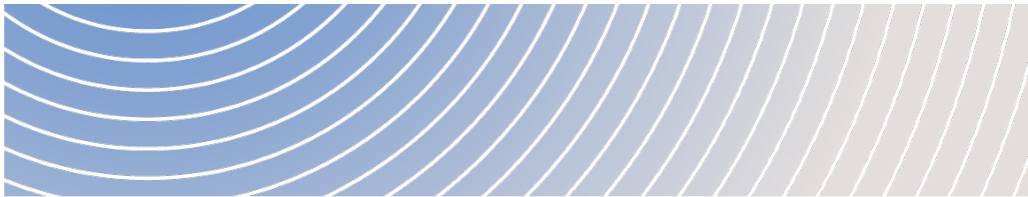




Agence d'évaluation
d'impact du Canada

Impact Assessment
Agency of Canada

Timiskaming Dam- Bridge of Quebec Replacement Project



INFORMATION REQUEST NO. 2

May 27th, 2024

PSPC Responses August 8th, 2025



Table of Contents

Important information to consider when responding to the information request	1
Methodology of Analysis	2
Information requests directed to the proponent	3
Comments and advice for the proponent.....	8
Alternative Means of Carrying out the Project.....	10
Information requests directed to the proponent	10
Atmospheric Environment.....	15
Information requests directed to the proponent	15
Comments and advice for the proponent.....	22
Surface Water	24
Information requests directed to the proponent	24
Comments and advice for the proponent.....	28
Riparian, Wetland and Terrestrial Environments.....	30
Information requests directed to the proponent	30
Fish and Fish Habitat	32
Information requests directed to the proponent	32
Comments and advice for the proponent.....	38
Birds and Bird Habitat.....	42
Information requests directed to the proponent	42
Comments and advice for the proponent.....	48
Species at Risk	50
Information requests directed to the proponent	50
Comments and advice for the proponent.....	56
Indigenous Peoples.....	58
Comments and advice for the proponent.....	58
Human Environment	61
Comments and advice for the proponent.....	61
Archaeological Resources.....	62
Information requests directed to the proponent	62
Comments and advice for the proponent.....	74



Accidents or Failures	75
Comments and advice for the proponent.....	75
Cumulative Effects	76
Information requests directed to the proponent	76
Monitoring and Follow-up Programs	101
Information requests directed to the proponent	101
Comments and advice for the proponent.....	104



Important information to consider when responding to the information request

Rationale for missing elements of information

The proponent must answer all the following questions to allow the Impact Assessment Agency of Canada (the Agency) to continue its analysis. Referring to the sector studies is not a sufficient response. These studies support the Environmental Impact Statement (EIS). The proponent must clearly indicate how it considered these studies in its environmental assessment and decisions.

If the proponent chooses to provide a single answer for more than one question, the proponent must clearly identify which questions the answer relates to.

The proponent must provide a rationale if no information is submitted for any of the items requested in this information request.

Review of the environmental effects assessment

For any questions that require a revision of the project's environmental effects assessment, the proponent must also update the following aspects:

- Description of potential environmental effects;
- Mitigation measures;
- Description and assessment of the significance of residual environmental effects;
- Cumulative effect assessment;
- Follow-up and monitoring programs.

Mitigation measure

In responding to the questions in this information request, the proponent must describe the practices, policies and commitments that constitute mitigation measures, i.e., technically and economically feasible measures for the elimination, reduction or control of the project's environmental effects. In its analysis of the significance of the effects, the Agency assesses whether the mitigation measures proposed by the proponent are adequate to mitigate the anticipated effects on the various valued components. In the absence of adequate mitigation measures proposed by the proponent, the Agency may conclude that there are significant adverse environmental effects and present its conclusions in the environmental assessment report submitted to the Minister.



Important notice to consider from PSPC for IR2 responses interpretation

Since publication of the Agency's Information Request No. 2 on May 27th, 2024, PSPC has further discussed the new dam-bridge alignment with **Kebaowek First Nation, Wolf Lake First Nation and Timiskaming First Nation**, each band within the Indian Act, as represented by the Chiefs and Councils (the "**SART First Nations**"), at their request. As a result of these discussions, PSPC has agreed to consider the downstream option with a modified sheet pile or alternate cofferdam located closer to the work site than the earthen cofferdam described in the EIS. PSPC's design-build contractors will be required to validate the feasibility of, and design of this alternate cofferdam, with input from Wolf Lake, Temiskaming and Kebaowek First Nations. However, in the EIS and responses to IAAC's information requests, PSPC is presenting the downstream scenario making use of an earthen cofferdam, which has greater environmental effects.



Methodology of Analysis

Information requests directed to the proponent

IAAC-2-1 - Valued Components

References

Canadian Environmental Assessment Agency (CEAA), August 2018. Guidelines for the Preparation of an Environmental Impact Statement, Part 1. Section 3.2.2 (Valued components to consider).

Tetra Tech, February 2023. Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 4, 5.1 and 10.1.2 and Chapters 18 to 20.

Public Services and Procurement Canada (PSPC), March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-1.

Context

For each of the valued components, the effects on Kebaowek, Wolf Lake and Timiskaming First Nations (SART) should be assessed in Table 20.1 of the proponent response to question IAAC-1-1. The table title should also be “Summary of Effects on the Human Environment” as it presents the effects on the human environment and not on the biological environment. Finally, the reference to paragraph 5(2)b)i), instead of 5(1)c(i) in Table 20.1 seems more appropriate for health and socio-economic aspects impacting non-Indigenous people.

The Agency instructs the proponent to:

- A) Provide a revised table considering SART information.

PSPC Response:

PSPC is committed to ongoing consultation and collaboration with the SART communities. PSPC has updated the title of Table 20.1 to reflect that it is a summary of effects on the human environment (see Appendix G). PSPC has attempted to integrate the SART communities’ valued components and significance ratings into Table 20.1. However, because the methods used in the SART reports are not consistent with those used in the EIS, PSPC is unable to interpret the results to ensure they fit within Table 20.1 while accurately reflecting SART’s significance ratings.

For example, the Bio-Cultural Impact Pathways Study for the Timiskaming Dam-Bridge Quebec Replacement Project produced by the Kichi Sibi Technical Team states on page 18:

“There is a possibility that employment and contracts at the site might briefly enhance our economies; but we are also concerned (as indicated in the tables above), that the project will diminish our well-being and our rights even further. If so, those changes will be serious, of medium economic impact, but will be experienced daily and be irreversible.”



Table 20.1. assesses the significance of the effect using the following criteria:

- direction of effect (positive or negative)
- magnitude
- geographical extent
- duration
- frequency
- reversibility

It is not evident to PSPC how the ratings 'serious' and 'medium economic impact' correspond to the ratings currently in Table 20.1 under magnitude. Additionally, the direction of these effects is also not evident. No geographical extent or duration is provided in the summary text or supporting tables within the Pathway Study. Finally, it is not clear whether the effect that "will be experienced daily and be irreversible" refers to employment, economies, or well-being and rights.

PSPC committed to working collaboratively with SART to revise Table 20.1 and requested clarification of their methodology to reach their conclusions. PSPC met with and exchanged emails with SART several times from July to November 2024 to work on resolving completion of the Table. The SART-led revision of the Table was listed as an action in a draft Consultation Work Plan sent to SART in late July 2024 and based on a meeting held with SART on July 5th. In a long email exchange starting September 27 and ending November 11, 2024, there was discussion about how to frame the table and sort it by *Section 35* rights holders and include other details about number of participants from other Indigenous groups. In one of those exchanges (October 3 & 7, 2024), SART indicated that they would be contracting a consultant to help them with completing the table and that those costs would be included in a future Consultation Agreement. They were also waiting for their lawyer to provide some clarity on IAAC's policy positions on UNDA. The matter was discussed again at a meeting between SART and PSPC on October 28, 2024 at which time PSPC noted they were waiting on SART's work plan and budget. SART noted at the meeting that they wanted mediation at the planned workshop around outstanding issues in IR1 and IR2. Since November 2024, SART and PSPC have been focused on addressing issues related to the dam-bridge alternatives and the issue of completing Table 20.1 was suspended.

PSPC recognizes the importance of understanding the effects of the Project on SART communities. PSPC remains open to continuing dialogue with SART to complete a summary of the Project effects on SART communities and will provide this to the Agency when it is available. In a meeting with SART, PSPC and the Agency in July 2025, it was understood that SART is working on the EA Report in which the significance of effects of the Project on SART would be expressed. If SART wishes to abandon the effort to complete Table 20.1, then PSPC trusts that SART and the Agency will accurately identify the significance of Project effects on the SART communities in the EA Report phase.



IAAC-2-2 - Wildlife Data Sources

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.1.6 (Fish and Fish Habitat), 7.1.7 (Birds and bird habitat) and 7.1.8 (Species at Risk).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Chapter 12.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-4.*

Context

There are concerns that the use of data from the Ontario dam replacement project in the present EIS may be outdated. In the proponent response to question IAAC-1-4, it is unclear what data for which species was carried over to the EIS from the Hatch reports. It is also unclear if Ontario databases were checked for more recent data.

The Agency instructs the proponent to:

- A) List all species assessed in the EIS that were informed by Hatch reports and the datasets carried over.

PSPC Response:

In the Environmental Effects Evaluation Report published in July 2014 by Hatch for the Timiskaming Ontario Dam Replacement, the following species were documented with desktop review and 2013 field data, and considered when appropriate for the Timiskaming Québec Dam Replacement EIS:

Fish:

- Bass sp.
- Brook Stickleback
- Brook Trout
- Brown Bullhead
- Burbot
- Cisco (2013 field data)
- Emerald Shiner
- Fallfish
- Freshwater Drum
- Johnny Darter
- Lake Chub
- Lake Sturgeon
- Lake Trout (2013 field data)
- Lake Whitefish (2013 field data)
- Longnose Sucker
- Monkfish



- Mooneye
- Northern Pike (2013 field data)
- Northern Hog Sucker
- Pumpkinseed
- Rock Bass
- Sauger
- Smallmouth Bass
- Shorthead Redhorse
- Trout-perch
- Walleye (2013 field data)
- White Sucker (2013 field data)
- Yellow Perch

Terrestrial fauna:

- Snapping Turtle (2013 field data)
- American Toad (2013 field data)
- Spring Peeper (2013 field data)
- Wood Frog (2013 field data)

Species of Conservation Concern (distribution range overlapping project site):

- American Bittern
- American Woodcock
- Bald Eagle (2013 field data – in transit)
- Bank Swallow
- Barn Swallow
- Bay-breasted Warbler (2013 field data)
- Belted Kingfisher
- Black Tern
- Bobolink
- Brown Trasher
- Canada Warbler
- Chimney Swift
- Common Loon (2013 field data)
- Common Nighthawk
- Common Snipe
- Common Tern (2013 field data)
- Eastern Meadowlark
- Eastern Wood-pewee
- Field Sparrow
- Golden-winged Warbler
- Great Black-backed Gull
- Killdeer
- Least Bittern
- Northern Flicker



- Northern Rough-winged Swallow
- Olive-sided Flycatcher
- Peregrine Falcon
- Purple Finch
- Red-headed Woodpecker
- Red-shouldered Hawk
- Rusty Blackbird
- Sedge Wren
- Short-eared Owl
- Spotted Sandpiper (2013 field data)
- Upland Sand piper
- Veery (2013 field data)
- Whip-poor-will
- Willow Flycatcher
- Wood Thrush
- Lake Sturgeon (2013 field data)
- Snapping Turtle (2013 field data)

As per DFO permit (file 14-HCAA-00814, condition 5), post construction monitoring of the Ontario Dam informed spawning of Walleye (*Sander vitreus*), Suckers species (*Catostomidea*), Lake Sturgeon (*Acipenser fulvescens*) and Lake Whitefish (*Coregonus clupeaformis*) for years 1 and 2 after construction (2017 and 2018). Techniques used include netting, egg mats and visual observation. This data is found in Hatch reports dated January 24, 2018 (Year 1 report) and February 12, 2019 (Year 2 report).

Furthermore, juvenile Lake Sturgeon and Lake Whitefish recruitment in a 9 km stretch in the Ottawa River below the Timiskaming Dam Complex was monitored in Year 4 post construction (2019). Netting was the prime technique deployed to assess recruitment, and habitat monitoring was also included in the report. This data is found in Hatch report dated January 19, 2021.

- B)** Review data and studies available from Ontario Wildlife databases and incorporate any recent (last 5 years) data or studies in the EIS.

PSPC Response:

NHIC data was consulted August 1, 2024. Only two species are cited in Timiskaming area namely American eel and Lake sturgeon (grids 17PM4474, 17PM4475, 17PM4574, 17PM4575). These were covered by 2017 and 2021 field work and well documented in the Quebec Dam Project EIS.

The Ontario Reptile and Amphibian Atlas 2009-2019 was consulted on July 15, 2024. Neither new species is reported in the area nor new data to integrate in the EIS report.

Since publication of the Hatch EEE Report for the Ontario Dam in 2013, no new Ontario Breeding Bird Atlas has been published. Atlas-2 was published for the 2001-2005 period, and Atlas-3 is expected in a few years for the 2021-2025 period.

The Important Bird Areas (IBA Canada) data was consulted on July 15, 2024, and no such area exists in the Timiskaming Region.



The Species at Risk in Ontario (SARO) list was consulted on July 18, 2024. A limited number of species was added to the list since the publication of the Hatch EEE Report for the Ontario Dam in 2013, and the status of some species was updated after 2013. New species or species with new status with habitat overlapping the project site are Yellow-banded Bumble Bee and Tri-colored Bat. Both of these species were considered in the Quebec Dam Project EIS.

Comments and advice for the proponent

Comment 2-1 - Integration of the United Nations Declaration on the Rights of Indigenous Peoples Act

References

PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-1.

Department of Justice Canada, 2023. United Nations Declaration on the Rights of Indigenous Peoples Act Action Plan. <https://www.justice.gc.ca/eng/declaration/ap-pa/ah/pdf/unda-action-plan-digital-eng.pdf>

Comments and advice

The United Nations (UN) Declaration on the Rights of Indigenous Peoples Act provides a roadmap for the Government of Canada and First Nations, Inuit and Métis to work together to implement the UN Declaration based on lasting reconciliation, healing and cooperative relations.

The Agency encourages the proponent to work in consultation and cooperation with First Nations, Inuit and Métis to achieve the objectives of the UN Declaration.

Because of their strong connections to traditional lands, SART and AOPFN pointed out that the project is located on unceded Algonquin land.

PSPC Response:

PSPC has committed to working collaboratively with SART and AOPFN, and other Indigenous groups to achieve the objectives of the UN Declaration. As such, PSPC has ensured that Indigenous groups were financially supported to conduct their own assessment of impacts on their rights and interests (consistent with UNDRIP Article 18). PSPC also used UNDRIP as the foundation for the assessment of the potential impacts on Indigenous rights (consistent with UNDRIP Article 32) in the EIS Chapter 13:

“In the absence of Treaty agreements for many of the Indigenous groups involved in the Project, the UNDRIP is used as a foundation to the assessment of potential impacts on Indigenous rights. For each of the VCs the relevant UNDRIP articles are listed and has formed the basis of the rights assessment goals/indicators. Some Indigenous groups have opted to conduct a rights assessment directly with the Agency and is therefore not contained in their sections of Chapter 13.”



Finally, PSPC will propose a co-led approach to planning and implementing the Environmental and Social Management Plan for the construction and post-construction phases of the Project consistent with UNDRIP Articles 26 and 32.

Alternative Means of Carrying out the Project

Information requests directed to the proponent

IAAC-2-3- Comparison of Options

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 2.2 (Alternative means of carrying out the project)*.

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 6.3.1.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-6 and 1-31 and comments 1-9 and 1-11.*

Arbour (2020). *Assessing inputs of contaminants in the upper Ottawa River near the Town of Témiscaming, Québec. M.E.Sc Thesis, Nipissing University, 292 pp. [Thesis - Assessing inputs of contaminants in the upper Ottawa River](#)*

Context

In response to question IAAC-1-6, the proponent provided an amended table with environmental, social, economic, and technical issues (Table 6.7 of the EIS). There are concerns arising from the review of different options, and most notably the rationale behind the preference of option 1 (construction downstream). It should be clear how each factor was considered in the decision-making process.

Furthermore, the proponent should acknowledge concerns on the location of the dam-bridge raised in SART Bio Cultural Impact Pathways Report. A total of 47.5% of Kebaowek First Nation members, who are the most active fishers of the three communities, highlighted option 2 (upstream of the existing location) as the preferred choice. Option 3 (same location) was the second choice for 33.8% of the members, while Option 1 (downstream of the existing location) was chosen by 14.5%.

Main issues are:

- (1) Fish and fish habitat. Although there is more surface area of fish habitat destroyed in option 2 (construction upstream), the types of habitats destroyed, and the ecological functions associated with these habitats in option 1 and option 3 (current layout) are very different from the type of habitat destroyed in option 2. It is unclear how the overall effect on fish habitat was calculated and whether there were different weightings assigned to the type of habitat.
- (2) Residual materials. It is unclear how the global effect of residual materials was calculated and whether there were different weightings assigned to the type of residual materials.

- (3) Contaminated soils. The contaminated soils sampled around the projected construction zone represents an issue that should be addressed in the comparative table.
- (4) Sediment volume. The proponent should explain why sediment sampling was not considered prior to selecting project option. Dredging comparisons are needed to assess each option.
- (5) Contaminated sediments. Characterization of sediment sampled upstream and downstream of the dam-bridge showed mercury content, as underlined by Arbour (2020). There are concerns about the potential release of contaminated sediments in the project area that should be comparatively addressed.

The Agency instructs the proponent to:

PSPC Comment (general):

PSPC would like to remind the Agency that SART and other Indigenous communities did comment on the analysis of the three options considered for this project as stated in Section 6.3.2 of the EIS:

“A more detailed analysis was conducted on the basis of environmental impacts. The first step of this comparative analysis consisted of identifying interactions between Project elements and VCs. The objective was to ensure that option 1 does not involve a significantly higher number of potentially negative interactions compared to options 2 and 3.

Tables 6.9, 6.10 and 6.11 show VC interactions with the elements of each of the three options. The letter “P” indicates a potential effect and the letter “N” indicates a negligible effect. The analysis is based on the judgement and experience of professionals working on the Project and of Indigenous communities when provided.

SART provided direct comments on each of the option tables (Tables 6.9 to 6.11) and noted that there were potential interactions between all project activities and all their VC's in options 1 and 2. Option 3 was preferred due to its relatively lower impact on Section 35 fishing rights compared with the other options presented. They noted that because local people fish at the Project location, dewatering and site clearing in all options had a potential interaction with land use and socio-economic conditions. Potential interactions were added for archaeological features as they noted concerns with the way the 2017 archaeological work had been done. Potential interactions on socio-economic conditions, wildlife species/habitats, and endangered species was noted due to the construction of the fish passage because they note that invasive species (such as bass) may affect other fish and “everyone”.

Potential interactions were noted for interactions between construction of the new dam and sediment quality, wildlife species and habitats, and endangered species. Related to operation activities potential impacts were noted for routine maintenance since the dam alters water flows and soil volume and quality, they believe, may also be impacted.

Antoine Nation provided comments on the tables and noted that there are potential interactions in option 1 with the construction of the fish passage on all their VCs except for architectural, archaeological, and cultural heritage resources. It is inferred from their comments provided during consultation, that this potential interaction also exists for options 2 and 3 since they also propose a fish passage. They noted all other interactions are considered negligible.

The AOO noted that the installation of the cofferdam in options 1 and 2 may impact Algonquin archaeological resources in the riverbed. Based on other comments received from the AOO, it is inferred that there could be potential interactions between all project activities and the AOO VCs. The AOO has

opted to complete an assessment of impacts on their rights independently and therefore may provide this assessment to the Agency later in an addendum.

AOPFN is preparing an independent analysis of the alternatives based on AOPFN-developed criteria. This analysis was not available at the time of submission to the Agency and will be submitted as an addendum to the EIS. These interactions are marked with "IA" indicating "in addendum."

The MNO provided direct comments on the interactions tables. They noted that option 3 have lesser impacts on current uses and rights (related to fish and therefore fishing impacts) but that option 3 also be more adverse than in options 1 and 2 on traffic. They note that for the options the scope of activities under 'waste management' and 'reconstruction of the new space' were unknown and therefore did not evaluate potential interactions with MNO VCs. These are denoted with an asterisk (). In option 3 they note that the interaction between 'reconstruction of the new space' and MNO VCs is not applicable. The MNO has opted to complete an assessment of impacts on their rights independently and therefore may provide this assessment to the Agency later in an addendum. Nevertheless, they have provided an indication of potential impacts on rights as shown in Tables 6.9 to 6.11. »*

Regarding the results of the SART Bio Cultural Impact Pathways Report that states that Option 3 and 2 are preferred by fishers, PSPC finds this result unsurprising since there was missing and mis-leading information about each option in the SART questionnaire. For example, in the survey it states that the downstream option would have 'significant effects on fish spawning habitats for pickerel, sucker, and threatened lake sturgeon' and says nothing of the proposed mitigations (beyond the fish ladder) to address impacts on fish habitat. The description in the survey of the other dam bridge options does not, in PSPC's opinion, objectively lay out the pros and cons of each. Therefore, PSPC believes that the survey was biased.

PSPC has offered to co-design and co-deliver a workshop whereby a full range of pros and cons of the three options are provided for evaluation by the SART community representatives. This will also include the information provided in the responses below.

- A) Provide a description of how the global effect on fish habitat was determined for each alternative.

PSPC Response:

Global effect on fish habitat was determined by calculation of loss of spawning area and other habitats sustaining fish population (growth, feeding) with equal weighting. Temporary and permanent loss was measured in m² and given equal weighting. Loss of more than 12,000 m² was considered "Negative Effect" and loss under 12,000 m² was considered "Neutral Effect". A "Positive Effect" would require net fish habitat gain.

- B) Provide a description of how the global effect of residual materials was determined for each alternative.

PSPC Response:

The global effect of residual materials was assessed by comparing the options, the one generating the most residual materials getting the lowest score (Negative Effect) and the one generating the less getting the best score (Positive Effect).



C) Describe how the contaminated soils have been addressed for each alternative, if any.

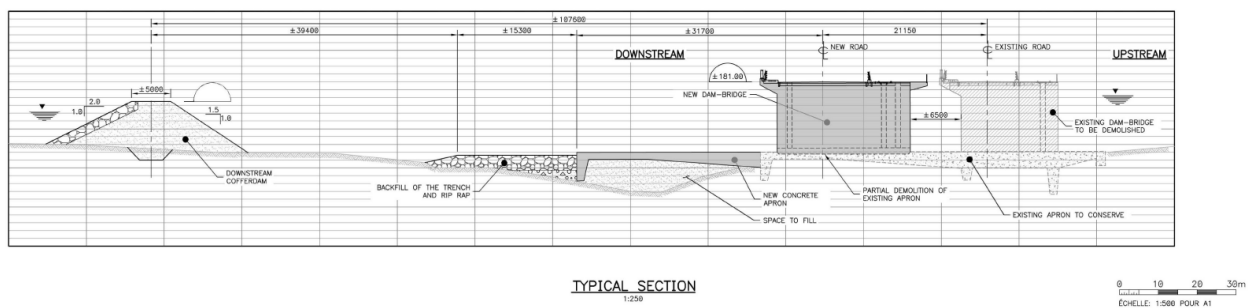
PSPC Response:

PSPC has access to a series of reports produced over the years giving a broad picture of the soil conditions on Long Sault Island and on the left bank of the river. The soil contamination identified (1 location only) was mapped and compared to the layout of the three options. Where project work did not intersect with the soil contamination site, no impact was identified. This was the case for the three options.

D) Provide a description of dredging sediment volumes for each option.

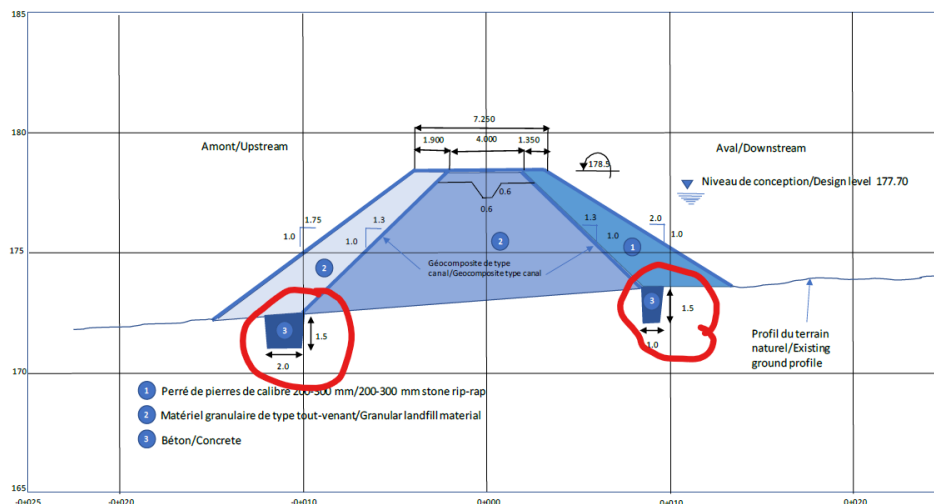
PSPC Response:

Dredging sediment volume – Option 1



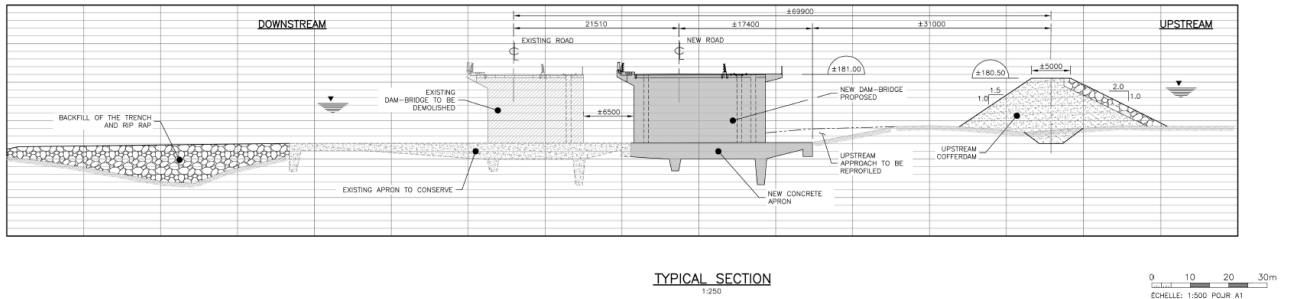
As the new dam-bridge would be built on the downstream apron of the existing dam-bridge, the only volume of sediment that may be dredged would be to secure the geomembrane of the cofferdam on the riverbed (see Figure 7.3 of the EIS below). A 2.0 m by 1.5 m trench is required downstream of the cofferdam and a 1.0 m by 1.5 m one is required upstream of the cofferdam. For a length of approximately 110 m, this represents a volume of sediment to remove of 495 m³.

Figure 7.3 Cross-section of the Cofferdam Required in Phase 1



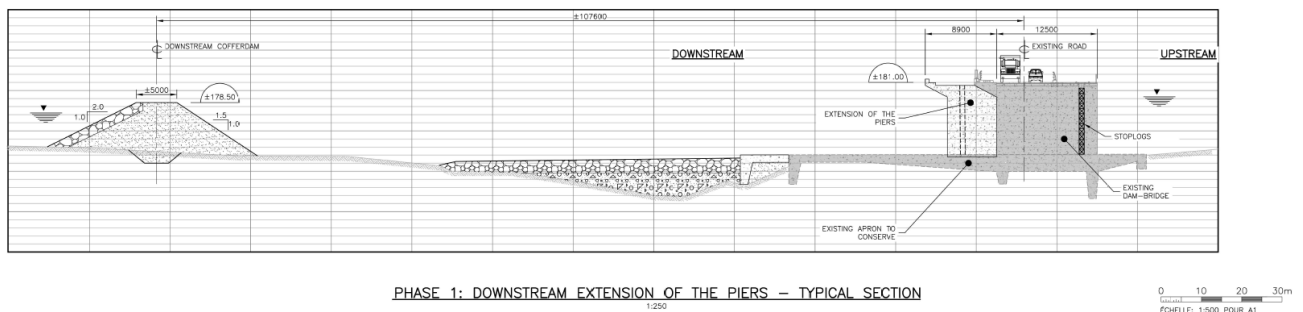


Dredging sediment volumes – Option 2



Option 2 would require building a new apron to support the upstream dam-bridge location. Having a width of 22 m, an average depth of 2,5 m and a length of 90 m, this represents a volume of 4,950 m³ of sediment to remove. The cofferdam would have the same characteristics as for Option 1 but with a length of 125 m, giving a sediment volume of 562.5 m³. Total sediment volume to remove for Option 2 is 5,512.5 m³.

Dredging sediment volumes – Option 3



The new dam-bridge for this option would use the existing apron but would require the same cofferdam as for Option 1 representing a sediment volume to remove of 495 m³.

E) Precise which option has the least potential of releasing potentially contaminated sediments.

PSPC Response:

Considering PSPC Response D) above, Options 1 and 3 would be less susceptible to release potentially contaminated sediments. Option 2 requires the removal of sediment volume (5,512.5 m³) more than 10 times greater than the other options (495 m³).



Atmospheric Environment

Information requests directed to the proponent

IAAC-2-4 - GHG Emissions - Operational and Decommissioning Phases

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.1.1 (Atmospheric, light and noise environment) and 7.2.1 (Changes to atmospheric, sound and light environments).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 11.2.1.1.3.2.3.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to comment 1-8.*

Context

The EIS is missing information on GHG emission estimates for the operational and decommissioning phases of the project. The proponent did not respond to ECCC recommendation to provide these estimates (comment 1-8 - GHG emissions – operational and decommissioning phases).

The Agency instructs the proponent to:

- A) Provide anticipated GHG emissions during operations and decommissioning phases.

PSPC Response:

An annual GHG emission estimate was made using PSPC energy bills for the 2022-2023 and 2023-2024 fiscal years. Main energy use was electricity for various building needs and lighting and diesel fuel for emergency generator and vehicles. The operation of the existing dam-bridge emits 53,6 tons eq.CO₂ t per year. As the same energy need is expected for the new dam-bridge, a total of 4,020 tons eq.CO₂ would be emitted during the 75-year life expectancy of the new dam-bridge.

For the decommissioning phase, PSPC assumes that this new dam-bridge will need to be replaced by a similar one in 75 years. Not knowing the technologies available in the future, the worse-case scenario would be a replacement using similar technologies as this project, emitting the same amount of GHG (3,410 tons eq.CO₂ = 3,197 tons eq.CO₂ from the EIS + 213 tons eq.CO₂ from response to IAAC-1-12).



IAAC-2-5 - Estimated Quantities of Contaminant Emissions

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.2.1 (Changes to the atmospheric, sound and light environments).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec), Environmental Impact Statement. Sections 11.2.1 and 11.2.1.1.1.*

PSPC, March 2023. *PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-9.*

Context

Part of the information used to make assumptions about the estimated contaminant emissions during the various phases of the project is missing. Without detailed information, ECCC is unable to confirm or evaluate the data presented by the proponent. In response to question IAAC-1-9, the proponent mentions that the assumptions were made using the experience of the Ontario dam, under the supervision of PSPC, and other similar projects in the region. These values are expected to evaluate the results anticipated for the Quebec dam-bridge.

The Agency instructs the proponent to:

- A) Provide the missing information used to make assumptions about the estimation of contaminant emissions, enabling the estimation of contaminant emission to be validated.

PSPC Response:

Assumptions made for calculation of air pollutants in Section 11.2.1.1.1 of the EIS are the same used for calculation of GHG in Section 11.2.1.1.3 of the EIS. These are:

Air emission sources

Type of source	Name	Description
1	Machinery for the construction of the new dam-bridge	Use of diesel fuel by machinery
2	Machinery for the demolition of the existing dam-bridge	Use of diesel fuel by machinery
3	Transportation of materials for the new dam-bridge	Use of diesel fuel by transport trucks: backfill, concrete, steel reinforcement, etc.
4	Transportation of materials from the demolition of the existing dam-bridge	Use of diesel fuel by transport trucks: Essentially residual materials from the demolition.



Diesel consumption by machinery and trucks

The rate of diesel consumption by machinery (excavators, front-end loaders, cranes, etc.) is estimated at 20 L/h on average by machine, based on data published by the manufacturer Caterpillar (2006). That value is considered to be representative of the average consumption by equipment needed for this type of work.

The rate of diesel consumption by highway transport trucks is 32 L/100 km on average per truck. That value reflects the average consumption of Class 8 heavy trucks, based on a study by the U.S. Energy Information Administration (2019).

Transport truck capacity

The estimate of transportation distances for materials and residual matter depends on the load capacity of the transport trucks. The calculations take into consideration the transport capacities indicated in the table below.

Material	Capacity
Backfill / demolition debris	20 t / truck
Concrete	8 m ³ / truck
Reinforcing steel	10 t / truck
Fabricated metals	10 t / truck
Residual matter	20 t / truck

Estimated quantity of materials

Material	Density	New dam-bridge construction		Existing dam-bridge demolition	
		m ³	t	m ³	t
Backfill / Demolition debris	1.6	55,000	88,000	14,695	23,512
Concrete	2.3	12,000	27,600	5,290	12,167
Reinforcing steel	-	-	1,222	-	6
Fabricated metals	-	-	29	-	48
Residual materials	-	-	0	2,035	4,070

Source of materials

Material	Possible source	Transportation distance
Backfill / demolition debris	North Bay	70 km
Concrete	North Bay	70 km



Reinforcing steel	Ottawa	375 km
Fabricated metals	Ottawa	375 km
Residual materials	North Bay	70 km

Estimated use of machinery on work site

Work type	Machinery time (hours)		
	New dam construction	Existing dam demolition	Total
Duration of work (days)	542	82	624
Civil	27,506	4,162	31,668
Founding-structure	876	132	1,008
Dismantling sheet pile	4,008	606	4,614
Total	32,390	4,900	37,290

Estimated trucking travel distance for new dam construction

Material	New dam construction			
	Material quantity		Number of trips	Travelled distance
	m ³	t	Round trip	km
Backfill	55,000	80,000	4,400	616,000
Concrete	12,000	27,600	1,500	210,000
Reinforcing steel	-	1,222	122	91,640
Fabricated metals	-	29	3	2,140
Residual materials	-	0	0	0
Contingency (10%)				91,980
	Total		6,025	1,001,760



Estimated trucking travel distance for existing dam demolition

Material	Existing dam demolition			
	Material quantity		Number of trips	Travelled distance
	m ³	t	Round trip	km
Backfill	14,695	23,512	1,176	164,640
Concrete	5,290	12,167	662	92,680
Reinforcing steel	-	6	1	750
Fabricated metals	-	48	5	3,750
Residual materials	-	4,070	204	28,560
Contingency (10%)				29,040
		Total	2,048	319,420

Specific emission factors

In order to estimate the level of atmospheric emissions for multiple parameters, emission factors from the U.S. EPA are used in the calculations (Nonroad exhaust emissions standards; Heavy-duty exhaust emission standards and AP-42 “Compilation of Air Emissions Factors from Stationary Sources”). Detailed information, such as specific emission factors and other calculation inputs, are presented in Appendix A of this document (in French only).

End result

Considering the above cited assumptions, conclusion of Section 11.2.1.1.1 of the EIS show on-site activities require the combustion of 745,800 liters of diesel, releasing 0.8 metric tons of CO, 0.09 tons of NO_x, 0.02 tons of SO₂, and 0.004 tons of PM_{2.5} to the atmosphere. In addition to on-site emissions, an additional 425 978 liters of diesel burnt by transport trucks on public roads will emit 2.7 tons of CO, 0.03 tons of NO_x, 0.01 tons of SO₂, and 0.002 tons of PM_{2.5}.

IAAC-2-6 - Blasting activities

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.2.1 (Changes to atmospheric, sound and light environments) and 7.4 (Mitigation measures).*



Tetra Tech, February 2023. Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec), Environmental Impact Statement. Sections 11.2, 11.2.1 and 11.2.1.1.1.

PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-11 and IAAC-1-15.

Context

In response to question IAAC-1-11, the proponent states that blasting activities would only be possible when a jackhammer could not be used to remove parts of the existing dam-bridge, but that it is impossible to assess the quantities of possible explosive used as well as their location. Blasting activities were used in the Ontario dam replacement project.

For blasting activities, the proponent refers to mitigation measures for the protection of fish that would have been agreed with the Department of Fisheries and Oceans (DFO) for the Ontario dam replacement project. According to the proponent, “no fish mortalities (floating fish) or impacts were observed or recorded during the contained-blast demolition of the dam-bridge piers”.

Furthermore, response to question IAAC-1-15 mentions only one mitigation measure to limit dust emissions, namely avoiding blasting activities during periods of high winds.

The Agency instructs the proponent to:

- A) Provide a realistic scenario for the use and handling of explosives.

PSPC Response:

A realistic scenario could be similar to what was experienced for the Timiskaming Ontario Dam Replacement project. Only the 15 piers of the old Ontario Dam were authorized to be demolished by means of blasting. Blasting occurred in January and February 2017. Each pier was approximately 5’ wide, 45.5’ long and 23.5’ deep. All drilling was carried out in advance of the scheduled blasting. There was one row of holes drilled on a 30” centers along the centerline axis of each pier. Drill-holes were 2.75” to 3” in diameter. Holes were drilled to the depth of concrete piers. Depth of holes was controlled to limit explosives column to remain within the concrete at the interface of piers and the base at the bottom. The drill hole at each end of the pier along its long axis was at a minimum standoff distance of 2’ from the edge.

Based on the Ontario Dam contractor’s past experience in blasting submerged piers, loading each hole with decoupled explosives column was recommended. Only nitroglycerine based explosives were used due to the cold temperatures and wet conditions. Explosive cartridges were traced with a single strand of 25 grain detonating cord along the depth of the hole to a collar of 3’. In order to minimize hole-to-hole interference, all holes in a single pier were recommended to be detonated simultaneously or to have sequencing single holes on a 25 ms delay. The deck was separated from piers prior to loading and blasting to ensure complete collapse of the pier charged with explosives.



- B) Present other mitigation measures to reduce dust generation during blasting.

PSPC Response:

If blasting is deemed required for the demolition of the Quebec Dam, the exposed portion of dam elements charged with explosives would be covered with rubber blasting mats as well as the use of suspended geotextile apron for protection against potential flying debris escaping the blast. A blasting specialist would be on site and could recommend any changes in blasting process such as improving blasting mat placement and fabric to limit fly ice (if conducted in winter) and/or fly concrete.

- C) Confirm which and whether there were any other environmental effects monitored for, following blasting at the Ontario dam site, and the criteria used for monitoring.

PSPC Response:

According to the Timiskaming Ontario Dam - FAA Summary Report (Hatch, April, 1 2021), during all demolition activities, the new dam was closed and there was no flow in this area, as required by Condition 2.2.1 of the FAA. Any and all blasting occurred outside of the critical fish spawning period (March 31 to July 15). Mitigation measures outlined in the DFO Measures to Avoid Causing Harm to Fish and Fish Habitat were included in the demolition plan. No fish mortality (floating fish) or impact was observed or recorded during the contained-blast demolition of the bridge piers.

- D) Describe what monitoring will be done if blasting is used for this project in addition to the noted incidental observations.

PSPC Response:

Fish monitoring will be conducted as per the requirements to be included in the DFO authorization. Blast induced vibrations will be monitored in accordance with available DFO guidelines for use of explosive in or near Canadian fisheries waters and requirements of Ontario Provincial Standard Specification. Also, as indicated in Response B above, a blasting specialist will be on site to monitor the impacts during blasting including monitoring of dust emissions. For dust, measures identified in the revised Table 23.1 (refer to IAAC-1-15) will be implemented and monitored as follows:

- Visual inspection and monitoring of dust emissions on and around the Project site should be carried out on a regular basis;
- Activities involving significant emissions of dust or causing nuisance due to air emissions should be identified and mitigation measures should be implemented if necessary (i.e. dust clouds reaching privately owned or publicly accessible areas);
- Complaints from neighbours regarding dust or air quality should be registered, analyzed, and addressed with the adequate mitigation measures.

- E) Include in this description any other anticipated effects from blasting in addition to fish spawning as well as methods employed to limit the overpressure threshold in or near waterways to 30 kPa (210 dB re 1 µPa) during blasting.

PSPC Response:

Should blasting be required, this would be undertaken in winter conditions as described in PSPC Response A) above, avoiding effect on fish spawning, and limiting effect on fish in general. Blasting would be done with new downstream dam-bridge closed, limiting possible effects on fish upstream of the existing dam-bridge. Should fish be found between the new and the existing dam-bridge before the blasting activities, fish would be captured and relocated prior to blasting.

Only vibration, dust emissions, and potential impact on fish from blasting are anticipated.

The recommendations included in the latest DFO Guidelines for the use of Explosives in or Near Canadian Fisheries Waters will be followed to ensure safe blasting and to mitigate the vibration and overpressure effects. Furthermore, mitigation measures described in the document "[Managing the Impact of Blast-induced Vibration and Overpressure on Fish and Fish Habitat](#)" published in 2019 by the US Federal Highway Administration can also complement DFO's recommendations, such as scare charges, bubble curtains and barriers, and reduction of surface area of the blast. Specific blasting method and mitigation measures will depend on condition of the existing dam-bridge at the time of demolition and will be submitted to appropriate authorities for permitting.

- F) Describe how Indigenous communities will be involved in the decision process and planning for blasting, including adaptive measures, if it is determined that blasting is required.

PSPC Response:

PSPC has committed to engaging with Indigenous groups for key project activities which includes blasting if it is deemed to be required. PSPC's goal is to avoid or limit blasting at a minimum, but if it's needed, the Indigenous groups will be part of the discussion during all the process surrounding any blasting activity.

Comments and advice for the proponent

Comment 2-2 - – Air Quality Management Plan

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.1.1 (Atmospheric, light and noise environment), 7.1.9 (Indigenous peoples) and 7.2.1 (Changes to atmospheric, sound and light environments), and 7.3.4 (Indigenous peoples).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 23.7.1.1.*



PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-15.

Comments and advice

In response to question IAAC-1-15, the proponent modified Table 23.1 of section 23.7.1.1 from the EIS. The Agency encourages the proponent to develop the air quality management plan with Indigenous communities affected, notably by including people in charge of the Algonquin Canoe Company Store.

PSPC Response:

PSPC has started to draft a collaborative approach to planning and implementing the Environmental and Social Management Plan (ESMP, please see Appendix D) which includes the air quality management plan. PSPC will share the ESMP with Indigenous communities over the summer and early fall 2024, and make sure to include representatives from Wolf Lake First Nations (owner of the Algonquin Canoe Company Store) for discussing the air quality management plan with them.



Surface Water

Information requests directed to the proponent

IAAC-2-7 – Service, Storage and Parking Areas and Mitigation Measures

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.2.2 (Changes to surface water) and 7.4 (Mitigation measures).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 11.2.3.4.2.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question AEIC-1-16.*

Context

Given the location and surface area of the service area and heavy equipment parking area, and the width of Long Sault Island (approximately 120 m), the following mitigation measures, presented in the response to question IAAC-1-16, seem difficult or impossible to implement:

- avoid work and storage in the 30 m riparian buffer zone;
- avoid moving machinery within the 30 m riparian buffer zone;
- install a concrete mixer washing station at least 60 m from the shoreline;
- install a temporary concrete plant at least 60 m from the shoreline.

