation is required. As part of the recording and documentation of the powerhouse, the documentation and recording of the equipment may be included as a required mitigation action.

7.0 Summary of Community Engagement

Bingham Chute GS has not been identified as a property of cultural heritage value or interest by the municipality. The property is not listed in a local inventory. Furthermore, no formally recognized heritage properties were identified in proximity to the subject property.

OPG has been consulting on the project with Nipissing First Nation, Dokis First Nation, and the Metis Nation of Ontario. No concerns with respect to built heritage or the cultural heritage landscape have been identified to date. These Indigenous communities will be circulated on the Class EA Screening Report that has been prepared by Arcadis on behalf of OPG.

The Municipality of Powassan will be circulated on the Class EA Screening Report that has been prepared by Arcadis on behalf of OPG. As noted in Recommendation 5, below, digital or hard copies of all cultural heritage reports prepared (CHER, CHIA and CHDR) will be provided to libraries in the Municipality of Powassan and can be circulated to the municipality directly as well.

The Ontario Heritage Trust (OHT) does not hold a heritage easement on the property, and the OHT had not commemorated the site or the property. The Ministry of Citizenship and Multiculturalism (MCM) has not included the property in the List of Provincial Heritage Properties. Finally, at the Federal level, the property is not included in the Canadian Register of Heritage Properties.

8.0 Conservation Recommendations

Bingham Chute GS was evaluated against Ontario Regulation 9/06 and Ontario Regulation 10/06 and documented in a CHER in October 2022. Through the application of the "Criteria for Determining Cultural Heritage Value or Interest" under O. Reg. 9/06, Bingham Chute GS is of cultural heritage value or interest, due to its design, associative and contextual values. Therefore, it is a provincial heritage property (PHP) as defined by the Standards and Guidelines. The Bingham Chute GS does not fulfill the evaluation criteria for provincial significance as set out in O. Reg. 10/06 and is not considered to be a provincial heritage property of provincial significance (PHPPS) as defined by the Standards and Guidelines.

The following conservation recommendations are provided to OPG to address the effects of the identified impacts to the Bingham Chute GS.

1. Powerhouse

   It is recommended that all exterior work be completed in a manner that is sympathetic to the cultural heritage value or interest of the property. This includes ensuring that the proposed replacement steel service door is painted a subdued or 'heritage' colour, such as a dark matte green. The shape and exterior finishing of the proposed addition on the south wall of the powerhouse should match the form and style of the addition that was previously present and occupy the same footprint. Figures 7 and 15 provide a visual indication of the original form and will ensure that the alteration recalls and earlier stage in the building's history. Reconstruction of the wood frame entry on the east wall should be designed to match the south wall addition. Plans for proposed exterior modifications should be reviewed by a heritage building professional in advance of the work.

2. Equipment

   It is recommended that Documentation of the heritage attributes of the facility should include the recovery and archival retention of all nameplates from the existing equipment (see Figure 12). This will address OWA Mitigation Option 6, *Retain built heritage attributes as a monument or remnant for viewing purposes only*. These nameplates include information of value to future researchers such as manufacturer identification, part or series numbers, and information on capacity or function. In addition, the distinctive black Westinghouse electrical controls should be removed and retained either as a static display, or in archived storage. The controls reflect an earlier, pre-automation operational environment and as such provided valuable insight into the technological challenges of early hydro-electric power generation. We note that the control units may need to be treated for residual asbestos. This work should be completed by qualified hazardous material personnel who are made aware of the heritage value of the equipment.

3. Cultural Landscape

   It is recommended that the cultural landscape be documented, and that overall configuration of the built and cultural landscape elements at Bingham Chute GS be protected from adverse alteration. Addressing this recommendation is largely passive, with sympathetic planning that maintains the general arrangement of elements and protects overall visibility from the public road. Introducing permanent signage or structures that may obscure the site from Highway 537 should be evaluated for adverse impact to the cultural landscape in advance of work.

4. Documentation

   It is recommended that a Cultural Heritage Documentation Report (CHDR) is prepared for the built heritage resources of the Bingham Chute GS property, focussed on the powerhouse (exterior and interior). This will address the substance of the OWA Mitigation Option 8 (b), *Undertake full recording and documentation of existing building*, even though the property was not subject to an Environmental Assessment. The documentation will take place prior to the commencement of work at the site, and may include additional documentation of the work in progress and on completion of the refurbished facility.