If the 30 m (or 60 m) riparian buffer strip is applied, there is almost no surface area left for the areas mentioned. It therefore seems difficult or impossible to carry out all the activities presented on Long Sault Island while respecting the 30 m or 60 m riparian buffer strip. The proponent will have to find storage, service and parking areas that respect the buffer strip, and ensure that mitigation measures are in place to capture TSS (total suspended sediments) from runoff from these areas.

It would also be relevant to define what is meant by “inert materials” to ensure that no contaminants or debris, including TSS, can reach surface waters.

The Agency instructs the proponent to:

- A) Locate on a map potential machinery maintenance and refuelling sites, hydrocarbon and material storage sites, concrete mixer parking and washing sites, and potential concrete plant sites that are compatible with the proposed mitigation measures, or present additional mitigation measures if their distance from watercourses is less than 30 m, or 60 m in the case of the concrete mixer washing station.



PSPC Response:

Considering the context above, the following adjustments are presented by PSPC.

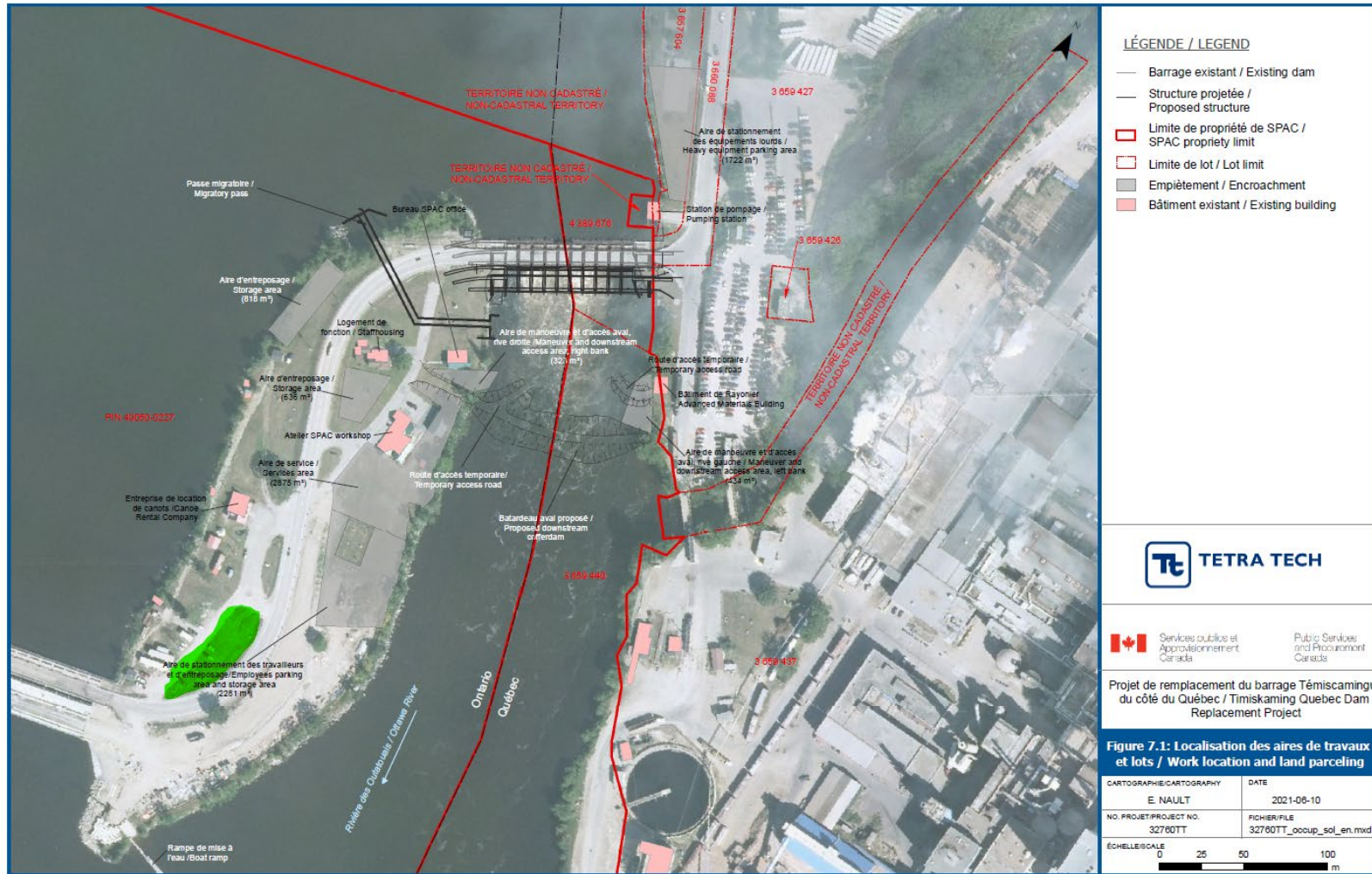
The location of potential site for machinery maintenance and refueling, and hydrocarbon storage corresponds to the 2,875 m² "Aire de service / Services area" identified on Figure 7.1 below. This area goes from the riverbank to Highway 63 on a distance of 55 m. Maintenance, refueling and hydrocarbon storage would be concentrated closer to Highway 63, more than 30 m from the riverbank. Major maintenance activity would be conducted outside of the work site.

Concrete mixer parking and washing station would be located in the 636 m² "Aire d'entreposage / Storage area". The washing station would be in the center of the area, giving a 60 m distance from the riverbank of both sides.

Some materials would be stored in the 2,281 m² "Aire de stationnement des travailleurs et d'entreposage / Employees parking area and storage area". This area goes from the riverbank to Highway 63 on an average distance of 47 m, giving room to limited storage 30 m away from the riverbank. PSPC is now considering an additional 2,525 m² storage area near the Ontario dam-bridge. This area is located between 37 m and 79 m away from the riverbank and would allow material storage on its full surface. It would also be suitable for the installation of the mobile concrete plant. This new area is highlighted in green in Figure 7.1 below.

The 818 m² "Aire d'entreposage / Storage area" near the riverbank would not be used.

As for use of the 1,772 m² "Aire de stationnement des équipements lourds / Heavy Equipment Parking Area", it would be equipped with a silt fence with absorbent mats to prevent discharge to the river. No mechanical maintenance or refueling would be allowed in this area. Should Rayonier activities decrease or stop in its neighboring installation, PSPC could solicit an agreement to use their parking space.





- B) Detail any additional mitigation measures planned to capture TSS from runoff from service and parking areas.

PSPC Response:

Proposed service and parking areas are composed mainly of grassland. Grass and vegetation within 10 m of the riverbank will be kept in place to complement the TSS mitigation measures already identified in the EIS. Runoff from service and parking areas will be captured by temporary ditches with retention basin before discharge to existing ditches or watercourse to allow deposition of TSS.

- C) Define what is meant by “inert materials”.

PSPC Response:

This concept is now obsolete has PSPC does not intend to use this 818 m² “Aire d’entreposage / Storage area”.

IAAC-2-8 –Management of Contaminated Sediments

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.1.5 (Surface water).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 11.1.9.5 and 22.5.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-20.*

Context

As indicated in the context of question IAAC-1-20, contaminated sediments should be managed on land, but the criteria for managing contaminated sediments are not specified in the proponent response.

The Agency instructs the proponent to:

- A) Specify the criteria for assessing sediment quality used for land-based management.

PSPC Response:

As stated in Section 22.5 of the EIS, PSPC intends to manage all dredged sediments in a terrestrial environment, regardless of the level of contamination. There is thus no need to consider a specific criteria to assess necessity for land-based management. After dredging, sediments will be stored in settling basin to reduce water content and will be sampled according to Québec or Ontario regulations depending on disposition site selected by the contractor. Water separated from the sediments will be sampled in the settling basin before discharge for total suspended solids (TSS) and for other contaminants found in the sediments (if required). Should water quality exceed Québec or Ontario regulations limits, further treatment will be required before discharge, or the effluent will have to be sent to a regulated facility for treatment.



Settling basin would be located in the 636 m² "Aire d'entreposage / Storage area" (see Figure 7.1 in IAAC-2-7), before use for concrete mixer parking and washing station.

If sediments stored in the settling basin show presence of contamination, monitoring of said contaminants in surface water (weekly) and groundwater (monthly) near the settling basin location will be implemented. Duration, methodology and concentration limits will be set according to contaminants found in the sediments.

IAAC-2-9 – Discharge Criteria for pH and Suspended Solids

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.2.2 (Changes to surface water) and 7.4 (Mitigation measures).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 11.2.3.4.2.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question AEIC-1-17.*

Context

Discharge criteria for pH and suspended solids are not included in response to question IAAC-1-17.

The Agency instructs the proponent to:

- A) Determine the applicable pH and suspended solids criteria that will be used to justify the discharge of concrete mixer wash water into the aquatic environment.

PSPC Response:

As concrete mixer wash station is expected to be located on Long Sault Island, discharge to the aquatic environment will take place on the Ontario side of the Ottawa River. The Ontario Provincial Water Quality Objectives (PWQO) set a limit for pH between 6.5 and 8.5. For suspended solids, PWQO requires that discharge does not change the natural turbidity by more than 10%. This requires turbidity monitoring of the Ottawa River during construction which is already integrated in the Monitoring Program presented in Section 22.4 of the EIS.

Comments and advice for the proponent

Comment 2-3 – Characterization of Excavated Material

References



CEAA, August 2018. Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 3.1 (Project components), 7.1.5 (Surface water), 7.2.2 (Changes to surface water), 7.4 (Mitigation measures) and 9 (Follow-up and monitoring programs).

Tetra Tech, February 2023. Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 7.1.2, 7.4 and 22.5.

PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-19.

Comments and advice

In response to question IAAC-1-19, the proponent states that the material to be excavated from the trenches consists of a boulder horizon followed by a till layer, and that consequently there would be no sediments to excavate. However, it is reasonable to expect that the till horizon will contain a matrix of material that can be characterized. Characterization of the material excavated from the trenches, and in particular the fine matrix of materials that make up the till, will have to be carried out in the same way as the sediments excavated between the containment curtain and the existing dam-bridge, to ensure that they can be safely used for cofferdam construction and properly managed when the cofferdam is dismantled.

PSPC Response:

PSPC commits to characterizing the fine material if there is any excavated from the trenches using the same method as the sediment excavated between the curtain and the existing dam.



Riparian, Wetland and Terrestrial Environments

Information requests directed to the proponent

IAAC-2-10 – Wetland Habitat

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.1.4 (Riparian and wetland environments), 7.2.3 (Changes to riparian, wetland and terrestrial environments) and 7.4 (Mitigation measures).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 10.1.2 and 12.1.5.1.1, Appendix 1 from Appendix 12.1 and Map 9-1.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question AEIC-1-27.*

Context

Response to IAAC-1-27 states that one wetland is in the vicinity of the project, adjacent to Gordon Creek. The proponent explains that this marsh is known to have several ecological functions, mainly water filtration, flood control, carbon sequestration, habitat function and erosion prevention. However, it does not mention for which species this wetland is used as habitat.

The Agency instructs the proponent to:

- A) Specify which migratory bird species or species at risk use this wetland as a habitat.

PSPC Response:

A specific eBird data request was made in July 2024. Results are in the table below. No species with protection status was identified. Migratory birds identified include American Robin (*Turdus migratorius*), Common grackle (*Quiscalus quiscula*), European herring gull (*Larus argentatus*) and Ring-billed gull (*Larus delawarensis*).

Mentions des feuillets eBird/EPOQ couvrant 2016 à 2024

Liste eBird	Année-mois-jour	Localité	Latitude	Longitude	Nb d'individus	Nom scientifique	Nom français
S32603610	2016-11-18 10:01	CA-QC-Témiscaming-77-155 Ch Kipawa - 46,7128x-79,1002	46,71276	-79,10020	9	Larus argentatus	Goéland argenté
S32650793	2016-11-18 10:01	CA-QC-Témiscaming-77-155 Ch Kipawa - 46,7128x-79,1002	46,71276	-79,10020	9	Larus argentatus	Goéland argenté
S32650794	2016-11-18 10:01	CA-QC-Témiscaming-77-155 Ch Kipawa - 46,7128x-79,1002	46,71276	-79,10020	9	Larus argentatus	Goéland argenté
S32650795	2016-11-18 10:01	CA-QC-Témiscaming-77-155 Ch Kipawa - 46,7128x-79,1002	46,71276	-79,10020	9	Larus argentatus	Goéland argenté
S54031801	2019-03-16 12:13	Témiscaming - route 101 / barrage	46,71159	-79,10050	3	Larus sp.	Goéland sp. (Larus sp.)
S73660487	2020-09-11 19:02	Témiscaming - route 101 / barrage	46,71159	-79,10050	7	Corvus brachyrhynchos	Corneille d'Amérique
S150671336	2023-05-06 12:11	Témiscaming - route 101 / barrage	46,71159	-79,10050	1	Turdus migratorius	Merle d'Amérique
S166785750	2024-03-31 14:20	CA-QC-Témiscaming-77-155 Ch Kipawa - 46,7128x-79,1002	46,71276	-79,10020	2	Corvus brachyrhynchos	Corneille d'Amérique
S166785750	2024-03-31 14:20	CA-QC-Témiscaming-77-155 Ch Kipawa - 46,7128x-79,1002	46,71276	-79,10020	1	Corvus corax	Grand Corbeau
S166785750	2024-03-31 14:20	CA-QC-Témiscaming-77-155 Ch Kipawa - 46,7128x-79,1002	46,71276	-79,10020	40	Larus argentatus	Goéland argenté
S166785750	2024-03-31 14:20	CA-QC-Témiscaming-77-155 Ch Kipawa - 46,7128x-79,1002	46,71276	-79,10020	7	Larus delawarensis	Goéland à bec cerclé
S166785769	2024-03-31 14:20	CA-QC-Témiscaming-77-155 Ch Kipawa - 46,7128x-79,1002	46,71276	-79,10020	2	Corvus brachyrhynchos	Corneille d'Amérique
S166785769	2024-03-31 14:20	CA-QC-Témiscaming-77-155 Ch Kipawa - 46,7128x-79,1002	46,71276	-79,10020	1	Corvus corax	Grand Corbeau
S166785769	2024-03-31 14:20	CA-QC-Témiscaming-77-155 Ch Kipawa - 46,7128x-79,1002	46,71276	-79,10020	40	Larus argentatus	Goéland argenté
S166785769	2024-03-31 14:20	CA-QC-Témiscaming-77-155 Ch Kipawa - 46,7128x-79,1002	46,71276	-79,10020	7	Larus delawarensis	Goéland à bec cerclé
S178466226	2024-05-21 15:21	Témiscaming - route 101 / barrage	46,71159	-79,10050	1	Quiscalus quiscula	Quiscale bronzé

- B) Specify whether monitoring of this wetland will be done, during construction of the new dam-bridge structure and demolition of the old one, to document any adverse effects on this wetland and its functions. If not, justify the absence of monitoring.

PSPC Response:

PSPC will commit to monitor bird presence in the wetland during construction and demolition phases of the project in spring, summer and fall. The contractor will have to daily monitor dust on the work site and will be required to extend this program with weekly monitoring in the adjacent wetland.

- C) Describe additional mitigation measures that could be implemented if adverse effects are expected on this wetland and its functions during construction and demolition.

PSPC Response:

Most likely effects are noise and dust. If adverse effects are found during construction and demolition, mitigation measures to implement are the same described in Section 11.2.1.1.2 of the EIS (dust) and Section 11.2.1.3.3.2.4.6 of the EIS (noise).



Fish and Fish Habitat

Information requests directed to the proponent

IAAC-2-11 – Health of Benthic Communities in Relation to Fish

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.3.1 (Fish and fish habitat)*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 12.1.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question AEIC-1-3.*

Context

There are concerns with the health of benthic communities in relation to other species, particularly sturgeon, using the dam-bridge site. It is unclear also if and how the proponent will monitor benthic communities post construction.

The Agency instructs the proponent to:

- A) Explain why benthic fauna was not assessed and no benthic community survey was carried out.

PSPC Response:

As stated in PSPC Response to IAAC-1-3, no such study was undertaken given the unsuitable substrate and high-water velocity around the existing and future dam-bridge for benthos. However, please see PSPC Response B) below for more information.

- B) Provide a description of methods for monitoring health and availability of food sources for fish species at the dam-bridge site post construction.

PSPC Response:

PSPC acknowledges the concern of Indigenous communities for benthic fauna as it is a primary food source for fish the communities depend on. PSPC will take advantage of the dewatering period of the project to document benthic fauna between the cofferdam and the existing dam-bridge. This will educate the post-construction follow-up program that will integrate benthic fauna. In addition, PSPC is committed to work with Indigenous communities on the fish habitat compensation plan. Specific care will be given in the compensation plan to allow growth of benthic fauna population in new habitat. As the project and the fish habitat compensation plan will be subject to a DFO's authorization, specific location and methodology of



sampling will be detailed during authorization process. The most common methodology for benthic survey consists of sampling sediment with a ponar grab and proceeding with species identification and individual counting in a controlled environment (office or field lab) with a benthic sieve bucket. It is expected that this follow-up will cover years 1, 3, and 5 post construction, with 4-season sampling as is commonly required by DFO.

Protocol to assess health and availability of benthos for fish was developed by Gibbons et al. (1993), using the Spatial or Control-Impact (CI) Design, “[...] which involves a comparison of benthic communities between potentially impacted sites and reference or control sites. Differences between the reference/control and impact sites are considered indicative of effects”.

This protocol recommends at least three sampling sites, to help determine a degree of impact:

- 1) Reference area: an area that is not exposed to the potential effect of the project but exhibits similar natural characteristics to the exposed monitoring sites.
- 2) Near-field exposure area: an area of high exposure to the source of impact but beyond the immediate region of effect.
- 3) Far-field exposure area: an area of less exposed than the near-field area but still within the zone of influence.

The physical and chemical characteristics of sites should be as similar as possible (substrate type, water velocity, depth, vegetation, pH, etc.) to isolate the impact of the dam on benthic communities. Sampling can be done manually, with specimens collected for identification. The number of specimens, types of benthos, and their health would then be compared between the sites to evaluate any potential impacts of the dam-bridge. More details on sampling methods and data analysis can be found in the protocol by Gibbons et al. (1993). Sampling can also be done by video data analysis, as conducted by Hamoutene et al. (2017) in their assessment of benthic communities.

Regardless of the sampling method, since no benthos studies were conducted before the construction of the dam-bridge, it would be important that the protocol for the assessment of the health of benthic communities includes reference sites. This approach would help analyze the spatial impacts of the dam and infer its potential effects on the directly affected area.

Gibbons, W.N., M.D. Munn and M.D. Paine. (1993). Guidelines for monitoring benthos in freshwater environments. Report prepared for Environment Canada, North Vancouver, B.C. by EVS Consultants, North Vancouver, B.C. 81 pp.

Hamoutene D., Salvo F., Belley R., Lush L., Hendry C. and Marshall K. (2017). An evaluation of benthic monitoring baseline assessments completed as part of the regulatory requirements for aquaculture finfish site applications on the South Coast of Newfoundland. *Can. Tech. Rep. Fish. Aquat. Sci.* Fs97 6/3222E-PDF: v + 25 p.



IAAC-2-12 – Fish and Fish Habitat Surveys and Indigenous Knowledge

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.1.6. (Fish and fish habitat).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 12.2.3.2 and Appendix 6 of Appendix 12.1.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question AEIC-1-31.*

Context

Response to question IAAC-1-31 provides examples of some of the Indigenous knowledge shared by Indigenous communities but does not discuss or describe how Indigenous knowledge did or did not inform habitat surveys.

The Agency instructs the proponent to:

- A) Provide a more detailed response on how Indigenous knowledge changed or did not change survey protocols (for example, any situation where Indigenous knowledge identified areas that were not surveyed by the proponent) and include the rationale for why Indigenous knowledge was not followed.

PSPC Response:

PSPC made every effort to integrate Indigenous knowledge into survey protocols. Survey protocols were shared with Indigenous groups before surveys began for comments and were updated based on the feedback shared.

Initial surveys were conducted in the spring of 2017; however, due to concerns raised by Indigenous communities about the lack of representation of normal spring conditions (unusually high water), PSPC commissioned Tetra Tech to conduct a supplementary sampling campaign in 2021.

The 2021 survey protocol was shared with Indigenous groups for comments in January 2021 and survey methods were amended throughout the spring/summer of 2021 in response to concerns shared by Indigenous groups. For example, following meetings held with the Indigenous groups, a decision was made to extend the Aquatic Study Area to cover approximately 0.5 km upstream of the Quebec dam despite no anticipated impacts on the water quality and aquatic habitats upstream of the dam.

The 2021 survey protocols were also updated after surveys began based on Indigenous knowledge.

Survey details	Indigenous knowledge integration
2017 spring fish survey (BBA Biofilia Inc.):	Due to concerns raised by Indigenous communities about the lack of representation of normal spring conditions (unusually high water), PSPC commissioned Tetra Tech to conduct a supplementary sampling campaign in 2021.
2021 summer fish survey (Tetra Tech): Survey protocol shared with Indigenous groups for comments in January 2021	<p>Comments from AOO and AOPFN received in spring 2021. Survey protocol was revised to extend study area upstream of the existing dam-bridge.</p> <p>Survey methods were amended throughout the spring/summer of 2021 in response to concerns shared by Indigenous groups. For example, to avoid spawner mortality as much as possible, the gillnets were set during the day for a period ranging from five to eight hours and checked every two hours and then every hour starting on June 15, 2021 based on concerns from Kebaowek First Nation.</p>
2021 fall fish survey: Planned but not completed.	Not conducted as issues identified by SART had not been resolved.

IAAC-2-13 - Potential Effects on Fish – Sluice-Gate System

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.3.1 (Fish and fish habitat).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 11.2.3.4.6, 12.2.3.2.1.4 and 19.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question AEIC-1-36.*

Context

In response to question IAAC 1-36, the proponent refers to a figure of a water flow below a sluice gate versus a logwood beam. Water flow patterns from the sluice-gate system are expected to be different with increased bottom water flow observed within a 50 m length downstream of the dam-bridge, as stated in section 11.2.3.3.2.5 of the EIS. The water flow change is illustrated qualitatively in figure 11-33. According



to the proponent, operation of a sluice-gate system instead of wood log system should have limiting effect on fish and fish habitat conditions. The rationale behind this statement is limited and supported by only one publication (Algera *et al.*, 2020). There are concerns about potential effects on water flows, such as how the sluice-gate system could affect spawning grounds, fish mortality and entrapment.

The Agency instructs the proponent to:

- A) Provide information on the biophysical effects of the change in water flow distribution downstream of the dam-bridge with the sluice-gate system.

PSPC Response:

A 3D modeling was conducted of the new dam-bridge to compare downstream water flow of the proposed sluice-gate system to a stoplog system (see Appendix F). Modeling was done for normal flow during spawning period (Scenario A) and for Spring maximum flow (Scenario B), with greater analysis on water flow at waterbed level to assess impact on spawning bed.

Results show minor change in flow velocity for Scenario A, maintaining water flow in the 0,5 to 1,5 m/s range suitable for Lake Sturgeon spawning. Scenario B shows more change in flow velocity, but this occurs before spawning season.

- B) Provide more information and background literature about the potential effects on fish spawning grounds and fish passage.

PSPC Response:

Fish spawning grounds

In a May 2018 publication of Baril & al. in Canadian Journal of Fisheries and Aquatic Science titled “Lake Sturgeon (*Acipenser fulvescens*) spawning habitat: a quantitative review”, four main characteristics of Lake Sturgeon were identified for a major river which is the Ottawa River:

- Water velocity in the 0.5 and 1.5 m/s range;
- Substrate class size between 64 mm (gravel) to 256 mm (cobble) of diameter, with interstitial space;
- Water temperature between 11 and 15 °C;
- Water depth in the 1.1 to 3 m range.

The project area between the cofferdam and the existing dam-bridge does not correspond to three of these characteristics for Lake Sturgeon spawning habitat:

- Water velocity is in a range of 1.5 to 2 m/s, reaching back 1 m/s downstream of the island, as stated in Sections 11.1.12 and 11.1.10.4 of the EIS;
- Substrate made of the existing dam-bridge concrete apron, concrete and steel debris and boulders (stones of >300 mm in diameter);
- Water depth between 5 and 10 m.



However, Lake Sturgeon eggs (8) and larvae (1) were observed during the 2021 inventories where the cofferdam is to be installed. This indicates use of this marginal spawning area by Lake Sturgeon.

The most suitable spawning habitat for Lake Sturgeon would be located 400 m downstream of the existing dam-bridge where water velocity, water depth and substrate would be most likely within characteristics described in Baril & al.

As presented in A) above, the 2024 water flow model conducted by PSPC (see Appendix F) shows limited change in flow velocity at riverbed level going from a stoplog system to a sluice-gate system at the location where Lake Sturgeon eggs and larvae were observed.

Fish passage

In addition to the findings of Algera et al. (2020) on fish injury and mortality during downstream passage through hydropower infrastructure, other scientific studies specifically address the impacts of sluice-gate dams on fish populations.

Gardner et al. (2016) studied the impacts of sluice-gate operation on the behaviour and survival of Atlantic salmon *Salmo salar* (L.) smolts and found that the sluices may negatively influence the mortality rate of migrating smolts, outside the range of levels that could be experienced naturally. They also found that smolts take longer to locate sluice gate passages than passages in the upper water column, thus delaying their migration. Boys et al. 2013's findings revealed that sluice gate systems expose fish to decompression forces, that can result in injury. The operation of the new sluice-gate system will however be sequenced such as to limit the adverse effects of water flow on fish, specifically during spring/summer and fall spawning seasons. In contrast, wood-log dams are less manageable and do not offer the same level of control.

Nevertheless, according to the 2016 study by Boys et al., fish larvae are minimally injured by their passage through undershot dams, such as the sluice-gate dam proposed here, as these are unlikely to generate pressures lower than the injury threshold for drifting larvae.

In their study on the impact of flow constriction on eel behavior during downstream migration, Piper et al. (2015) demonstrated that rapid water acceleration caused by dams causes initial upstream rejection, followed by adjustment to new flow conditions and ultimately passage of the structure. Similarly, Egg et al. (2017) found that a Silver Eels predominantly used the undershot sluice gate as a migration corridor, rather than the eel bypass system present at the dam. Higher current velocity at the undershot sluice gate even resulted in a higher number of Silver Eels using the corridor. This suggests that an undershot sluice gate system, if it has enough current velocity, can be successfully used by fish for downstream migration.

Wood-log systems produce hydraulic stresses such as fluid shear stress, which can occur in the turbulent flow immediately downstream of the dam (Boys et al., 2013). A sluice-gate system, to be used in the future dam-bridge, greatly mitigates this issue, and therefore reduces the risks of fish injury.

Boys, C. A., Baumgartner, L., Miller, B., Deng, Z., Brown, R., & Pflugrath, B. (2013). Protecting downstream migrating fish at mini hydropower and other river infrastructure, Technical report. NSW Department of Primary Industries. No. 137. ISSN 1837-2112



Boys, C. A., Robinson, W., Miller, B., Pflugrath, B., Baumgartner, L. J., Navarro, A., Brown, R., Deng, Z., & Pacific Northwest National Lab (PNNL), Richland, WA (United States). (2016). How low can they go when going with the flow? Tolerance of egg and larval fishes to rapid decompression. *Biology Open*, 5(6). <https://doi.org/10.1242/bio.017491>

Gardner, C. J., Rees-Jones, J., Morris, G., Bryant, P. G., & Lucas, M. C. (2016). The influence of sluice gate operation on the migratory behaviour of Atlantic salmon *Salmo salar* (L.) smolts. *Journal of Ecohydraulics*, 1(1-2), 90–101. <https://doi.org/10.1080/24705357.2016.1252251>

Egg, L., Mueller, M., Pander, J., Knott, J., & Geist, J. (2017) Improving European Silver Eel (*Anguilla anguilla*) downstream migration by undershot sluice gate management at a small-scale hydropower plant. *Ecological Engineering: Part A*, 106, 349–357. <https://doi.org/10.1016/j.ecoleng.2017.05.054>

Piper, A. T., Manes, C., Siniscalchi, F., Marion, A., Wright, R. M., & Kemp, P. S. (2015). Response of seaward-migrating European eel (*Anguilla anguilla*) to manipulated flow fields. *Proceedings of the Royal Society B: Biological Sciences*, 282(1811). <https://doi.org/10.1098/rspb.2015.1098>

- C) Provide evidence of where incubation and larval drift occur and an estimate of water flow change at this location.

PSPC Response:

As stated in B) above, indication of Lake Sturgeon spawning is found 75 m downstream of the existing dam-bridge, and most suitable location for incubation and larval drift is located 400 m downstream of the dam-bridge. The 2024 model results detailed in Appendix F show limited change in water flow at the 75 m distance of the dam-bridge. No water flow change is expected at the most suitable location for incubation and larval drift located 400 m downstream of the dam-bridge.

Comments and advice for the proponent

Comment 2-4 – Work Periods for Fish

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 1. Section 3.2.2 (Valued components to consider)*.

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 4, 5.1 and 10.1.2 and Chapters 18 to 20*.

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-1*.

Comments and advice

In Table 18.1, it is recommended to avoid construction work during periods that could not only affect critical fish spawning but also during periods that could affect egg incubation and larval drift.



PSPC Response:

As described in PSPC Response to IAAC-2-13 above, the area between the cofferdam and the existing dam-bridge is a marginally suitable spawning habitat for Lake Sturgeon according to scientific literature (Baril *et al.*, 2019; Peterson *et al.*, 2007). Mature Lake Sturgeons were found in the project area during field surveys but small number of eggs and larvae was capture confirming limited spawning within the construction site. What we observed from previous surveys is that the most likely spawning habitat for Lake Sturgeon would be located 400 m downstream of the existing dam-bridge (suitable water velocity, water depth and substrate) which is outside the construction site. Given that the most likely spawning habitat for Lake Sturgeon is outside of the construction area and considering that the spawning began in early June or mid-June from observations made from previous fish surveys, PSPC is confident that a construction start in mid-July (i.e. 30 days or more after spawning observations from previous surveys; referred to Comment 2-5 below) and the mitigation measures identified in the EIS are sufficient to limit the impacts on egg incubation and larval drift.

Comment 2-5 –Larval Drift and Dewatering Period

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.1.6. (Fish and fish habitat), and 7.3.1 (Fish and fish habitat).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 11.2.3.3.2.5 et 19.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question AEIC-1-43 and comment 1-15.*

Comments and advice

DFO and the First Nations of Kebaowek, Wolf Lake and Timiskaming raised doubts about the effectiveness, as a mitigation measure, of starting the dewatering period around mid-July, i.e. 10 days after the water temperature in the work area reaches 18°C. In the scientific literature, some authors report that lake sturgeon eggs hatch between 7 and 10 days after spawning. However, there is no consensus on this number of days, and other authors suggest longer periods before hatching. For example, Smith *et al.* (2017) and Peterson *et al.* (2007) mention a period of 8 to 14 days before hatching, depending on water temperatures, and Smith *et al.* (2017) and LaHaye *et al.* (1992) indicate that the larva will consume its yolk sac reserves before drifting downstream from the spawning site. This period could take from 13 to 19 days after hatching before the larva moves downstream. Thus, these various authors suggest that the time taken by lake sturgeon to use the spawning site, from the egg stage to the drifting larva, may extend to 30 days after spawning.

Since, according to the scientific literature, there is a possibility that lake sturgeon eggs and larvae may still be present in the area to be dewatered in mid-July, the proposed waiting period before the start of dewatering is not conservative enough and should therefore be extended to 30 days following spawning.



PSPC Response:

See PSPC Response to Comment 2-4 above.

Comment 2-6 – Fish Passage and Fish Habitat Compensation Design and Planning

References

CEAA, August 2018. Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.1.6. (Fish and fish habitat), and 7.3.1 (Fish and fish habitat).

Tetra Tech, February 2023. Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 11.2.3.3.2.5 et 19.

PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to questions AEIC-1-37 and 1-38.

Comments and advice

Following discussions with all stakeholders, the proponent is encouraged to commit to and provide a description of next steps to include impacted Indigenous communities in fish passage and fish habitat compensation design and planning.

PSPC Response:

PSPC maintains a commitments table outlining activities that will occur in the consultation, construction, and monitoring phases of the project to respond to Indigenous interests and concerns. This table includes commitments related to ongoing consultation with Indigenous communities on the fish passage design and fish habitat compensation planning. PSPC has also developed communication and consultation plans in collaboration with Indigenous groups to prioritize and schedule discussions on topics of interest and concern to the Indigenous groups. Further discussions with Indigenous groups on the fish passage and habitat compensation are planned during DFO's authorization process and will be scheduled with Indigenous groups based on their priorities and availabilities.

Comment 2-7 - Fish Spawning Optimization Plan

References

CEAA, August 2018. Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 2.2 (Alternative means of carrying out the project), 7.3.1 (Fish and fish habitat) and 7.4 (Mitigation measures).

Tetra Tech, February 2023. Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 6 and 7.9.

PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-42.



Comments and advice

Response to question IAAC-1-42 mentions a DFO Fisheries Act Authorization that was issued for the Ontario dam replacement project. A Fish Spawning Optimization Plan was produced. The proponent should share this plan with impacted Indigenous communities.

Furthermore, in its response, the proponent states that the plan will be adapted for the Quebec dam-bridge replacement project based on the Ontario dam experiences. The proponent should consult Indigenous communities to adapt the plan.

PSPC Response:

PSPC remains committed to consulting Indigenous groups throughout the project lifecycle and intends to engage Indigenous groups further on fish and fish habitat compensation details. A Fish Spawning and Optimization Plan will be developed in consultation with Indigenous groups. The Fish Spawning Optimization Plan for the Ontario Dam replacement project will be shared as part of these discussions and will be used to inform an adapted plan for the Quebec dam replacement project.



Birds and Bird Habitat

Information requests directed to the proponent

IAAC-2-14 – Use of Databases and Indigenous Knowledge in Bird Baseline Surveys

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.1.7 (Birds and bird habitat).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 12.1.9.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-44.*

Context

In response to question IAAC-1-44, the proponent considers that the information provided from existing data, field observations and Indigenous knowledge is sufficient for the description of current conditions for birds in the study area. However, the avian surveys carried out by the proponent are considered limited. As stated in the context of the question, the eBird data does not seem to have been used for the nesting period and would provide a clearer view of the presence of birds in the study area.

Additionally, although the proponent states Indigenous knowledge was used in the EIS, this is not verified by the information provided.

The Agency instructs the proponent to:

- A) Provide an analysis of data from the eBird database.

PSPC Response:

In fact, a request to the eBird data was made on November 7, 2022 and data obtained was considered and analyzed in the EIS. The data obtained covered the 2012 to 2021 period as shown in the table below.

Mentions des feuillets eBIRD/EPOQ couvrant 2012 à 2021
(automne et automne)

Identifiant du feuillet (GID)	Date (jj-mm-aaaa)	Saison	Latitude	Longitude	Nb d'observation	N° taxonomique	Nom latin	Nom français
E1522762	07-01-2013	Hiver	46.71700	-79.10000	11	663	<i>Bucephala clangula</i>	Garrot à oeil d'or
S16877249	10-02-2014	Hiver	46.71276	-79.10020	2	663	<i>Bucephala clangula</i>	Garrot à oeil d'or
S20743722	28-11-2014	Automne	46.84380	-79.16727	1	20829	<i>Corvus corax</i>	Grand Corbeau
S20743722	28-11-2014	Automne	46.84380	-79.16727	3	31167	<i>Pinicola enucleator</i>	Durbec des sapins
S39795198	30-09-2017	Automne	46.84647	-79.17827	3	20829	<i>Corvus corax</i>	Grand Corbeau
S39795198	30-09-2017	Automne	46.84647	-79.17827	1	20496	<i>Cyanocitta cristata</i>	Geai bleu
S39795198	30-09-2017	Automne	46.84647	-79.17827	4	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S42252334	26-01-2018	Hiver	46.66830	-79.07403	1	663	<i>Bucephala clangula</i>	Garrot à oeil d'or
S42252334	26-01-2018	Hiver	46.66830	-79.07403	1	7967	<i>Haliaeetus leucocephalus</i>	Pygargue à tête blanche
G3437700	02-09-2018	Automne	46.84128	-79.20911	1	4688	<i>Archilochus colubris</i>	Colibri à gorge rubis
G3437700	02-09-2018	Automne	46.84128	-79.20911	1	1189	<i>Bonasa umbellus</i>	Gélinotte huppée
G3437700	02-09-2018	Automne	46.84128	-79.20911	2	20496	<i>Cyanocitta cristata</i>	Geai bleu
G3437700	02-09-2018	Automne	46.84128	-79.20911	5	10918	<i>Dryobates villosus</i>	Pic chevelu
G3437700	02-09-2018	Automne	46.84128	-79.20911	2	6326	<i>Larus delawarensis</i>	Goéland à bec cerclé
G3437700	02-09-2018	Automne	46.84128	-79.20911	1	10728	<i>Picoides arcticus</i>	Pic à dos noir
S48771522	26-09-2018	Automne	46.72059	-79.09773	5	20762	<i>Corvus brachyrhynchos</i>	Corneille d'Amérique
S48771531	26-09-2018	Automne	46.72240	-79.09734	2	20496	<i>Cyanocitta cristata</i>	Geai bleu
S48771531	26-09-2018	Automne	46.72240	-79.09734	1	31905	<i>Spizella passerina</i>	Bruant familier
S54031801	16-03-2019	Hiver	46.71159	-79.10050	3	6408	<i>Larus sp.</i>	Goéland sp. (<i>Larus sp.</i>)
G4497419	07-09-2019	Automne	46.84357	-79.19382	1	7896	<i>Accipiter striatus</i>	Épervier brun
G4497419	07-09-2019	Automne	46.84357	-79.19382	2	28890	<i>Bombycilla cedrorum</i>	Jaseur d'Amérique
G4497419	07-09-2019	Automne	46.84357	-79.19382	1	27380	<i>Catharus ustulatus</i>	Grive à dos olive
G4497419	07-09-2019	Automne	46.84357	-79.19382	2	20762	<i>Corvus brachyrhynchos</i>	Corneille d'Amérique
G4497419	07-09-2019	Automne	46.84357	-79.19382	1	11237	<i>Dryocopus pileatus</i>	Grand Pic
G4497419	07-09-2019	Automne	46.84357	-79.19382	2	11575	<i>Falco peregrinus</i>	Faucon pèlerin
G4497419	07-09-2019	Automne	46.84357	-79.19382	3	6339	<i>Larus argentatus</i>	Goéland argenté
G4497419	07-09-2019	Automne	46.84357	-79.19382	2	32952	<i>Setophaga tigrina</i>	Paruline tigrée
S60668375	08-09-2019	Automne	46.83395	-79.18514	1	10728	<i>Picoides arcticus</i>	Pic à dos noir
G4575539	11-10-2019	Automne	46.84357	-79.19382	1	10918	<i>Dryobates villosus</i>	Pic chevelu
G4575539	11-10-2019	Automne	46.84357	-79.19382	1	11237	<i>Dryocopus pileatus</i>	Grand Pic
G4575539	11-10-2019	Automne	46.84357	-79.19382	5	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S60595862	12-10-2019	Automne	46.84357	-79.19382	5	1189	<i>Bonasa umbellus</i>	Gélinotte huppée
S60595862	12-10-2019	Automne	46.84357	-79.19382	1	27389	<i>Catharus guttatus</i>	Grive solitaire
S60595862	12-10-2019	Automne	46.84357	-79.19382	1	26109	<i>Certhia americana</i>	Grimpereau brun
S60595862	12-10-2019	Automne	46.84357	-79.19382	1	25942	<i>Corthylio calendula</i>	Roitelet à couronne rubis
S60595862	12-10-2019	Automne	46.84357	-79.19382	6	20762	<i>Corvus brachyrhynchos</i>	Corneille d'Amérique
S60595862	12-10-2019	Automne	46.84357	-79.19382	2	20829	<i>Corvus corax</i>	Grand Corbeau
S60595862	12-10-2019	Automne	46.84357	-79.19382	2	20496	<i>Cyanocitta cristata</i>	Geai bleu
S60595862	12-10-2019	Automne	46.84357	-79.19382	2	10892	<i>Dryobates pubescens</i>	Pic mineur
S60595862	12-10-2019	Automne	46.84357	-79.19382	1	11237	<i>Dryocopus pileatus</i>	Grand Pic
S60595862	12-10-2019	Automne	46.84357	-79.19382	1	6616	<i>Gavia immer</i>	Plongeon huard
S60595862	12-10-2019	Automne	46.84357	-79.19382	1	6339	<i>Larus argentatus</i>	Goéland argenté
S60595862	12-10-2019	Automne	46.84357	-79.19382	1	32187	<i>Melospiza melodia</i>	Bruant chanteur
S60595862	12-10-2019	Automne	46.84357	-79.19382	2	681	<i>Mergus merganser</i>	Grand Harle
S60595862	12-10-2019	Automne	46.84357	-79.19382	10	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S60595862	12-10-2019	Automne	46.84357	-79.19382	6	25946	<i>Regulus satrapa</i>	Roitelet à couronne dorée
S60595862	12-10-2019	Automne	46.84357	-79.19382	3	33040	<i>Setophaga coronata</i>	Paruline à croupion jaune
S60595862	12-10-2019	Automne	46.84357	-79.19382	1	26022	<i>Sitta canadensis</i>	Sittelle à poitrine rousse
S60595862	12-10-2019	Automne	46.84357	-79.19382	2	27616	<i>Turdus migratorius</i>	Merle d'Amérique
S60595862	12-10-2019	Automne	46.84357	-79.19382	1	32112	<i>Zonotrichia albicollis</i>	Bruant à gorge blanche
G4585545	13-10-2019	Automne	46.84357	-79.19382	10	20762	<i>Corvus brachyrhynchos</i>	Corneille d'Amérique
G4872753	13-01-2020	Hiver	46.69168	-79.09166	1	663	<i>Bucephala clangula</i>	Garrot à oeil d'or
G4872753	13-01-2020	Hiver	46.69168	-79.09166	1	20829	<i>Corvus corax</i>	Grand Corbeau
G6350667	01-09-2020	Automne	46.84357	-79.19382	3	27389	<i>Catharus guttatus</i>	Grive solitaire

Mentions des feuillets eBIRD/EPOQ couvrant 2012 à 2021
(automne et automne)

Identifiant du feuillet (GID)	Date (jj-mm-aaaa)	Saison	Latitude	Longitude	Nb d'observation	N° taxonomique	Nom latin	Nom français
G6350667	01-09-2020	Automne	46.84357	-79.19382	1	31267	<i>Haemorhous purpureus</i>	Roselin pourpré
G6350667	01-09-2020	Automne	46.84357	-79.19382	5	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
G6350667	01-09-2020	Automne	46.84357	-79.19382	10	33040	<i>Setophaga coronata</i>	Paruline à croupion jaune
G6350667	01-09-2020	Automne	46.84357	-79.19382	5	32950	<i>Setophaga ruticilla</i>	Paruline flamboyante
G6350667	01-09-2020	Automne	46.84357	-79.19382	1	26022	<i>Sitta canadensis</i>	Sittelle à poitrine rousse
G5710502	11-09-2020	Automne	46.84357	-79.19382	4	11371	<i>Colaptes auratus</i>	Pic flamboyant
G5710502	11-09-2020	Automne	46.84357	-79.19382	2	20762	<i>Corvus brachyrhynchos</i>	Corneille d'Amérique
G5710502	11-09-2020	Automne	46.84357	-79.19382	1	31905	<i>Spizella passerina</i>	Bruant familial
G5710502	11-09-2020	Automne	46.84357	-79.19382	2	32112	<i>Zonotrichia albicollis</i>	Bruant à gorge blanche
S74283958	11-09-2020	Automne	46.84357	-79.19382	1	7967	<i>Haliaeetus leucocephalus</i>	Pygargue à tête blanche
S73660487	11-09-2020	Automne	46.71159	-79.10050	7	20762	<i>Corvus brachyrhynchos</i>	Corneille d'Amérique
S74283175	12-09-2020	Automne	46.84357	-79.19382	1	27380	<i>Catharus ustulatus</i>	Grive à dos olive
S74283175	12-09-2020	Automne	46.84357	-79.19382	1	20829	<i>Corvus corax</i>	Grand Corbeau
S74283175	12-09-2020	Automne	46.84357	-79.19382	15	20496	<i>Cyanocitta cristata</i>	Geai bleu
S74283175	12-09-2020	Automne	46.84357	-79.19382	2	10892	<i>Dryobates pubescens</i>	Pic mineur
S74283175	12-09-2020	Automne	46.84357	-79.19382	1	11237	<i>Dryocopus pileatus</i>	Grand Pic
S74283175	12-09-2020	Automne	46.84357	-79.19382	3	32878	<i>Leiopylis ruficapilla</i>	Paruline à joues grises
S74283175	12-09-2020	Automne	46.84357	-79.19382	1	32859	<i>Mniotilta varia</i>	Paruline noir et blanc
S74283175	12-09-2020	Automne	46.84357	-79.19382	8	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S74283175	12-09-2020	Automne	46.84357	-79.19382	4	25946	<i>Regulus satrapa</i>	Roitelet à couronne dorée
S74283175	12-09-2020	Automne	46.84357	-79.19382	2	33023	<i>Setophaga caerulescens</i>	Paruline bleue
S74283175	12-09-2020	Automne	46.84357	-79.19382	1	32974	<i>Setophaga fusca</i>	Paruline à gorge orangée
S74283175	12-09-2020	Automne	46.84357	-79.19382	1	32971	<i>Setophaga magnolia</i>	Paruline à tête cendrée
S74283175	12-09-2020	Automne	46.84357	-79.19382	1	32950	<i>Setophaga ruticilla</i>	Paruline flamboyante
S74283175	12-09-2020	Automne	46.84357	-79.19382	2	27616	<i>Turdus migratorius</i>	Merle d'Amérique
G5710507	12-09-2020	Automne	46.84357	-79.19382	6	11371	<i>Colaptes auratus</i>	Pic flamboyant
G5710507	12-09-2020	Automne	46.84357	-79.19382	1	10918	<i>Dryobates villosus</i>	Pic chevelu
G5710507	12-09-2020	Automne	46.84357	-79.19382	2	31267	<i>Haemorhous purpureus</i>	Roselin pourpré
G5710507	12-09-2020	Automne	46.84357	-79.19382	1	6339	<i>Larus argentatus</i>	Goéland argenté
G5710507	12-09-2020	Automne	46.84357	-79.19382	7	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
G5710507	12-09-2020	Automne	46.84357	-79.19382	1	32843	<i>Seiurus aurocapilla</i>	Paruline couronnée
G5710507	12-09-2020	Automne	46.84357	-79.19382	5	33040	<i>Setophaga coronata</i>	Paruline à croupion jaune
G5710516	13-09-2020	Automne	46.84357	-79.19382	1	6026	<i>Actitis macularius</i>	Chevalier grivelé
G5710516	13-09-2020	Automne	46.84357	-79.19382	2	25942	<i>Corthylio calendula</i>	Roitelet à couronne rubis
G5710516	13-09-2020	Automne	46.84357	-79.19382	18	20496	<i>Cyanocitta cristata</i>	Geai bleu
G5710516	13-09-2020	Automne	46.84357	-79.19382	2	32921	<i>Geothlypis trichas</i>	Paruline masquée
G5710516	13-09-2020	Automne	46.84357	-79.19382	6	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
G5710516	13-09-2020	Automne	46.84357	-79.19382	2	32843	<i>Seiurus aurocapilla</i>	Paruline couronnée
G5710516	13-09-2020	Automne	46.84357	-79.19382	2	32112	<i>Zonotrichia albicollis</i>	Bruant à gorge blanche
S74091327	25-09-2020	Automne	46.84357	-79.19382	2	1189	<i>Bonasa umbellus</i>	Gélinotte huppée
S74091327	25-09-2020	Automne	46.84357	-79.19382	1	10918	<i>Dryobates villosus</i>	Pic chevelu
S74091327	25-09-2020	Automne	46.84357	-79.19382	1	6616	<i>Gavia immer</i>	Plongeon huard
S74091327	25-09-2020	Automne	46.84357	-79.19382	1	31267	<i>Haemorhous purpureus</i>	Roselin pourpré
S74091327	25-09-2020	Automne	46.84357	-79.19382	1	33040	<i>Setophaga coronata</i>	Paruline à croupion jaune
S74385148	03-10-2020	Automne	46.70860	-79.10093	12	30836	<i>Anthus rubescens</i>	Pipit d'Amérique
S74686244	11-10-2020	Automne	46.72082	-79.09558	12	27616	<i>Turdus migratorius</i>	Merle d'Amérique
S74686244	11-10-2020	Automne	46.72082	-79.09558	1	32099	<i>Zonotrichia leucophrys</i>	Bruant à couronne blanche
S74759119	11-10-2020	Automne	46.84580	-79.18744	2	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S74759119	11-10-2020	Automne	46.84580	-79.18744	2	25946	<i>Regulus satrapa</i>	Roitelet à couronne dorée
S74759119	11-10-2020	Automne	46.84580	-79.18744	1	26025	<i>Sitta carolinensis</i>	Sittelle à poitrine blanche
S74712479	11-10-2020	Automne	46.72102	-79.09533	1	10892	<i>Dryobates pubescens</i>	Pic mineur
S74712479	11-10-2020	Automne	46.72102	-79.09533	1	27616	<i>Turdus migratorius</i>	Merle d'Amérique
G5855272	29-10-2020	Automne	46.84357	-79.19382	1	30836	<i>Anthus rubescens</i>	Pipit d'Amérique
G5855272	29-10-2020	Automne	46.84357	-79.19382	3	10892	<i>Dryobates pubescens</i>	Pic mineur

Mentions des feuillets eBIRD/EPOQ couvrant 2012 à 2021
(automne et automne)

Identifiant du feuillet (GID)	Date (jj-mm-aaaa)	Saison	Latitude	Longitude	Nb d'observation	N° taxonomique	Nom latin	Nom français
G5855272	29-10-2020	Automne	46.84357	-79.19382	1	7967	<i>Haliaeetus leucocephalus</i>	Pygargue à tête blanche
G5855272	29-10-2020	Automne	46.84357	-79.19382	4	27616	<i>Turdus migratorius</i>	Merle d'Amérique
G5855272	29-10-2020	Automne	46.84357	-79.19382	1	32099	<i>Zonotrichia leucophrys</i>	Bruant à couronne blanche
G5855274	29-10-2020	Automne	46.71287	-79.10051	5	28886	<i>Bombicilla garrulus</i>	Jaseur boréal
G5933812	08-11-2020	Automne	46.84357	-79.19382	2	20762	<i>Corvus brachyrhynchos</i>	Corneille d'Amérique
G5933812	08-11-2020	Automne	46.84357	-79.19382	3	20829	<i>Corvus corax</i>	Grand Corbeau
G5933812	08-11-2020	Automne	46.84357	-79.19382	4	20496	<i>Cyanocitta cristata</i>	Geai bleu
G5933812	08-11-2020	Automne	46.84357	-79.19382	1	7967	<i>Haliaeetus leucocephalus</i>	Pygargue à tête blanche
G5933812	08-11-2020	Automne	46.84357	-79.19382	2	6339	<i>Larus argentatus</i>	Goéland argenté
G5933812	08-11-2020	Automne	46.84357	-79.19382	15	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S76347518	15-11-2020	Automne	46.83756	-79.21293	1	31423	<i>Acanthis flammea</i>	Sizerin flammé
S76347518	15-11-2020	Automne	46.83756	-79.21293	1	1189	<i>Bonasa umbellus</i>	Gélinotte huppée
S76347518	15-11-2020	Automne	46.83756	-79.21293	1	20762	<i>Corvus brachyrhynchos</i>	Corneille d'Amérique
S76347518	15-11-2020	Automne	46.83756	-79.21293	1	20829	<i>Corvus corax</i>	Grand Corbeau
S76347518	15-11-2020	Automne	46.83756	-79.21293	1	20496	<i>Cyanocitta cristata</i>	Geai bleu
S76347518	15-11-2020	Automne	46.83756	-79.21293	1	10918	<i>Dryobates villosus</i>	Pic chevelu
S76347518	15-11-2020	Automne	46.83756	-79.21293	3	32036	<i>Junco hyemalis</i>	Junco ardoisé
S76347518	15-11-2020	Automne	46.83756	-79.21293	1	20384	<i>Perisoreus canadensis</i>	Mésangeai du Canada
S76347518	15-11-2020	Automne	46.83756	-79.21293	1	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S76347518	15-11-2020	Automne	46.83756	-79.21293	1	31551	<i>Spinus tristis</i>	Chardonneret jaune
S94625558	06-09-2021	Automne	46.84357	-79.19382	2	20762	<i>Corvus brachyrhynchos</i>	Corneille d'Amérique
S94625558	06-09-2021	Automne	46.84357	-79.19382	7	20496	<i>Cyanocitta cristata</i>	Geai bleu
S94625558	06-09-2021	Automne	46.84357	-79.19382	1	7967	<i>Haliaeetus leucocephalus</i>	Pygargue à tête blanche
S94625558	06-09-2021	Automne	46.84357	-79.19382	2	32859	<i>Mniotilta varia</i>	Paruline noir et blanc
S94625558	06-09-2021	Automne	46.84357	-79.19382	8	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S94625558	06-09-2021	Automne	46.84357	-79.19382	4	26022	<i>Sitta canadensis</i>	Sittelle à poitrine rousse
S94625701	06-09-2021	Automne	46.84357	-79.19382	1	8075	<i>Buteo platypterus</i>	Petite Buse
S94625701	06-09-2021	Automne	46.84357	-79.19382	1	27369	<i>Catharus fuscescens</i>	Grive fauve
S94625701	06-09-2021	Automne	46.84357	-79.19382	1	27380	<i>Catharus ustulatus</i>	Grive à dos olive
S94625701	06-09-2021	Automne	46.84357	-79.19382	2	20496	<i>Cyanocitta cristata</i>	Geai bleu
S94625701	06-09-2021	Automne	46.84357	-79.19382	6	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S94625701	06-09-2021	Automne	46.84357	-79.19382	1	33023	<i>Setophaga caeruleascens</i>	Paruline bleue
S94625701	06-09-2021	Automne	46.84357	-79.19382	1	33018	<i>Setophaga pensylvanica</i>	Paruline à flancs marron
S94625701	06-09-2021	Automne	46.84357	-79.19382	1	32950	<i>Setophaga ruticilla</i>	Paruline flamboyante
S94625701	06-09-2021	Automne	46.84357	-79.19382	3	26022	<i>Sitta canadensis</i>	Sittelle à poitrine rousse
S94625841	06-09-2021	Automne	46.84357	-79.19382	1	1309	<i>Canachites canadensis</i>	Tétras du Canada
S94625841	06-09-2021	Automne	46.84357	-79.19382	1	20829	<i>Corvus corax</i>	Grand Corbeau
S94625841	06-09-2021	Automne	46.84357	-79.19382	1	11237	<i>Dryocopus pileatus</i>	Grand Pic
S94625890	07-09-2021	Automne	46.84357	-79.19382	2	20829	<i>Corvus corax</i>	Grand Corbeau
S94625966	08-09-2021	Automne	46.84357	-79.19382	2	7416	<i>Cathartes aura</i>	Urubu à tête rouge
S94625966	08-09-2021	Automne	46.84357	-79.19382	6	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S94625966	08-09-2021	Automne	46.84357	-79.19382	8	26022	<i>Sitta canadensis</i>	Sittelle à poitrine rousse
S94625966	08-09-2021	Automne	46.84357	-79.19382	1	26385	<i>Troglodytes hiemalis</i>	Troglodyte des forêts
S94629328	09-09-2021	Automne	46.84357	-79.19382	1	1189	<i>Bonasa umbellus</i>	Gélinotte huppée
S94629781	09-09-2021	Automne	46.84357	-79.19382	1	7416	<i>Cathartes aura</i>	Urubu à tête rouge
S94629781	09-09-2021	Automne	46.84357	-79.19382	1	3174	<i>Coccyzus erythrophthalmus</i>	Coulicou à bec noir
S94629781	09-09-2021	Automne	46.84357	-79.19382	125	20496	<i>Cyanocitta cristata</i>	Geai bleu
S94629781	09-09-2021	Automne	46.84357	-79.19382	30	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S94629781	09-09-2021	Automne	46.84357	-79.19382	5	26022	<i>Sitta canadensis</i>	Sittelle à poitrine rousse
S94629781	09-09-2021	Automne	46.84357	-79.19382	1	31551	<i>Spinus tristis</i>	Chardonneret jaune
S94629917	09-09-2021	Automne	46.84357	-79.19382	1	11371	<i>Colaptes auratus</i>	Pic flamboyant
S94629917	09-09-2021	Automne	46.84357	-79.19382	15	20496	<i>Cyanocitta cristata</i>	Geai bleu
S94629917	09-09-2021	Automne	46.84357	-79.19382	50	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S94629917	09-09-2021	Automne	46.84357	-79.19382	1	32843	<i>Seiurus aurocapilla</i>	Paruline couronnée

Mentions des feuillets eBIRD/EPOQ couvrant 2012 à 2021
(automne et automne)

Identifiant du feuillet (GID)	Date (jj-mm-aaaa)	Saison	Latitude	Longitude	Nb d'obser- vation	N° taxono- mique	Nom latin	Nom français
S94629917	09-09-2021	Automne	46.84357	-79.19382	1	27616	<i>Turdus migratorius</i>	Merle d'Amérique
S94629917	09-09-2021	Automne	46.84357	-79.19382	50	32112	<i>Zonotrichia albicollis</i>	Bruant à gorge blanche
S94630225	11-09-2021	Automne	46.84357	-79.19382	1	1189	<i>Bonasa umbellus</i>	Gélinotte huppée
S94630225	11-09-2021	Automne	46.84357	-79.19382	1	20829	<i>Corvus corax</i>	Grand Corbeau
S94630225	11-09-2021	Automne	46.84357	-79.19382	3	20496	<i>Cyanocitta cristata</i>	Geai bleu
S94630225	11-09-2021	Automne	46.84357	-79.19382	20	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S94630225	11-09-2021	Automne	46.84357	-79.19382	1	33023	<i>Setophaga caerulescens</i>	Paruline bleue
S94630225	11-09-2021	Automne	46.84357	-79.19382	20	26022	<i>Sitta canadensis</i>	Sittelle à poitrine rousse
S94630225	11-09-2021	Automne	46.84357	-79.19382	5	32112	<i>Zonotrichia albicollis</i>	Bruant à gorge blanche
S94630358	12-09-2021	Automne	46.84357	-79.19382	1	8773	<i>Strix varia</i>	Chouette rayée
S94630376	12-09-2021	Automne	46.84357	-79.19382	1	33034	<i>Setophaga pinus</i>	Paruline des pins
S95228740	26-09-2021	Automne	46.71089	-79.10177	7	303	<i>Branta canadensis</i>	Bernache du Canada
S95228740	26-09-2021	Automne	46.71089	-79.10177	2	7416	<i>Cathartes aura</i>	Urubu à tête rouge
S95228740	26-09-2021	Automne	46.71089	-79.10177	1	11371	<i>Colaptes auratus</i>	Pic flamboyant
S95228740	26-09-2021	Automne	46.71089	-79.10177	2	20762	<i>Corvus brachyrhynchos</i>	Corneille d'Amérique
S95228740	26-09-2021	Automne	46.71089	-79.10177	1	20829	<i>Corvus corax</i>	Grand Corbeau
S95228740	26-09-2021	Automne	46.71089	-79.10177	3	20496	<i>Cyanocitta cristata</i>	Geai bleu
S95228740	26-09-2021	Automne	46.71089	-79.10177	1	10892	<i>Dryobates pubescens</i>	Pic mineur
S95228740	26-09-2021	Automne	46.71089	-79.10177	1	10918	<i>Dryobates villosus</i>	Pic chevelu
S95228740	26-09-2021	Automne	46.71089	-79.10177	2	11237	<i>Dryocopus pileatus</i>	Grand Pic
S95228740	26-09-2021	Automne	46.71089	-79.10177	1	7967	<i>Haliaeetus leucocephalus</i>	Pygargue à tête blanche
S95228740	26-09-2021	Automne	46.71089	-79.10177	2	6339	<i>Larus argentatus</i>	Goéland argenté
S95228740	26-09-2021	Automne	46.71089	-79.10177	5	6326	<i>Larus delawarensis</i>	Goéland à bec cerclé
S95228740	26-09-2021	Automne	46.71089	-79.10177	2	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S95228740	26-09-2021	Automne	46.71089	-79.10177	1	25946	<i>Regulus satrapa</i>	Roitelet à couronne dorée
S95228740	26-09-2021	Automne	46.71089	-79.10177	1	32950	<i>Setophaga ruticilla</i>	Paruline flamboyante
S95228740	26-09-2021	Automne	46.71089	-79.10177	3	27616	<i>Turdus migratorius</i>	Merle d'Amérique
S96081248	07-10-2021	Automne	46.83500	-79.19337	1	1189	<i>Bonasa umbellus</i>	Gélinotte huppée
S96081248	07-10-2021	Automne	46.83500	-79.19337	1	8094	<i>Buteo jamaicensis</i>	Buse à queue rousse
S96081248	07-10-2021	Automne	46.83500	-79.19337	3	26109	<i>Certhia americana</i>	Grimpereau brun
S96081248	07-10-2021	Automne	46.83500	-79.19337	2	25942	<i>Corthylio calendula</i>	Roitelet à couronne rubis
S96081248	07-10-2021	Automne	46.83500	-79.19337	2	20829	<i>Corvus corax</i>	Grand Corbeau
S96081248	07-10-2021	Automne	46.83500	-79.19337	4	20496	<i>Cyanocitta cristata</i>	Geai bleu
S96081248	07-10-2021	Automne	46.83500	-79.19337	3	10892	<i>Dryobates pubescens</i>	Pic mineur
S96081248	07-10-2021	Automne	46.83500	-79.19337	4	11237	<i>Dryocopus pileatus</i>	Grand Pic
S96081248	07-10-2021	Automne	46.83500	-79.19337	1	31267	<i>Haemorhous purpureus</i>	Roselin pourpré
S96081248	07-10-2021	Automne	46.83500	-79.19337	3	32036	<i>Junco hyemalis</i>	Junco ardoisé
S96081248	07-10-2021	Automne	46.83500	-79.19337	19	21259	<i>Poecile atricapillus</i>	Mésange à tête noire
S96081248	07-10-2021	Automne	46.83500	-79.19337	2	25946	<i>Regulus satrapa</i>	Roitelet à couronne dorée
S96081248	07-10-2021	Automne	46.83500	-79.19337	10	26022	<i>Sitta canadensis</i>	Sittelle à poitrine rousse
S96081248	07-10-2021	Automne	46.83500	-79.19337	4	27616	<i>Turdus migratorius</i>	Merle d'Amérique
S96081248	07-10-2021	Automne	46.83500	-79.19337	6	32112	<i>Zonotrichia albicollis</i>	Bruant à gorge blanche
S98324770	27-11-2021	Automne	46.71596	-79.10199	4	26890	<i>Sturnus vulgaris</i>	Étourneau sansonnet

- B) Describe how Indigenous knowledge and Indigenous-led studies (e.g., SART report on avian surveys) was sought to inform bird surveys and describe how and if it was incorporated into methods and if not, explain the reasons why.

PSPC Response:

The protocol for the bird surveys conducted in 2021 was shared and reviewed by the Indigenous groups. Some groups provided comments which were addressed in a revised version of the protocol. In advance of the survey, a meeting was also held with the AOPFN AAC members to discuss the protocol and the comments they had on it.

The results of the SART's avian surveys were included in Section 12.1.9.7 of the EIS. As the 2017 and 2021 bird surveys were conducted before the SART bird survey (June/July 2022), the SART report did not inform the bird surveys.

IAAC-2-15 – Bird Nesting Survey on the Existing Dam-Bridge

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.1.7 (Birds and bird habitat), 7.3.2 (Birds and bird habitat), 7.4 (Mitigation measures) and 9 (Follow-up and monitoring programs).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 12.1.9.4 and 12.2.8.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-45.*

Context

As stated in response to question IAAC-1-45, ECCC and the Agency understand that a complementary avian nesting survey will be conducted on the existing dam-bridge structure during the final design phase.

The Agency instructs the proponent to:

- A) Provide a complete and detailed methodology, including, but not limited to, how the dam-bridge will be checked, at what time of day the inventories will take place, at what time(s) of the year, and for how many days.

PSPC Response:

Avian nesting survey will be conducted by trained field personnel through visual observation from both shores and from the road deck, using binoculars and a spotting scope at a distance that allows observation of nests without disturbing bird natural activity. The distance must be determined on site. This is preferred to listening stations as the noise level caused by the water flowing through the dam-bridge is high and song analysis giving limited indication of nesting activity for many species. Nevertheless, constant auditory attention for the presence of birds will be maintained by staff to establish a more representative picture of



avian species in the vicinity of the site. All detections of bird data (auditory or visual observation) will be collected according to the breeding evidence codes, levels of certainty and definition of the Québec Breeding Bird Atlas. Québec Breeding Bird Atlas indicates 4 levels of nesting certainty, such as possible breeding, probable breeding and confirmed breeding. For instance, repeated round trips by a species in a single location should be indicated as confirmed breeding.

Survey will be conducted mainly in Spring, from end of March to end of June, where nesting activity is at its peak. Monthly visits will be made. As nests may be difficult to observe in deep corners and other masked structures, survey will be done at sunrise and late afternoon, period at which birds leaving or returning to nest is most likely. The morning period starts 30 minutes before sunrise and lasts until 3.5 to 4 hours after sunrise. The evening period begins 3.5 to 4 hours before sunset and extends until 30 minutes after sunset. Bird species, number of individual and behavior will be noted along with time and weather conditions. Observations would be made for a period of one hour per station, in the morning and evening.

In addition, should nest be observed and assessable, surveyors will document egg and chick presence without disturbance if possible.

- B) Provide in greater details the mitigation measures that will be put in place to avoid negative effects on birds if the existing dam-bridge is used by avian fauna for nesting.

PSPC Response:

The new dam-bridge being planned 19 m downstream of the existing dam-bridge, little space is available to implement mitigation measures, should nesting be confirmed on the existing dam-bridge. PSPC approach would consist of preventing nesting on the existing dam-bridge during the project duration, providing temporary nesting structures to relevant bird species on Long Sault Island, and integrating nesting structures suitable for relevant bird species on the new dam-bridge, allowing the safe displacement of bird nesting population.

Exclusion netting would be installed at least 1 year before construction work and be maintained for the duration of the project until demolition work. Installation would be made in late fall to prevent return nesting in the following spring. Nesting monitoring would be maintained throughout the project duration to make adjustments should nesting activity be observed in spite of exclusion netting.

Comments and advice for the proponent

Comment 2-8 –Birds other than Migratory Birds and not of Precarious Status

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.3.2 (Birds and bird habitat).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 12.2.7.*



PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-53.

Comments and advice

Construction work may cause disturbance beyond federal lands. Although the project is on federal land, it is expected that the same measures will be applied to all bird species not protected by the *Migratory Birds Convention Act* (1994).

PSPC Response:

PSPC commits to extending mitigation measures to all bird species encountered on the work site.



Species at Risk

Information requests directed to the proponent

IAAC-2-16 – Assessment of Species at Risk

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.3.3 (Species at Risk)*.

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 12.2.6. and 12.2.8.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-54 and 1-58 and Appendix G (Table 1).*

Context

In Table 1 of Appendix G, a column entitled “Permanent or temporary habitat loss” has been added. However, effects other than habitat loss are not described, such as disturbance that could be caused by noise during construction of the new dam-bridge and dismantling the existing dam-bridge, including blasting.

All potential effects of the project on species at risk must be described. In addition, the Eastern Red bat, Hoary bat and Silver bat, identified during the inventory carried out by SART, are species that have been assigned endangered status by COSEWIC in 2023.

Among the measures implemented for birds and bats at risk, the avoidance of the nesting period for clearing and grading works is not included in Table 1. However, in response to question IAAC-1-54, the proponent undertook to avoid this period for clearing and grading during nesting period. ECCC believes this is a key measure to avoid harming migratory birds, bird and bat species at risk, and that it should be included in Table 1.

The Agency instructs the proponent to:

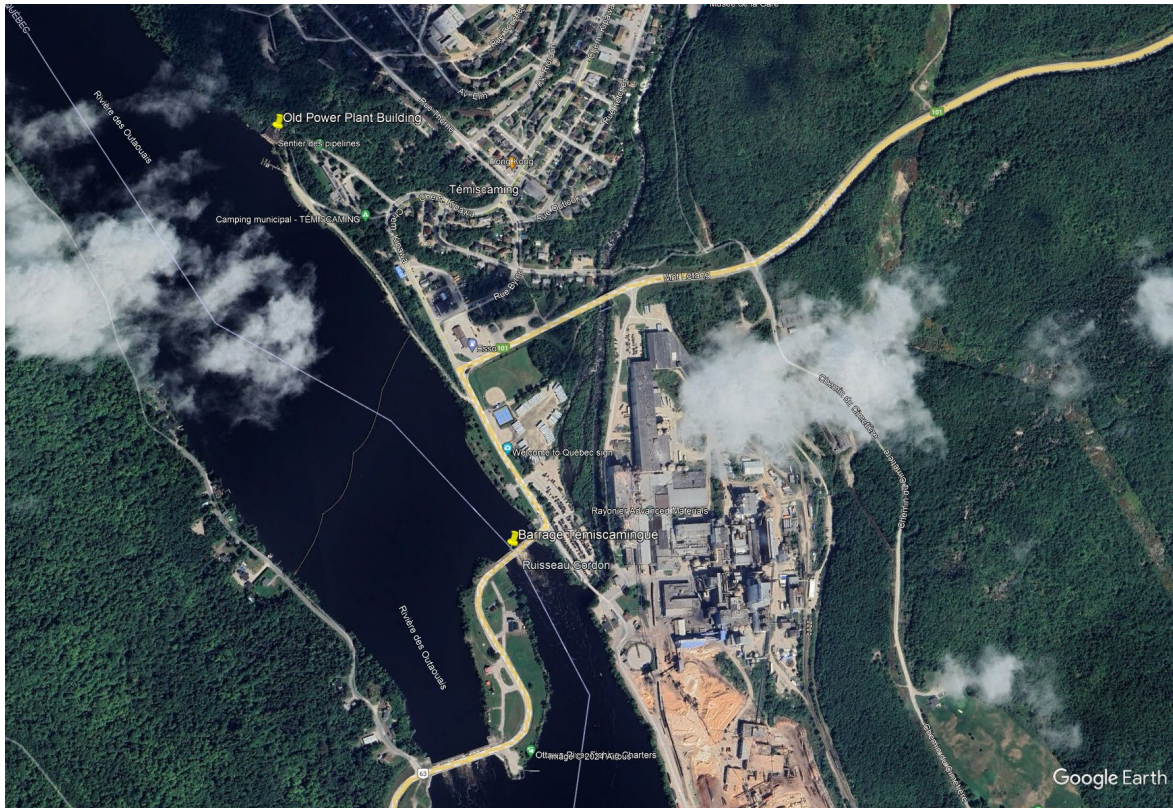
- A) Assess the potential effects of the project on Eastern Red, Hoary and Silver bats, and evaluate the potential to recover habitat for these species in the study area. Map where appropriate. Provide a description of this assessment.

PSPC Response:

Effect on Eastern Red, Hoary and Silver bats would be similar to effects on other bat species, as these species were observed at the same location, 800 m North of the project site, outside of PSPC study area



(see the *Old Power Plant Building* in the image below). This effect is considered negligible due to distance of work to this observation site limiting noise, vibration and dust nuisance. And as work will not be allowed during night time, effect on feeding activity over water is limited.



- B) Provide a description of all potential project effects on species at risk and mitigation measures planned to limit them.

PSPC Response:

See amended Table 1 in Appendix B of this document.

- C) Provide a justification as to why avoidance of the nesting period was not provided as a mitigation measure. In the case that it was an omission, include this mitigation measures.

PSPC Response:

See amended Table 1 in Appendix B of this document. The only bird species at risk having suitable nesting habitat on the work site is the common nighthawk. Avoidance of clearing and grading work during nesting period has been added.



IAAC-2-17 – Results of the Bat Survey - Old Power Plant

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.1.8 (Species at Risk)*.

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 12.1.8.5 and 12.2.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-59 and 1-61 and Appendix F.*

Context

According to the bat survey report produced by SART (Appendix F), the former power station is a site where bats hibernate. However, very few buildings are used as a bat hibernaculum in Quebec, as it is difficult to maintain a cool and constant temperature for bat hibernation. In addition, there is no evidence of winter use of the site since the survey was carried out in August. It is more likely that this building is used as a maternity roost site.

The bat recording devices installed in the building would have captured eight bat species. However, the results for guano only indicate the presence of the Big Brown bat. According to the MELCCFP, the presence of the Eastern Pygmy bat has never been recorded in Abitibi-Témiscamingue. It is uncommon to be able to link all bat calls to species, as there may be overlap in the call frequencies of some species. A validation of this information should be done and further information on the methods used to better interpret the data.

The Agency instructs the proponent to:

- A) Provide a validation of the information and results. For example, but not limited to, confirm that the results have been carried out and verified by more than one specialist.

PSPC Response:

SART's consultant (FRi) acknowledges that "Data was not collected during the right time of year to assess whether or not the building is a hibernation site. The consultant mentioned: "FRi can provide data summaries and the analysis if required".

- B) Provide a detailed version of the methodology used in SART survey.

PSPC Response:

The report in Appendix E provided by SART's consultant FRi gives details on methodology. FRi mentioned they can provide additional details if needed. FRi also stated that "The SART report incorrectly describes the building as a hibernation site – note that monitoring was not done at the right time of year to confirm this; the building may be suitable for some species e.g. Big Brown, but this has yet to be determined."



- C) Confirm whether recorders were positioned to capture bats feeding over water.

PSPC Response:

The report in Appendix E describes the deployment locations for each of the recorders. FRi also stated: “Yes, some were positioned near or at the water’s edge to maximize bat detection since the Team understands that bats feed over water.”

- D) Provide the recordings from the bat recording devices.

PSPC Response:

SART’s consultant FRi replied “The raw data files are huge – in the order of 100’s of GB. FRi doesn’t typically archive raw data for more than a couple of years; so FRi may no longer have access to the raw data files. FRi can provide the summary files, but if required, FRi will search the archive and can provide the raw data files if they have been retained”.

IAAC-2-18 - Bat Survey on the Existing Dam-Bridge

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.3.3 (Species at Risk)*.

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 12.2.6. and 12.2.8.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-58 and 1-59 and Appendix G (Table 1)*.

Context

Table 1 of Appendix G mentions that the proponent will conduct a bat survey in the current dam-bridge prior to its dismantling.

The Agency instructs the proponent to:

- A) Provide a complete and detailed methodology, including, but not limited to, how the crevasses will be checked, at what time of day the inventories will take place, at what time(s) of the year, and for how many days.

PSPC Response:

Bat presence on the existing dam-bridge will be assessed with ultrasound recorders with omnidirectional microphone allowing identification of bats through analysis of species-specific echolocation signature. One recording device will be installed at each end of the structure, and targeting area where the SART study reported bat sounds. Recordings will be made from sunset to sunrise. A total of 10 nights of recording is planned in early June, during peak maternity period. Should presence of bat be revealed by recordings, on-



site inspection would be undertaken to confirm and localize exact nesting sites. Use of camera to be inserted in crevasses may be required where simple visual inspection is inefficient.

IAAC-2-19 – Monitoring Effects on Bats

References

CEAA, August 2018. Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.3.3 (Species at Risk) and 9 (Follow-up and monitoring programs).

Tetra Tech, February 2023. Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 12.2.5.2.2, 12.2.5.5 and 12.2.6.1, chapter 19 and section 23.5.

PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-60 and IAAC-1-63 and Appendices F and G.

Context

In response to questions IAAC-1-60 and 1-63, the proponent intends to monitor the abandoned building located 1 km from the project, which serves as a habitat for bats, with additional efforts during periods of high noise levels. The proponent also intends to avoid bats before undertaking demolition work on the existing dam-bridge. It is unclear how the data collected would be used to verify whether the project has an effect on bats that are considered species at risk. The proponent does not explain additional mitigation measures that could be implemented if monitoring results reveal effects on bat species, for example due to noise during construction of the new dam-bridge and dismantling of the existing dam-bridge.

If it is determined that the existing dam-bridge structure is used as a maternity roost or resting sites by bats, the proponent will install nets at least 1 year before demolition works begin. The proponent is also planning to integrate structures for bats on the new dam-bridge.

PSPC Comment on Context:

PSPC is willing to explore potential options for installing bat roosting structures on the dam, but, at this time, has not committed to integrating nesting structures. Please refer to Response to IAAC-1-59:

“Given this, PSPC believes that mitigation and compensation measures presented in the EIS and in the revised Table 1 (see Appendix G) are sufficient. Nevertheless, PSPC will explore the opportunity to integrate a structure to the project to provide resting and maternity opportunities for bats.”

Should a bat specific structure be considered for the new dam design, its installation would be completed before the demolition of the existing dam.

The Agency instructs the proponent to:

- A) Explain how data from the monitoring program will be analyzed to verify if the project affects bats, particularly those using the old building and the dam-bridge.



PSPC Response:

At the old building site, monitoring will be made by noise level measurement as this is the most likely effect to occur at this site located 800 m North of the work area. Before construction work, ambient noise level will be measured. During construction and demolition phases, noise level will be measured during “high noise” activities such as sheet piling, Hamer jack demolition and blasting (if required). Noise increase of 5 dBA above ambient noise will be considered an impact.

At this time, bat nesting on the existing dam-bridge is not confirmed. Should bat nesting be confirmed, PSPC would install exclusion netting before deconstruction phase and be maintained for the duration of the project until demolition work is completed to avoid bat presence and effects on bats. Installation would be made in late fall to prevent return nesting in the following spring. Nesting monitoring would be maintained throughout the project duration to make adjustments should nesting activity be observed in spite of exclusion netting.

- B) Specify whether additional mitigation measures will be implemented if adverse effects are observed on bats that are considered species at risk, particularly those using the old building or the new dam-bridge structure. If so, provide a description of those mitigation measures.

PSPC Response:

If noise levels exceed the 5 dBA above ambient level at the old building, work will be interrupted to implement additional mitigation measures such as reducing the number of machinery working simultaneously or waiting for more favorable wind direction. Exclusion of bat at the existing dam-bridge prior to construction phase eliminate the need to implement additional mitigation measures.

- C) Discuss any exclusion measures, other than installing a net, that is considered and how they would be implemented over time.

PSPC Response:

Other than the suggested measures specified in PSPC Response B) above, netting being an effective and proven exclusion measure, no other exclusion measure is considered.

- D) Specify when the structures for bats on the new dam-bridge will be operational and confirm whether this will be before the demolition of the existing dam-bridge.

PSPC Response:

Should bat nesting be confirmed on the existing dam-bridge and it is deemed favorable to install a nesting structure, a compensation nesting structure would be included in the design of the new dam-bridge. This new nesting structure would be operational before undertaking demolition of the existing dam-bridge.



IAAC-2-20 - Mitigation Measures for Turtles during Operation

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.3.3 (Species at Risk)*.

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 12.2.5. and 12.2.6.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-68.*

Context

Response to question IAAC-1-68 states that the risks associated with the operation of the dam for turtles are the opening and closing of the locks, and that turtles could be injured or killed. However, the proponent mentions that, since most turtles prefer shallow water, their presence at the opening and closing of the locks is considered unlikely, and the risk negligible.

The proponent also states that the operation of the dam follows a protocol developed with the support of DFO to limit risks to fish, and that this protocol will be updated for the operation of the new dam. Mitigation measures for turtles will be explored as part of the protocol update.

The Agency instructs the proponent to:

- A) Provide a description of mitigation measures that could be implemented to reduce the risk of effects on turtles associated with the opening and closing of locks during operation of the dam.

PSPC Response:

The high-water velocity passing through sluice gates makes the risk of harm to turtle highly unlikely during closure of the sluice gates. PSPC is however open to discuss specific conditions to add to its operational procedure to implement opening and closing sequence reducing risk to turtle and other species like fish. This sequence can be programmed to ensure consistency of application.

Comments and advice for the proponent

Comment 2-9 – Species Status Changes

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.1.8 (Species at Risk)*.

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 4.2.1.5.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-55.*



Comments and advice

The Agency asks the proponent to consider the changing status of species at risk at every stage of the project, and to ensure that the necessary measures are implemented to protect species at risk.

PSPC Response:

PSPC commits to considering the changing status of species at risk at key project stages and ensuring that measures are implemented to protect species at risk.

Comment 2-10 – Turtles - Wildlife Management Plan

References

CEAA, August 2018. Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.3.3 (Species at Risk), 7.4 (Mitigation measures) and 9.2 (Monitoring program).

Tetra Tech, February 2023. Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 7.1.2, 7.1.3, 12.2.6.1, 19 and 22.4.

Tetra Tech, February 2023. Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec), Summary Environmental Impact Statement. Section 6.2.

PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-67 and 1-69.

Comments and advice

The proponent will have to provide its wildlife management plan to ECCC prior to the start of construction, mentioning all the measures that would be implemented if turtles are found in the project area and justifying the location(s) where the turtles would be relocated.

PSPC Response:

PSPC commits to providing to ECCC with its wildlife management plan for turtles having a status under the Species at Risk Act (SARA).



Indigenous Peoples

Comments and advice for the proponent

Comment 2-11- Effects on the Health of Indigenous Peoples

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.3.4 (Indigenous peoples –health and socio-economic conditions).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 13.1 and Appendix 13.1.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-71 and 1-72.*

Context

In response to questions IAAC-1-71 and IAAC-1-72, and according to chapter 13.6 of the EIS, the proponent states that the project presents a very low risk of contamination of wild-collected foods or from other routes of exposure for human health. The proponent is therefore of the opinion that it was unnecessary to conduct a human health risk assessment. However, among the Indigenous peoples impacted by the project, there is a significant perception of risk of contamination of traditional foods (see SART's Bio-Cultural Impact Pathways Study).

PSPC Response:

PSPC is aware of the perception of risk of contamination of traditional foods and included this perceived effect within the human health effects assessment. There is no pathway from the Project to contamination of wild-collected foods or other routes of exposure to human health; however, PSPC commits to including traditional foods in monitoring programs because of the perceived effect and will include this within the Environment and Social Management Plan.

Comment 2-12 – Concerns about Traditional Food

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.3.4 (Indigenous Peoples) and 7.4 (Mitigation Measures).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 11.2.2.1, 13.2.4.3.1.2, 13.2.4.3.5.1, 13.3.4.3.1, 13.5.4.3.2, 13.4.4.7.1 and 22.5.*



PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-72.

Comments and advice

Communities likely to consume fish are on both sides of the provincial boundary between Quebec and Ontario. The proponent refers to Ontario's safe consumption rates for fish. However, Ontario's guidelines are not site-specific.

Health Canada encourages the proponent to consult provincial government information sources related to the place of residence in order to have specific follow-up activities.

Health Canada also encourages the proponent to involve provincial public health departments in follow-up activities and communication plans. These plans should be developed prior to the start of construction. This would ensure that local communities have access to complete and up-to-date information (e.g., communication of the proponent's analysis results and applicable consumption advice from the provincial public health authorities).

PSPC Response:

PSPC commits to consulting provincial government information sources related to the place of residence to support the development of specific follow-up activities.

PSPC has developed community-specific consultation and communications plans with the Indigenous groups consulted on the Project. PSPC further commits to engaging provincial public health departments on follow-up activities and the project-level communications plan for informing Indigenous groups, the public, and industry stakeholders about construction, monitoring, and follow-up activities.

Comment 2-13- Compliance with Internal Nation-to-Nation Protocols

References

PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-82.

Department of Justice Canada, 2023. United Nations Declaration on the Rights of Indigenous Peoples Act Action Plan. <https://www.justice.gc.ca/eng/declaration/ap-pa/ah/pdf/unda-action-plan-digital-eng.pdf>

Comments and advice

AOPFN and SART pointed out that "cultural activities" is more appropriate than "ceremony" to capture all cultural activities.

SART also requests that the proponent follow the Algonquin protocol.



PSPC Response:

PSPC commits to using the term “cultural activities” instead of “ceremony” in future to reflect the preference of the AOPFN and SART. If the Algonquin Protocol is shared, PSPC will consider it in developing plans and activities.

Comment 2-14- Effects on Potential or Established Aboriginal and Treaty Rights

References

CEAA, August 2018. Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 6 (Impacts to potential or established Aboriginal or treaty rights)

Tetra Tech, February 2023. Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement, section 13.1

Services publics et Approvisionnement Canada, mars 2024. Public Services and Procurement Canada Response to the Information Request No. 1 (Part 1). Response to question IAAC-1-70.

Comments and advice

The proponent should consider biocultural loss, because of depletion and contamination of Indigenous fisheries food sources, as an effect on potential and established treaty rights.

PSPC Response:

PSPC is committed to ongoing discussions with SART to better understand the severity and magnitude of these losses including what is causing them, including potentially from the Project, and therefore the impacts to Aboriginal and Treaty rights. PSPC has prepared a collaborative approach to the Environmental and Social Management Plan (ESMP, Appendix D) that was shared and will be discussed with SART. Part of implementing the ESMP could include implementing mitigations that reduce, compensate for (through off-setting) or avoid impacts on fisheries and monitoring effects of the Project on biocultural loss.



Human Environment

Comments and advice for the proponent

Comment 2-15- Noise Management Plan

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.1.1 (Atmospheric, light and noise environment), 7.1.9 (Indigenous peoples), 7.2.1 (Changes to atmospheric, sound and light environments), 7.3.4 (Indigenous peoples), 7.3.5 (Other valued components that may be affected by the project) and 7.4 (Mitigation measures).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 8.1.4.6.3, 8.1.6.4.1.4, 11.2.1.1.2, 11.2.1.3.3.2.4.6 and 11.2.1.3.3.2.16.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-83 and 1-84.*

Comments and advice

Indigenous communities are concerned about the project's potential effects on the sound environment. The proponent should provide the Noise Management plan for review and input by Health Canada and Indigenous communities involved. The Agency recommends that the proponent develop the Noise Management Plan in consultation with Indigenous communities and that reasonable timelines are discussed and established with them in terms of its implementation.