   The CHDR, which will require additional fieldwork and draw on the information contained in the CHER and CHIA, will be prepared for OPG under supervision by a professional heritage consultant in good standing

with the Canadian Association of Heritage Professionals (CAHP) and with demonstrated experience in the preparation of heritage documentation reports. The heritage consultant may convene an interdisciplinary team to support aspects of documentation and to ensure the completeness of the documentation report. The CHDR should include an historical summary of the development of the Bingham Chute GS, historical photographs, site plans, contemporary photographs of the structures, photographic key plans and available design drawings.

5. Allocation of Cultural Heritage Reports

OPG will retain copies of all cultural heritage reports prepared (CHER, CHIA and CHDR) within the OPG official document repository system. Additionally, OPG will provide digital or hard copies of the reports to libraries in the Municipality of Powassan. Consideration should be given to supporting the library for the work associated with accessioning and cataloguing the reports.

Sources

Arcadis Canada Inc. 2025. *Ontario Power Generation OWA Class EA Screening Process Report Bingham Chute Generating Station Life Extension Project. May 2025.*

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Northwest Archaeological Assessments Ltd. 2022. *OPG Heritage* Review Process: Cultural Heritage Research Report, Bingham Chute Generating Station Redevelopment Project, South River, Municipality of Powassan, District of Parry Sound, Ontario. October 15, 2022.

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Unterman McPhail Associates, Heritage Resource Management Consultants. 2021. Preliminary Assessment: Potential for Cultural Heritage Value or Interest, Bingham Chute Generating Station, Geographic Township of South Himsworth, Municipality of Powassan, District of Parry Sound, Ontario. Report on file with OPG, Toronto.

Figures

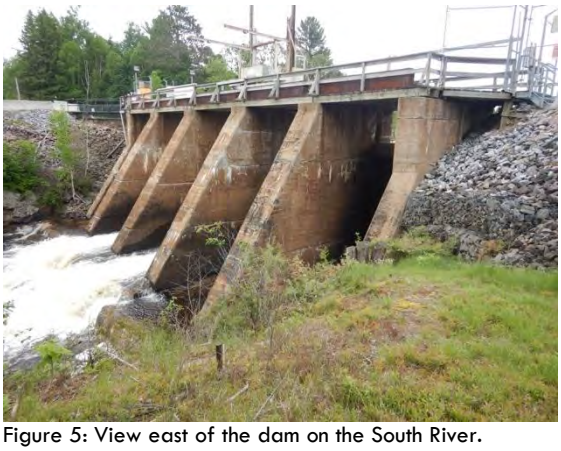

Figure 5: View east of the dam on the South River.

Figure 8: View northwest of brick powerhouse. Differential weathering of the brick preserves a shadow outline of the earlier addition on south wall.

Figure 6: View east of the headworks.

Figure 9: View north of south wall of powerhouse. Door and transom windows to be replaced.

Figure 7: View north of penstock and powerhouse. Compare with Figure 15.

Figure 10: View west showing tailrace exit from powerhouse.

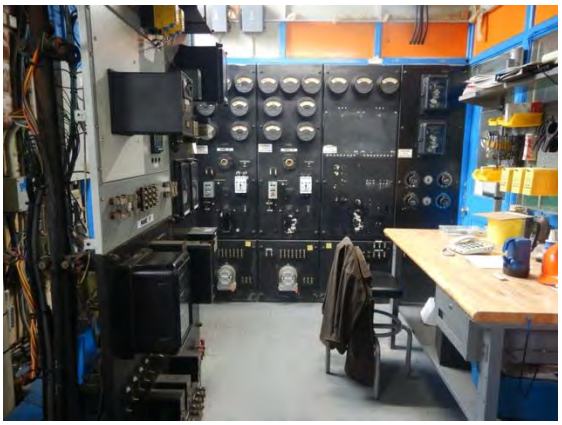

Figure 11: Electrical controls to be preserved off-site are original to the 1923 construction.