The Noise Management plan should justify the choice of noise impact indicators applicable to the project and their sources (e.g. Health Canada guidelines or provincial guidelines) as well as describe steps to be taken to resolve noise complaints, including opportunities for establishing dispute resolution processes.

PSPC Response:

PSPC is aware of and considered Indigenous groups' concerns related to the potential effects of the Project on the sound environment in the EIS. PSPC commits to developing a noise management plan in consultation with Indigenous groups and sharing the plan with Health Canada for additional review and comment.

PSPC has prepared a collaborative approach to the Environmental and Social Management Plan (ESMP, Appendix D) and will consult with Indigenous groups. The ESMP will include a noise management plan. The noise management plan of the ESMP, including indicators, will be informed by Health Canada, provincial guidelines, and other industry best practices. The ESMP will include a reporting framework for receiving and addressing noise complaints.



Archaeological Resources

Information requests directed to the proponent

IAAC-2-21 –Archaeological Chance-find Protocol

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.1.9. (Indigenous peoples) and 7.1.11. (Human environment).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Chapter 13.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-87, comment 1-39 and Appendix M-4 – Chance Find Protocol – Task 4.*

Context

As mentioned in the response to question IAAC-1-87, the proponent plans to implement a chance-find protocol in lieu of active archaeological monitoring of the work, given the low underwater archaeological potential in the work area. According to Parks Canada, this approach is appropriate. However, the protocol itself (chance-find protocol or marine archaeological protocol, Appendix M-4) was missing. The terrestrial chance-find protocol also was not presented.

Parks Canada points out that the protocol should apply to both Indigenous and non-Indigenous archaeological resources whether underwater or on land.

The Agency instructs the proponent to:

- A) Provide the chance-find protocol (marine and terrestrial) for archaeological work.

PSPC Response:

Please find in Appendix C the Marine Chance-Find Protocol. A terrestrial Chance-Find Protocol will be developed before the construction which will include a one-pager procedure for the contractor in case of any findings.

- B) Describe the underwater or terrestrial measures that will be put in place to ensure that accidental archaeological finds are recognized by workers during construction, reported to the appropriate people, and then protected until they can be evaluated by experts.

PSPC Response:

The Marine and Terrestrial Chance-Find Protocol will be part of the solicitation documentation for potential contractors to bid on the construction contract. The protocol will be discussed with construction workforce



to ensure the appropriate measures are implemented if archaeological resources are found. Below are the measures that will be put in place (extract from the Marine Chance-Find Protocol):

3.0 MARINE ARCHAEOLOGICAL RESOURCES

Discovery of suspected archaeological resources shall be managed in accordance with the Archaeological Resources Contingency Plan.

3.1 Archaeological Resources Contingency Plan

Purpose: To ensure that archaeological resources identified during construction are protected and that discovery of artifacts and/or human bones are managed as per all applicable legislation, regulations and First Nations, Métis, and Indigenous protocols.

Concerns: Although the Timiskaming Dam Replacement Project limits has been investigated for historical resources directly within the project area, there is the potential to discover/find archaeological resources and human remains during construction. If not properly handled these valuable resources could be inadvertently destroyed or not treated with the respect that they deserve.

Identification: During construction all personnel are responsible for immediately reporting any unusual materials unearthed during the construction phase to the Timiskaming Dam Replacement Project Construction Manager or his designate or any of the PSPC representatives. PSPC staff are responsible for taking control of the situation. PSPC will ensure that the construction manager is aware of any unusual materials being unearthed and will ensure that any next steps are taken immediately, including stop work orders if necessary. PSPC will also immediately contact First Nations, Métis, and Indigenous communities and follow all Chance Find Procedures.

3.2 For Discovery of Human Remains

UPON DISCOVERY OF POTENTIAL HUMAN REMAINS ALL WORK MUST STOP.

Stop Work: Where a find is thought to be human remains, work within 100 meters of the find shall be stopped immediately and the Construction Manager and the PSPC representatives, must be notified immediately.

Investigation: All work must stop immediately. PSPC will work with First Nations, Métis, and Indigenous communities, local police and a qualified heritage resource specialist or third-party archaeologist, to decide on next steps and develop, if warranted, an appropriate mitigation plan.

Action: Processes are different according to jurisdiction, but the general principles are the same in both Ontario and Quebec. When human remains are accidentally discovered, the main course of action is to follow Article 182 of the Criminal Code in the Canadian constitution as outlined by Parks Canada [here](#).

When potential human remains are found, the following process must be followed:

- 1) **All work must stop**, and the site must be secured from both personnel and the public. Any soils associated with the potential remains should be secured as well. Nothing should be moved from the location, including any associated soils. No photographs can be taken of the bone in question.
- 2) First Nations, Métis, and Indigenous communities must be contacted as part of chance find protocols. Requests may be made for specific ceremony or practices to take place with regards to the remains. Representatives may be on site as part of the Chance Find Protocols for investigations.
- 3) An archaeologist should come to identify if the remains are humans. If they are clearly not human, and First Nations, Métis, and Indigenous communities are in agreement, work can proceed. If the fragment is determined to be of human origin, work cannot proceed. Section 3.3 discusses the discovery of cultural non-human remains (faunal remains) relating to an archaeological resource.
- 4) Police must be contacted. They will evaluate if there is any forensic interest in the remains. This will involve a coroner or other specialist. The location of the discovery will determine if Ontario or Quebec police will be called.
- 5) The Coroner will confirm if the remains require any further involvement by the Police. If they do not, the case gets released to the landowner and will fall under the appropriate legislation based on the location of the remains.
- 6) Burial Investigation proceeds roughly as follows:
 - a. Initial inspection of site and remains;
 - b. Create a workplan in conjunction with First Nations, Métis, and Indigenous communities to address the location of the remains and identify if any additional interments/disarticulated remains are present in the surrounding area
 - i. At this stage (unless recovering disturbed remains) exhumation does not occur, just identification and some documentation;
 - c. Workplan is circulated to the client, and government ministries for review and comment prior to beginning work;
 - d. Once workplan is approved, the investigation can begin;
 - e. After the investigation is completed, and any remains/interments have been identified, the archaeologist submits a report to the appropriate governing bodies for review. Work on site will be remain shut down until mitigations agreed to with communities have been completed, including any ceremonies.

3.3 For Discovery of Suspected Archaeological Resources

Upon discovery of suspected archaeological resources at the specific site, work must stop.

Stop Work: Where a find is thought to be an archaeological resource, work within 100 meters of the find shall be stopped immediately and the Construction Manager and the PSPC representatives must be notified immediately.

Contact: PSPC representatives shall immediately contact the MCM (Ministry of Citizenship and Multiculturalism) and an archaeologist. Additionally, PSPC will work with First Nations, Métis,

and Indigenous communities, to decide on next steps and develop, if warranted, an appropriate mitigation plan.

Investigation: All work must stop immediately. PSPC will work with First Nations, Métis, and Indigenous communities, local police and a qualified heritage resource specialist or third-party archaeologist, to decide on next steps and develop, if warranted, an appropriate mitigation plan. An investigation shall be carried out to determine an appropriate approach to dealing with the find.

Action:

1. **All work shall be halted** in the area of the find and a buffer erected to isolate the find for at least 100 meters.
2. All archaeological work shall be conducted by a licensed marine archaeologist.
3. First Nations, Métis, and Indigenous communities shall be immediately contacted and a monitor requested to be on site during the archaeological investigation. Any chance find protocols must be followed.
4. Archaeological investigation of the area of the find and its environs shall be conducted using a pedestrian transect where possible however as the area has been determined to be one of boulders and rocks the more probable survey methodology will be one of investigation in and between the boulders/rocks.
5. Evaluation of the resource will be discussed with PSPC, Tetra Tech and the First Nations, Métis, and Indigenous communities groups if findings are of Indigenous interest. If recovery is required, a conservation plan will be developed with all parties prior to any removal. An evaluation shall be made as to the integrity and strength of archaeological resources prior to their recovery.
6. Mitigation measures may include avoidance and protection (resource remains in situ and the site area is protected); recovery and conservation (see below for more details on both recovery and conservation); recording (georeferencing, mapping and photography); curation by Indigenous groups according to provincial polices as well as First Nations, Métis, and Indigenous protocols; and/or monitoring of the resource (archaeologist will remain on site until all construction activities at or near the archaeological resource have ceased and will act to protect the resource from all direct and indirect impact from construction).
7. All finds shall be georeferenced prior to any removal.
8. Wherever possible, archaeological resources shall be mapped and photographed in situ. Recording shall be conducted in metric units. **NB:** This does not apply to potential human remains, which should never be photographed.
9. The conservation plan shall be followed for the recovery and temporary conservation of the archaeological resources prior to their removal to a conservation facility.
10. A license report will be written detailing the location, identification, recording and photography, recovery and interpretation of find(s). Recommendations shall be included as part of this report. The conservation report may require additional time to prepare, depending on level of conservation required, and might not be available immediately to include as an appendix to the report. A summary of the proposed/on-going conservation should be included in the report as interim measure.

11. Artifacts - Under the Ontario Heritage Act and under the issued marine archaeological license, the license holder is entrusted to maintain the artifacts that are recovered from any project. It is the preference of ARA that artifacts be stored/housed/displayed on a permanent basis other than at its facility. Final disposition must be determined in conjunction with engaged First Nations, Métis, and Indigenous communities and Chance Find Procedures must be followed. A list of deposit locations include:

- **Musée d'art de Rouyn-Noranda**
201 Av. Dallaire local 154
Rouyn-Noranda, Quebec J9X 4T5
Tel.: (819) 762-6600
- **Parks Canada**
- **Magasin général Dumulon**
191, avenue du Lac
Rouyn-Noranda, Quebec
J9X 5C3
Tel. : (819) 797-7125
- **Musée de la Gare**
15 Rue Humphrey
Témiscaming, QC J0Z 3R0
Tel.: (819) 627-1846

Commencement of Work: Work in the vicinity of the find can only be resumed when authorized by the PSPC Manager in consultation with the Construction Manager and after clearance has been received from the Ministry of Citizenship and Multiculturalism and the First Nations, Métis, and Indigenous communities.

- C) Describe how the protocol will respect, implement, and integrate Indigenous' protocols with the project chance-find procedures.

PSPC Response:

The Marine Chance-Find Protocol was shared and reviewed by the Indigenous groups. When available, Indigenous chance-find protocols were shared with PSPC and these protocols were appended to the Marine Chance-Find Protocol (see Appendixes B and C of the Marine Chance-Find Protocol). As part of the action plan, upon discovery of human remains or suspected archaeological resources, First Nations, Métis, and Indigenous communities shall be immediately contacted and a monitor requested to be on site during the archaeological investigation. Any chance find protocols must be followed.



IAAC-2-22 – Archaeological Collections Management

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.3.4 (Indigenous peoples) and 7.3.5 (Other valued components that may be affected by the project).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 13.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-86.*

Context

In response to question IAAC-1-86, the proponent referred to Ontario's legislation. However, Treasury Board's Directive on the Management of Material applies on federal lands in lieu of Ontario regulations. In keeping with the directive, federal custodians may have repositories for archaeological artifacts. If a federal custodian determines that it is not appropriate or does not have the resources to conserve a collected archaeological resource, it may decide to transfer it to a federal institution or museum, to a museum of another level of government, to an Indigenous organization or public institution whose mission is related to the nature of the collected resource, or to a public authority, as defined in the Cultural Property Export and Import Act (1985) [subsection 4.2.22 of the Directive on the Management of Materiel].

The Agency instructs the proponent to:

- A) Describe how the archaeological documentation and the conservation of collections will be managed in accordance with the requirements under the Treasury Board's Directive on the Management of Materiel.

PSPC Response:

Given PSPC does not have repositories for archaeological artifacts, the final disposition will be determined in conjunction with the engaged Indigenous groups, and the Marine Chance-Find procedures must be followed. A list of potential deposit locations has been included in the Marine Chance-Find Protocol which includes some local locations as well as Parks Canada (see Section 3.3 of the Chance-Find Protocol).

Musée d'art de Rouyn-Noranda

201 Av. Dallaire local 154
Rouyn-Noranda, Quebec J9X 4T5
Tel.: (819) 762-6600

- **Parks Canada**
- **Magasin général Dumulon**
191, avenue du Lac
Rouyn-Noranda, Quebec
J9X 5C3
Tel. : (819) 797-7125

- **Musée de la Gare**
15 Rue Humphrey
Témiscaming, QC J0Z 3R0
Tel.: (819) 627-1846

Also, Section 4 of the Marine Chance-Find Protocol presents a conservation plan for freshwater environment:

4.0 CONSERVATION PLAN

The following has been adapted from a conservation plan produced by the Canadian Conservation Institute for Scarlett Janusas Archaeology Inc. for another project in a freshwater environment (Grant and Binnie 2017).

4.1 Introduction

The purpose of this section is to provide advice in the handling of possible artifacts recovered from a freshwater excavation and/or dewatered area for the project area known as the Timiskaming Dam Replacement (Quebec) project. All removal of artifacts must be done under a marine archaeological license issued by the Ontario government. The license/permit shall include exploration, excavation, screening, monitoring, and recovery of artifacts. Artifacts collected will be conserved (through one of the conservation agencies provided in Appendix A - List of Conservation Labs/Facilities).

The marine archaeologist has already conducted in-water archaeological assessment and background research including side scan sonar, magnetometer, video and snorkel survey. At present only one archaeological site has been identified, a wooden crib, located at the south end of the project area, but it is also located outside the proposed area of construction. A portion of the project area will be dewatered once a cofferdam has been established (north of the mouth of Gordon Creek) to allow for the construction of a new dam. The area that will be dewatered has been shown through the in-water archaeological assessment to be composed of boulders and rocks, construction debris, miscellaneous metal objects possibly connected with the construction of the early dam and cofferdam, or the current dam, and organic (parts of trees) ecofacts, such as unmodified logs. There exists the possibility of small artifacts being wedged in between boulder and rock crevices.

4.2 Conservation Plan Template

Should artifacts be located/revealed during the dewatering and construction phase of the cofferdam and dam, then the following plan needs to be enacted.

Before Recovery

- As soon as an artifact is subject to air exposure, its equilibrium has been disturbed and mishandling can lead to irreversible damage.

- Documentation (under license) such as mapping and photography should be completed before recovery of the artifact(s).
- Each artifact should be examined to determine its strength and integrity prior to recovery.

During and after recovery

- The majority of artifacts can be recovered using plastic buckets, padded milk crates, or chloroplast sheets. However, waterlogged organics may be weaker than they appear and should be supported during lifting and transporting.
- Each artifact must be assigned a provenience number after recovery and entered into an inventory list. The area around each artifact should be examined for additional associated artifacts.

General handling procedures

1. Keep artifacts wet

- All artifacts must be kept wet until they are documented and dealt with in a controlled environment such as a lab. Tanks or buckets filled with water during transport are subject to swaying and the action could potentially damage an artifact. In these cases, artifacts should be packed wet as soon as possible, or braced to avoid movement and damage.
- Any attached soil, fibrous material or concretion should remain intact (i.e. do not remove) until examined and assessed by the lab/conservator. Removal may damage the artifact.
- Artifacts can be stored in tanks of water to keep them wet prior to transport. River water can be used to store the artifacts, but water should be changed on a weekly basis.
- Once transported to a conservation facility, the organic artifacts can be transferred to regular tap water, however, metal objects should be stored in
- deionized or distilled water.

2. Store artifacts with appropriate packing materials

- Storage and packaging materials should be inert, that is, stable plastics such as polyethylene, polycarbonate, polystyrene are the most common of the stable plastics
- Artifacts should be packed in Ziploc bags or plastic containers of various sizes (depending on size of artifact) with well sealing lids or alternatively wrapped in thick (6 mm) polyethylene sheeting and taped with duct or packing tape.

3. Label each artifact

- Contents of the container/bag should be labelled with tape and marked with waterproof markers
- Polyethylene or Tyvek tags can be used alternatively and tied to the artifact with string or green plastic coated florist wire
- Paper tags sealed in a Ziploc bag can be used for large wrapped artifacts not submerged in water.

4. Provide support for artifacts with appropriate materials

- An artifact may look strong as they are waterlogged and look “plump”, but wet organic artifacts tend on the whole to be weak. Fragile artifacts need to be supported on an inert support such as Coroplast.
- A layer of soft polyethylene foam over the Coroplast support is recommended for soft organic materials to prevent flattening of the underside
- Thicker planks of polyethylene can be carved to provide supports to prevent heavy round artifacts from rolling
- The artifacts can be secured to the support with plastic wrap or medical bandages.
- A layer of flexible polyethylene foam can be used to pad and protect the surface of flat artifacts before bagging, however this must be judged on site to ensure the artifact will not be impacted
- Larger or heavy artifacts may need more substantial support such as wood or metal. A layer of inert plastic should be used between the metal support and the artifact, especially as metal to metal contact may cause galvanic corrosion.
- Orthopedic casting kits of polyurethane resin and mesh can be used to create special form fitting supports
- Nylon or polypropylene rope can be used on large items but the rope should be padded with Ethafoam where it contacts the artifact to prevent wear marks
- White toweling can be used to cover robust artifacts to keep them wet under the plastic layer
- Plastic pipe wrap or plastic gutters can be used to support round rope artifacts to help them keep their shape
- Bubble pack and plastic food wrap can be used, but may contain chlorides, which will leave marks on metal surfaces (corrosion)
- If stacking artifacts in bins, place the heaviest artifacts on the bottom and interweave with bubble pack, foam or toweling to prevent crushing and/or abrasion
- Objects should be padded sufficiently to prevent movement during transportation without exerting excessive pressure on the artifact

5. Store artifacts in an appropriate environment

- Artifacts should be kept as cool as possible – stored out of sunlight and preferably refrigerated to reduce mold growth
- Freezing is recommended if the time before treatment will be lengthy, but as all plastics “breathe” there is risk of artifact drying out.
- Wrapping the plastic wrapped artifacts in tinfoil (providing an air impermeable membrane) will prevent the artifacts from drying out
- Biocides are generally not recommended due to safety to personnel and possible interactions with the artifacts.

Prioritize treatment of artifacts

- Recovered artifacts can be sorted into three categories: i) those requiring minimal treatment, ii) artifacts which can be put on hold (don't require immediate treatment), and iii) those requiring treatment under the supervision of a conservator.
- Any composite artifacts (containing more than one material) containing organic materials should be treated as an organic artifact.
- Inorganic non-metallic artifacts (such as glass, ceramic, stone and brick):
 - Require minimal treatment (fresh water origin)
 - Dirt and rootlets or other organic material should be cleaned off with a brush which does not mark the artifact surface and the artifact be slow air dried. This is commonly done in a Ziploc bag left open to allow air to circulate.
 - Condensation should be wiped out of the bag each day.
 - Drying can be slowed by closing the opening partially.
 - Drying should be done in a cool location and artifact observed for possible growth of mold.
 - Artifacts should be observed for efflorescence forming on the surface as this is a possible indicator of a chloride problem. If efflorescence is observed, drying should be stopped until the cause is determined.
- Paper documents or photographs require immediate care and should be sent immediately to the conservator
- All other artifacts should be packed for transportation to the conservation facility for assessment and treatment.

List of supplies and materials useful in the field work for packing and storage

Ziploc bags, various sizes
 Plastic bins or containers with covers, insulated food coolers, various sizes
 Coroplast sheets
 Plastic food wrap
 Bubble pack, various sizes
 Flexible, thin polyethylene foam (Ethaflex, Sentinel)
 Ethaflex plank
 Toweling, white (prewashed) Polyethylene tags (Tyvek, Polypaper)
 Plaster gutters, plastic pipe wrap
 Planks or plywood
 Fiberglass or nylon window screening
 Tape (duct, reinforced mailing tape, 3M yellow, masking tape)
 Medical bandages, various widths
 Green florist wire
 Waterproof markers, black (Sharpies pen)
 Monel staples and stapler
 Nylon or polypropylene ropes
 Plastic buckets
 Milk crates



Net bags
Orthopedic casting kits
Hand water mister
Scissors
Small tools (trowels, spatulas, brushes)
Water container or garden hose and spray nozzle

A list of conservation facilities and conservators is presented in Appendix A - List of Conservation Labs/Facilities of the Marine Chance-Find Protocol.

IAAC-2-23 – Potential Cultural Value of the Existing Dam-Bridge

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.1.9. (Indigenous peoples) and 7.1.11 (Human environment).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Chapter 13.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-88 and Appendices M-1 and M-2.*

Context

As stated in response to question IAAC-1-86, the *Heritage Impact Assessment* recommends that the remains of the old dam-bridge be thoroughly documented. The *Marine Archaeological Survey (2023)* noted remains adjacent to their southwestern study section along the eastern shore of Long Sault Island, but did not document them, as they were considered terrestrial archaeological resources.

The *Marine Archaeology Assessment (2023)* noted that a wooden structure identified by Archéotec could be linked to the construction of the 1934 dam. Archaeological Research Associates were unable to locate this structure. Archéotec did not provide a precise location, so it is possible that this structure is located outside the study area.

The Agency instructs the proponent to:

- A) If possible, confirm whether the wooden structure identified by Archéotec is located within the project area. If so, identify and describe the measures that will be taken to investigate and assess the heritage value.

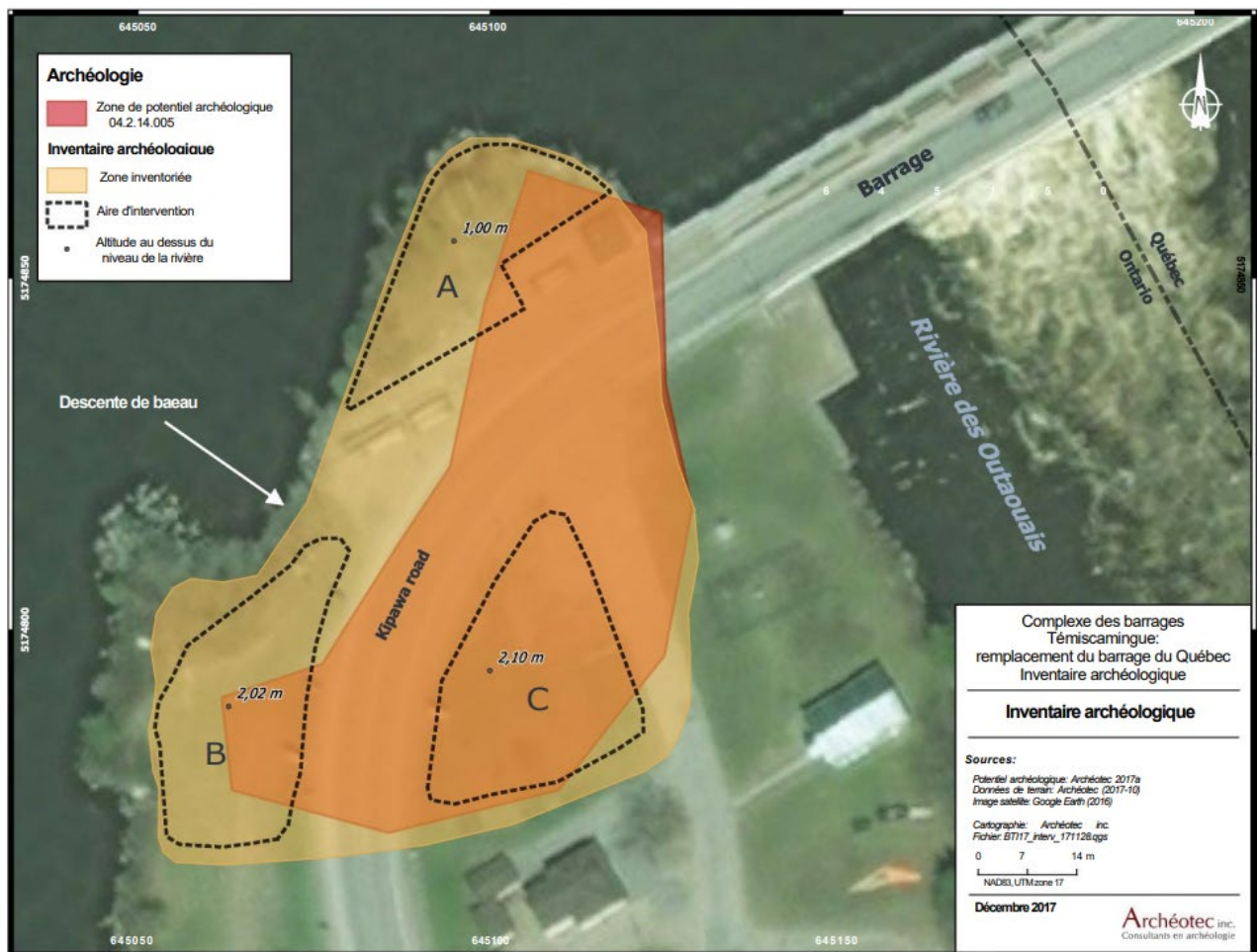
PSPC Response:

Based on the Archaeological Evaluation, Phase II report (Archéotec, 2017), the wooden structure would be located in Intervention Area A (see the map below), without any specific georeferencing. However, when ARA investigated the area, no such structure was found. This area and the tip of the island won't be affected by the construction activities and as such no measures will be implemented.



In addition, the report is not clear whether this structure was linked to the construction of the existing dam:

“Such wood pieces can also be observed on the shore, where their configuration confirms that they form some kind of caisson or retaining structure that allows the filling material to resist erosion from water and ice. The presence of wood blocks and retaining structures clearly indicates that all of this area of the island was backfilled and redesigned. There is no natural soil in this part of the island.”



B) Specify what measures will be taken to document the remains of the old dam-bridge.

PSPC Response:

An inspection of the existing dam will be undertaken prior to the construction, and locating and documenting the remains of the old dam will be conducted at the same time.



Comments and advice for the proponent

Comment 2-16 – Archaeological Survey

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.1.9. (Indigenous peoples) and 7.1.11. (Human environment).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 13.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-87.*

Comments and advice

AOPFN recommends that an additional archaeological survey be undertaken once the cofferdams are installed if deemed necessary.

PSPC Response:

If it deems safe, PSPC will explore the possibility of conducting an additional archaeological survey once the cofferdam is installed.

Comment 2-17 – Potential Heritage Sites

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.1.9. (Indigenous peoples) and 7.1.11 (Human environment).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 13.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-88.*

Comments and advice

In response to question IAAC-1-88, SART suggests considering the Algonquin Canoe Company store, boat rack and shed as a heritage site considering the importance of this company for the Algonquin people.

PSPC Response:

PSPC acknowledges the importance of the boat rack and shed of the Algonquin Canoe Company store and will take these assets into consideration for future heritage site assessment.



Accidents or Failures

Comments and advice for the proponent

Comment 2-18 – Emergency Response Plan and Petroleum Products

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.6.1 (Effects of potential accidents or malfunctions).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 11.2.2.2.2, 11.2.3.3.2.3, 15.1, 15.2 and 15.3.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to question IAAC-1-89.*

Comments and advice

Response to question IAAC-1-89 indicates that up to 4,500 litres of fuel may be stored on site, and that a tanker truck may be used to refuel equipment on site. Given these activities and the project's proximity to the aquatic environment, there is a potential for effect on various environmental receptors in the event of accidents or malfunctions during the construction phase.

ECCC recommends the proponent to follow the instructions described in comment 1-41 concerning the development of an emergency plan and a spill response plan for all activities to be undertaken during the project, including those involving the storage of fuel products.

PSPC Response:

ECCC's recommendations will be followed when developing the emergency plan and the spill response plan.

In addition, Wolf Lake First Nation requests consultation on fuel storage.

PSPC Response:

PSPC commits to consulting Wolf Lake First Nation on fuel storage when contractor is on board.



Cumulative Effects

Information requests directed to the proponent

IAAC-2-24 – Cumulative Effects of Air Quality

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.6.3 (Cumulative effects assessment)*.

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 17.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-94.*

Context

Although the proponent followed the sequence of steps required for the assessment of cumulative effects on air quality in its response to question IAAC-1-94, the content remains minimal, especially regarding mitigation measures.

The proponent's response mentions that a monitoring program will be implemented to assess compliance with “set limits” for air and noise emissions during construction. However, the chapters on monitoring and follow-up (chapters 22 and 23) do not include “set limits for air quality”.

The Agency instructs the proponent to:

- A) Clarify what is meant by “set limit” and provide an explanation of what these set limits are for air emissions.

PSPC Response:

In Section 11.1.4 of the EIS, air quality measured by the MELCCFP station located in Temiscaming shows air quality to be compliant with Québec PM_{2.5}, SO₂, and O₃ regulatory limits. The aggregated air quality index shows air quality to be “Good” or “Acceptable” for 60% to 80% of the time for the 2008-2019 period.

The 2021 NPRI reports shows the biggest air emission contributor is Rayonier with following releases:

- CO = 1,031 T
- NO_x = 607 T
- SO₂ = 103 T
- PM_{2.5} = 70 T



In PSPC response to IAAC-2-5 A) above, air emissions for the project were calculated as follows:

- CO = 3.5 T
- NO_x = 0.12 T
- SO₂ = 0.03 T
- PM_{2.5} = 0.006 T

Given this result for the project, PSPC intends to limit air quality monitoring only to dust monitoring which may be a source of nuisance associated to air quality. The limit for dust emission is visible dust more than 2 m from the source. The Contractor will be required to implement daily visual dust monitoring. If a dust event exceeding the 2 m limit is detected, mitigation measures such as dust suppressant on road, use of vacuum truck and watering demolition site would be implemented before resuming work.

IAAC-2-25 - Mercury levels

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.1.5 (Surface water), 7.3.1 (Fish and fish habitat) and 7.6.3 (Cumulative effects assessment).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 17.5.1.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-98.*

Context

In response to IAAC-1-98, the proponent has only provided general “grey literature” concerning the suspension of mercury in water overtime and have not provided primary evidence on current concentrations of mercury in water within and in proximity to the project area. Given Indigenous communities member's concerns with the potential for mercury in the water, in fish and in sediments, further investigation is required.

The Agency instructs the proponent to:

- A) Provide data to support the claim that mercury concentrations in fish, water, and sediments have returned to pre-dam-bridge levels at the project site.

PSPC Response:

PSPC would like to issue an erratum. In Table 11.5 of Section 11.1.9.5 of the EIS, data from Arbour, 2020 study for mercury in sediment was not transcribed correctly. For mercury, the data should have been expressed in ng/g (ppb) and not mg/kg (ppm). Hence, correct transcription from Arbour, 2020 should read as follows:



	Guidelines or the protection of aquatic life					Station		
	<u>ISQG</u> (CCME)	<u>LEL</u> (ON)*	<u>CER</u> (QC)*	<u>CSE</u> (QC)*	<u>CEO</u> (QC)*	<u>1</u>	<u>2</u>	<u>3</u>
<u>Chemical parameters (metals)</u>								
<u>Mercury</u> (ng/g – ppb)	-	-	<u>94</u>	<u>170</u>	<u>250</u>	<u>1.86</u>	<u>1.18</u>	<u>11.37</u>

* ISQG: Interim sediment quality guidelines (CCME)

* LEL: Lowest effect level (ON)

* CER: Rare effect level (QC) – CER: concentration d'effets rares

* CSE: Effect threshold level (QC) – CSE: concentration seuil produisant un effet

* CEO: Occasional effect level (QC) – CEO: concentration d'effets occasionnels

Considering this revised data on mercury in sediments at the three sampling stations closest to the Timiskaming Québec dam-bridge, levels measured in Arbour, 2020 are largely lower than existing provincial criteria, showing a return to pre-dam-bridge conditions.

IAAC-2-26 – Cumulative Effects on Culture, Heritage, and Traditional Practices

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Section 7.6.3 (Cumulative effects assessment)*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 17.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-94 and IAAC-1-95.*

Context

In response to questions IAAC-1-94 and IAAC-1-95, the proponent lists several activities to capture the scope of cumulative effects on Algonquin lands and waters. However, the proponent has not described how or if they have considered recommendations for measures from the AOPFN Cumulative Effects Study (CES). This study indicates that existing levels of effect in the Kichí-Síbi (Ottawa River) already severely constrain and significantly impact where and how AOPFN members practice rights, maintain critical connections to land, and pass on knowledge to younger generations.

The Agency instructs the proponent to:

- A) Describe how Indigenous-led studies were considered and incorporated in the assessment, most notably in Table 17.1 of the EIS.



PSPC Response

When Table 17.1 was created, it considered the information provided to PSPC in the Indigenous-led studies. To address this request, Table 17.1 has been modified to add specific reference to Indigenous-led studies.

REVISED Table 17.1 of the EIS: Rationale behind the selection of VCs

Valued Component	Residual effect from the project?	Is the VC likely to be affected by other past, present, and future projects in the spatial and temporal boundaries?	Selected	Rationale
Air quality	Yes	Yes	Yes	The residual effects of the Project on air quality and noise would be temporary and limited to the construction period. The AOPFN CES notes that there have been cumulative effects on cultural continuity, sense of place and knowledge sharing due to loss of peace and solitude. These effects would not interact with any future foreseeable physical activities. The temporary effects of the Project on air quality will be combined with emissions from the Rayonier plant which started in 1917.
Soil and groundwater (including erosion)	Yes	No	No	Residual effects will be limited to the construction period and no other physical activities are planned for the same period of time and same location that could affect soil and groundwater and consequently result in the release of suspended solids. There will be no residual effect after construction. Suspended solids from other sources are considered in the fish habitat assessment.
Water contaminants (mercury)	No	Yes	Yes	Although the Project itself has no impact on mercury levels in water, this component is of interest to Indigenous groups (referenced in AOPFN CES) and is therefore addressed in the cumulative effects study.
Water quantity (flows, velocities)	Yes	Yes	Yes	The residual impact for the modifications of flows and velocities is limited to the construction period. Given that other past projects (dams) have impacted the flow regime of the Ottawa River, and Indigenous groups, this component has been selected for the cumulative effects.
Fish and fish habitat (including water quality modifications - SS)	Yes	Yes	Yes	The Project will result in temporary and permanent effects on fish and fish habitat. Considering that the residual effects of the Project could be cumulative with other physical activities and that this component is of interest to Indigenous groups (including SART and AOPFN), this component has been retained in the cumulative effects study. The Project's impact on water quality, primarily suspended sediments, combined with the impacts from other past, present or future foreseeable projects on water quality in general, may influence fish and fish habitat. However, the Project impacts will be offset by the restoration of the fish habitat. Spawning areas below the dams in Ontario and Quebec are important whitewater spawning areas for many species.
Migratory birds (terrestrial and waterfowl)	Yes	No	No	Non-significant residual Project effects on migratory birds are expected. The temporary effects of the Project on the terrestrial species are limited to Long Sault Island which will be revegetated at the end of the construction. The revegetation program will be done in collaboration with the Indigenous groups as has been requested by SART and AOPFN. At the end, this could even result in a positive effect depending on the chosen vegetation. Waterfowl may be affected negatively due to noise in the work area, but a positive impact can be associated with providing calm water areas downstream of the cofferdam. Past experience has demonstrated that birds will adjust quickly to construction noise and use the

Valued Component	Residual effect from the project?	Is the VC likely to be affected by other past, present, and future projects in the spatial and temporal boundaries?	Selected	Rationale
				construction area despite the nuisance. Given the very specific impact and the short term duration, and that there will be no overlap of other projects and that in some cases the impact may even be positive, the component has not been selected for the cumulative effects.
Species at risk (sturgeon, eel, turtles, hickorynut mussels, bats)	Yes	Yes	Yes	<p>Residual effects are expected on sturgeon and turtles. Cumulative effects on turtles have not been addressed here given that the impacts are limited to the work area and are temporary, and no other physical activities that could have an impact on turtles are being planned at the same time in the same spatial area. Indigenous groups have noted that the Project will prolong existing impacts associated with barriers across the Ottawa River at Temiscaming and further impact spawning habitat.</p> <p>Hickorynut mussels are not recorded in the area due to the absence of sandy substrate, so it has not been selected for the cumulative effect assessment. This species is indirectly considered in the cumulative effects assessment due to its close relationship with the sturgeon at certain stages of its life cycle.</p> <p>No eels are present in the area. However, the fishway could have a positive long-term effect (but still unknown for now), in combination with other upcoming fishway projects on downstream dams and they are therefore considered in the cumulative effects assessment.</p> <p>Sturgeon has been selected for the cumulative effects assessment as sturgeon spawning has been confirmed downstream of the Timiskaming Dam Complex. The Project will have direct impact on those spawning grounds and on fish life cycles, which will be compensated for by the offsetting program. Spawning areas below the dams in Ontario and Quebec are probably the only whitewater spawning areas for sturgeon. However, other future foreseeable projects could have cumulative effects on this species.</p> <p>Even if some bat species at risk (little brown bat, tricolor bat and Northern long eared myotis bats) are present and feed on insects in the project area, other physical activities are not expected to affect insects in this area, so no cumulative effects on bats are anticipated.</p>
Vegetation	Yes	No	No	Some of the vegetation (mainly grass with some native vegetation near the shore) on Long Sault Island will be impacted by the Project during construction, but those effects will be reversed following construction by implementing a revegetation plan, in collaboration with the Indigenous groups. It is recognized that portions of Long Sault Island and sections of the Ottawa River at Temiscaming have been impacted in the past from transportation, dam, human settlement and commercial and industrial developments. The residual Project effect is limited to the construction period and in a limited area that is not expected to be impacted by other future foreseeable projects, and the impact on vegetation will be positive due to the implementation of the revegetation plan which aligns with the goal of site restoration as

Valued Component	Residual effect from the project?	Is the VC likely to be affected by other past, present, and future projects in the spatial and temporal boundaries?	Selected	Rationale
				stated in the AOPFN Cumulative Effects Study (CES). For that reason, vegetation has not been selected for the cumulative effect assessment.
Wildlife	Yes	No	No	The vegetation within the construction area will be disturbed and/or cut. These changes could impact the wildlife around the work area. The work area is a small area, already disturbed by human presence and industries (as was confirmed by the AOPFN CES), but is home to observed mustelids which have homes in the rocks around the dam replacement area and feed on the local fisheries. This area will be restored after closure of the work site, aiming for an improvement in the available habitat compared to the pre-work condition. To our knowledge, no other future foreseeable project or physical activity in the vicinity will cause wildlife habitat loss. Noise could also disturb wildlife, but simulations indicate that this has only localized effects (distance less than 500 meters). Given the localized and short duration of noise impacts on wildlife, and considering that natural noise from water circulation is already high, this VC has not been selected for the cumulative effects assessment.
Physical and Cultural Heritage	Yes	Yes	Yes	Residual Project effects are predicted for the physical and cultural heritage values of Long Sault Island, the Ottawa River and any archaeological resources found on or in them due to alteration of these natural heritage landscape features and to potential artifact destruction during construction. The altered natural aesthetic of these features has impacted their value and use for the purposes of practicing Indigenous culture which in turn could impact the health and wellbeing of Indigenous groups. These impacts were reflected in the AOPFN CES. Although no artifacts were found in the 2017 survey, to prevent irreversible impacts to artifacts that could be found in the riverbed, an archeological assessment will occur in collaboration with Indigenous groups before construction. Dam and bridge construction (and re-construction), roads, linear infrastructure such as pipelines, human settlement, natural resource development (forestry, mining) have and will continue to impact the physical and cultural heritage values of the Ottawa River and Long Sault Island. Therefore, this VC will be scoped into the cumulative effects assessment.
Fish and Fish Harvesting	Yes	Yes	Yes	Residual Project effects to fish and fish harvesting include impacts from water contamination, destruction of fish habitat and bridge lights which impact fish abundance and availability for harvesting; fencing and signage limiting fishing access. These effects were noted in the AOPFN CES. All of the effects have the potential to lead to decreased fish abundance and therefore availability for fishing. Reduced fish could impact fish consumption and cultural continuity which affects Indigenous health and well-being. To increase native fish species a fishway is proposed to be installed during the construction of the dam. While the fish ladder is anticipated to have positive effects, there remains the possibility that providing a fishway to a wide variety of fish species may degrade fish populations, by

Valued Component	Residual effect from the project?	Is the VC likely to be affected by other past, present, and future projects in the spatial and temporal boundaries?	Selected	Rationale
				<p>connecting water bodies that were previously separated by the dam and allowing predation by introduced fish species or migration out of certain areas of the Ottawa River. These effects may also alter fish abundance and fishing. The combined effect of the fishway at the Timiskaming Dams with other fish passages constructed on downstream dams could result in cumulative impacts on fishing in the future. Contaminants from other past, present and future foreseeable physical activities may create real or perceived barriers to fishing because of concern about fish health and possible risks of consuming those fish. Past, present and future foreseeable urban and resource developments adjacent to the Ottawa River cumulatively impacts access to the river for fishing. Fishing is therefore brought forward into the cumulative effects assessment.</p>
Wildlife and Wildlife Harvesting	Yes	Yes	Yes	<p>Anticipated residual Project effects on wildlife and wildlife harvesting include wildlife mortality and habitat loss due to Project activities impacting harvested species abundance and therefore their availability for harvesting. Wildlife mortality from Project activities may include direct casualties, or indirect, for example, impacts to fish abundance may impact wildlife populations that rely on them. Any negative impact to wildlife could result in a negative impact to harvesting and therefore could impact diet, health and wellbeing and cultural continuity. These effects were noted in the AOPFN CES. Project disturbance to wildlife and hunting is anticipated during Project construction and will act in combination with human settlement, traffic, roads, and industrial developments to perpetuate impacts on wildlife abundance and harvesting in this area well into the future. Therefore, wildlife harvesting is brought forward into the cumulative effects assessment.</p>
Harvesting of Plants and Natural Materials	Yes	Yes	Yes	<p>Indigenous people who harvest riparian plants and natural materials in the vicinity of the Project have been and will continue to be impacted by the loss of plants and natural materials on Long Sault Island and the banks of the Ottawa River during construction and, in the immediate footprint of the Project throughout the operation phase. Avoidance of the Project area for plant/natural material harvesting because of real or perceived contamination of plants and natural materials from dust, chemicals, spills and roadway runoff has likely contributed to the avoidance of the Project area for harvesting. These effects are primarily from the (past and presently proposed) Project construction, traffic using the roadway, and nearby industrial influences (Rayonier) which will interact and have interacted with Project effects in the past, present and future.</p> <p>Reductions in plant harvesting and use could limit the opportunity for Indigenous groups to teach about cultural plants thereby disrupting cultural continuity and negatively affecting health and wellbeing that may have been supported through the consumption and use of plants for food or medicines.</p> <p>A re-vegetation plan for Long Sault Island is planned in collaboration with Indigenous groups to mitigate some of the past effects on plant harvesting and provides an opportunity for</p>

Valued Component	Residual effect from the project?	Is the VC likely to be affected by other past, present, and future projects in the spatial and temporal boundaries?	Selected	Rationale
				renewed Indigenous stewardship of the plants and natural materials on Long Sault Island. Therefore harvesting of plants and natural materials is considered in the cumulative effects assessment.
Health and Socio-Economics	Yes	No	No	<p>Anticipated but non-significant negative residual Project effects on health and socio-economic conditions are expected on:</p> <ul style="list-style-type: none"> • barriers to employment from potential racism, sexism, or bullying. • decreased participation in cultural events, • increases in non-indigenous land and resource uses • disruption of community life (non-Indigenous) • demands on health care facilities (non-indigenous). <p>These effects result from limited Project employment opportunities during construction and not from changes to the environment from the Project. Under CEAA 2012, the changes to health and socio-economic conditions were focused on those that are caused by change to the environment. Furthermore, there are many employment opportunities available regionally, it is challenging to predict how individual employer policies and corporate cultures could impact employee behaviours and choices. For these reasons this VC is not brought forward into the cumulative effects assessment.</p>
Water Use	Yes	Yes	Yes	Some Indigenous people have reported that they avoid the use of the Ottawa River for drinking, swimming, and bathing, and will do so- particularly during Project construction - because of real or perceived contaminants in sediment and dam construction materials. The Project effects are combined with the effects on river water quality from human settlement (municipal storm and wastewater outfalls), other dam construction, roadway run-off, agricultural run-off, natural resource development (mining, forestry), and nuclear research facilities that introduce sediments, metals and other contaminants to the river. These have and will continue to contribute to impacts on water quality and therefore its use. These effects were noted in the AOPFN CES. It is for these reasons that water use is brought forward into the cumulative effects assessment.
Access and Travel Throughout Algonquin Lands and Waters	No	No	No	Indigenous groups' access to travel through the Ottawa River has been impacted since the construction of the dams located throughout the watershed. This was a noted effect in the AOPFN CES. While many other travel routes within the Ottawa River watershed have been altered or made inaccessible, the construction of the original Timiskaming dam did not impede travel routes as the Long-Sault rapids impeded river navigation and portage routes were necessary to traverse this part of the Ottawa River (Archéotec, 2017, 2017a). The

Valued Component	Residual effect from the project?	Is the VC likely to be affected by other past, present, and future projects in the spatial and temporal boundaries?	Selected	Rationale
				<p>construction of the dam with bridge has increased interprovincial access which has a number of socio-economic benefits. Furthermore, no negative residual Project effects to navigation on the Ottawa River or Algonquin Lands are expected. Nearby boat launches are not expected to change and the existing dam will remain open for travel until the construction of the replacement dam is complete.</p>



- B) Provide mitigation measures for cumulative impacts on Indigenous culture, heritage, and traditional practices.

PSPC Response:

PSPC has discussed additional mitigations for project and cumulative effects with AOPFN in early 2024 as was documented in IAAC 1-79. A comparison of the mitigations suggested by AOPFN and committed to by PSPC to the mitigations suggested in the AOPFN CES is provided in the Tables below. The Tables note overlap and what additional suggested mitigations will be applied to address cumulative effects. It should be noted that many of the recommended mitigations suggested by AOPFN in the CES had already been included in the EIS.

Tables on mitigations suggested by AOPFN and PSPC Commitments

AOPFN Valued Component: Protection and Stewardship of Culturally Important Plant Species

AOPFN recommendation for mitigation and enhancement measures and strategies (in AOPFN Alternative Means Assessment)	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
3.1.3				
Offsetting for Vegetation Loss: Planning and implementation of offsetting must be done in collaboration with AOPFN. The AAC noted that, at minimum, offsetting should be done at a minimum of a 3:1 ratio, though preferably higher. The AAC also noted that the scope of area currently proposed for offsetting is inadequate to support plant species to thrive and is looking forward to engaging in offset planning with PSPC.	X		PSPC has committed to involving Indigenous groups in revegetating Long Sault Island.	Yes – AOPFN requested to be involved in Project site restoration with goal of net habit improvement.
Pre-construction surveys: Support should be provided by the Proponent for AOPFN Guardians	X		Bats, birds, and Species at Risk surveys will need to be	Yes – AOPFN requested vegetation inventories



AOPFN recommendation for mitigation and enhancement measures and strategies (in AOPFN Alternative Means Assessment)	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
to conduct pre-construction surveys.			conducted prior to construction. AOPFN will be consulted and if appropriate, involve the AOPFN Guardians.	including of vulnerable species with involvement of AOPFN guardians and direction from the ACC.
Use of Native Plants: AOPFN is requesting a commitment from the Proponent to creating a wider “natural” riparian zone (as opposed to manicured lawn), by utilizing native plants. A “greener” shoreline should also be utilized (e.g., gentler slope, as opposed to shoreline hardening with riprap).	X		PSPC has committed to involving First Nations in revegetating Long Sault Island including using native plants. Riprap material was used for erosion control as the current is very strong. However, design of riprap can be adapted to allow partial revegetation with native plants to create a more natural environment. This will be part of the discussion for revegetating the island.	Yes – AOPFN requested to involve AOPFN in site restoration with goal of net habit improvement.



Additional mitigation measures: In the CES, AOPFN requests that there be no use of herbicides, pesticides or other toxic substances in general operations for the Project. This was a commitment made to mitigate vegetation impacts.

AOPFN Valued Component: Protection and Stewardship of Wildlife Habitat and Species

AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
3.2.3				
Commitment to involve and support AOPFN in co-developing wildlife management plans – including determining the location of protective fencing (e.g. for turtles)	X		PSPC has committed to involving AOPFN in the preparation of the EMP.	Yes – AOPFN requested that Algonquin knowledge of wildlife and wildlife habitat be used in site restoration planning and in wildlife protection measures.
Commitment to offset and include AOPFN in planning and implementation of offsetting for wildlife habitats including bat and swallow habitat	X		PSPC has committed to involving AOPFN in the preparation of the EMP.	Yes – AOPFN requested that Algonquin knowledge of wildlife and wildlife habitat be used in site restoration planning and in wildlife protection measures.
Commitment to support AOPFN Guardians in Wildlife monitoring and adaptive management	X		PSPC has committed to involving AOPFN in the	Yes – AOPFN requested capacity building



AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
			preparation of the EMP. Project specific work for Guardians, if applicable, will be discussed as part of the EMP and the IPP.	support for Guardians.

Additional mitigation measures: In the CES AOPFN suggests that study areas for wildlife be expanded. Through AOPFN participation in the ESMP (Appendix D), Algonquin knowledge will be used to consider appropriate monitoring areas for wildlife species.

AOPFN Valued Component: Protection and Stewardship of Spiritual, Cultural, Historic, Archaeological Relationships and Sacred Spaces

AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
3.3.3				
AOPFN Involvement in Culture and Heritage Studies: To support AOPFN's right to self-determination, PSC needs to provide opportunities and funding	X		No additional archaeological studies are planned prior to construction. If	Yes – AOPFN requests that professionals who are AOPFN members or



<p>AOPFN recommendation for mitigation and enhancement measures and strategies</p>	<p>Supported by PSPC to off-set potential project impacts</p>	<p>To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities</p>	<p>Rationale / comments</p>	<p>Mitigation Also suggested in AOPFN CES (Yes/No)</p>
<p>for the AOPFN archaeological team to conduct surveys, in addition to involvement in all PSPC-led studies.</p>			<p>this changes, PSPC will contact AOPFN. Also, an archaeological survey might be conducted when the cofferdam is installed. If so, PSPC will contact AOPFN.</p> <p>AOPFN's chance find protocol is being considered in the preparation of the chance find protocol for project construction which includes notification and involvement of AOPFN.</p>	<p>hired/appointed by AOPFN be brought for site visits; that a representative ben on location and involved in pre-project assessments, monitoring in construction and post-construction monitoring.</p>
<p>AOPFN Chance-Find Procedure: The Proponent (and contractors) must respect and adhere to AOPFN's chance-find procedure.</p>	<p>X</p>		<p>The AOPFN procedure has been shared with ARA who will consider it in the Chance Find Protocol for the project. This will be shared with AOPFN and other Indigenous</p>	<p>Yes – AOPFN requests monitoring during and after construction to reduce risks to any found historic places, artefacts and burial sites.</p>



AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
			groups for review and comment.	
Funding for AOPFN Cultural Programming: PSPC should make a financial contribution to AOPFN cultural programming that has been established to mitigate the loss of Algonquin culture and heritage. This contribution should be through untied funds.	X	X	Request is not proportional to the understood project impacts on the AOPFN. This kind of initiatives will have to be discussed with PSPC on a broader level. Funding needs to be tied to project-specific objectives.	Yes – AOPFN requests financial support from development of cultural education materials.

AOPFN Valued Component: Protection and Stewardship of Fish Habitat and Fish Species

AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
3.4.3				



AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
<p>Appropriate Habitat Offsetting: Considering the amount of fish spawning habitat (and consequently fish populations) that would be destroyed, the AAC asserted that the minimum replacement ratio needs to be 3:1. A minimum of 3:1 ratio would provide a greater probability of the habitat being established and able to support thriving fish spawn. The AAC also noted that this offsetting needs to occur on the Ontario side of the dam-bridge, prior to the start of construction, for a greater chance of shortening the recovery time for fish species to be lost.</p>	<p>X</p>		<p>To discuss as part of fish offsetting plan and DFO authorization.</p> <p>Description of the effects on fish from project-specific effects are included in the EIS.</p>	<p>No – off-setting ratios are not mentioned in the AOPFN CES as mitigation. However, PSPC has committed to involving AOPFN in monitoring and preparation of the Environmental and Social Management Plan (ESMP) for the Project which could include monitoring success of fisheries off-setting measures, aquatic invasive species.</p>
<p>AOPFN Engagement on Cofferdam Design: The AAC identified the cofferdam (construction, dismantling and material(s) used) as having a huge detrimental effect on fish habitat and fish species. Since the cofferdam design is pending the selection of a contractor, the AAC is seeking a commitment from PSPC that AOPFN will be engaged by the contractor on the specific design of the cofferdam,</p>	<p>X</p>		<p>Tetra Tech has completed the design of the cofferdam which is in the EIS. The design will be discussed with AOPFN at future meetings to review options.</p>	<p>No – engagement in cofferdam design is not mentioned in the AOPFN CES as mitigation.</p>



AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
as well as on alternatives to the use of a cofferdam. For instance, members discussed the need to explore using a Bailey bridge or steel-plated cofferdam as an alternative.				
Support for AOPFN Guardian Program: The AAC emphasized the need for AOPFN Guardians to be involved in all stages of the Project, in order to support AOPFN's stewardship roles towards fish and fish habitat.	X		Project specific work for Guardians, if applicable, will be discussed as part of the EMP and the IPP.	Yes – AOPFN requested capacity building support for Guardians.

AOPFN Valued Component: Member Fishing

AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
3.5.3				
Monitoring and Enforcement: AAC members expressed concerns over threats to endangered or threatened fish species, and to		X	Fishing is already prohibited from Long Sault Island and PSPC has	Yes – AOPFN requested capacity building



<p>AOPFN recommendation for mitigation and enhancement measures and strategies</p>	<p>Supported by PSPC to off-set potential project impacts</p>	<p>To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities</p>	<p>Rationale / comments</p>	<p>Mitigation Also suggested in AOPFN CES (Yes/No)</p>
<p>AOPFN member harvesting from illegal fishing on the river. The committee spoke to the need for monitoring to ensure compliance with conservation regulations. This monitoring could involve responsible government authorities stationing a game warden or conducting digital surveillance of such areas to enforce current regulations.</p> <p>The AOPFN's role would involve the participation of Guardian monitors in compliance monitoring and reporting.</p>			<p>already committed to policies for limiting hunting and fishing of contracted construction workers.</p> <p>PSPC has no jurisdiction to implement the requested mitigations related to game wardens, and digital surveillance. PSPC will continue to support signage on the Island to inform anglers about fishing restrictions.</p> <p>PSPC, DFO, nor the provincial government can prohibit fishing by rights holders.</p>	<p>support for Guardians.</p>
<p>Improving Awareness: On curbing illegal fishing, members noted that current signage in the conservation areas is not sufficient and does not contain sufficient information, as well, what signage exists is currently</p>	<p>NA</p>	<p>NA</p>	<p>This mitigation needs to be deferred to the Ontario Ministry of Natural Resources and Forestry.</p>	<p>No – this type of signage was not a suggested mitigation in the AOPFN CES.</p>



AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
not in good repair. Signage on restrictions to fishing need to be updated with AOPFN input. For instance, signage should contain supporting information, such as penalties for non-compliance, objectives, and scope of restrictions, etc.				

AOPFN Valued Component: Protection and Stewardship of Water

AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
3.6.3				
Cofferdam Material: As previously mentioned, AOPFN has serious concerns about the impacts of the proposed cofferdam, including the potential degradation of the material utilized. If a cofferdam is to be used, the material should be selected (with AOPFN involvement) to avoid or minimize pollution and/or sedimentation.	X		Specifications for the cofferdam material is in Section 7.4 of the EIS. As indicated in the EIS: "The contractor must select quarries and sand pits that have all of the	No – engagement in cofferdam design is not mentioned in the AOPFN CES as mitigation.



AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
			required environmental authorizations. The material from these quarries and sand pits must be clean and uncontaminated.”	
Water Quality and Quantity Monitoring: To support water quality and quantity monitoring following construction, sampling must be done before, during and after construction, as well as upstream and downstream of the Project site. This data is key to creating a robust and useful dataset on water quality that would, in turn, inform appropriate mitigations and water management planning.	X		The water quality monitoring plan is presented in Section 22.4 of the EIS.	Yes – AOPFN requested water quality and quantity monitoring as a mitigation.
Water Flow Management: AOPFN understands that water flow planning is managed by PSPC and permitting authorities (e.g., DFO), and would like to emphasize that water flow must be protective of aquatic life and habitat. Further, AOPFN must be involved in the planning and discussions on flow rate and flow management, as well as in monitoring and follow up.	X		This will be discussed with DFO and PSPC as this is related to the DFO authorization. A draft protocol for operating the Timiskaming Dam Complex that is protective of aquatic life and habitat is currently under	No – the AOPFN CES does not request participation in planning and discussions on flow rate and flow management, monitoring and follow up.



AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
			review by DFO. When available, it will be shared with AOPFN and other Indigenous groups.	
<p>Climate Change Forecasting: During the detailed design for the Project, PSPC should ensure and clearly demonstrate that the durability and life expectancy of the dam-bridge are adaptive to climate change. AOPFN notes that it is important to build a structure that is secure from increasingly frequent extreme weather events. This approach would prevent avoidable impacts on the environment and on AOPFN members, from having to rebuild due to the collapse of the structure.</p>	X		<p>PSPC has already committed to this in the EIS.</p> <p>The dam will comply with the Dam Safety Guidelines of the Canadian Dam Association and the Quebec and Ontario requirements for standards and best practices that include risks related to extreme weather events.</p>	No – the AOPFN CES does not request climate change forecasting.
<p>AOPFN Water Ceremonies: In order to respect AOPFN's stewardship role, PSPC should support AOPFN to conduct water ceremonies, as required by Algonquin traditions.</p>	X		PSPC has already committed to this in the EIS.	No – water ceremonies are not a suggested mitigation noted in the AOPFN CES.



AOPFN Valued Component: Access and Navigation on Ottawa River

AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
3.7.3				
Support for AOPFN Navigation and River Access: To mitigate ongoing impacts to AOPFN access, PSPC should make a financial contribution (through untied funds) that would support the acquisition of community boats, and programs targeted at improving members' access and use of the river.		X	This request is not proportional to the understood project impacts on the AOPFN as the Project does not impede access to the Ottawa River and in fact facilitates access to inland water bodies on both sides of the border (by the bridge).	No – no specific request was made in the AOPFN CES regarding acquisition of boats, however, they did request cultural programming that could include programs that target member access and use of the river.

AOPFN Valued Component: AOPFN Governance and Autonomy

AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
3.8.3				
AOPFN Involvement in Management and Monitoring Planning: In addition to the monitoring committee, AOPFN must be involved in all planning for management and monitoring done outside of the committee. To support AOPFN's role, PSPC should ensure that adequate capacity support is negotiated with and provided to AOPFN.			More clarification is needed about this request.	Yes – AOPFN requests participation in management and monitoring planning.
AOPFN Involvement in Contractor Selection: The AAC also emphasized the need for AOPFN to be part of the process for selecting contractors for the project, including but not limited to input in the Requests for Proposal to be done, ie., a statement outlining the need for the contractor to work with AOPFN to determine the most suitable material to be used to build the cofferdam.	X		Being part of the process for selecting contractors will exclude AOPFN from any subcontracts or joint ventures or IPP opportunities with the selected contractor due to conflicts of interest. PSPC is committed to optimizing opportunities for local and Indigenous service providers for direct and	No – this is not noted as a mitigation in the CES. AOPFN notes that they must incur an economic benefit from the Project.



AOPFN recommendation for mitigation and enhancement measures and strategies	Supported by PSPC to off-set potential project impacts	To discuss to off-set regional and cumulative impacts on the AOPFN with PSPC and other regional proponents and jurisdictional authorities	Rationale / comments	Mitigation Also suggested in AOPFN CES (Yes/No)
			indirect employment related to the project. Specifications for the cofferdam material is in Section 7.4 of the EIS.	



Monitoring and Follow-up Programs

Information requests directed to the proponent

IAAC-2-27 - pH Monitoring during Demolition

References

CEAA, August 2018. *Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.2.2 (Changes to surface water), 7.4 (Mitigation measures) and 9 (Follow-up and monitoring programs).*

Tetra Tech, February 2023. *Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Section 22.4.*

PSPC, March 2024. *PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-101.*

Context

Response to question IAAC-1-101 lists the commonly used products that could be used to lower the pH. The proponent has also committed to engage with Indigenous communities should pH levels rise above 9. AOPFN is concerned about being notified only after there has been a substantial rise in pH.

ECCC believes that the product used to lower the pH and the demolition method should be determined and included in the EIS to avoid a delay and minimize effects on water quality in the receiving environment. AOPFN would also prefer to plan and discuss adaptative measures prior to worst-case scenarios.

The Agency instructs the proponent to:

- A) Specify the product and describe the methodology that would be used to lower the pH of the water located between the new dam-bridge and the containment curtain during demolition of the existing structure.

PSPC Response:

While physical measures (cofferdams, turbidity curtains) can help mitigate the impacts of concrete demolition on water pH and therefore on wildlife, treatments to lower elevated water pH before it is released back in the waterway prove more effective. Carbon dioxide sparging is a technique that lowers water pH levels by introducing carbon dioxide (CO₂) into the water.

The advantages of carbon dioxide sparging include its rapid action, cost-effectiveness, and safer handling compared to acidic compounds. It is also self-buffering, making it difficult to create excessively low pH levels, and the material is readily available (City of Tacoma, 2021). As a result, this technique has become



increasingly popular for lowering water pH in construction sites. If carbon dioxide sparging were to be needed for this project, the following steps (or similar) could be implemented:

Construction phase

- Installation of the cofferdam;
- Note water pH between existing dam-bridge and cofferdam;
- If needed, add CO₂ to the water between the dam-bridge and cofferdam until the pH reaches the range of 6.9–7.1. Use a carbon dioxide diffuser positioned near the bottom of the river to introduce compressed CO₂, allowing it to bubble up through the water and diffuse evenly;
- Gradually release the water to avoid stirring up sediments.

Demolition phase

- Note water pH between existing dam-bridge and new dam-bridge before and during demolition;
- If needed, add CO₂ to the water between the two structures until the pH reaches the range of 6.9–7.1. Use a carbon dioxide diffuser positioned near the bottom of the river to introduce compressed CO₂, allowing it to bubble up through the water and diffuse evenly;
- Gradually release the water to avoid release of debris and sediments.

The use of this method would allow proactive control over the water's pH before release, thereby reducing the risk of exceeding a pH of 9.

Other methods, such as using phosphoric acid or hydrochloric acid or another neutralizing agent (Ling et al. 2019), can also lower water pH. As with carbon dioxide sparging, the agent would be injected in the water. However, while effective, acids present safety concerns due to their hazardous nature. Additionally, incorrect dosage of the acid can lead water pH levels to become too low.

PSPC is open to discussing with AOPFN to determine the most preferable method for use.

Caltrans Division of Research, Innovation and System Information (DRISI). (2016). Determining the Appropriate Amount of Time to Isolate Portland Cement Concrete from Receiving Waters - Preliminary Investigation. <https://dot.ca.gov/-/media/dot-media/programs/research-innovation-system-information/documents/preliminary-investigations/pcc-and-water-ph-pi-revised-2-1-16-a11y.pdf>

City of Tacoma – Environmental services. (2021). Stormwater Management Manual, July 2021 Edition. https://www.cityoftacoma.org/UserFiles/Servers/Server_6/File/cms/SWMM_WebBook/Responsive%20HTML5/index.html#t=BookBook%2FStormwater_Management_Manual_July_2021_Edition%2FStormwater_Management_Manual_July_2021_Edition.htm

Ling, H., Su, C., Xia, H., Suo, F., Xiao, M., & Cheng, Y. (2019). Treatment and benefit analysis of wastewater from construction of hydropower project. E3S Web of Conferences, 136. <https://doi.org/10.1051/e3sconf/201913606024>

- B)** Describe how the proponent will work with impacted Indigenous communities to identify monitoring thresholds, notification procedures, and collaboration on adaptive responses.



PSPC Response:

PSPC has developed a collaborative approach to the Environmental and Socio-economic Management Plan (ESMP; please see Appendix D) and will consult with Indigenous groups in fall 2024 or in winter 2025 to define the monitoring thresholds, notification procedures, and collaboration on adaptive responses. PSPC is proposing that the ESMP be co-led with the SART communities (the Indigenous groups located closest to the dam) in collaboration with AOPFN, and include 2-way information sharing with other impacted Indigenous groups.

IAAC-2-28 - Surface Monitoring Program

References

CEAA, August 2018. Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.2.2 (Changes to surface water), 7.4 (Mitigation measures) and 9 (Follow-up and monitoring programs).

Tetra Tech, February 2023. Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Sections 7.1.2, 11.2.3.4 and 22.4.

PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-100.

Context

AOPFN members have expressed great concern for the protection of water. Response to question IAAC-100 states that the surface monitoring program will be extended to begin before start of construction work (4 to 6 months) to set baseline conditions and extend after demolition work (4 to 6 months) to assess return to initial conditions. AOPFN is concerned that six months following demolition is an inadequate period for monitoring given concerns for disturbance to mercury and other contaminants that could still be present following that timeframe.

The Agency instructs the proponent to:

- A) Provide a description of what will be done if the contaminants are still detected after the 6-month post-demolition monitoring period.

PSPC Response:

Depending on the contaminant, a variety of measures may be required and PSPC response must be considered with the following limitations.

If a post-demolition contaminant was already detected prior to ground-breaking and contaminant levels are similar 6 months post-demolition, this would be considered a return to baseline conditions and would not require further work from PSPC.

If a post-demolition contaminant was already detected prior to ground-breaking and contaminant levels are lower 6 months post-demolition, this would be an improvement from baseline conditions and would not require further work from PSPC.

If a post-demolition contaminant was already detected prior to ground-breaking and contaminant levels are higher 6 months post-demolition (or a new contaminant is detected), this would require PSPC to investigate on possible cause of this increase. If the cause is associated with TQDRP, additional mitigation measure will be required with extended water quality monitoring, the length of which will depend on the selected mitigation measure.

However, in all cases, should such contaminant levels exceed regulatory limits, PSPC would need to share this information with appropriate governmental agencies and collaborate in identifying contaminant source and required mitigation measures.

Comments and advice for the proponent

Comment 2-19- Involvement of Indigenous Peoples into Monitoring and Follow-up Programs

References

CEAA, August 2018. Guidelines for the Preparation of an Environmental Impact Statement, Part 2. Sections 7.4 (Mitigation measures) and 9 (Follow-up and monitoring programs).

Tetra Tech, February 2023. Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement. Chapters 22 and 23.

PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-66, 1-72, 1-95, 1-100, 1-101, and comment 1-23.

Comments and advice

The proponent should engage in culturally appropriate communication plans and commit to co-develop protocols, monitoring, mitigation and follow-up measures with SART, AOPFN, and other affected Indigenous communities. This commitment should include, but not be limited to, wildlife protocols, archaeological chance-find protocols, cumulative effect assessment, fish passage planning as well as risk communication plans related to mercury concerns.

For instance, AOPFN has been undergoing sturgeon and eel studies, under DFO's Aboriginal Fund for Species at Risk, and expects the proponent to work with AOPFN to incorporate study findings into monitoring and management plans. Likewise, SART has conducted several reports (Neme Biocultural Study, Bio-Cultural Impact Pathways, Algonquin Canoe Company: Business Impact Analysis, Fish Survey Protocols). Results and recommendations from these studies should be discussed and integrated into the design of future monitoring and management plans.



PSPC Response:

See response to IAAC-2-27. PSPC is working with Indigenous groups to develop culturally appropriate communications plans, protocols, monitoring, mitigation and follow-up measures with SART, AOPFN, and other affected Indigenous communities. The ESMP Approach (Appendix D) attached to the response to IAAC-2-27 will include wildlife protocols, archaeological chance-find protocols, cumulative effect assessment, fish passage planning, communication plans related to mercury concerns, and other indicators the impacted Indigenous groups identify as requiring monitoring.

The ESMP Approach considers the AOPFN and SART studies and will be discussed and amended further based on feedback from Indigenous groups.

Comment 2-20 - Hiring of Indigenous Peoples

References

CEAA, August 2018. Guidelines for the Preparation of an Environmental Impact Statement, Part 2, section 7.3.4 (Indigenous peoples – Health and socio-economic conditions)

Tetra Tech, February 2023. Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) Environmental Impact Statement, section 13.1 and Appendix 13.1

PSPC, March 2024. PSPC Response to Information Request No. 1 (Part 1). Response to questions IAAC-1-73.

Comments and advice

In its response to question IAAC-1-73, the proponent mentions job opportunities for members of Indigenous communities. It is important to distinguish section 35 of the Constitution Act (1982) right holders from other groups. Therefore, the Agency encourages to prioritize the hiring of First Nations members from SART and AOPFN and to favor the hiring of members from AOO, MNO and Antoine Nation at every stage of the project, from construction-demolition phase, to monitoring and follow-up programs.

PSPC Response:

See response to IAAC-2-27. PSPC has engaged with the Indigenous groups recommended by the Agency, distinguishing between section 35 rightsholders and other groups. PSPC commits to negotiating IPPs with each Indigenous group, prioritizing contracting from the AOPFN and SART communities and then favouring the AOO, MNO, and Antoine Nation, followed by local community contractors at every phase of the project.



APPENDIX A: Air contaminant emission factors considered (IAAC-2-5)

Émissions dues à la combustion de diesel

Paramètre	Machinerie fixe et mobile	Camions de transport
Diesel consommé	745 800 litres	425 978 litres
Estimation travail fourni	223 740 kWh	127 793 kWh
	300 040 bhp.h	171 374 bhp.h
Efficacité moteur diesel	0.3 kWh/l	0.3 kWh/l
Références		
U.S. EPA Nonroad Compression-Ignition Engines: Exhaust Emission Standards (Tier IV 2014+) U.S. EPA Heavy-Duty Highway Compression-Ignition Engines and Urban Buses: Exhaust Emission Standards (2007+) SO ₂ : Norme 15 mg-S/kg-diesel, Règlement sur le soufre dans le carburant diesel (DORS/2002-254)		
Monoxyde de carbone (CO)	3.5 g/kWh	15.5 g/bhp.h
Oxydes d'azote (NO _x)	0.4 g/kWh	0.2 g/bhp.h
Dioxyde de soufre (SO ₂)	0.0255 g/l	0.0255 g/l
Particules totales (PM ₇)	0.02 g/kWh	0.01 g/bhp.h
Particules PM ₁₀	0.02 g/kWh	0.01 g/bhp.h
Particules PM _{2.5}	0.02 g/kWh	0.01 g/bhp.h
Hydrocarbures non méthaneux (HCNM)	0.19 g/kWh	0.14 g/bhp.h
Émissions de combustion de la machinerie fixe et mobile		
Monoxyde de carbone (CO)	0.78 tonnes	2.66 tonnes
Oxydes d'azote (NO _x)	0.089 tonnes	0.034 tonnes
Dioxyde de soufre (SO ₂)	0.019 tonnes	0.011 tonnes
Particules totales (PM ₇)	0.0045 tonnes	0.0017 tonnes
Particules PM ₁₀	0.0045 tonnes	0.0017 tonnes
Particules PM _{2.5}	0.0045 tonnes	0.0017 tonnes
Hydrocarbures non méthaneux (HCNM)	0.043 tonnes	0.024 tonnes

Émissions dues à la manutention des matériaux et agrégats

Paramètre	Valeur	Unité
Quantités de remblais et agrégats manipulés (construction du nouvel ouvrage, déconstruction de l'ancien)	151 279	tonnes
Nombre d'étapes de manutention des agrégats	3	-
Référence		
U.S. EPA AP-42 13.2.4 "Aggregate Handling and Storage Piles" Eq (1) U = 3.7 m/s (normales climatiques North Bay) M = 11% (misc. fill materials)		
Particules totales (PM ₇)	2.11E-04	kg/t
Particules PM ₁₀	1.00E-04	kg/t
Particules PM _{2.5}	1.51E-05	kg/t
Émissions de manutention des agrégats		
Particules totales (PM ₇)	0.10	tonnes
Particules PM ₁₀	0.05	tonnes
Particules PM _{2.5}	0.01	tonnes

Émissions dues à la circulation des machines

Paramètre	Valeur	Unité
Heures de machinerie	37 290	heures
Vitesse moyenne	0.2	km/h
Distance parcourue	7 458	km
Atténuation (jours avec précipitation)	41%	-
Référence		
U.S. EPA AP-42 13.2.2 "Unpaved Roads" Eq (1a) s = 4.7% (caractérisation agrégats 0-3/4") W = 23 tons (20 tonnes estimées)		
Particules totales (PM ₇)	1.79E+03	g/km
Particules PM ₁₀	4.55E+02	g/km
Particules PM _{2.5}	4.55E+01	g/km
Émissions de manutention des agrégats		
Particules totales (PM ₇)	7.87	tonnes
Particules PM ₁₀	2.00	tonnes
Particules PM _{2.5}	0.20	tonnes

Compilation des émissions

Paramètre	Unité	Combustion (machinerie)	Combustion (camions routiers)	Sous-total Combustion	Manutention des matériaux	Circulation machines mobiles	Sous-total Particules
Monoxyde de carbone (CO)	tonnes	0.78	2.66	3.44		0	0
Oxydes d'azote (NO _x)	tonnes	0.089	0.034	0.124		0	0
Dioxyde de soufre (SO ₂)	tonnes	0.019	0.011	0.030		0	0
Particules totales (PM ₇)	tonnes	0.0045	0.0017	0.0062	0.096	7.9	7.97
Particules PM ₁₀	tonnes	0.0045	0.0017	0.0062	0.045	2.0	2.04
Particules PM _{2.5}	tonnes	0.0045	0.0017	0.0062	0.007	0.2	0.21
Hydrocarbures non méthaneux (HCNM)	tonnes	0.043	0.024	0.067		0	0



APPENDIX B: Table 1 – Status, Habitat, Occurrence, and Presence of Species at Risk (IAAC-2-16)

Table 1 - Status, Biology, Habitat, Occurrence and Presence of Species at Risk

Common name used by COSEWIC	COSEWIC Status	Scientific name	Status on Schedule 1 of SARA	Provincial Status (Quebec)	Distribution - Habitats - Biology HIGHLIGHTS	Overlap between range and study site	Presence of occurrence(s)	Presence of occurrence(s)	Temporary and Permanent Habitat Loss	Replacement/Compensation Habitat	Other Potential Project Effect	Mitigation, Monitoring, Follow-up Measures
							Field survey(s)	CDPNQ				
American Eel	Threatened	<i>Anguilla rostrata</i>	None	Likely to be designated	All freshwaters, estuaries and marine waters that have access to the Atlantic Ocean, from Niagara Falls in the Great Lakes to the middle of the Labrador coast.	Yes	-	-	Temporary loss during construction (cofferdam). No permanent loss expected as location of new dam not in suitable habitat for feeding.	None required	None as the species is not found in the project area.	None required
Lake Sturgeon	Threatened	<i>Acipenser fulvescens</i>	None	Likely to be designated	See details in Section 12.1.6.7.1 for habitats	Yes	Scientific fisheries (presence of adults and eggs)	-	Temporary loss of spawning conditions during construction phase. No permanent habitat loss as spawning conditions will be return to initial state after completion of the new dam-bridge.	PSPC intends to improve habitat conditions downstream of the dam to improve egg incubation and larva development after spawning.	Accidental presence in the dewatering zone during construction phase. Nuisance in case of blasting during demolition phase.	General wildlife monitoring in case of accidental presence or catch during construction. Specific mitigation measures to limit work during spawning season and to limit release of pollutants in surface water. Specific spawning follow-up program after construction work to assess return of spawning activities and efficiency of compensation habitat. Scare charges and bubble curtain to limit blast overpressure during demolition phase.
Blanding's Turtle	Endangered	<i>Emydoidea blandingii</i>	Endangered	Threatened	Southern Quebec (despite isolated records as far north as Abitibi-Témiscamingue and as far east as the Capitale-Nationale region of Quebec City). Wetlands characterized by clear, eutrophic waters.	Possible	-	-	No habitat loss (no wetland on project site).	N/A	Accidental presence in the dewatering zone during construction phase. Nuisance in case of blasting during demolition phase.	General wildlife monitoring in case of accidental presence or catch. Scare charges and bubble curtain to limit blast overpressure during demolition phase.
Eastern Painted Turtle	Special Concern	<i>Chrysemys picta picta</i>	Special Concern	None	The range of the Central Painted Turtle extends from Ontario and western Quebec to the U.S. states of the Great Lakes and Ohio Valley. Wetlands (e.g., marshes, swamps, ponds, bogs, ancient meanders) and water bodies (e.g., lakes, rivers, streams) that are relatively shallow with low currents and an abundance of vegetation, sun exposure sites, and organic substrate. The species is semi-tolerant to human-modified landscapes and may occasionally inhabit urban ponds and lands subject to human-induced disturbance (e.g., agricultural ponds, impoundments, water treatment facilities).	Yes	Seen in some locations in 2014	Yes, within a 25 km radius	No habitat loss as project site conditions are not favorable to this species (no low current river with abundance of vegetation and organic substrate).	N/A	Accidental presence in the dewatering zone during construction phase. Nuisance in case of blasting during demolition phase.	General wildlife monitoring in case of accidental presence or catch. Scare charges and bubble curtain to limit blast overpressure during demolition phase.

Snapping Turtle	Special Concern	<i>Chelydra serpentina</i>	Special Concern	None	Southern and central Quebec. Prefers habitat characterized by weak current, soft muddy bottom and dense aquatic vegetation. Ponds, swamps and shallow bays, along rivers, in slow-moving streams or in areas combining several types of aquatic environments. Some individuals manage to survive in urbanized environments, such as golf course basins or irrigation canals, but it is unlikely that a population will be able to settle there.	Yes	Seen in some locations in 2014	Yes, within a 25 km radius	No habitat loss as project site conditions are not favorable to this species (no weak current river, muddy riverbed, abundance of aquatic vegetation).	N/A	Accidental presence in the dewatering zone during construction phase. Nuisance in case of blasting during demolition phase.	General wildlife monitoring in case of accidental presence or catch. Scare charges and bubble curtain to limit blast overpressure during demolition phase.
Northern Myotis	Endangered	<i>Myotis septentrionalis</i>	Endangered	None	Wintering in mines and caves, resting in trees or anthropogenic structures. Northern Myotis maternity colonies are strongly associated with forest cover, streams and tree characteristics. Female northern bats make greater use of anthropogenic structures in areas where habitat is fragmented and there are few potential trees for resting	Yes	-	-	No wintering habitat loss. Possible loss of resting habitat in the existing dam structure, although no sighting confirmed.	PSPC will explore the integration of a nesting structure in final design of the new dam.	None as only known roost site located 800 m North of the work site, and wrokplanned during daytime only.	Bat specific survey 1 year before construction of existing dam. If bat activity noted, existing dam structure to be covered with nets before spring to avoid bat resting during deconstruction work. If installed, successful use of nesting structure on new dam to be integrated in a 3-year follow-up program.
Little Brown bat	Endangered	<i>Myotis lucifugus</i>	Endangered	None	Little Brown bats are one of only a few bat species that use buildings and other anthropogenic structures (e.g., bat roosts, bridges and barns) to rest (particularly to form maternity colonies). Can use the same site for more than 50 years. Hunt above water	Yes	Presence of a maternity roost in an abandoned building 1 km upstream from the dam on the Quebec side	-	No wintering habitat loss. Possible loss of resting habitat in the existing dam structure, although no sighting confirmed.	PSPC will explore the integration of a nesting structure in final design of the new dam. An abandoned building 1 km North of the dam is a well documented resting site available for the species.	None as only known roost site located 800 m North of the work site, and wrokplanned during daytime only.	Bat specific survey 1 year before construction of existing dam. If bat activity noted, existing dam structure to be covered with nets before spring to avoid bat resting during deconstruction work. If installed, successful use of nesting structure on new dam to be integrated in a 3-year follow-up program.
Tri-colored bat	Endangered	<i>Perimyotis subflavus</i>	Endangered	Likely to be designated	Overwinters in the deepest sections of caves or mines. Hunt over water. Resting sites are in forest environments	Yes	Presence of a maternity roost in an abandoned building 1 km upstream from the dam on the Quebec side	-	No wintering habitat loss. Possible loss of resting habitat in the existing dam structure, although no sighting confirmed.	PSPC will explore the integration of a nesting structure in final design of the new dam. An abandoned building 1 km North of the dam is a well documented resting site available for the species.	None as only known roost site located 800 m North of the work site, and work planned during daytime only.	Bat specific survey 1 year before construction of existing dam. If bat activity noted, existing dam structure to be covered with nets before spring to avoid bat resting during deconstruction work. If installed, successful use of nesting structure on new dam to be integrated in a 3-year follow-up program.
Eastern Red Bat	Endangered	<i>Lasiurus borealis</i>	None	Threatened	Rarely overwinters in Canada. Resting sites are in forest environments. Hunt over water.	Yes	Presence of roost in an abandoned building 1 km upstream from the dam on the Quebec side	-	No wintering habitat loss. Possible loss of resting habitat in the existing dam structure, although no sighting confirmed.	PSPC will explore the integration of a nesting structure in final design of the new dam. An abandoned building 1 km North of the dam is a well documented resting site available for the species.	None as only known roost site located 800 m North of the work site, and work planned during daytime only.	Bat specific survey 1 year before construction of existing dam. If bat activity noted, existing dam structure to be covered with nets before spring to avoid bat resting during deconstruction work. If installed, successful use of nesting structure on new dam to be integrated in a 3-year follow-up program.
Hoary Bat	Endangered	<i>Lasiurus cinereus</i>	None	None	Rarely overwinters in Canada. Tree roosting species. Hunt over water.	Yes	Presence of roost in an abandoned building 1 km upstream from the dam on the Quebec side	-	No wintering habitat loss. Possible loss of resting habitat in the existing dam structure, although no sighting confirmed.	PSPC will explore the integration of a nesting structure in final design of the new dam. An abandoned building 1 km North of the dam is a well documented resting site available for the species.	None as only known roost site located 800 m North of the work site, and work planned during daytime only.	Bat specific survey 1 year before construction of existing dam. If bat activity noted, existing dam structure to be covered with nets before spring to avoid bat resting during deconstruction work. If installed, successful use of nesting structure on new dam to be integrated in a 3-year follow-up program.
Silver Bat	Endangered	<i>Lasionycteris noctivagans</i>	None	None	Overwintering in Canad mainly in British Columbia and Southern Ontario. Roosting tree cavities and buildings.Hunt over water.	Yes	Presence of roost in an abandoned building 1 km upstream from the dam on the Quebec side	-	No wintering habitat loss. Possible loss of resting habitat in the existing dam structure, although no sighting confirmed.	PSPC will explore the integration of a nesting structure in final design of the new dam. An abandoned building 1 km North of the dam is a well documented resting site available for the species.	None as only known roost site located 800 m North of the work site, and work planned during daytime only.	Bat specific survey 1 year before construction of existing dam. If bat activity noted, existing dam structure to be covered with nets before spring to avoid bat resting during deconstruction work. If installed, successful use of nesting structure on new dam to be integrated in a 3-year follow-up program.

Eastern whip-pour-Will	Threatened	<i>Anrostomus vociferus</i>	Threatened	Likely to be designated	Associated, in summer as in winter, with pines and oaks. Prefers to nest in semi-open forests or fragmented forests with clearings	Yes	No Spring/Summer eBird List No eBird-EPOQ Fall/Winter Listing	Yes, within a 25 km radius	No habitat loss as project site conditions are not favorable to this species (no pine or oak trees, no semi-open forest). No nesting couple affected.	N/A	None	General wildlife monitoring in case of accidental presence or catch.
Common Nighthawk	Special Concern	<i>Chordeiles minor</i>	Threatened	Likely to be designated	Nests in a wide variety of open habitats with vegetated soils, such as dunes, beaches, newly logged forests, burns, deforested areas, rocky outcrops, bare rocky terrain, grasslands, pastures, bogs, marshes, lake shores and river banks. roofs covered with gravel (mainly in Montreal).	Yes	No Spring/Summer eBird List Yes eBird-EPOQ Fall/Winter Listing	Yes Nesting Last observation: 2007 (25 km radius from the dam)	Temporary grassland loss during construction work. Minimal permanent habitat loss as parts of the grassland will be revegetated with shrubs to increase biodiversity and improve habitat for other nesting species valued by Indigenous groups. No nesting couple affected.	Some grassland will be added in former alignment of the road passing on the dam.	Injury during accidental presence in work zone.	General wildlife monitoring in case of accidental presence or catch. Avoid clearing and grading work during nesting period.
Peregrine Falcon anatum/tundrius	None	<i>Falco peregrinus anatum/tundrius</i>	Special Concern	Vulnerable for anatum andn Likely to be designated for tundrius	Arctic tundra to coastal regions, grasslands and large urban centres. Nests in a crevasse or on the protrusion of a cliff of 50 to 200 m preferably, but sometimes on a ledge of a large building or bridge	Yes	Yes Spring/Summer eBird List Yes eBird-EPOQ Fall/Winter Listing	Yes Nesting Last observation: 2010 (25 km radius from the dam)	None as project site not suitable nesting habitat for this species. Hunting opportunity unchanged with replacement of the dam. No nesting couple affected.	N/A	Injury during accidental presence in work zone. Reduction of food source on Long Sauylt Island during construction and demlition phase.	General wildlife monitoring in case of accidental presence or catch.
Golden-winged Warbler	Threatened	<i>Vermivora chrysoptera</i>	Threatened	Likely to be designated	Regeneration areas where young shrubs grow, surrounded by mature forests	Possible	No Spring/Summer eBird List No eBird-EPOQ Fall/Winter Listing	Yes (25 km radius from the dam)	None as project site not suitable habitat for this species (no regeneration areas with shrubs). No nesting couple affected.	N/A	Injury during accidental presence in work zone.	General wildlife monitoring in case of accidental presence or catch.
Rusty Blackbird	Special Concern	<i>Euphagus carolinus</i>	Special Concern	Likely to be designated	In Canada, the Rusty Blackbird is found in all provinces and territories, representing 70% of the North American breeding range. Nesting in the boreal forest where the species prefers the shores of wetlands, such as low-flow streams, bogs, marshes, swamps and beaver ponds, and pasture edges. In winter, the Rusty Blackbird mainly occupies humid forests and, to a lesser extent, cultivated fields.	Yes	No Spring/Summer eBird List No eBird-EPOQ Fall/Winter Listing	Yes (25 km radius from the dam)	None as project construction site not suitable habitat for this species (no boreal forest, no low-flow stream). No nesting couple affected.	N/A	None	N/A
Barn Swallow	Special Concern	<i>Hirundo rustica</i>	Threatened	None	Nests primarily on and in man-made structures, including barns and outbuildings, garages, houses, bridges and culverts	Yes	Yes Spring/Summer eBird List Yes eBird-EPOQ Fall/Winter Listing	No provincial status	Possible loss of nesting habitat in the existing dam structure, although no sighting confirmed. No nesting couple affected.	PSPC will explore the integration of nesting structure in final design of the new dam.	Injury during accidental presence in work zone. Reduction of food source on Long Sauylt Island during construction and demolition phase.	Bird specific survey 1 year before construction of new dam. If bird nesting activity noted, existing dam structure to be covered with nets before spring to avoid bird nesting during deconstruction work. If installed, successful use of nesting structure on new dam to be integrated in a 3-year follow-up program. General wildlife monitoring in case of accidental presence or catch.