Figure 12: View east, interior, showing Unit 2. Three brass manufacturer's plates are visible in the image.

Figure 13: View west of the switchyard. The storage building is seen to the left of photo.

Figure 14: View of the storehouse, original to the 1920s construction.

Figure 15: View of office / lunchroom.

Figure 16: Bingham Chute GS log lifting crane, date unknown. Element of the cultural heritage landscape.

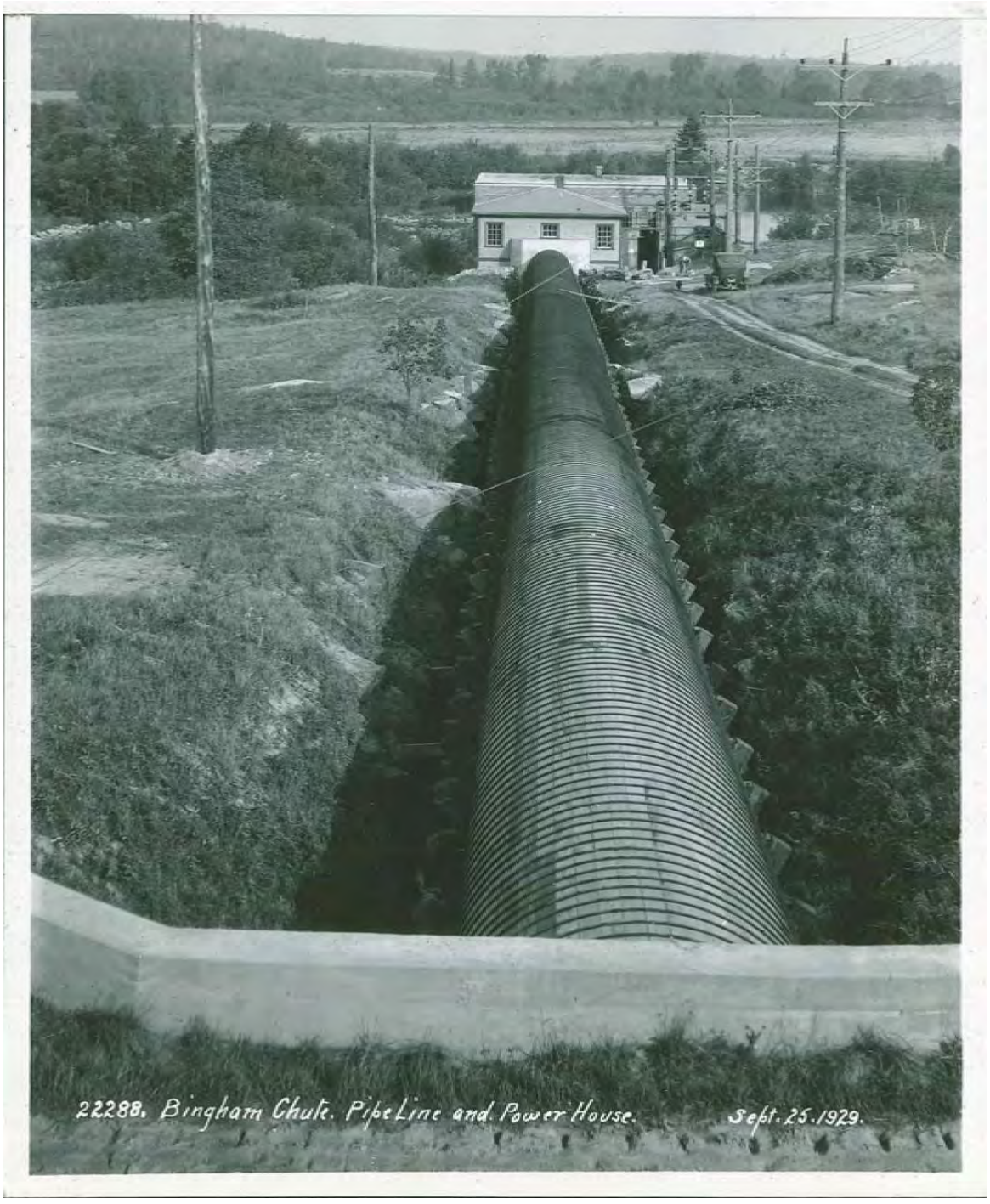

Figure 15: Early photograph of Bingham Chute GS showing original wood frame shed addition to south wall. Note the wood stave penstock and wood penstock supports, all of which were replaced circa 1975. Refer also to Figure 7.