Chimney Swift	Threatened	<i>Chaetura pelagica</i>	Threatened	Likely to be designated	Associated with urban and rural areas where chimneys are available as a nesting and resting site. Traditional masonry chimneys (made of bricks, clay tiles, concrete blocks or stones) typically found on older religious buildings (churches, rectories, convents, schools), commercial and residential buildings located in neighborhoods built before 1960	Yes	Yes Spring/Summer eBird List Yes eBird-EPOQ Fall/Winter Listing	Yes Area of concentration Last observation: 2016 (25 km radius from the dam)	None as project site not suitable habitat for this species (no chimney or open building). No nesting couple affected.	N/A	None	N/A
Wood Thrush	Threatened	<i>Hylocichla mustelina</i>	Threatened	None	Nests mainly in secondary forests and mature deciduous and mixed forests	Yes	No Spring/Summer eBird List Yes eBird-EPOQ Fall/Winter Listing	Yes (25 km radius from the dam)	None as project construction site not suitable habitat for this species (no secondary and mature forest). No nesting couple affected.	N/A	Injury during accidental presence in work zone.	General wildlife monitoring in case of accidental presence or catch.
Eastern wood-pewee	Special Concern	<i>Contopus virens</i>	Special Concern	None	Middle forest cover of clearings and at the edge of deciduous and mixed forests	Yes	Yes Spring/Summer eBird List Yes eBird-EPOQ Fall/Winter Listing	No provincial Status	None as project site not suitable habitat for this species (no middle forest or edge of forest). No nesting couple affected.	N/A	Injury during accidental presence in work zone.	General wildlife monitoring in case of accidental presence or catch.
Olive-sided flycatcher	Special Concern	<i>Contopus cooperi</i>	Threatened	Likely to be designated	Forest clearings, forest edges near a natural opening (such as a river or swamp) or man-made opening (such as felled forest), burnt forests, or openings in old forest stands	Yes	No Spring/Summer eBird List Yes eBird-EPOQ Fall/Winter Listing	Yes (25 km radius from the dam)	None as project site not suitable habitat for this species (no forest or edge of forest). No nesting couple affected.	N/A	Injury during accidental presence in work zone.	General wildlife monitoring in case of accidental presence or catch.
Short-eared Owl	Threatened	<i>Asio flammeus</i>	Special Concern	Likely to be designated	Dense grasslands, as well as tundra composed of areas of small willows	Yes	No Spring/Summer eBird List No eBird-EPOQ Fall/Winter Listing	Yes (25 km radius from the dam)	None as project site not suitable habitat for this species (no dense grassland or tundra). No nesting couple affected.	N/A	Injury during accidental presence in work zone.	General wildlife monitoring in case of accidental presence or catch.
Bank Swallow	Threatened	<i>Riparia riparia</i>	Threatened	None	Vertical slopes, including river banks, cliffs along lakes and oceans, aggregate quarries, road trenches and earth piles.	Yes	No Spring/Summer eBird List Yes eBird-EPOQ Fall/Winter Listing	Yes Nesting (25 km radius from the dam)	None as project site not suitable habitat for this species (no vertical slope or suitable river bank). No nesting couple affected.	N/A	Injury during accidental presence in work zone.	General wildlife monitoring in case of accidental presence or catch.
Yellow Rail	Special Concern	<i>Coturnicops noveboracensis</i>	Special Concern	Threatened	It nests in places in the southern portion of Quebec, mainly along the St. Lawrence River, as far as Gaspésie, and along the Saguenay River. There are also summer mentions in Abitibi-Témiscamingue. Preference for the upper part of large freshwater and brackish water marshes, where vegetation is dense and short. Dense sedge marsh or other low plants.	No	No Spring/Summer eBird List No eBird-EPOQ Fall/Winter Listing	Yes (25 km radius from the dam)	N/A	N/A	N/A	N/A
Yellow-banded Bumble Bee	Special Concern	<i>Bombus terricola</i>	Special Concern	Likely to be designated	Has been reported in all Canadian provinces and territories except Nunavut. Mixed forests, agricultural land, urban areas, mountain meadows, grasslands and boreal environments. Flowers of plants belonging to many genera. Queens hibernate in soil and in decaying organic matter such as rotten tree trunks.	Yes	-	-	Temporary grassland loss during construction work. Improved permanent habitat as parts of the grassland will be revegetated with shrubs and other medicinal plants to increase biodiversity and improve habitat for other nesting species valued by Indigenous groups.	Improved permanent habitat as parts of the grassland will be revegetated with shrubs and other medicinal plants to increase biodiversity and improve habitat for other nesting species valued by Indigenous groups.	Injury during accidental presence in work zone.	None planned at this point.

Monarch	Endangered	<i>Danaus plexippus</i>	Special Concern	None	The species' breeding range in Canada is south of the 50th parallel in Ontario, Quebec and the Maritimes and south of the 54th parallel in Manitoba, Saskatchewan and Alberta. Milkweed (many species) are the only plants on which the monarch caterpillar feeds. These plants grow mainly in open and periodically disturbed environments, such as roadsides, fields, wetlands, grasslands and open forests.	Yes	-	-	No temporary or permanent habitat loss (no milkweed on site).	Improved permanent habitat as parts of the grassland will be revegated with shrubs and other medicinal plants to increase biodiversity and improve habitat for other nesting species valued by Indigenous groups.	Injury during accidental presence in work zone.	None planned at this point.
Hickorynut	Endangered	<i>Obovaria olivaria</i>	Endangered	Likely to be designated	The hickory lives mainly in the sandy bottoms (substrates) of large deep rivers (at least 2 to 3 m) with moderate to rapid currents.	Yes	-	-	No temporary or permanent habitat loss (riverbed unsuitable fo the species in the work area).	N/A	Sediment release may affect hickorynut individuals and habitat downstream of the work site.	N/A



APPENDIX C: Marine Archeological Intervention Plan (IAAC-2-21)

**Marine Archaeological Assessment
Task 4 – Marine Archaeological Intervention Plan
Timiskaming Dam-Bridge of Quebec
Replacement Project (Quebec)
Intersection of Lake Temiskaming and the Ottawa River
Straddling Border of Québec and Ontario**

Prepared for:

Martin Dorais, Project Manager
Tetra Tech QI Inc.
1377 Avenue Galilée
Québec, Québec, G1P 4G4
Direct: (438) 469-2454
Cell: (438) 888-4463
Email: martin.dorais@tetrattech.com

And

Public Services and Procurement Canada
Judith Brousseau, Project Manager
Tel: (613) 407-9183
Email: Judith.brousseau@tpsgc-pwgsc.gc.ca

Licensed under
S. Janusas
ARA File #2022-0574

12/07/2024

MARINE ARCHAEOLOGICAL INTERVENTION PLAN

The Archaeological Intervention Plan must be provided to the construction crew and presented as an Archaeological Sensitivity Training Program to avoid, buffer, isolate and/or protect known and any newly discovered archaeological resource, and to immediately contact Tetra Tech and PSPC.

Archaeological Sensitivity Training Program

<original signed by>

Prepared By: Scarlett Janusas: _____ Date: _____
Marine Archaeologist

Reviewed By: Alexis Dunlop: _____ Date: _____
Project Archaeologist

Approved By: Judith Brousseau _____ Date: _____
PSPC

Project Co. _____ Date: _____

TABLE OF CONTENTS

MARINE ARCHAEOLOGICAL INTERVENTION PLAN	2
1.0 INTRODUCTION	4
2.0 BACKGROUND	4
3.0 MARINE ARCHAEOLOGICAL RESOURCES	6
3.1 Archaeological Resources Contingency Plan	6
3.2 For Discovery of Human Remains	6
3.3 For Discovery of Suspected Archaeological Resources	7
4.0 CONSERVATION PLAN	9
4.1 Introduction	9
4.2 Conservation Plan Template	10
Before Recovery	10
During and after recovery	10
General handling procedures	10
Prioritize treatment of artifacts	12
5.0 CONTACTS	13
5.1 Communication Matrix	13
5.2 Engaged Indigenous and Métis Contacts	13
6.0 BIBLIOGRAPHY AND REFERENCES CITED	15
7.0 Appendix A - List of Conservation Labs/Facilities	17
8.0 Appendix B – AOPFN Chance Find Protocol	22
9.0 Appendix C - SART Inadvertent (Chance) Finds Protocol	23

1.0 INTRODUCTION

The Timiskaming Quebec Dam Replacement project will be implemented by Public Services and Procurement Canada (PSPC) in the Provinces of Ontario and Quebec (Figure 1). Tetra Tech QI Inc. (Tetra Tech) and PSPC retained the services of Archaeological Research Associates (ARA) to conduct a marine archaeological assessment. This archaeological intervention plan will address the one identified archaeological resource, the crib, (CeGs-3) and the possibility of additional chance archaeological finds and human remains being revealed/found during the construction phase.

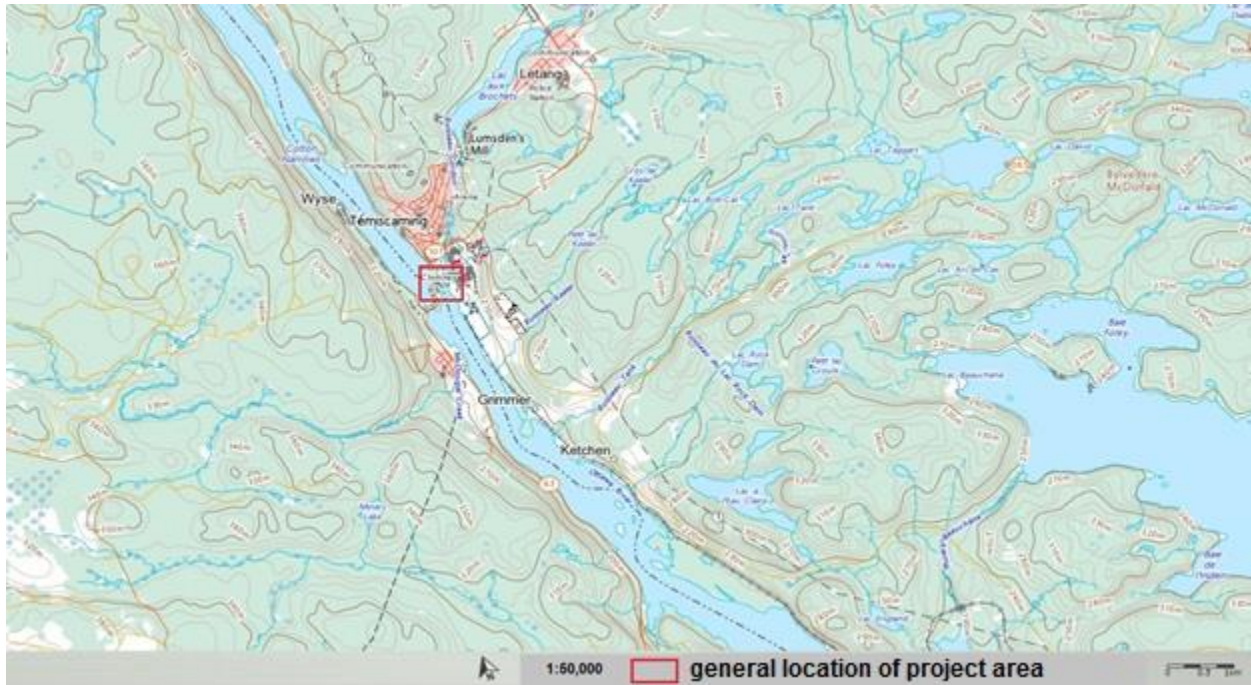


Figure 1: General Location of Project Area

2.0 BACKGROUND

The nature of archaeology is such that the presence of human burials often cannot be detected from the surface, unless they are associated with a tombstone, other type of marker, possibly impressions on the ground surface, or from archival research. Without these surface features or archival information, it is difficult to identify human burials.

Pre-contact and historical Indigenous sites could include burials. Burials, whether singly, or in large scale burial complexes, are sacred to the Indigenous people. Burials located along the shore can easily erode into the water and in some cases, be deliberately placed in the water. Storm and flood waters can displace human burials located some distance from a shoreline and relocate them in the water.

If any bone is discovered during construction, **STOP**. Even a single human bone fragment is sufficient to stop construction.

Only one archaeological site was located during the in-water archaeological assessment. This site was a wooden crib, provided with a Borden number, CeGs-3. The site location is provided in Figure 2. The wooden crib has notched interlocking timbers and appears to measure approximately eight (8) metres in length with a width of between three (3) to four (4) metres in length. The top of the crib is located in about 2 metres of water depth. The position of the crib is 4642.6081N, 07905.9329W.



Figure 2: Crib (CeGs-3) Location

3.0 MARINE ARCHAEOLOGICAL RESOURCES

Discovery of suspected archaeological resources shall be managed in accordance with the Archaeological Resources Contingency Plan.

3.1 Archaeological Resources Contingency Plan

Purpose: To ensure that archaeological resources identified during construction are protected and that discovery of artifacts and/or human bones are managed as per all applicable legislation, regulations and First Nations, Métis, and Indigenous protocols. Chance-find protocols from AOPFN and SART were shared with PSPC and are appended to this plan (Appendix B – AOPFN Chance Find Protocol & Appendix C - SART Inadvertent (Chance) Finds Protocol).

Concerns: Although the Timiskaming Dam Replacement Project limits has been investigated for historical resources directly within the project area, there is the potential to discover/find archaeological resources and human remains during construction. If not properly handled these valuable resources could be inadvertently destroyed or not treated with the respect that they deserve.

Identification: During construction all personnel are responsible for immediately reporting any unusual materials unearthed during the construction phase to the Timiskaming Dam Replacement Project Construction Manager or his designate or any of the PSPC representatives. PSPC staff are responsible for taking control of the situation. PSPC will ensure that the construction manager is aware of any unusual materials being unearthed and will ensure that any next steps are taken immediately, including stop work orders if necessary. PSPC will also immediately contact First Nations, Métis, and Indigenous communities and follow all Chance Find Procedures. Please refer to Appendix B – AOPFN Chance Find Protocol & Appendix C - SART Inadvertent (Chance) Finds Protocol.

3.2 For Discovery of Human Remains

UPON DISCOVERY OF POTENTIAL HUMAN REMAINS ALL WORK MUST STOP.

Stop Work: Where a find is thought to be human remains, work within 100 metres of the find shall be stopped immediately and the Construction Manager and the PSPC representatives, must be notified immediately.

Investigation: All work must stop immediately. PSPC will work with First Nations, Métis, and Indigenous communities, local police and a qualified heritage resource specialist or third-party archaeologist, to decide on next steps and develop, if warranted, an appropriate mitigation plan.

Action: Processes are different according to jurisdiction, but the general principles are the same in both Ontario and Quebec. When human remains are accidentally discovered, the main course of action is to follow Article 182 of the Criminal Code in the Canadian constitution as outlined by Parks Canada [here](#).

When potential human remains are found, the following process must be followed:

- 1) **All work must stop**, and the site must be secured from both personnel and the public. Any soils associated with the potential remains should be secured as well. Nothing should be moved from the location, including any associated soils. No photographs can be taken of the bone in question.
- 2) First Nations, Métis, and Indigenous communities must be contacted as part of chance find protocols. Requests may be made for specific ceremony or practices to take place with regards to the remains. Representatives may be on site as part of the Chance Find Protocols for investigations.
- 3) An archaeologist should come to identify if the remains are humans. If they are clearly not human, and First Nations, Métis, and Indigenous communities are in agreement, work can proceed. If the fragment is determined to be of human origin, work cannot proceed. Section 3.3 discusses the discovery of cultural non-human remains (faunal remains) relating to an archaeological resource.
- 4) Police must be contacted. They will evaluate if there is any forensic interest in the remains. This will involve a coroner or other specialist. The location of the discovery will determine if Ontario or Quebec police will be called.
- 5) The Coroner will confirm if the remains require any further involvement by the Police. If they do not, the case gets released to the landowner and will fall under the appropriate legislation based on the location of the remains.
- 6) Burial Investigation proceeds roughly as follows:
 - a. Initial inspection of site and remains;
 - b. Create a workplan in conjunction with First Nations, Métis, and Indigenous communities to address the location of the remains and identify if any additional interments/disarticulated remains are present in the surrounding area
 - i. At this stage (unless recovering disturbed remains) exhumation does not occur, just identification and some documentation;
 - c. Workplan is circulated to the client, and government ministries for review and comment prior to beginning work;
 - d. Once workplan is approved, the investigation can begin;
 - e. After the investigation is completed, and any remains/interments have been identified, the archaeologist submits a report to the appropriate governing bodies for review. Work on site will be remain shut down until mitigations agreed to with communities have been completed, including any ceremonies.

3.3 For Discovery of Suspected Archaeological Resources

Upon discovery of suspected archaeological resources at the specific site, work must stop.

Stop Work: Where a find is thought to be an archaeological resource, work within 100 metres of the find shall be stopped immediately and the Construction Manager and the PSPC representatives must be notified immediately.

Contact: PSPC representatives shall immediately contact the MCM (Ministry of Citizenship and Multiculturalism) and an archaeologist. Additionally, PSPC will work with First Nations, Métis,

and Indigenous communities, to decide on next steps and develop, if warranted, an appropriate mitigation plan.

Investigation: All work must stop immediately. PSPC will work with First Nations, Métis, and Indigenous communities, local police and a qualified heritage resource specialist or third-party archaeologist, to decide on next steps and develop, if warranted, an appropriate mitigation plan. An investigation shall be carried out to determine an appropriate approach to dealing with the find.

Action:

1. **All work shall be halted** in the area of the find and a buffer erected to isolate the find for at least 100 metres.
2. All archaeological work shall be conducted by a licenced marine archaeologist.
3. First Nations, Métis, and Indigenous communities shall be immediately contacted and a monitor requested to be on site during the archaeological investigation. Any chance find protocols must be followed.
4. Archaeological investigation of the area of the find and its environs shall be conducted using a pedestrian transect where possible however as the area has been determined to be one of boulders and rocks the more probable survey methodology will be one of investigation in and between the boulders/rocks.
5. Evaluation of the resource will be discussed with PSPC, Tetra Tech and the First Nations, Métis, and Indigenous communities groups if findings are of Indigenous interest. If recovery is required, a conservation plan will be developed with all parties prior to any removal. An evaluation shall be made as to the integrity and strength of archaeological resources prior to their recovery.
6. Mitigation measures may include avoidance and protection (resource remains in situ and the site area is protected); recovery and conservation (see below for more details on both recovery and conservation); recording (georeferencing, mapping and photography); curation by Indigenous groups according to provincial polices as well as First Nations, Métis, and Indigenous protocols; and/or monitoring of the resource (archaeologist will remain on site until all construction activities at or near the archaeological resource have ceased and will act to protect the resource from all direct and indirect impact from construction).
7. All finds shall be georeferenced prior to any removal.
8. Wherever possible, archaeological resources shall be mapped and photographed in situ. Recording shall be conducted in metric units. **NB:** This does not apply to potential human remains, which should never be photographed.
9. The conservation plan shall be followed for the recovery and temporary conservation of the archaeological resources prior to their removal to a conservation facility.
10. A licence report will be written detailing the location, identification, recording and photography, recovery and interpretation of find(s). Recommendations shall be included as part of this report. The conservation report may require additional time to prepare, depending on level of conservation required, and might not be available immediately to include as an appendix to the report. A summary of the proposed/on-going conservation should be included in the report as interim measure.
11. Artifacts - Under the Ontario Heritage Act and under the issued marine archaeological licence, the licence holder is entrusted to maintain the artifacts that are recovered from

any project. It is the preference of ARA that artifacts be stored/housed/displayed on a permanent basis other than at its facility. Final disposition must be determined in conjunction with engaged First Nations, Métis, and Indigenous communities and Chance Find Procedures must be followed. A list of deposit locations include:

- **Musée d'art de Rouyn-Noranda**
201 Av. Dallaire local 154
Rouyn-Noranda, Quebec J9X 4T5
Tel.: (819) 762-6600
- **Parks Canada**
- **Magasin général Dumulon**
191, avenue du Lac
Rouyn-Noranda, Quebec
J9X 5C3
Tel. : (819) 797-7125
- **Musée de la Gare**
15 Rue Humphrey
Témiscaming, QC J0Z 3R0
Tel.: (819) 627-1846

Commencement of Work: Work in the vicinity of the find can only be resumed when authorized by the PSPC Manager in consultation with the Construction Manager and after clearance has been received from the Ministry of Citizenship and Multiculturalism and the First Nations, Métis, and Indigenous communities.

4.0 CONSERVATION PLAN

The following has been adapted from a conservation plan produced by the Canadian Conservation Institute for Scarlett Janusas Archaeology Inc. for another project in a freshwater environment (Grant and Binnie 2017).

4.1 Introduction

The purpose of this section is to provide advice in the handling of possible artifacts recovered from a freshwater excavation and/or dewatered area for the project area known as the Timiskaming Dam Replacement (Quebec) project. All removal of artifacts must be done under a marine archaeological licence issued by the Ontario government. The licence/permit shall include exploration, excavation, screening, monitoring, and recovery of artifacts. Artifacts collected will be conserved (through one of the conservation agencies provided in Appendix A - List of Conservation Labs/Facilities).

The marine archaeologist has already conducted in-water archaeological assessment and background research including side scan sonar, magnetometer, video and snorkel survey. At present only one archaeological site has been identified, a wooden crib, located at the south end of the project area, but it is also located outside the proposed area of construction. A portion of the

project area will be dewatered once a cofferdam has been established (north of the mouth of Gordon Creek) to allow for the construction of a new dam. The area that will be dewatered has been shown through the in-water archaeological assessment to be composed of boulders and rocks, construction debris, miscellaneous metal objects possibly connected with the construction of the early dam and cofferdam, or the current dam, and organic (parts of trees) ecofacts, such as unmodified logs. There exists the possibility of small artifacts being wedged in between boulder and rock crevices.

4.2 Conservation Plan Template

Should artifacts be located/revealed during the dewatering and construction phase of the cofferdam and dam, then the following plan needs to be enacted.

Before Recovery

- As soon as an artifact is subject to air exposure, its equilibrium has been disturbed and mishandling can lead to irreversible damage.
- Documentation (under licence) such as mapping and photography should be completed before recovery of the artifact(s).
- Each artifact should be examined to determine its strength and integrity prior to recovery.

During and after recovery

- The majority of artifacts can be recovered using plastic buckets, padded milk crates, or chloroplast sheets. However, waterlogged organics may be weaker than they appear and should be supported during lifting and transporting.
- Each artifact must be assigned a provenience number after recovery and entered into an inventory list. The area around each artifact should be examined for additional associated artifacts.

General handling procedures

1. Keep artifacts wet.

- All artifacts must be kept wet until they are documented and dealt with in a controlled environment such as a lab. Tanks or buckets filled with water during transport are subject to swaying and the action could potentially damage an artifact. In these cases, artifacts should be packed wet as soon as possible, or braced to avoid movement and damage.
- Any attached soil, fibrous material or concretion should remain intact (i.e. do not remove) until examined and assessed by the lab/conservator. Removal may damage the artifact.
- Artifacts can be stored in tanks of water to keep them wet prior to transport. River water can be used to store the artifacts, but water should be changed on a weekly basis.

- Once transported to a conservation facility, the organic artifacts can be transferred to regular tap water, however, metal objects should be stored in deionized or distilled water.
- 2. Store artifacts with appropriate packing materials**
 - Storage and packaging materials should be inert, that is, stable plastics such as polyethylene, polycarbonate, polystyrene are the most common of the stable plastics
 - Artifacts should be packed in Ziploc bags or plastic containers of various sizes (depending on size of artifact) with well sealing lids or alternatively wrapped in thick (6 mm) polyethylene sheeting and taped with duct or packing tape.
 - 3. Label each artifact**
 - Contents of the container/bag should be labelled with tape and marked with waterproof markers
 - Polyethylene or Tyvek tags can be used alternatively and tied to the artifact with string or green plastic coated florist wire
 - Paper tags sealed in a Ziploc bag can be used for large wrapped artifacts not submerged in water.
 - 4. Provide support for artifacts with appropriate materials**
 - An artifact may look strong as they are waterlogged and look “plump”, but wet organic artifacts tend on the whole to be weak. Fragile artifacts need to be supported on an inert support such as Coroplast.
 - A layer of soft polyethylene foam over the Coroplast support is recommended for soft organic materials to prevent flattening of the underside
 - Thicker planks of polyethylene can be carved to provide supports to prevent heavy round artifacts from rolling
 - The artifacts can be secured to the support with plastic wrap or medical bandages.
 - A layer of flexible polyethylene foam can be used to pad and protect the surface of flat artifacts before bagging, however this must be judged on site to ensure the artifact will not be impacted
 - Larger or heavy artifacts may need more substantial support such as wood or metal. A layer of inert plastic should be used between the metal support and the artifact, especially as metal to metal contact may cause galvanic corrosion.
 - Orthopedic casting kits of polyurethane resin and mesh can be used to create special form fitting supports
 - Nylon or polypropylene rope can be used on large items but the rope should be padded with Ethafoam where it contacts the artifact to prevent wear marks
 - White toweling can be used to cover robust artifacts to keep them wet under the plastic layer
 - Plastic pipe wrap or plastic gutters can be used to support round rope artifacts to help them keep their shape
 - Bubble pack and plastic food wrap can be used, but may contain chlorides, which will leave marks on metal surfaces (corrosion)
 - If stacking artifacts in bins, place the heaviest artifacts on the bottom and interweave with bubble pack, foam or toweling to prevent crushing and/or abrasion

- Objects should be padded sufficiently to prevent movement during transportation without exerting excessive pressure on the artifact
- 5. Store artifacts in an appropriate environment**
- Artifacts should be kept as cool as possible – stored out of sunlight and preferably refrigerated to reduce mold growth
 - Freezing is recommended if the time before treatment will be lengthy, but as all plastics “breathe” there is risk of artifact drying out.
 - Wrapping the plastic wrapped artifacts in tinfoil (providing an air impermeable membrane) will prevent the artifacts from drying out
 - Biocides are generally not recommended due to safety to personnel and possible interactions with the artifacts.

Prioritize treatment of artifacts

- Recovered artifacts can be sorted into three categories: i) those requiring minimal treatment, ii) artifacts which can be put on hold (don’t require immediate treatment), and iii) those requiring treatment under the supervision of a conservator.
- Any composite artifacts (containing more than one material) containing organic materials should be treated as an organic artifact.
- Inorganic non-metallic artifacts (such as glass, ceramic, stone and brick):
 - Require minimal treatment (fresh water origin)
 - Dirt and rootlets or other organic material should be cleaned off with a brush which does not mark the artifact surface and the artifact be slow air dried. This is commonly done in a Ziploc bag left open to allow air to circulate.
 - Condensation should be wiped out of the bag each day.
 - Drying can be slowed by closing the opening partially.
 - Drying should be done in a cool location and artifact observed for possible growth of mold.
 - Artifacts should be observed for efflorescence forming on the surface as this is a possible indicator of a chloride problem. If efflorescence is observed, drying should be stopped until the cause is determined.
- Paper documents or photographs require immediate care and should be sent immediately to the conservator
- All other artifacts should be packed for transportation to the conservation facility for assessment and treatment.

List of supplies and materials useful in the field work for packing and storage

Ziploc bags, various sizes
 Plastic bins or containers with covers, insulated food coolers, various sizes
 Coroplast sheets
 Plastic food wrap
 Bubble pack, various sizes
 Flexible, thin polyethylene foam (Ethafoam, Sentinel)
 Ethafoam plank
 Toweling, white (prewashed)

Polyethylene tags (Tyvek, Polypaper)
 Plaster gutters, plastic pipe wrap
 Planks or plywood
 Fiberglass or nylon window screening
 Tape (duct, reinforced mailing tape, 3M yellow, masking tape)
 Medical bandages, various widths
 Green florist wire
 Waterproof markers, black (Sharpies pen)
 Monel staples and stapler
 Nylon or polypropylene ropes
 Plastic buckets
 Milk crates
 Net bags
 Orthopedic casting kits
 Hand water mister
 Scissors
 Small tools (trowels, spatulas, brushes)
 Water container or garden hose and spray nozzle

A list of conservation facilities and conservators is presented in Appendix A - List of Conservation Labs/Facilities.

5.0 CONTACTS

5.1 Communication Matrix

To be completed by the Contractor and submitted to PSPC and Tetra Tech

POSITION	CONTACT INFORMATION
PSPC Project Manager	
Tetra Tech Project Manager	
Marine Archaeologist	
Archaeological Project Manager	
Ministry of Citizenship and Multiculturalism - Ontario	1-866-700-0040 (toll free)

5.2 Engaged Indigenous and Métis Contacts

In the event of the discovery of artifacts or human remains:

Community	Contact
SART Communities (SART)	Rosanne Van Schie, vanschie3@gmail.com Please see Appendix C - SART Inadvertent (Chance) Finds Protocol.
Algonquins of Pikwàkanagàn First Nation (AOPFN)	AOPFN Consultation Department Tel: 613-625-1551 E-mail: Consultation@pikwakanagan.ca Please see Appendix B – AOPFN Chance Find Protocol.
Antoine Nation (AN)	Ivan Filion, ivan.filion@gmail.com CC Chief Davie Joannis, joanissedavie@gmail.com
Métis Nation of Ontario (MNO)	If artifacts or human remains are found, contact a Métis archaeologist or MNO R5CC. Robyn Rumney, robynr@metisnation.org Julian Greer, juliang@metisnation.org
Algonquins of Ontario (AOO)	Algonquins of Ontario Consultation Office 31 Riverside Drive, Suite 101 Pembroke, Ontario K8A 8R6 Tel: 613-735-3759 Fax: 613-735-6307 E-mail: algonquins@tanakiwin.com

6.0 BIBLIOGRAPHY AND REFERENCES CITED

Archaeological Research Associates Inc. (ARA)

- 2023 *Marine Archaeological Assessment, Background Research, Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) (715-32760TT), Intersection of Lake Temiskaming and the Ottawa River Straddling Border of Québec and Ontario*. Licence 2023-02. On file with PSPC and MCM.
- 2023 *Marine Archaeological Assessment, Task 2, Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) (715-32760TT), Intersection of Lake Temiskaming and the Ottawa River Straddling Border of Québec and Ontario*. Licence 2023-10. On file with PSPC and MCM.
- 2024 *Marine Archaeological Assessment, Technical Note, Task 3, Timiskaming Dam-Bridge of Quebec Replacement Project (Quebec) (715-32760TT), Intersection of Lake Temiskaming and the Ottawa River Straddling Border of Québec and Ontario*. Licence 2023-10. On file with PSPC.

Grant, Tara and Nancy E. Binnie

- 2017 *Conservation Plan for a Fresh Water Excavation, King's Wharf, Penetanguishene (Discovery Harbour), CCI Report No. 130567*. Produced for Scarlett Janusas Archaeology Inc. On file with SJA and MCM.

Hamilton, D.L.

- 1996 *Basic Methods of Conserving Underwater Archaeological Material Culture*. US Department of Defense Legacy Resource Management Program, Washington.

Parks Canada.

- 2022 *What to Do When Something is Discovered – Human Remains*. https://parks.canada.ca/docs/r/pfa-fap/sec7/decouv_discov3. Accessed April 1, 2024.

Robinson, W.

- 1998 *First Aid for Underwater Finds*. Archetype Publications in association with the Nautical Archaeology Society and the National Maritime Museum, London.

Sease, C.

- 1987 *A Conservation Manual for the Field Archaeologist*. Archaeological Research Tools, Vol. 4, Institute of Archaeology, University of California, Los Angeles.

Singley, K.

1988 *The Conservation of Archaeological Artifacts from Freshwater Environments*. Lake Michigan Maritime Museum, South Haven, Michigan.

Watkinson, D., and V. Neal

1998 *First Aid for Finds*. United Kingston Institute for Conservation Archaeology Section and Rescue – The British Archaeological Trust, United Kingdom.

<http://www.ioa.ucla.edu/press/conservation-manual-field-archaeologist>

Cross, S. Hett, C. and M. Bertulli

1991 *Conservation Manual for Northern Archaeologists*. Prince of Wales Northern Heritage Centre Archaeology Reports Number 9, Yellowknife.

<https://www.pwnhc.ca./download/conservation-manual-for-northern-archaeologists/>

7.0 Appendix A - List of Conservation Labs/Facilities

Canadian Conservation Institute
 1030 Innes Road
 Ottawa, Ontario K1B 4S7
iccservices-cciservices@pch.gc.ca
Telephone 613-998-3721
Toll-free 1-866-998-3721
TTY 1-888-997-3123
Fax 613-998-4721

Canadian Conservation Consortium
contact@canadianconservationconsortium.ca.

NAME	SPECIALIZATION	PROVINCE	PRIVATE COMMISSIONS?
Marie-Lou Beauchamp	Photographs, Paper	ON	
Kathleen (Kathy) Bond	Objects	ON	
Carole Breckler	Metals	QC	
Barry Briggs	Paintings, Fine Arts Collections	ON	
Mireille Brulotte	Wood	QC	
Margot Brunn	Mixed Collections	AB	
Lauren Buttle	Paper	BC	
Jennifer Cheney	Paintings	ON	
Elizabeth Cloutier	Stone and derivatives	QC	
Aude Connord	Sculpture, Outdoor bronzes, Metals	QC	
Charlie Costain	Analysis, Environment	ON	
Wendy Crawford	Paintings	ON	
Laszlo Cser	Paintings	ON	

NAME	SPECIALIZATION	PROVINCE	PRIVATE COMMISSIONS?
<u>Colleen Day</u>	Objects, Archaeological Materials	BC	
<u>Wendy de Feydeau</u>	Paper, Paintings	Switzerland	
<u>Rachel Dessaints</u>	Textiles	QC	
<u>Vincent Dion</u>	Paper	Ontario	
<u>A. Jane Dosman</u>	Paper	ON	
<u>Alison Douglas</u>	Paintings	ON	
<u>Heather Dumka</u>	Objects	AB	
<u>Shirley Ellis</u>	Textiles	AB	
<u>Tiffany Eng Moore</u>	Books, Archival Materials	ON	
<u>Aliaksei Fedarenka</u>	Stone and derivatives	ON	
<u>Élisabeth Forest</u>	Paintings	QC	
<u>Paula E. French</u>	Archival Materials, Objects	NL	
<u>Alexander Gabov</u>	Sculpture	ON	
<u>Laurence Gagné</u>	Sculpture	QC	
<u>Ann Marlène Gagnon</u>	Paintings	QC	
<u>Michelle Gallinger</u>	Paintings	NS	
<u>Majid Ghazian</u>	Metals	ON	
<u>Fiona Graham</u>	Preventive Conservation	ON	
<u>Anita Henry</u>	Paintings	QC	
<u>Gregory Hill</u>	Photographs, Archival Materials	ON	
<u>Gregory Howarth</u>	Paintings	United Kingdom	

NAME	SPECIALIZATION	PROVINCE	PRIVATE COMMISSIONS?
Lisa Isley	Books	AB	
Elizabeth Jablonski	Paintings	NS	
Monika Jankowiak	Sculpture, Stone and derivatives, Fine Arts Collections, Polychrome Sculpture, Outdoor bronzes, Objects, Metals, Wood, Mixed Collections, Archaeological Materials, Furniture, Preventive Conservation, Conservation Management	ON	
Sonia Kata	Textiles	QC	
Greg Kelley	Furniture	ON	
Emy Kim	Objects	ON	
Diana Komejan	Mixed Collections	ON	
Wojciech Kulikowski	Paintings, Polychrome Sculpture, Outdoor bronzes	ON	
Cyndie Lack	Paintings	BC	
Jessica Lafrance-Hwang	Objects	QC	
Simon Lambert	Preventive Conservation	ON	
Julia Landry	Archival Materials	NS	
Anne Lapointe	Paintings, Murals, Architectural Finishes	QC	
Myriam Lavoie	Sculpture, Murals, Outdoor bronzes, Objects, Metals, Conservation Management	QC	
Miki Lee	Preventive Conservation	NL	

NAME	SPECIALIZATION	PROVINCE	PRIVATE COMMISSIONS?
<u>Kasey Lee</u>	Objects, Preventive Conservation, Conservation Management	BC	
<u>Patrick Legris</u>	Paintings	ON	
<u>Carmen Li</u>	Objects, Preventive Conservation	AB	
<u>Chloé Lucas</u>	Photographs	ON	
<u>Anne MacKay</u>	Sculpture	QC	
<u>Anne Maheux</u>	Fine Art on Paper	ON	
<u>John McElhone</u>	Photographs	ON	
<u>Esther Méthé</u>	Textiles	NS	
<u>Bethany Jo Mikelait</u>	Paintings	ON	
<u>Donald Murchison</u>	Sculpture, Paintings	AB	
<u>Michael O'Malley</u>	Paintings	QC	
<u>Isabelle Paradis</u>	Sculpture, Stone and derivatives, Polychrome Sculpture, Architectural Finishes	QC	
<u>Janice Passafiume</u>	Paper, Paintings	ON	
<u>Emmanuelle A. Perron</u>	Paintings	QC	
<u>Marie-Chantale Poisson</u>	Sculpture, Paintings	QC	
<u>Stephanie Porto</u>	Paper	ON	
<u>Katherine Potapova</u>	Paper	AB	
<u>Melissa Potter</u>	Paper	ON	
<u>Barbara A. Ramsay</u>	Paintings, Wall Paintings, Murals, Conservation Management	United States	

NAME	SPECIALIZATION	PROVINCE	PRIVATE COMMISSIONS?
<u>Jacqueline Riddle</u>	Objects	ON	
<u>Sophie Roberge</u>	Paintings	QC	
<u>Jennifer Robertson</u>	Paper, Books	ON	
<u>Terry Rutherford</u>	Paper, Books, Preventive Conservation	BC	
<u>Ann Shaftel</u>	Thangkas	NS	
<u>Veronique Belon Slougui</u>	Archival Materials	ON	
<u>Heidi Sobol</u>	Paintings	ON	
<u>Catherine Stewart</u>	Paintings	NS	
<u>Dee Stubbs-Lee</u>	Objects	NB	
<u>Aimie Turcotte</u>	Paintings	QC	
<u>Robert Waller</u>	Mineralogical Collections	ON	
<u>Marianne Webb</u>	Polychrome Sculpture, Objects, Lacquer	BC	

8.0 Appendix B – AOPFN Chance Find Protocol

AOPFN CULTURE AND HERITAGE ARTEFACTS AND SITES CHANCE-FIND PROCEDURE



Algonquins of Pikwakanagan First Nation

Public Services and Procurement Canada Contractors and Personnel are NOT permitted to collect and/or keep any heritage resources within AOPFN unceded Algonquin Territory.

The following procedures provide contingency measures for the discovery of AOPFN Culture and Heritage Sites and Artefacts prior to and during construction of all Public Services and Procurement Canada Projects.

Core Principles

- All Algonquins of Pikwàkanagàn (AOPFN) Algonquin heritage sites, artefacts, and knowledge must be treated with the utmost respect, in line with AOPFN laws, values, and protocols.
- It will be the responsibility of the Proponent to notify other First Nations where finds are located in shared territories.
- Any archaeology study resulting from a chance-find must involve AOPFN as research partners, with funding to support such research identified and sought after by both parties.
- AOPFN's Consultation Department (See Contact Section below) will be contacted well in advance of any proposed cultural heritage data collection programs being developed.
- Any Heritage Resource Specialist or third-party archaeologists hired to do peer review or collect information in the field associated with the chance-find must be vetted by AOPFN before they are hired by the Proponent or Contractor. ¹
- Data collection alone is not an appropriate measure for chance-find culture and heritage artefacts and sites.
- Data collection concerning AOPFN culture and heritage artefacts and sites will not be permitted without AOPFN written permission and sharing of data collected

¹ See Appendix A: AOPFN Vetted Heritage and Resource Specialist List

on chance-find sites or artefacts outside of normal regulatory reporting requirements, also requires AOPFN written permission.

- If any Algonquin artefacts require excavation, they must be curated either by Omàmiwininì Pimàdjowin: Algonquin Way Cultural Centre or by an alternative institution agreed to by AOPFN on an “In-Trust” capacity until Omàmiwininì Pimàdjowin: Algonquin Way Cultural Centre is prepared to take over care.
- AOPFN Ancestral Remains are the sole property of AOPFN and data and biological samples cannot be collected or analysed without AOPFN written permission. Destructive sampling of AOPFN Ancestral Remains MUST be avoided and will only be permitted by AOPFN if DNA confirmation is required and harm to the remains is minimized.

Culture and Heritage Resource Discovery during Construction

If suspected culture and heritage resource sites are discovered during construction, the proponent and its consultants are required to implement the measures listed below.

- Immediately notify the AOPFN Consultation Department (See Contact Section below).
- With AOPFN, decide whether the services of a qualified Heritage Resource Specialist or third-party archaeologist, vetted by AOPFN, may be necessary and notify the appropriate regulatory authority if required. ¹
- AOPFN may request photographic, video, GPS, Google maps, and/or other forms of documentation of the site(s) of interest to aid decisions going forward. If requested, documentation must be sent to AOPFN as soon as possible.
- AOPFN will determine the need for Neya Wabun Guardians to secure the site or identify an agreeable process for Proponent personnel to secure the site if the Guardians are not immediately available.
- Prohibit the collection of any historical, archaeological, or spiritual artefacts important to AOPFN by Project personnel or consultants except for by a qualified Heritage Resource Specialist or third-party archaeologist working with AOPFN and acting as authorized by the appropriate regulator/permit.
- Suspend work immediately in the vicinity (i.e., within 100 m) of any newly identified archaeological, historical, or spiritual sites (e.g., modified bone, pottery fragments etc.). Work at that location may not resume until the measures agreed to with AOPFN are implemented.

¹ See Appendix A: AOPFN Vetted Heritage and Resource Specialist List

- Clearly mark the site using fencing and flagging to secure avoidance where appropriate. For in-water work, maintain cofferdams and prevent water from entering the site.
- As and where required, AOPFN will work with the Proponent and a qualified Heritage Resource Specialist or third-party archaeologist (vetted by AOPFN) to develop, if warranted, an appropriate mitigation plan. ¹ The mitigation measure options available may include site avoidance, ceremony, monitoring/surveillance, among other options, and will be decided between Public Services and Procurement Canada and AOPFN.

AOPFN Ancestral Remains Discovered During Construction

In the event that suspected burial grounds or human remains are discovered during construction, the proponent and its consultants are required to implement the mitigation measures listed below.

- Suspend work immediately in the vicinity (i.e., within 100 m) of the newly identified burial ground and or human remains. Work at that location may not resume until the measures below have been implemented.
- Stake or flag off the location to secure avoidance.
- Immediately notify the AOPFN Consultation Department.
- Notify the local police and appropriate regulatory authorities. AOPFN must be involved in all communications, meetings and determination processes with respective authorities.
- AOPFN will determine the need for the Neya Wabun Guardians to secure the site or identify an agreeable process for Proponent personnel to secure the site if AOPFN representatives are not immediately available.
- If there is potential for disturbance to the site due to trafficability or high public visibility, assign employees to stand watch until AOPFN representatives, the local police and Heritage Resource Specialist or third-party archaeologist (vetted by AOPFN) arrives.
- Cover any exposed remains with clean plastic sheeting, tarpaulin, blanket or other covering until AOPFN representatives, local police and Heritage Resource Specialist, vetted by AOPFN, is present.

¹ See Appendix A: AOPFN Vetted Heritage and Resource Specialist List

- Do not backfill. If excavated fill has been loaded into a truck, empty the excavated fill at a nearby secure location agreed to with AOPFN in order for AOPFN, local police and Heritage Resource Specialist to inspect.
- If in water work, maintain cofferdams and prevent water from entering the site.
- If the remains are determined to be AOPFN ancestral or familial relations a field visit with the family of the ancestor, and or others (as appropriate) to conduct the proper ceremonies will be required.
- Media communications concerning remains will not occur without AOPFN permission and participation and MUST NOT occur until after AOPFN has had opportunity to contact familial relations and/or other community members and brief Chief and Council.
- As and where required, AOPFN will work with the Proponent, local police, and a qualified Heritage Resource Specialist or third-party archaeologist, vetted by AOPFN, to decide on next steps and develop, if warranted, an appropriate mitigation plan.
- The Contractor and/or Proponent will only resume work in that area once the archaeological and forensic studies are complete, mitigation measures are complete, any required AOPFN ceremony and or protocols have been respected and followed and clearance has been granted by AOPFN, the local police, and appropriate government authority.

AOPFN Contact Information

AOPFN Consultation Department	Phone Number	Email
Manager	613-625-1551	Consultation@pikwakanagan.ca
Communications Specialist	613-625-1551	communications.consultation@pikwakanagan.ca
Neya Wabun Guardians Program Coordinator	613-625-1551	guardians@pikwakanagan.ca

¹ See Appendix A: AOPFN Vetted Heritage and Resource Specialist List

Proponent Contact Information

Role	Phone Number	Email
TO BE ADDED BY PROPONENT	XXX-XXX-XXXX	

¹ See Appendix A: AOPFN Vetted Heritage and Resource Specialist List

Appendix A: AOPFN Vetted Heritage and Resource Specialist List

Provided is a list of AOPFN Vetted Heritage and Resource Specialists, including company names with either the owner or main archaeologist as some of the companies are apart of larger firms.

1. Past Recovery; Jeff Earle
2. Matrix Heritage; Ben Mortimer
3. Stantec; Colin Varley
4. Golder/WSP; Randy Hahn
5. Cameron Heritage; Courtney Cameron

¹ See Appendix A: AOPFN Vetted Heritage and Resource Specialist List

9.0 Appendix C - SART Inadvertent (Chance) Finds Protocol

Inadvertent (Chance) Finds Protocol

PSPC Temiskaming Dam Replacement (Quebec Side) Project

0.0 Definitions

Archaeological Find – Artifacts, features, archaeological sites, and human remains (or evidence thereof) located during planned archaeological work undertaken by Ontario licenced archaeologists with the Ministry of Citizenship and Multiculturalism.

Inadvertent (Chance) Find – Artifacts, features, archaeological sites, and human remains (suspected, or clear evidence thereof) located by non-archaeologists during operations, development, exploration, or other working environments undertaken outside of an archaeological assessment process.

1.0 Best Practices Regarding Inadvertent Finds

The following is a procedure for investigating inadvertent finds, undertaking temporary work stoppage and/or the avoidance of sensitive areas within the Project in the event of an unexpected discovery.

This plan provides protocols in the event of inadvertently encountering a variety of buried archaeological deposits (registered, or previously unknown archaeological sites), and human remains. Other areas within the scope of this document include protocols for working nearby areas of established archaeological potential, as well as, the inadvertent discovery of human remains. Additionally, this plan aims to set out the best practices to be carried out in the event of a chance encounter with areas of archaeological potential or known archaeological values.

From the outset it should be noted that this set of protocols is written solely concerning archaeological values and human remains. Native Values, although occasionally overlapping with archaeological values (pre-contact archaeological sites, and some early historic sites, as well as burial sites), are considered largely separate as many native values can only be identified from an emic perspective (by the First Nations themselves). Many other Native Values exist, including but not limited to harvesting grounds, spiritual sites, habitation sites, to name a few.

As the identification of Native Values rests solely among First Nation communities, any information regarding the protocols concerning the protection and identification of these values rest with the First Nations themselves.

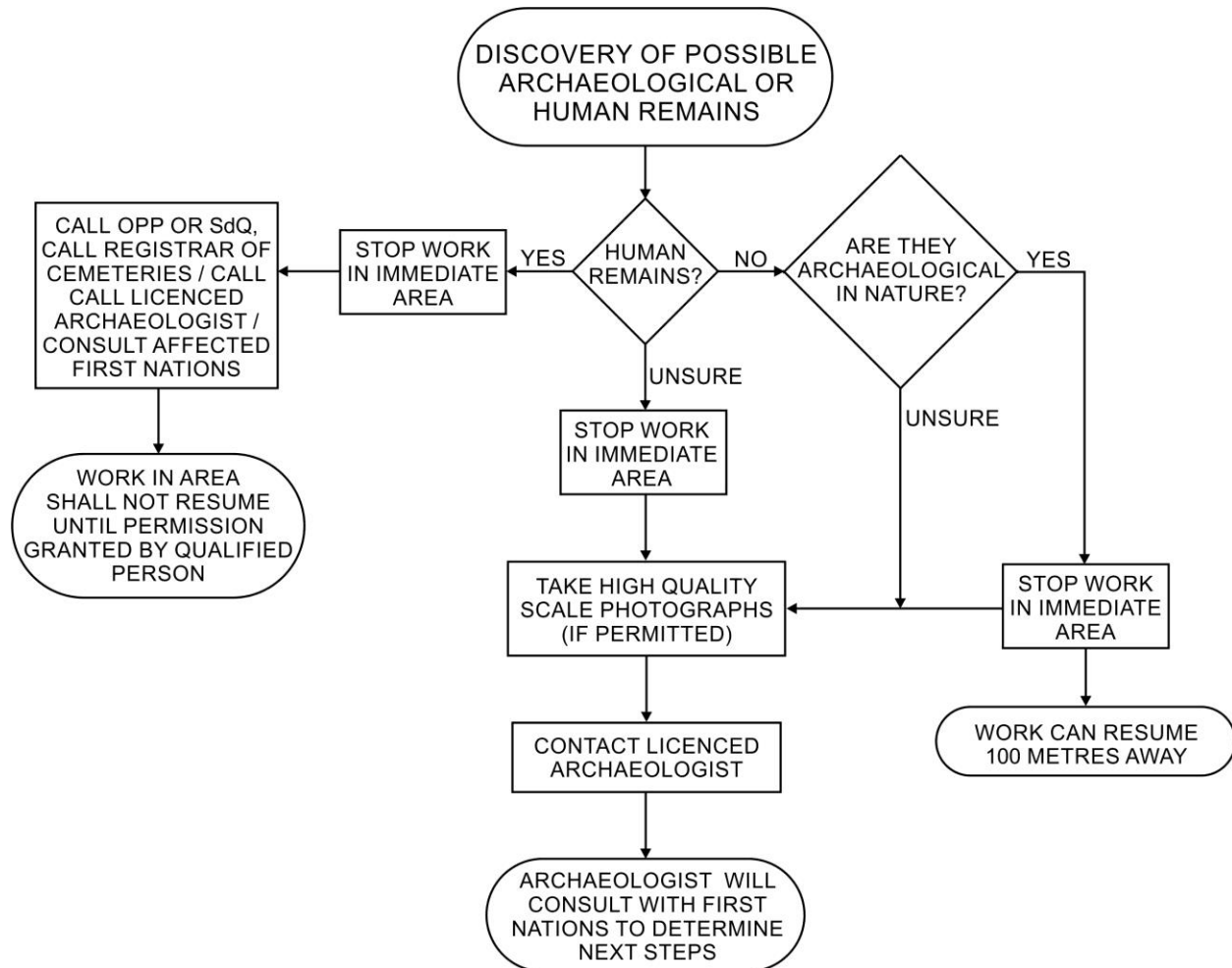
2.0 Types of Archaeological Values / Human Remains which may be Encountered, and the Associated Protocols.

Some types of events that may trigger a work stoppage or area bypassing:

- The inadvertent discovery of human remains during infrastructure development or construction operations.
- The inadvertent discovery of conspicuous archaeological / heritage remains (cabin walls, rock structures, etc.).
- The inadvertent discovery of buried archaeological materials – e.g., stone tools (i.e. arrowheads, spear points or flakes, etc.).
- The accidental encroachment on a registered archaeological site(s).

- The accidental encroachment into an area of archaeological potential not previously assessed but established through earlier Stage 1 archaeological assessment reports.

2.1 Flow Chart to Guide Decision Making Related to Inadvertent Finds.



2.1.1 Encountering Human Remains

If human remains, or suspected human remains are encountered an immediate stop work order must be given. At the time the human remains are encountered there exists a legal obligation to contact the Ontario Provincial Police, or the Sûreté de Québec, and/or the Provincial Coroner, and the Registrar of Cemeteries at. Additionally, the area should be flagged for future relocation, and all staff working, or potentially working in the area must be notified so that the site remains an undisturbed as possible.

- First Nations should be contacted about the discovery, all relevant information should be conveyed to the local First Nations.
- No removal or displacement of any human remains is permitted at the time of discovery, and no work shall recommence until such permission is granted by provincial authorities.

2.1.2 Encountering Buried Archaeological Materials (sites, artifacts, features)

If positive or suspected positive identification of archaeological remains (stone tools / fragments, hearths, etc.) is encountered all work must cease, and a licenced archaeologist must be contacted to determine if the materials are archaeological in nature, and to recommend the next steps required. No work should resume until such time as First Nation communities are consulted with, and the next steps are identified.

2.1.3 Encountering Previously Unknown Conspicuous Archaeological or Heritage Remains

When working, a chance that conspicuous remains of archaeological or heritage sites may be encountered. These will be identified by structural elements protruding from the ground, and often take the form of cabin walls (or fragments thereof), or the remains of stone structures). If encountered, all work in the vicinity must cease, and a licenced archaeologist must be contacted to determine if the remains are archaeological or built heritage in nature. If archaeological, the archaeologist will recommend a plan of mitigation which may include avoidance or investigation, depending on the constraints or opportunities available. If non-archaeological (built heritage), the archaeologist will recommend to the proponent the best course of action and the contact information of individuals who are qualified to assess and recommend future courses of action.

2.2 General Protocol When Encountering Archaeological (or Potentially Archaeological) Resources During Activities Which Impact the Soil Integrity.

In the event that any of the above occurs the following is the procedure:

- Immediately the worker(s) operating the equipment take a short work stoppage and/or avoids-bypasses the area, and subsequently notifies the supervisor.
- If the worker's supervisor is in the area, immediate notification should be made to the supervisor. If the supervisor / worker does not work for PSPC, a SART representative should be notified.
- In some cases, a short work stoppage may be all that is required. For example, if the supervisor or environmental monitor thinks there might be an artifact they should immediately contact and send any relevant information to a licenced archaeologist. If it is determined that no artifact or is value present, work could immediately re-start. No further action would be required.
- If archaeological resources are located, the area in question should be immediately demarcated with flagging tape to avoid any further impact until the issue is resolved.
- The nature and rationale of the work stoppage as well the next necessary steps would be discussed via a conference call.
- If the issue cannot be resolved by telephone/email, then the operations in the vicinity of the find should be suspended while the issue is investigated. A site visit will be necessary by the archaeologist and/or First Nation Monitor (representative).
- Following the site visit, an Action Plan to resolve the issue should be immediately developed based on the input of all the relevant individuals.

2.3 Work Stoppages & Bypassing of Areas with Human Remains

Should possible human remains be found work in the discovery area is to be immediately halted and the area flagged off & bypassed. Contact is to be made with the local Sûreté de Québec detachment in Témiskaming (if on the Québec side) and the OPP in Ontario (and through PSPC), First Nations, FN police and the Registrar of Cemeteries. Contact should also be made with the Ministry of Citizenship and Multiculturalism.

Revision 1.0 – Date: 10Jun2024

Contact Information:

Ontario Provincial Police

(888) 310-1122

Sûreté de Québec

(514) 598-4141

Ministry of Public and Business Service Delivery (MPBSD)

Provincial Registrar of Cemeteries

Ian Hember

ian.hember@ontario.ca

Office of the Chief Coroner

25 Morton Shulman Ave. Toronto, Ontario

M3M 0B1

(416) 314-4000

Woodland Heritage Northeast Limited

Ryan Primrose (Licenced Professional Archaeologist)

ryan@woodlandnortheast.com

(705) 676-7458

Ministry of Citizenship and Multiculturalism

Paige Campbell

Archaeology Review Officer

435 S. James St., Suite 334

Thunder Bay, ON, P7E 6S7

(807) 475-1632

paige.campbell@ontario.ca

cc: archaeology@ontario.ca

Kebaowek First Nation

Verna Polson (Cultural Coordinator)

vpolson@kebaowek.ca

(819)-627-3309

Timiskaming First Nation

Lindsay Polson (Director Lands and Resources)

SD.Manager@atfn.ca

(819)-723-2291

Wolf Lake First Nation

Martha Polson (Director General)

mpolson@wolfakefirstnation.com

819-627-3628 ext. 2

873-997-9998 (cell)

5 Riordon Avenue, Temiscaming, QC, J0Z 3R0

cc: kmckenzie@wolfakefirstnation.com



APPENDIX D: TQDRP ESMP Approach

Timiskaming Quebec Dam Project Proposed Approach to an Indigenous Co-led Environment and Social Management and Monitoring Plan

Introduction and Background

Since 2016, Public Services and Procurement Canada (PSPC) has been engaging in the federal impact assessment for the Timiskaming Quebec Dam Replacement Project (the “Project”), the Indigenous communities that exercise their rights in the vicinity of the Project. The communities and PSPC jointly prepared the impact assessment and in it they identified several environmental, social and cultural values that must be monitored in pre-construction, during construction, and post-construction. PSPC has committed to meaningfully involving Indigenous groups in planning and implementation of the environmental and socio-cultural management and monitoring program.

This document outlines a proposed approach to an Indigenous co-led (with PSPC) Environmental and Social Management and Monitoring Plan (ESMP). This approach will be reviewed and refined with input from all Indigenous groups involved in Project planning.

Environmental and Socio-economic Management System

The Environmental and Socio-economic Management System (ESMS) guides consultation and consists of plans and programs to monitor and manage the project impacts and cumulative effects on environmental, social, and cultural valued components. It will be guided by regulatory requirements, and developed, implemented and evaluated collaboratively by PSPC, the construction contractor and Indigenous groups. It is comprised of four elements: the Environmental Monitoring Program, the Socio-economic Management Plan, Indigenous Participation Plan and the Follow-up Program.



Figure 1: Environmental and Socio-economic Management System (ESMS)

Environmental Monitoring Program (pre-, and during construction): Ensures compliance with mitigation measures by collecting activity and environmental data to determine project performance. Includes monitoring of GHGs, erosion, sediment, fish and fish habitat, water quality, noise, wildlife, vegetation, spill prevention, invasive species, wastewater and solid waste.

Indigenous Participation Plan (Construction): Negotiated between PSPC and Indigenous groups and is a plan specific to employment, training, skills development, equality, and sub-contracting during construction.

Socio-economic Management Plan (pre-, during and post-construction): Summarizes socio-economic mitigation and enhancement measures and processes for evaluated effectiveness and remedying gaps. Includes monitoring of indigenous rights and interests, safety, community infrastructure and services, harvesting, education and skills, cultural well-being, health and well-being, archaeological resources.

Follow Up Program (Post Construction): Evaluates the assessment conclusions and the effectiveness of mitigation and enhancement measures and provide processes for responding to issues. Includes monitoring of socio-economic conditions, spawning grounds, fish compensation measures, revegetation, and fish passage.

What will be monitored is contained in **Appendix A**. Excerpts from Chapter 22 of the EIS which outlines environmental management planning and monitoring is contained in **Appendix B**.

Establishing and Implementing the ESMS: A Proposed Approach

Principles guiding the ESMS:

Collaborative – The most impacted Algonquin communities will be involved as a partner with PSPC (and their contractor, and environmental consultants, Tetra Tech, Odonaterra) in planning and implementing the ESMS. This ensures that the responsibilities of both parties are honoured and respected in this program.

Prioritizes Closest Communities – The ESMS fully involves the Indigenous groups that live closest to the Project site and provides the results of the monitoring program to other Indigenous groups involved in the impact assessment for the Project.

Shared responsibility – The ESMS recognizes that there are finite resources available for monitoring and that monitoring results must be available in a timely manner for government, other indigenous groups, stakeholders and the public. Therefore, we will collaboratively plan one monitoring program for each of the environmental components (for example water quality, or fish) that involves all directly responsible parties. Certain socio-economic parameters will be monitored separately by and for each of the potentially impacted Indigenous groups.

Co-consideration of Indigenous knowledge and western science – The ESMS will be created through collaboration and therefore co-considers Indigenous knowledge and western science about the environment and socio-economic values.

Regular Communication – To ensure coordination and timely planning and implementation of the ESMS, there will be regularly scheduled meetings with standing agenda items. This will help to reduce the burden of ad hoc scheduling and to keep the ESMS on track.

Proposed Governance / Participation Structure

We propose that the ESMS will be governed by three different groups:

- a Joint PSPC-Algonquin Monitoring Management Committee (“Management Committee” or “MC”),
- an Environmental and Social Technical Monitoring Team (“Monitoring Team” or “MT”), and
- a Monitoring Coordination Team (“Coordination Team” or “CT”).

Their composition, roles and responsibilities are outlined below. Examples of Indigenous monitoring committees for reference include the TransMountain Expansion project (see: <https://www.iamc-tmx.com/>).

Joint PSPC-Algonquin Monitoring Management Committee (“Management Committee”) – is the Committee that manages and makes decisions about the ESMS. The committee: Is comprised of representatives selected by the groups using their own governance and decision-making processes. The Committee:

- Is comprised of 2 representatives each from KFN, WLFN, TFN, AOPFN, PSPC and the construction contractor.
- Participates in regular bi-monthly meetings to discuss monitoring results.
- Reviews and provides constructive feedback on the materials being shared with the communities / public.
- Sets thresholds for corrective action / adaptive management for environmental, social and cultural parameters.
- Ensures that western science and Indigenous knowledge are co-considered in decision-making.
- Makes joint decisions by consensus about monitoring work, and corrective actions to take to address any impacts. If consensus cannot be achieved after efforts have been taken to reach it and a decision needs to be made in the best interest of the Project, PSPC will retain this responsibility.
- Can make changes to the ESMS by consensus.

Environmental and Social Technical Monitoring Team (“Monitoring Team”) – is the Team responsible for conducting the monitoring work. The Team:

- Is comprised of the contractor (co-lead), Tetra Tech (co-lead), Kichi-Sipi Technical Team (co-lead), AOPFN Guardians, and Odonaterra (for socio-economic effects).
- Monitors environmental and social components as required in the conditions of approval (if and as given) by the Ministry of Environment and Climate Change (MECC) and the Department of Fisheries and Oceans (DFO). A preliminary list of components to be monitored are in **Appendix A**.
- Monitoring Team reports to the Management Committee.

Coordination Team – is the Team that supports and coordinates the tasks undertaken by the Management Committee and the Monitoring Team. They prepare materials to share with Indigenous groups, stakeholders and the public. This Team:

- Is comprised of staff from Tetra Tech and Odonaterra.
- Is responsible for compiling the monitoring data with interpretation/analysis for discussion by the Management Committee.
- Sends proposed monitoring programs to other Indigenous groups, and local stakeholders for review; compiles review comments and sends them to the Management Committee.
- Prepares plain language summaries in English and in French of the monitoring information for dissemination to communities / public.
- Uploads information to a project website / information HUB.
- Informs Indigenous groups when summaries are available for broader community distribution using their own methods and tools for communications.
- The Coordination Team reports to the Management Committee.

Construction Monitoring and Reporting Process

This is a proposed sequence for monitoring and reporting. The party responsible for each step is indicated in parentheses.

1. Plan monitoring programs (MC & MT)
2. Share monitoring programs with other Indigenous groups for inputs (CT)
3. Revise / refine monitoring programs based on inputs (MC & MT)
4. Conduct monitoring programs (MT)
5. Submit monitoring results with recommendations for corrective actions (MT)
6. Compile and analyze results and submit to Management Committee (CT)
7. Review and discuss monitoring results from western science and Indigenous knowledge perspectives, determine corrective actions (if any), plan upcoming monitoring work (MC)

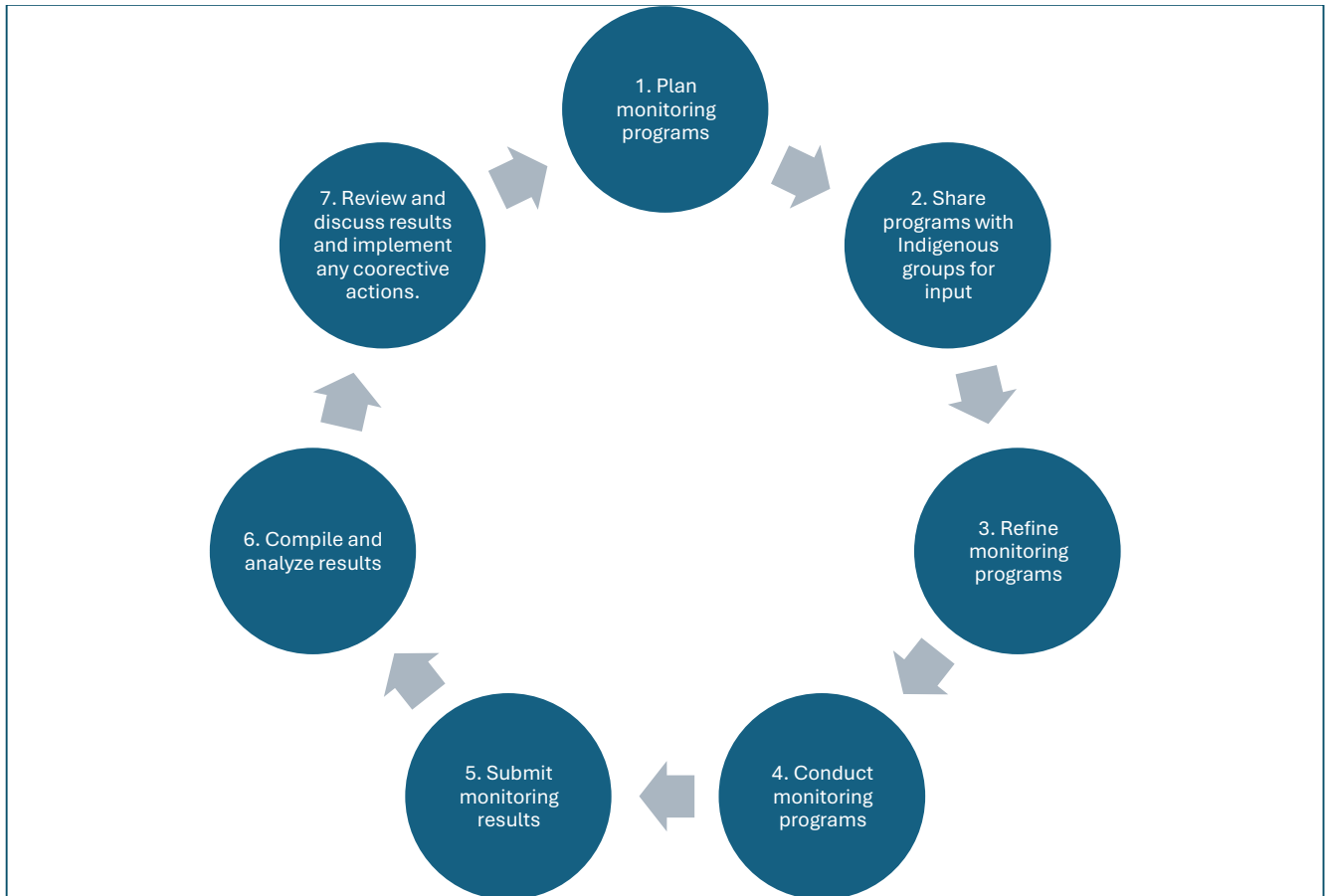


Figure 2: Proposed Monitoring and Reporting Process

Organization of Monitoring Data

We propose a wholistic monitoring approach that combines the western science and traditional/local knowledge datasets about the environment and social VCs that recognizes that all the VCs being monitored influence and connect with each other in the following categories:

- **Water and Fish:** sediment control, water quality, fish, fishing, sensory disturbances (air/noise/atmosphere)
- **Terrestrial:** wildlife (birds, bats, swallows, etc.), plants, plant harvesting, hunting, sensory
- **Community / Cultural / Economic:** business, employment, traffic, archaeology, cultural uses, community services, sensory

It is proposed that the monitoring results are compiled by the Coordination Team and discussed by the Management Committee within these categories, rather than as separate, unconnected programs.

Participation of other Indigenous groups

Other indigenous groups will be engaged by the Coordination Team to review past and future monitoring work programs and the results. Comments from these groups will be provided by the Coordination Team to the Management Committee for consideration in monitoring plans. Plain language summaries of the monitoring results will be shared with these groups, and they may disseminate them to their communities as they wish using their own communication protocols and tools. They may also request access to the technical monitoring results, which will be provided. PSPC will financially support technical review of these materials as requested by each group.

Appendix A: Monitoring Programs

Timiskaming Quebec Dam Replacement Project - Environmental Survey, Monitoring and Follow-up Activities

General topic	Project Phase	Task type	Description	Parameters	Frequency	Start date	End date	Responsibility	Source	Results Disseminated to:
Terrestrial	Pre-construction	Survey	Complementary bat survey	Bat use of existing dam	1 survey	18 months before start of work	14 months before start of work	PSPC/TT	IAAC-1-60 B)	
Terrestrial	Pre-construction	Survey	Complementary bird survey	Bird nesting on existing dam	1 survey	18 months before start of work	14 months before start of work	PSPC/TT	IAAC-1-45 A)	
Terrestrial	Pre-construction	Survey	Species at risk	Survey of species listed under Species at Risk Act	1 survey	2 months before start of work	1 month before start of work	PSPC/TT	IAAC-1-79 A)	
Terrestrial	Pre-construction	Survey	Migratory bird inventory	Survey of species listed under Migratory Birds Convention Act	2 survey/year : Spring and Fall	1 year prior to start of Work (spring)	1 year prior to start of Work (fall)	PSPC/TT	IAAC Comment-1-32	
Terrestrial	Pre-construction	Exclusion/protection	Bat exclusion	Installation of exclusion devices to prevent nesting, resting on existing structure before deconstruction	1 installation	18 months before start of deconstruction	14 months before start of deconstruction	PSPC/TT	EIS Section 12.2.5.5	
Terrestrial	Pre-construction	Exclusion/protection	Bird exclusion	Installation of exclusion devices to prevent nesting, resting on existing structure before deconstruction	1 installation	18 months before start of deconstruction	14 months before start of deconstruction	PSPC/TT	IAAC-1-45 A)	
Community	Pre-construction	Modeling	Establishing noise levels expected during construction work	dBA level according to limits from the Ministère de l'Environnement, de la Lutte contre les Changements Climatiques, de la Faune et des Parcs	1 before groundbreaking	4 months before start of work	1 month before start of work	Contractor	EIS Section 22.3	
Terrestrial	Pre-construction	Design	Vegetation restoration plan	Selection of plant species and landscaping for Long Sault Island	1 Design before Request For Proposal	18 months before start of construction	14 months before start of construction	PSPC/TT	EIS Section 13.3.4.5.2	
Water&Fish	Construction	Management Plan	Erosion and Sediment Control Plan	Proper implementation of EIS mitigation measures				Monitoring Team	EIS Section 22.1	
Water&Fish	Construction	Management Plan	Spill Prevention and Response Plan	Proper implementation of EIS mitigation measures				Monitoring Team	EIS Section 22.1	
Terrestrial	Construction	Management Plan	Invasive Alien Plant Species Management Plan	Proper implementation of EIS mitigation measures				Monitoring Team	EIS Section 22.1	
Terrestrial	Construction	Management Plan	Wildlife Management Plan	Proper implementation of EIS mitigation measures				Monitoring Team	EIS Section 22.1	
Water&Fish	Construction	Management Plan	Waste Water Management Plan	Proper implementation of EIS mitigation measures				Monitoring Team	EIS Section 22.1	
Terrestrial	Construction	Management Plan	Waste Management Plan	Proper implementation of EIS mitigation measures				Monitoring Team	EIS Section 22.1	
Terrestrial	Construction	Monitoring	Global monitoring of contractor's Management Plans	Proper implementation of EIS mitigation measures				Monitoring Team		
Community	Construction	Monitoring	GHG Monitoring Plan	Fuel consumed by on-site machinery	Weekly	Day 1 of work	Last day of work	Monitoring Team	EIS Section 22.2	
Community	Construction	Monitoring	GHG Monitoring Plan	Road transport distance for material delivery and disposal and employee travel	At each reception/shipping	Day 1 of work	Last day of work	Monitoring Team	EIS Section 22.3	
Community	Construction	Monitoring	Ambient noise monitoring	dBA level near sensitive receptor (5 to 6 such receptors) according to limits from Ministère de l'Environnement, de la Lutte contre les Changements Climatiques, de la Faune et des Parcs	weekly and in case of complaint	Day 1 of work	Last day of work	Monitoring Team	EIS Section 22.3	
Community	Construction	Monitoring	Ambient noise monitoring: bats	Monitoring of noise effect on bats occupying existing bridge (if required)	weekly	Day 1 of work	Last day of work	Monitoring Team	EIS Section 12.2.5.5	
Community	Construction	Monitoring	Noise mitigation measures implementation	Proper implementation of EIS mitigation measures	Daily	Day 1 of work	Last day of work	Monitoring Team	EIS Section 11.2.1.3.3.2	
Community	Construction	Complaint management	Investigation of noise complaints	Identification and suppression of noise source	Within 1 day	Day 1 of work	Last day of work	Monitoring Team		
Water&Fish	Construction	Monitoring	Surface water quality monitoring	-Suspended sediment, turbidity, pH, metals, mercury -3 stations upstream and 3 downstream of cofferdam -1 control station upstream of dam	Continuous for turbidity and pH; Weekly for others (monthly if no exceedance found)	4 months before start of work	1 month after end of work	Monitoring Team	EIS Section 22.4	
Water&Fish	Construction	Monitoring	Sediment characterization program	-Metals (including Hg), PCBs, PAHs, C10-C50 hydrocarbons, TOC, particle size -Number of samples and location depending on presence of sediment	1 after closing of dam and before cofferdam construction	Day 1 of work	30 days after Day 1 of work	Monitoring Team	EIS Section 22.5	
Water&Fish	Construction	Survey	Spawning ground monitoring	Monitoring of spawning downstream of cofferdam and of Ontario Dam	Spring and fall	Year 1 of work	Last year of work	Monitoring Team	EIS Section 23.1	
Terrestrial	Construction	Monitoring	Monitoring of Bat Roosting Site North of dam site	Monitoring effect of project on roosting site (noise, light, etc.)	1/month	Year 1 of work	Last year of work	Monitoring Team	EIS Section 23.5	
Terrestrial	Construction	Monitoring	Wildlife Mortality Monitoring	Detection and documentation of death of wildlife on work site	Daily	Day 1 of work	Last day of work	Monitoring Team	EIS Section 23.6	
Community	Construction	Monitoring	Air quality mitigation measures implementation	Machinery idling; Machinery maintenance; Truck load cover	Daily	Day 1 of work	Last day of work	Monitoring Team	EIS Section 11.2.1.1.1	
Community	Construction	Monitoring	Dust mitigation measures implementation	On-site/off-site dust monitoring; Road sweeping; Watering of work areas; Speed limits; Stockpile cover	Daily	Day 1 of work	Last day of work	Monitoring Team	EIS Section 11.2.1.1.2	

Timiskaming Quebec Dam Replacement Project - Environmental Survey, Monitoring and Follow-up Activities

Community	Construction	Complaint management	Investigation of dust complaints	Identification and suppression of dust source	Within 1 day	Day 1 of work	Last day of work	Monitoring Team	EIS Section 11.2.1.1.2	
Community	Construction	Monitoring	Night luminosity	Construction work lighting directed towards construction area	Daily	Day 1 of work	Last day of work	Monitoring Team	EIS Section 11.2.1.2	
Water&Fish	Construction	Monitoring	Water dynamic	Water level during construction	Daily	Day 1 of work	Last day of work	Monitoring Team	EIS Section 11.2.3.3.2.4	
Water&Fish	Construction	Monitoring	Cofferdam integrity	Cofferdam stability	Daily	Day 1 of work	Last day of work	Monitoring Team	EIS Section 12.2.3.6	
Water&Fish	Construction	Monitoring	Hickorynut protection	Assess presence of hickorynut during dewatering	1 dewatering	Start of dewatering	End of dewatering	Monitoring Team	IAAC-1-32 A)	
Water&Fish	Construction	Relocation	Hickorynut protection	Relocate any hickorynut in dewatered area	1 dewatering	Start of dewatering	End of dewatering	Monitoring Team	IAAC-1-32 A)	
Water&Fish	Construction	Relocation	Fish / turtle protection	Relocate any fish and turtle in dewatered area	1 dewatering	Start of dewatering	End of dewatering	Monitoring Team	IAAC-1-34 A) + IAAC-1-67 A)	
Water&Fish	Construction	Monitoring	Fish monitoring	Fish activity monitoring near cofferdam (including forage species)	Spring and fall	Year 1 of work	Last year of work	Monitoring Team	IAAC-1-36 C)	
Terrestrial	Construction	Survey	Bird nesting survey	To identify any nesting activity on work site	Every Spring (mid-March to end August)	Year 1 of work	Last year of work	Monitoring Team	IAAC-1-53 A)	
Water&Fish	Post-construction	Survey	Fish habitat compensation project follow-up	Physical integrity and biological use of new habitat; substrate type, current velocity, bathymetry, density of eggs, etc...	As per DFO's authorization (usually years 1, 3, 5, 7)	1 year after completion of habitat	7 year after completion of habitat	PSPC/TT	EIS Section 23.2	
Terrestrial	Post-construction	Monitoring	Revegetation on river banks and island	Planted vegetation survival rates, landscaping stability, presence of invasive species, wildlife use	1/year, early summer	year 1 after seeding	years 3 after seeding	PSPC/TT	EIS Section 23.3	
Water&Fish	Post-construction	Monitoring	Fish passage use (if built)	Camera monitoring in the passage and near the entry point to count and identify fish using the passage	As per DFO's authorization (usually years 1, 3, 5, 7)	1 year after completion of passage	7 year after completion of passage	PSPC/TT	EIS Section 23.4	
Terrestrial	Post-construction	Monitoring	Bat use of roosting structure integrated to new dam or PSPC site (if built)	-Number and species using the structure -Type of behavior on structure (resting, nursing, etc.)	1/year, early summer	year 1 after installation	years 3 after installation	PSPC/TT	IAAC-1-59 B)	
Terrestrial	Post-construction	Monitoring	Swallow use of nesting structure integrated to new dam or PSPC site (if built)	-Number and species using the structure -Type of behavior on structure (resting, nursing, etc.)	1/year, early summer	year 1 after installation	years 3 after installation	PSPC/TT	IAAC-1-47 B)	
Terrestrial	Post-construction	Monitoring	Yellow-banded Bumble Bee and Monarch	Use of new landscape	1/year, early summer	year 1 after work	years 3 after work	PSPC/TT	IAAC-1-97 A)	

Timiskaming Quebec Dam Replacement Project - Socio-Economic Monitoring Activities

General topic	Project Phase	Task type	Description of proposed mitigation or	Parameters	Start date	End date	Responsibility	Source	Results Disseminated to:
Barriers to employment	Dam construction	Monitor - grievance	Monitor Indigenous women and marginalized worker concerns and respond to issues as they arise	Monitoring of employment and business outcomes. Worker numbers, percentage Indigenous vs. non, local vs. non-local etc.	Beginning of dam construction	End of dam construction	Monitoring Team	EIS Ch. 20	
Barriers to employment	Dam construction	Monitor - grievance	Institute confidential whistle-blower / grievance system for the workplace	Report on incidents of racism and sexism on the work site through grievance mechanism and local monitor	Beginning of dam construction	End of dam construction	Monitoring Team	EIS Ch. 20	
Increased land use by non-Indigenous workers	Dam construction	Monitor - local and grievance	Ensure all workers are aware of, and follow, provincial rules and regulations regarding hunting and fishing; work with provincial conservation officers to monitor/enforce rules		Beginning of dam construction	End of dam construction	Monitoring Team	EIS Ch. 20	
Disruption of community life due to construction activity and temporary workers	Dam construction	Monitor - local monitor	Encourage renting local housing rather than using hotels and local campgrounds and other tourism-based accommodations		Beginning of dam construction	End of dam construction	Monitoring Team	EIS Ch. 20	
Disruption of community life due to construction activity and temporary workers	Dam construction	Monitor - feedback from local accommodation	Liaise with hotel owners in advance of construction to secure the needed Project accommodation, if required	Monitor feedback from local accommodation regarding capacity issues	Beginning of dam construction	End of dam construction	Monitoring Team	EIS Ch. 20	
Disruption of community life due to construction activity and temporary workers	Dam construction	Monitor - grievance	Institute zero-tolerance policy for inappropriate behaviour on the job and in communities, where appropriate	Identify any instances of worker conduct through grievance mechanism	Beginning of dam construction	End of dam construction	Monitoring Team	EIS Ch. 20	
Disruption of community life due to construction activity and temporary workers	Dam construction	Monitor - meetings with local services	Communicate early and regularly with contractor, local police, social services, and municipalities to establish working relationships and ongoing exchange of information, incident tracking, corrective actions, and other strategies, as required	Annual or more regular as needed meetings with local police, emergency service providers and community leaders to discuss any incidents and determine other mitigative actions	Beginning of dam construction	End of dam construction	Monitoring Team	EIS Ch. 20	
Increased demand on health care facilities during construction	Dam construction	Monitor - data from onsite medical	Recommend employees access regular medical care in their own communities	Data from onsite medical, how many workers referred on to local medical facilities etc. Monitor feedback from local health authorities regarding capacity issues	Beginning of dam construction	End of dam construction	Monitoring Team	EIS Ch. 20	
Increased demand on health care facilities during construction	Dam construction	Monitor - onsite first-aid facilities	Provide first-aid facilities on site and having first aid responders on site at all times	Monitor onsite, occupational vs non-occupational, urgent vs. non-urgent incidents and those requiring medical treatment or transfer to hospital	Beginning of dam construction	End of dam construction	Monitoring Team	EIS Ch. 20	
Increased land use during construction	Dam construction	Monitor - local monitor	Give preference to local and Indigenous workers to minimize changes to harvesting		Beginning of dam construction	End of dam construction	Monitoring Team	EIS Ch. 20	
Perceived/real impacts on fish health due to contaminants	Dam construction	Monitor	Involve Indigenous groups in monitoring activities	Annual or more regular (as determined in collaboration with Indigenous groups) reporting on monitoring results and success of local, Indigenous monitoring initiatives.	Beginning of dam construction	End of dam construction	Monitoring Team	EIS Ch. 20	
Impacts of construction noise on wildlife and migratory birds and wildlife habitat	Dam construction	Monitor - grievance, local monitor	Keep noise pollution to a minimum and establish quiet hours, especially during the night to help provide a more suitable environment for wildlife, where possible (see Section 11.2.3 for more measures related to noise)		Beginning of dam construction	End of dam construction	Monitoring Team		
Physical removal and/or disturbance of shoreline plants during construction	Dam construction and operation	Monitor	Include Indigenous groups in monitoring restored plants		Beginning of dam construction	End of dam construction	Monitoring Team		
Reduced harvesting of plants for food and medicine due to actual or perceived contamination of plants and medicines from dust, or plant absorption of chemicals from road runoff, or construction spills	Dam construction and operation	Monitor - grievance	Manage dust during construction with water		Beginning of dam construction	End of dam construction	Monitoring Team		
Avoidance of the Ottawa River due to construction activities that may release contaminants in sediment and from dam construction materials	Dam construction	Monitor - grievance	Monitor water quality changes during the Project activities		Beginning of dam construction	End of dam construction	Monitoring Team		

Appendix B: Excerpts from Chapter 22 of the EIS:

All of the proposed mitigation measures (Tables 18.1, 19.1 and 20.1) will be subject to environmental monitoring during construction. Environmental site supervisors will be mandated by PSPC to carry out the monitoring of the construction activities. SART communities mentioned their interest to participate in the construction monitoring. AN and AOPFN mentioned that they would like to be involved in the long-term monitoring of water quality, fish and fish habitats, and also to be involved in the development of the fish compensation program and its follow-up. In addition, several communities expressed their interest in participating in the development of the revegetation plan for the island and its shores following the construction and its follow-up. Also, the MNO requires involvement in the noise monitoring plan.

Site reports will be produced on a daily basis and an annual report will be submitted to PSPC, the Indigenous groups, DFO and the Agency. A partial report may also be submitted at the end of each of the four phases of work. It should be noted that some mitigation measures are the PSPC's responsibility (e.g. archaeology) and therefore, will not be delegated to the contractor nor included in the contractual clauses. PSPC will prepare reports on these measures and will forward them to the Indigenous groups, DFO and the Agency.

A general Environmental Management Plan (or Project Environmental Protection Plan) for the construction period will be prepared by the contractor and submitted to PSPC environmental supervisor for comments and approval. This plan will also be shared by PSPC to Indigenous groups for their review. All comments will be forwarded to the contractor to be addressed in a final version. The Environmental Management Plan will include specific plans such as, but not limited to:

- Erosion and Sediment Control Plan;
- Spill prevention and Response Plan;
- Invasive alien plant species (IAS) Management Plan;
- Wildlife-management Plan;
- Waste Water Management Plan;
- Waste Management Plan.

Re: follow up programs (Section 23 of EIS):

Several Indigenous groups have expressed their interest in participating in the various follow-ups that will be carried out and PSPC is in favour of this participation. The details of the involvement of each community will be clarified with them before the beginning of the construction. In general, the follow-up reports will be prepared following each follow-up and will be transmitted to the Indigenous groups, DFO and the Agency and to any other organization/municipality that would like to see them. The Project website could be used for this dissemination.