Appendix I

Inventory of Built Heritage Resources and Cultural Heritage Landscape elements, Bingham Chute GS. (Unterman McPhail Associates, 2021).

TABLE 1: BINGHAM CHUTE GS: CURRENT LIST OF BUILT HERITAGE RESOURCES AND CULTURAL HERITAGE LANDSCAPE ELEMENTS OF POTENTIAL CULTURAL HERITAGE VALUE OR INTEREST

EQUIPMENT	DESCRIPTION	PRELIMINARYASSESSMENT: POTENTIAL CULTURAL HERITAGE VALUE OR INTEREST
OPG information as of August 2020		
Governor	N/A	Little to no potential for cultural heritage value or interest
Generator	Pre 1975: Canadian Westinghouse Co. (1909) and moved to Bingham Chute in 1923.	High potential for cultural heritage value or interest as a fixture/equipment of 40 years of age and older of the power house.
Turbine	Pre 1975: Double horizontal Francis (1923), Manufacturer: William Kennedy	High potential for cultural heritage value or interest as a fixture/equipment of 40 years of age and older of the power house.
Scroll Case	Pre-1975: Pressure case	High potential for cultural heritage value or interest as a fixture/equipment of 40 years of age and older of the power house.
Draft Tube(s)	Yes, no date provided.	High potential for cultural heritage value or interest as a fixture/equipment of 40 years of age and older of the power house.
Rotating Exciter	Pre 1975: Installed 1923	Some potential for cultural heritage value or interest.
Actuator	Yes, no date provided.	Little to no potential for cultural heritage value or interest.
Switches/ Switch Gear	Yes, 2015	Little to no potential for cultural heritage value or interest.
Probes?	Yes, no date provided.	Little to no potential for cultural heritage value or interest.
Data loggers	SCADA	Little to no potential for cultural heritage value or interest.
Sluice gates	N/A	Little to no potential for cultural heritage value or interest.
Log lifter	Post 1975; about 1990	Little to no potential for cultural heritage value or interest.
Stop logs	Yes, no date provided.	Little to no potential for cultural heritage value or interest.
Switchyard	Post 1975: Built in 2016.	Little to no potential for cultural heritage value or interest.
Aqueduct	N/A	N/A
Surge Tank	N/A	N/A
Penstock	Pre 1975: Replaced in 1974	High potential for cultural heritage value or interest as a CHL element of 40 years and older in age and as a significant component in understanding the GS operation.
Trash racks	Post 1975: Replaced in 2010.	Little to no potential for cultural heritage value or interest.
Overhead crane	Yes, no date provided.	Little to no potential for cultural heritage value or interest.
Main Dam(s) & Intake, Forebay	Pre 1975: Main Dam (1923)	Review OPG document, *Review of OPG's Dam: Proposed Screening Guidelines/ Procedures/Criteria*[23] as a screening process to assist in determining the heritage potential of OPG dam structures.
Headworks (Headrace Canal Spillway)	Pre 1975: Headworks	High potential for cultural heritage value or interest as a CHL element of 40 years and older in age and as a significant component in understanding the GS operation.
Main Structures/ Buildings:	Pre-1975: Power House (1924)	High potential for cultural heritage value or interest as a BHR of 40 years and older in age and as a significant component in understanding the GS operation.
Tailrace	Pre-1975: Built 1924	High potential for cultural heritage value or interest as a CHL element of 40 years and older in age and as a significant component in understanding the GS operation.
Transformer Building	Post 1975: 2015	Little to no potential for cultural heritage value or interest.
Bridge(s)	N/A	N/A
Switchyard	Post 1975: 2016	Little to no potential for cultural heritage value or interest.
Maintenance/Storage Buildings	Post 1975	Little to no potential for cultural heritage value or interest.
Office /Lunch Room	Post 1975: 1982-83	Little to no potential for cultural heritage value or interest.

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