APPENDIX E: Bat Monitoring Methodology (IAAC-2-17)

To: Rosanne van Schie & TDQRP Technical Team
Date: November 15, 2021
From: Rebecca Geauvreau, FRi Ecological Services



Project: Algonquin Kichi Sibi Bat Monitoring – Timiskaming
Dam Replacement Summary Memo

Monitoring Summary

The TDQRP technical team and FRi biologist deployed three passive ultrasonic monitors on August 8, 2021, in the old public works hydrogeneration station building at the Marina in Timiskaming, QC. The monitoring equipment consisted of Wildlife Acoustics SM4BAT full spectrum ultrasonic recorders and microphones. The recorders were deployed on each of the three floors in areas where the team anticipated bats would be flying and/or roosting. These recorders were monitoring from August 8th through August 21st, 23rd and 31st respectively. At least six species of bats, including two at-risk (endangered) bats are confirmed present. A summary table of the species detected is included below.

Bat guano was observed on the basement level of the building, underneath suitable roost locations on the southwest facing wall which overlooks the Ottawa River. The guano was collected in two pooled sample vials following the protocol outlined by the Northern Arizona DNA lab. Samples were submitted for analysis on August 9th. A summary of the results is included below.

On August 31st, the Technical Team and FRi biologist refreshed the batteries and SD cards in each of the three recorders. They were redeployed in the building (basement location), alongside the river south of the dam on the west side behind the Public Works building and in front of the old marina building over the water. At the time of writing, one of the three recorders has been retrieved and the data analyzed. A summary of the results is included below.

The team used hand-held Wildlife Acoustics ultrasonic bat detectors to conduct in-person monitoring at the marina on the night of August 31st. Little brown bats were both detected acoustically and observed flying.

Results

August deployments:

Timiskaming Unit 1 – Second floor, chair storage room

	EPTFUS	LASBOR	LASCIN	LASNOC	MYOLEI	MYOLUC	MYOSEP	PERSUB		NOID	NOISE
	Big brown	Eastern red	Hoary	Silver-haired	Small-footed	Little brown	Northern myotis	Tri-colored			
*	1		152	67			1	1		631	3097
20210808			19	14			1			50	39
20210809	1		26	18						75	42
20210810			5	1						11	2159
20210811			6	5						27	470
20210812			7	3						15	53
20210813			3							28	5
20210814			2	1						5	8
20210815			2	2						2	3
20210816			4							8	10
20210817			2	7						18	12
20210818			1	2						7	6
20210819			10	4						18	19
20210820			22	3						41	35
20210821			11	2						25	20
20210822			1							4	6
20210823			1	2						4	2
20210824			12							97	55
20210825			4	1				1		58	54
20210826			1							63	40
20210827			2							1	3
20210828			6							4	8
20210829			5							64	36
20210830				2						6	6
20210831										0	6

This deployment was more enclosed in a small room, door close with just a few partially broken/open windows. The fewer passes suggest a less receptive deployment environment. This deployment also had windows facing north and east – not over the water which helps explain the reduced numbers.

Timiskaming Unit 2 – Basement, near window and open water, near guano

	EPTFUS	LASBOR	LASCIN	LASNOC	MYOLEI	MYOLUC	MYOSEP		PERSUB	NOID	NOISE
	Big brown	Eastern red	Hoary	Silver-haired	Small-footed	Little brown	Northern myotis		Tri-colored		
*	789	1108	1349	2130	3	745	2		365	9326	5179
20210808	67	44	146	182		62	1		17	650	197
20210809	128	84	183	197		56			12	868	257
20210810	69	17	25	96		41			28	678	2666
20210811	119	182	80	168		70	1		28	1230	261
20210812	71	76	93	271		122			16	1004	250
20210813	54	42	24	321		47			18	674	149
20210814	9	7	17	33		69			3	288	51
20210815	37	40	27	131		26			5	403	76
20210816	47	65	30	128		57			22	637	175
20210817	34	44	55	177		45			46	403	205
20210818	37	46	22	122		37			16	446	154
20210819	55	118	229	123	2	32			50	687	257
20210820	35	249	207	66		22			39	607	227
20210821	22	80	161	79	1	18			41	454	176
20210822	4	3	12	9		19			11	112	25
20210823	1	11	38	27		22			13	185	53

Similar to the other recorders, the NOID represent bat passes and are a relative mix of both species at risk and non-species at risk bats.

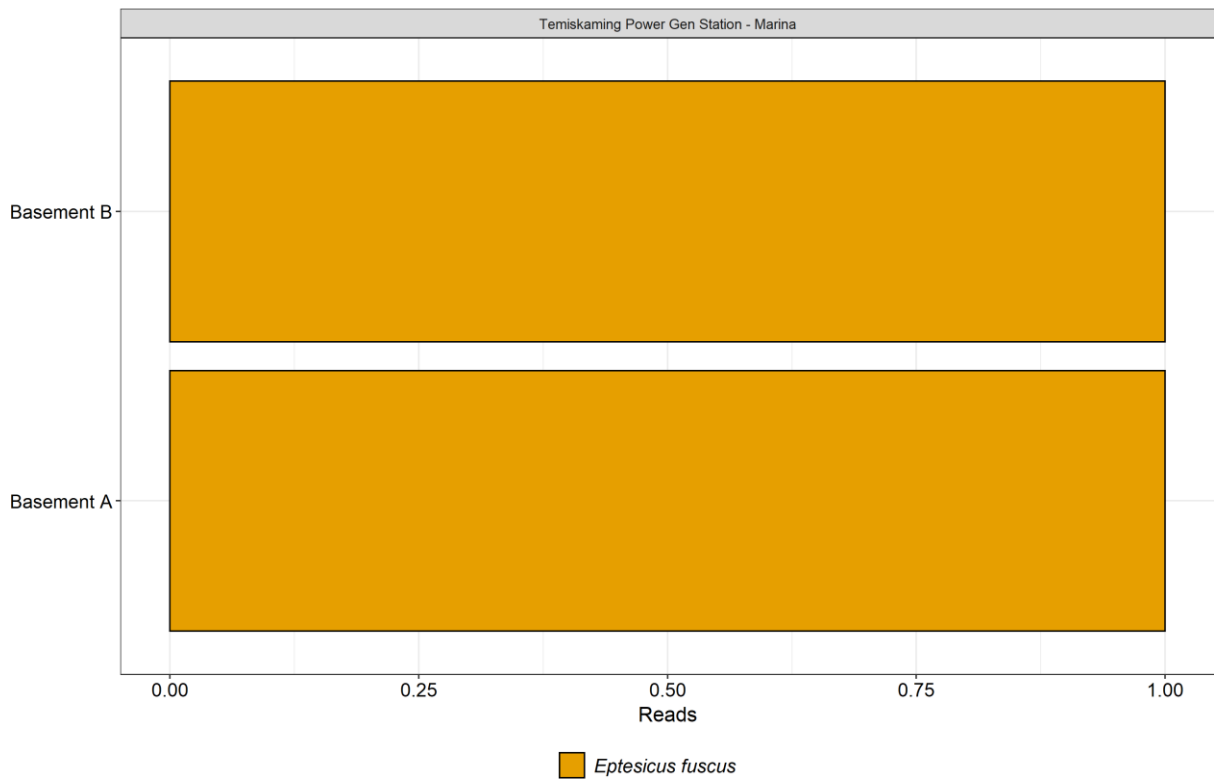
Timiskaming Unit 3 – Shower room, third floor, open windows facing north and east

	EPTFUS	LASBOR	LASCIN	LASNOC	MYOLEI	MYOLUC	MYOSEP	PERSUB		NOID	NOISE
	Big brown	Eastern red	Hoary	Silver-haired	Small-footed	Little brown	Northern myotis	Tri-colored			
*	9	1	386	464		40	23	3		4043	6562
20210808		1	48	48		3	1			224	140
20210809	1		60	68		3				412	178
20210810	2		12	17		9	3	1		467	3275
20210811			36	28		5	3			448	1805
20210812	4		28	51		4	5			584	298
20210813	1		4	24		1				233	133
20210814			8	2		5	3			197	96
20210815	1		2	15		2				131	81
20210816			7	28		1	5			261	104
20210817			21	78		3		1		269	94
20210818			13	17		2				251	115
20210819			59	53						232	110
20210820			73	26		2		1		212	97
20210821			15	9			3			122	36

Three endangered bats detected here; caution that the ‘cluttered’ environment could be mis-identifying high frequency passes. Note that the Northern myotis passes were analysed in the context of adjacent calls, it is quite possible that low numbers of Northern myotis passes were detected. Also note that most of the ‘NOID’ which represents bat passes the auto-identification software couldn’t recognize, are in fact, species at risk/high-frequency bat passes.

DNA Sampling

Results:



From Northern Arizona University DNA Lab: We detected big brown bat (*Eptesicus fuscus*) for 100% of the sequences for all samples.

September Deployment

All three recorders were refreshed and redeployed on August 31st as follows:

Timiskaming Unit 2 was left in the basement (unit 2) as this was unit that was adjacent the guano and seemed to be the best location for hibernating bats to enter/exit the building. Timiskaming Unit 3 was deployed along the shoreline south of the dam behind the public works buildings. We did our best to disguise both the unit and the microphone because of the ongoing construction activity and fishing activities.

Results

Timiskaming Unit 3 – Shoreline of Ottawa River, south of dam, west side

The unit was deployed at the base of a small shrub with the microphone in the shrub-top facing the river. The deployment location and position were intended to pick up any bats flying, foraging or otherwise (roosting) at or near the dam. The microphone placement was positioned to maximize bat detection.

	EPTFUS	LASBOR	LASCIN	LASNOC	MYOLEI	MYOLUC	MYOSEP	PERSUB		NOID	NOISE
	Big brown	Eastern red	Hoary	Silver-haired	Small-footed	Little brown	Northern myotis	Tri-colored			
*	82	343	255	592		594		2494		2969	396
20210831	3	2	96	19		75		124		403	31
20210901	7		20	71		39		28		119	12
20210902	2	1	27	15		50		22		85	8
20210903	10	141	43	95		125		306		372	2
20210904	9			2		6		151		584	222
20210905	1	175	11	42		75		231		312	73
20210906	30	20	16	61		86		363		227	3
20210907	15	1	4	143		37		169		544	16
20210908						52		16		59	17
20210909	4	3	22	15		30		309		139	6
20210910	1		16	129		19		775		125	6

Hand-Held Echo Meter Touch

On August 31st, some members of the technical team used hand-held monitors to do in-person monitoring – little brown bats were observed and heard. Wildlife Acoustics Echo Meter Pro and Echo Meter Touch units were used with iPhone/iPad for real-time in-person monitoring.

Little brown bats were detected foraging and flying outside the marina building. At least two individuals were observed during the short monitoring period just after dark.

Discussion

There are eight species of bats known in the general Timiskaming area. They are big brown bat, Eastern red bat, hoary bat, silver-haired bat, (Eastern small-footed bat), little brown myotis, Northern myotis, and tri-colored bat. Of these, four are listed as 'Endangered' federally and four are considered not at risk.

Bats in Quebec (and Ontario) use four kinds of roosts: day roosts, night roosts, maternity roosts, and overwintering roosts. Three of the non species at risk bats – Eastern red, hoary, and silver-haired – all migrate south of Canada for the winter months, while big brown bats hibernate in attics, eaves, and other suitable locations. The others – all species at risk bats – little brown myotis, Northern myotis, tri-colored bat and Eastern small-footed bat – hibernate in mines, caves, and other suitable natural and anthropogenic sites. Monitoring roost sites at the appropriate time of year can provide reliable evidence of use.

The start of monitoring at the marina building in August precludes reliable detection of maternity roost monitoring, but it did confirm the presence of species at risk and non-species at risk bats. Monitoring in the spring and summer of 2022 will help to further the understanding of how and when bats are using the building infrastructure. The acoustic monitoring into September provides additional information about species presence and use.

From the data from Unit 3 which was deployed along the river south of the dam, little brown myotis and tri-colored bats are present, probably migrating, and likely somewhere near their respective hibernacula. Continued monitoring both in the spring and late summer/early fall next year will provide additional information on species use of the area. Early spring monitoring can detect emergence from hibernacula; if the marina building is a hibernaculum, early spring monitoring can confirm this.

Lastly, monitoring of the marina building both in-person and passively during June and July of 2022 will assist with understanding if the building is a maternity roost.

Work by Others

The following excerpts from reporting completed by Hatch and TetraTech were provided to FRi by the technical team for consideration.

Hatch (2012)

The following species at risk, listed in Schedule 1 of SARA (2002) have been identified with distribution range that overlaps the TODR Project location during the record review (Hatch, 2012a) or the field surveys: Threatened: Canada Warbler, Common Nighthawk, Golden-winged Warbler, Least Bittern, Olive-sided Flycatcher, Red-headed Woodpecker, Whip-poor-will. Endangered or Extirpated: No endangered or Extirpated species were identified during the record

review (Hatch, 2012a) and the field surveys. None of these species at risk have been observed during the breeding bird and/or other surveys within the terrestrial study area.

TetraTech (2017)

Field surveys confirmed the presence of four special status wildlife species in the aquatic and terrestrial environments under study, namely the bald eagle, a vulnerable species under the Quebec Act Respecting Threatened or Vulnerable Species, but without status under the Canadian Species at Risk Act or as per the COSEWIC, the common nighthawk (*Chordeiles minor*) and the chimney swift (*Chaetura pelagica*), two species likely to be threatened or vulnerable under the Quebec Act Respecting Threatened or Vulnerable Species and deemed threatened under the Canadian Species at Risk Act and by the COSEWIC, and the barn swallow (*Hirundo rustica*), a species designated as threatened by the COSEWIC, but without status under the Quebec Act Respecting Threatened or Vulnerable Species and Canadian Species at Risk Act.

It is possible that other species deemed potentially present in the aquatic and terrestrial environment study areas are indeed present, such as bats and the snapping turtle. However, bats probably frequent the areas for feeding due to the low quality of diurnal habitats in the terrestrial environment study area (Fabianek, 2015; Tremblay and Jutras, 2010)¹. In addition, the absence of snapping turtles in the aquatic environment study area in 2017 suggests that its presence in that sector of the Ottawa River is sporadic.

FRi Comment

Hatch (2012)

The work by Hatch in 2012 appears to be a desktop review and specifically references Schedule 1 of the *Species at Risk Act* (SARA). It isn't clear if any field surveys were completed to assess for the presence of bats or bat habitat.

Three of the four endangered bats (little brown, Northern, and tri-colored) were recommended for emergency listing in February 2012 by COSEWIC. They were emergency listed, reassessed in November 2013, and confirmed as 'endangered' and subsequently listed on Schedule 1 in 2014. Hatch's reference to Schedule 1 in 2012, missed the species emergency listing and the fact that the species was still considered endangered even though it was not on Schedule 1. Schedule 1 species are afforded protection under the Act while species not listed on Schedule 1 are not.

The details of Hatch's field work aren't clear, but there does not appear to have been any monitoring or field surveys specific to bats or their habitat.

¹ Fabianek, F.-H. (2015). *Sélection de l'habitat diurne des chauves-souris dans un contexte d'aménagements sylvicoles en forêt boréale*. Université Laval.

Tremblay, J. A. et Jutras, J. (2010). *Les chauves-souris arboricoles en situation précaire au Québec - Synthèse et perspectives*. *Le naturaliste canadien*, 134(1), 29-40.

TetraTech (2017)

TetraTech acknowledged the likelihood of bats in the study area and assumed their presence was attributed to the apparent low-quality of diurnal habitats nearby but did not follow up with any field surveys or assessments of the same.

TetraTech's assertion of low-quality habitat fails to acknowledge the variety of life history of the eight bat species whose range overlaps the study area. For the species at risk bats, Little Brown, and Tri-colored bats forage in open areas, usually near water, wetlands and along forest edges. They do not glean from foliage and must drop from height to fly. In contrast, Northern myotis are more commonly found in closed canopy forested ecosystems where they are adept at foraging both aerially and gleaning from foliage. They are not typically detected over open or aquatic habitats. Unlike little brown and tri-colored bats, Northern myotis are able to launch off the ground to fly, which means they can make use of different habitats for roosting and foraging.

For all bats, they must rest between feeding/foraging bouts each night. When bats rest, they find a safe roost where they can rest and digest. Guano is almost always found at or under these roost locations. Where bats are foraging, roosting – at minimum – temporary night roosts will always be present. Bridges, dams, buildings and other similar concrete and steel structures with rough surfaces and expansion joints, are often used for roosting. Sometimes these anthropogenic structures offer suitable longer-term roosts like maternity or day roosts. Again, guano underneath and/or on roost structures and sites is often evident.

A general comment with respect to both previous studies/reporting is that bats are active at night and rest during the day and use echolocation (ultrasonic sound) to navigate and eat – sounds not audible to humans. Most field work and related monitoring doesn't happen at night, nor does it 'listen' or 'look' for ultrasonic calls. Specialized ultrasonic detectors are needed to assess for the presence of bats.

The Technical Team utilized two kinds of ultrasonic monitoring – passive and in-person – as well as DNA analysis to confirm the presence of seven species of bats including three endangered species.

Recommendations for Monitoring 2022

To further the present understanding of how species at risk bats (and other bats) use the study area, the following monitoring approaches are recommended:

1. Passive acoustic (ultrasonic) monitoring at the marina building to assess for possible maternity roosting, June & July 2022. Little brown bats are the most likely species at risk bat to use buildings for maternity roosts.
2. In-person acoustic monitoring and exit surveys in June and again in July (at least 3 nights each month) at the marina building. This should overlap the passive recorder deployments; this will act as a control and bolster the in-person monitoring.
3. Passive acoustic monitoring at the dam site to assess for possible maternity roosting in the expansion joints/dam infrastructure; if bats are detected, targeted in-person monitoring for three nights in June and again in July with exit counts.
4. Opportunistic DNA sampling of all known guano piles; if desired, collect samples once or twice monthly to detect changes in species use during the active season.
5. The passive and in-person monitoring in June – July at both the marina building and the dam site will also detect both day and/or night roost use by males and non-breeding females.
6. It is possible there are maternity roosts or hibernacula in other nearby buildings or infrastructure – initial surveys of these sites in the daytime to assess for evidence of bats e.g., roosting bats, guano is recommended. If evidence of bats is observed, targeted passive and in-person monitoring is appropriate.
7. Trees can also be used for maternity roosts – tricolored bats in particular roost in clusters of dead (and living) red oak and other deciduous leaves. This species was detected in relatively higher numbers at least migrating by the study area. Northern myotis also prefers large hollow trees or trees with loose bark for maternity roosting; they are unlikely to be found in buildings and less likely to use bridges, dams, and other anthropogenic structures. Northern myotis were detected in small numbers – likely because the deployments didn't overlap their specific preferred habitat. Terrestrial surveys in suitable forested habitat coupled with passive monitoring can assist with identifying potential roost sites. These targeted surveys will help identify trees that are being used for roosting by both Tri-colored and Northern myotis bats.

Respectfully,

<original signed by>

Rebecca Geauvreau
Species at Risk Biologist
FRi Ecological Services



APPENDIX F: Water Flow Modeling (IAAC-2-13)



TO: Stephanie Pelosse, MPA
Jérémie Maillet-Leblanc
Public Services and Procurement Canada

FROM: Gabriel Rouleau, P. Eng. – Hydrology And Hydraulics Engineer
Jean Gauthier, P. Eng. M.Sc. – Senior Hydrology And Hydraulics Engineer
Martin Dorais, M. Env., VEA®, VPSGE®, ENV-SP® – Project Manager
René A. Camacho, Ph.D, P.E, M.ASCE – Water Resources Modeling Expert

DATE: January 27, 2025 – Revision A – Preliminary

PROJECT: Timiskaming Dam-Bridge of Quebec Replacement Project

SUBJECT: **Response To Question IAAC-2-13**
PSPC Reference: R.073116.307
IAAC Reference: 80151
Tetra Tech Reference: 32760TT

1 CONTEXT

In 2016, Tetra Tech was commissioned to provide engineering services to Public Services and Procurement Canada (PSPC) for the Timiskaming Dam-Bridge of Quebec Replacement Project. As part of this project, various activities focused on hydrological and hydraulic aspects.

In June 2018, the Impact Assessment Agency of Canada (IAAC) initiated an environmental assessment under the Canadian Environmental Assessment Act of 2012 for the project. In February 2023, the Environmental Impact Statement (EIS) for the project, prepared by Tetra Tech, was submitted to the IAAC by PSPC. This study addresses the project's hydraulic aspects in Chapter 11 – Physical Environment, and biological aspects in Chapter 12 – Biological Environment.

Following the EIS submission, the IAAC issued Information Request 1, an excerpt of which is presented in Section 1.1 (specifically, question IAAC-1-36). The excerpt is accompanied by the associated response.

Subsequently, the IAAC issued Information Request 2, which includes question IAAC-2-13, for which this technical memorandum provides a response. It is presented below in Section 1.2. Additional information was also provided by the IAAC to guide the response to question IAAC-2-13.

1.1 Information Request No. 1 – Question IAAC-1-36

Context

The EIS only discusses the impacts of changes in flows and levels associated with the dam operations that may impact aquatic ecosystems, including behaviour and reproduction. The EIS does not contain a detailed assessment of the construction and operational impacts of the project and the dam on the full life cycle and life stages of fish. The proponent did not fully assess the potential effects on fish between the wooden truss system (currently in use) and the use of mechanized gates, or the impact on all fish life cycles. The shift in operation from top to bottom may alter the impact of the project on downstream fish passage. The difference in current strength and water temperature between the two types of water flow mechanisms could potentially affect fish habitats downstream of the dam. The operations of a dam can also have an impact on the thermal regime of a water body or river. This could have a negative impact on several life stages of fish and wildlife. Chapter 19 of the EIS (second paragraph) states that a fish offsetting program will be developed to offset the loss of spawning

TECHNICAL MEMORANDUM

grounds (walleye and sturgeon) downstream of the dam. This program will be implemented in collaboration with Indigenous groups and DFO, and its effectiveness will be monitored. However, larval and rearing stages have not been sufficiently considered for most, if not all, of the fish species mentioned in the EIS. Additional efforts should be made to ensure that all life stages important for the survival and perpetuation of the species are properly considered.

The Agency instructs the proponent (Public Services and Procurement Canada) to:

- A) characterize and describe the potential effects related to dam operation (power, thermal regime, etc.), because of the change from top operation (timber beams) to bottom operation (mechanized gates), on the whole life cycle of fish, including the construction and operation phase;

PSPC Response:

As stated in Section 11.2.3.4.6 of the EIS, water becomes shallower in the Lake Témiscaming upstream of the Québec Dam-Bridge limiting occurrence of thermoclines.

“However, the reach upstream from the dam is much shallower than the rest of the lake and the disruption of water from high velocities on the approach to the dam is significant, such that it is very likely that there will be no thermocline there in the summer and that the water will be the same temperature throughout the water column. In addition, as it goes through the dam, there is a significant mixing of the water column, which also mitigates potential temperature differences compared to the current situation. In short, it would be highly unlikely that there would be a significant difference in water temperature downstream from the dam compared to the current situation.”

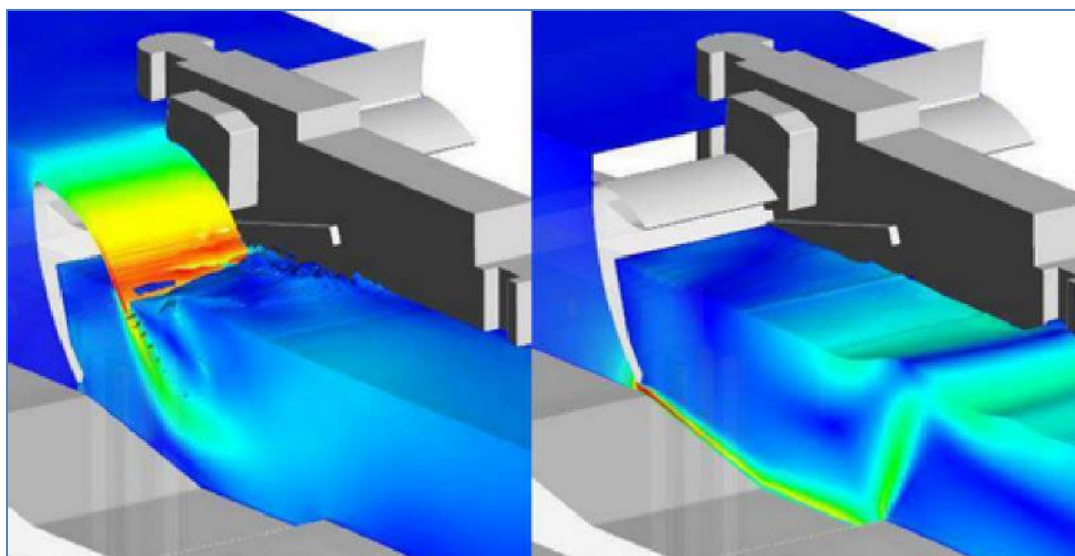
Operation a sluice-gate system instead of stop-log system should have no effect on thermal regime downstream, limiting effect on fish and fish habitat conditions.

Flow pattern from the sluice-gate system is expected to be different with increased bottom flow observed within a 50 m length downstream of the dam-bridge, as stated in Section 11.2.3.3.2.5 of the EIS:

“The new dam will be equipped with sluice gates rather than wood beams as seen in the current structure. In this context, the water flows through the base (the bottom), so under pressure under the sluice, rather than by overflowing above the beams. Figure 11-33 shows an example of these two types of flow. On the left, we see a flow above the beams, creating more turbulence on the water surface, while the right shows water flowing below the sluice, creating higher velocities at the bottom of the river”.

TECHNICAL MEMORANDUM

Figure 11-33 Example of Flow below a Sluice Gate vs. a Beam



As it is the case for the existing Dam Operation Plan, the operation of the new sluice-gate system will be sequenced such as to limit effect of flow on fish in general, and more specifically during spring/summer and fall spawning seasons.

As for potential effects to fish passing through sluice gates going downstream, the Algera & al (2020) article cited provides interesting data, even though it focuses on hydroelectrical dams. The authors conclude that most damage is caused by turbines, spillways, and sluiceways. Bypass structures have the smallest impact on fish being designed to direct fish where fall heights are lesser and without moving parts. When considering the Timiskaming Québec Dam-Bridge project, its nature is closer to a bypass structure, with limited mechanical components and limited water column height. It is therefore expected that the operation of a sluice-gate system would have limited effects on fish, larvae and eggs going downstream.

1.2 **Information Request No. 2 – Question IAAC-2-13**

Context

In response to question IAAC 1-36, the proponent refers to a figure of a water flow below a sluice gate versus a logwood beam. Water flow patterns from the sluice-gate system are expected to be different with increased bottom water flow observed within a 50 m length downstream of the dam-bridge, as stated in section 11.2.3.3.2.5 of the EIS. The water flow change is illustrated qualitatively in Figure 11-33. According to the proponent, operation of a sluice-gate system instead of wood log system should have limiting effect on fish and fish habitat conditions. The rationale behind this statement is limited and supported by only one publication (Algera et al., 2020). There are concerns about potential effects on water flows, such as how the sluice-gate system could affect spawning grounds, fish mortality and entrapment.

The Agency instructs the proponent to:

- A) Provide information on the biophysical effects of the change in water flow distribution downstream of the dam-bridge with the sluice-gate system.
- B) Provide more information and background literature about the potential effects on fish spawning grounds and fish passage.
- C) Provide evidence of where incubation and larval drift occur and an estimate of water flow change at this location.

TECHNICAL MEMORANDUM

In addition to the question above, the IAAC provided Tetra Tech with the following clarifications to guide the response:

- Although the question does not specifically concern Lake Sturgeon, it is relevant to focus on it first, since it is a species of interest.
- Make sure to explain the flow patterns in the Z dimension (depth) in relation to biological aspects (spawning grounds, egg incubation, larval drift, etc.).

2 SUMMARY OF BACKGROUND DATA

To answer IAAC's question, it is essential to conduct a review of background data. The purpose of this step is to acquire knowledge about fish spawning grounds downstream of the dam, and the dam's hydrology and hydraulics.

2.1 Spawning Grounds

2.1.1 Location of Known Spawning Grounds

As part of the EIS, various data were collected on the spawning grounds downstream of the dam. Their locations and suitable spawning conditions are known and shown on EIS Map 12.22 in Appendix A. Map 12.22a from the EIS in Appendix A shows the location of confirmed and potential habitats for Lake Sturgeon.

Based on the additional information received, the analysis focuses on Lake Sturgeon (*Acipenser fulvescens*) spawning grounds, particularly the spawning ground directly downstream of the dam, identified as TT-006. The EIS clearly highlights the importance of this species to the study site and communities.

2.1.2 Reproductive Cycle of Lake Sturgeon

According to COSEWIC (2017), the reproductive cycle of Lake Sturgeon includes spawning, egg incubation, hatching, and larval drift. Spawning usually occurs in May and June, but the timing varies from year to year. It has been observed in waters with a velocity of 0.1 to 2.1 m/s, on various coarse substrates (cobbles, boulders, gravel, bedrock, slag) and at depths ranging from less than 0.3 to 23 m. Velocities below 0.3 m/s were not suitable for successful hatching due to sedimentation, predation, and fungal infections. Spawning is suitable in waters between 8 and 21.5°C, but the optimal temperature range for some populations is considerably smaller.

According to Bruch et al. (2002), the optimal spawning characteristics for Lake Sturgeon are:

- Velocity: between 0.5 and 1.5 m/s;
- Water depth: between 1.1 and 3 m;
- Coarse substrate: gravel and stone (between 64 and 256 mm in diameter).

These values are used for this analysis.

2.2 Hydrological and Hydraulic Data

Key hydrological and hydraulic data were collected as part of the engineering work for the dam replacement and provided to IAAC as part of the EIS in *SR.2.2.H – “Analyse des aspects hydrauliques” (Analysis of Hydraulic Aspects, Tetra Tech, 2017)*. To answer IAAC's questions, the water levels upstream and downstream of the dam must be known, in addition to the operating mode of the dam. Tetra Tech (2017) documented the levels upstream and downstream of the dam. The data used to produce this report were also consulted to answer the question IAAC-2-13.

In addition, for the preparation of the *SR.5 report – “Plan de gestion des eaux de construction” (Construction Water Management Plan, Tetra Tech, 2018)*, a three-dimensional (3D) hydraulic model had been developed to evaluate the flow dynamics during construction. This model was used to answer question IAAC-2-13.

Finally, to find out how the dam operates during the spawning period of Lake Sturgeon, PSPC engineers assigned to manage the existing dam were contacted.

TECHNICAL MEMORANDUM

2.2.1 Water Level Upstream of the Dam

In the summer, the maximum operating level of the Timiskaming reservoir is 179.56 m to protect shoreline residents from flooding. This level is 1.2 m below the maximum water level reached in 1909 before the dams were built (Ogden Beeman & Associates, 1997).

The minimum level required for navigation is 178.65 m. This level is maintained during the summer, from mid-May to mid-October, to ensure navigability for this period. In general, the reservoir level is maintained at approximately 179.35 m and is only lowered during low flows, when flows from the various tributaries are reduced to maintain a desired minimum outflow of 300 m³/s (Ogden Beeman & Associates, 1997).

2.2.2 Water Level Downstream of the Dam

Downstream of the dam, the hydrometric station 02JE024 records water levels at the southern tip of the island. The data show that there is no correlation between the total flow passing through the Timiskaming dams and the water level at station 02JE024. However, they show that the level varies between ± 174 m and ± 177.7 m. These data are shown in Figure 1.

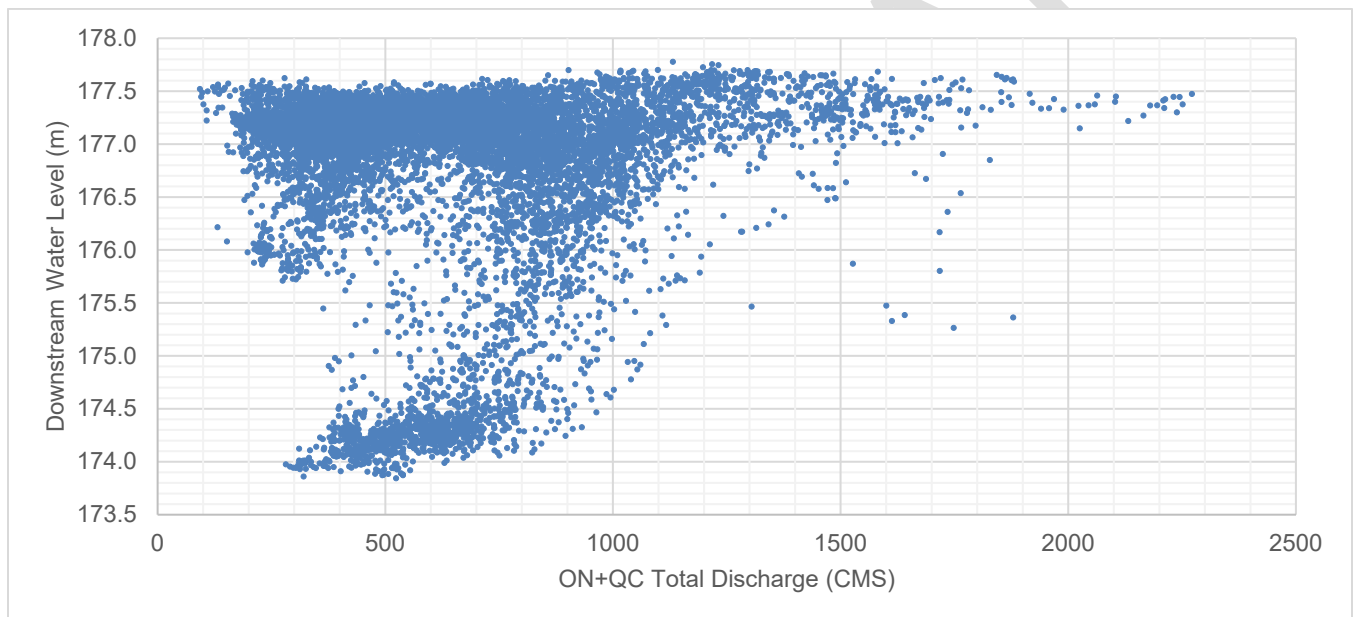


Figure 1: Discharge and Water Levels Downstream of Timiskaming Dams (Data From 1987 to 2015)

2.2.3 Operating Mode of the Dam

Procedures for the operating modes of the existing dam with stoplog weirs during the spawning period of Lake Sturgeon were provided by PSPC. They were provided for the spring of 2019, a year when exceptional flooding occurred on the Ottawa River, and for 2010, a year when flows were lower. The data provided correspond to the number of stoplogs, out of a maximum of 16, that were in place in each gate, numbered from 1 to 10, incrementally from the left bank to the right bank. The data are shown in Table 1.

TECHNICAL MEMORANDUM

Table 1: Operating Mode Data of the Existing Dam During the Spawning Period of the Lake Sturgeon

Reference period	Number of stoplogs in each gate									
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
Early May to late June 2010	16	16	16	6	8	10	10	16	16	16
May 12 to 25, 2019	0	0	0	0	0	16	0	16	0	0
Second week of June to the end of June 2019	16	16	0	16	16	16	0	16	16	0

PSPC has provided a detailed operation plan for the Timiskaming Ontario Dam, but such a plan is not available for the Timiskaming Quebec Dam. PSPC has indicated, however, that the next operating plan to optimize fish spawning will need to consider both dams at the same time.

3 METHODOLOGY

The objective is to:

Answer question IAAC-2-13 by comparing the flow patterns downstream of the new Timiskaming Quebec Dam by choosing stoplog weir or mechanized sluice gate.

The chosen method to achieve the objective is to:

Conduct three-dimensional hydraulic modelling of the flow downstream of only the new Timiskaming Quebec Dam using FLOW-3D software.

More specifically, two scenarios were considered for hydraulic modelling:

- A. "Typical" scenario for the potential spawning period of Lake Sturgeon;
- B. High flow scenario during possible sturgeon spawning periods.

For each of these scenarios, the flow patterns are calculated by considering the proposed dam, downstream of the existing dam, equipped with ten stoplog weirs gates and ten mechanized sluice gates. For the same scenario, the results can be compared for both types of gates. Both scenarios are described in more details below.

3.1 Scenario A

Scenario A is a scenario of average condition over the sturgeon spawning period. The water level in Timiskaming Lake is set at the normal operating level in the summer, i.e. 179.35 m. The downstream level corresponds to the historical average level recorded at hydrometric station 02JE024 from May 1st to June 30, i.e. 177.21 m. The operating mode of the dam is that of 2010, as shown in Table 1.

Based on analytical equations, it is estimated that the flow through the Timiskaming Quebec Dam under these conditions is ± 300 m³/s. This assessment must be validated by 3D hydraulic modelling.

The opening of the mechanized sluice gates for this scenario is presented in Table 2. These were evaluated using analytical equations to be equivalent to the flow passing through the stoplog weirs.

3.2 Scenario B

Scenario B is a high flow scenario during the potential sturgeon spawning period. The approximate recurrence chosen for the modelled flood is two years. It should be noted that the two-year recurrence flow of ± 1700 m³/s is not fully modelled since only the Timiskaming Quebec Dam is analyzed. A flow of ± 600 m³/s is modelled at the Quebec Dam by setting the upstream water level at the maximum operating level of 179.56 m, setting the downstream level to the average of the minimum historical levels recorded at hydrometric station 02JE024 from May 1st to June 30 of 176.51 m, and applying the June 2019 gate openings shown in Figure 2.

The opening of the mechanized sluice gates for this scenario is presented in Table 2.

TECHNICAL MEMORANDUM

Table 2: Opening of the Mechanized Sluice Gates on Each Gate for Scenarios A and B

Scenario	Opening of the mechanized sluice gates on each gate (m)									
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
A	0	0	0	3.4	2.9	2.0	2.0	0	0	0
B	0.1	0.1	8.0	0.1	0.1	0.1	8.0	0.1	0.1	8.0

3.3 Modelled Area

The modelled area covers ± 100 m upstream of the dam and ± 197 m downstream of the dam. This area is shown in Figure 2. 5,566,154 computational grid cells are located in the study area. The cells are spaced 0.3 m apart near the dam, then settle at 0.6 m and 1.2 m further from the dam.



Figure 2: Modelled Area in Relation to the Proposed Dam

For all the scenarios modelled, the dam location is the proposed location analysed for the EIS, which makes it possible to analyse the impact of the choice of gate type. The location of the dam is shown in Figure 2.

TECHNICAL MEMORANDUM

4 RESULTS

The velocity results calculated by the 3D model are presented in the figures from Appendix B to Appendix E for the different scenarios and gate types. It should be noted that the distance scales displayed on the cross-sections and longitudinal profiles are shown for indicative purposes only as they correspond to the local coordinate system, in meters, of the 3D model.

The results shown in the figures in the appendices are those calculated at the end of the simulation. The simulation duration for each scenario is shown in Table 3.

The simulated flows in each gate by type of gate are shown in Table 4.

Table 3: Simulation Duration for Every Modelling Setup

Scenario	Type of gate	Simulation duration (seconds)
A	Stoplog weir	600
	Mechanized sluice gate	600
B	Stoplog weir	700
	Mechanized sluice gate	1000

Table 4: Simulated Flows in Each Gate for Every Modelling Setup

Gate	Scenario A				Scenario B			
	Stoplog weir		Mechanized sluice gate		Stoplog weir		Mechanized sluice gate	
	Number	Flow rate (m ³ /s)	Opening (m)	Flow rate (m ³ /s)	Number	Flow rate (m ³ /s)	Opening (m)	Flow rate (m ³ /s)
#1	16	-	0	-	16	-	0,1	7.39
#2	16	-	0	-	16	-	0,1	7.50
#3	16	-	0	-	0	198.70	8,0	199.00
#4	6	123.26	3,4	138.50	16	-	0,1	11.40
#5	8	94.78	2,9	118.00	16	-	0,1	10.40
#6	10	59.80	2	61.20	16	-	0,1	6.95
#7	10	58.10	2	62.00	0	198.50	8,0	199.00
#8	16	-	0	-	16	-	0,1	6.87
#9	16	-	0	-	16	-	0,1	7.12
#10	16	-	0	-	0	196.40	8,0	196.00
Total		335.94		379.70		593.60		651.63

The simulated flows for the models with mechanized sluice gates are higher than those for the stoplog weirs. The difference is $\pm 13\%$ for scenario A and $\pm 10\%$ for scenario B. This is explained by the limitations of the analytical equation used to estimate the gate openings that would be required to achieve the same flow as with the stoplog weirs.

TECHNICAL MEMORANDUM

The equation used is $Q = CbH\sqrt{2g\Delta h}$, which is a significant simplification of the flow that occurs under a partially opened gate.

Despite the differences in flow rates, the results can be used to analyze velocities, while considering the induced uncertainties. Naturally, the simulated flow velocities may be on average higher for scenarios with mechanized sluice gates compared to scenarios with stoplog weirs due to the higher flow rates. It should be noted that the time required to perform a simulation is several days and that performing additional iterations would have caused unnecessary delays.

For scenario B, mechanized sluice gates #1-2, #4-6, and #8-9 were opened by 0.1 m during the simulation, as it was expected that an equivalent flow rate would be calculated over the fully closed stoplog weirs. However, the low flow over the stoplog weirs created instabilities in the model, so they had to be completely closed. The locally high velocities generated by the gates opened by 0.1 m can be discounted.

5 ANALYSIS OF THE RESULTS

The various figures presenting the results, located in the appendices, show that the type of gate has an impact on the flow velocity pattern for partially open gates, as in scenario A. For mechanized sluice gates, higher local velocities are observed near the gates. This impact decreases with distance. The figures also show that for fully closed or fully open gates (scenario B), the type of gate has no impact. For scenario B, the differences in velocities are mainly attributable to the difference in total flow rate. The difference in the general flow pattern downstream of the dam can be explained by the non-stationarity of the flow.

To analyze the impact of the type of gate on spawning grounds, the results of the velocity at ground level were extracted of the hydraulic model for the area downstream of the dam.

The results of the velocity at ground level are shown on the map in Appendix F for the area downstream of the proposed dam. The location of the spawning ground TT-006 is also shown on the map. The average flow velocities near the riverbed in these areas are shown in Table 5 for the two scenarios and types of gates.

Table 5: Average Velocity at Ground Level Downstream of the Dam and in Spawning Ground TT-006

Scenario	Type of gate	Average velocity at ground level (m/s)	
		Downstream of the dam	In spawning ground TT-006
A	Stoplog weir	0.87	0.87
	Mechanized sluice gate	1.10 (+ 26%)	1.04 (+ 20%)
B	Stoplog weir	1.59	2.10
	Mechanized sluice gate	1.61 (+ 1%)	2.43 (+ 16%)

The results presented in Table 5 lead to the following conclusions:

- Under average conditions during the sturgeon spawning period (scenario A), the velocity at ground level is generally higher downstream of the dam and in the TT-006 spawning ground with mechanized sluice gates than with stoplog weirs, but the velocity remains within the target range for sturgeon spawning, between 0.5 and 1.5 m/s. Part of the increase in velocity can be explained by the 13% higher modeled flow rate for mechanized sluice gates compared to stoplog weirs.
- Under flood conditions (scenario B), the average velocity at ground level is higher than the upper limit of the range suitable for spawning (1.5 m/s) with either mechanized sluice gates or stoplog weirs. Part of the increase in velocity can be explained by the 10% higher modeled flow rate for mechanized sluice gates compared to stoplog weirs.

TECHNICAL MEMORANDUM

In Appendix F, a second map shows the difference in velocity generated by mechanized sluice gates compared to stoplog weirs downstream of the proposed dam. The difference in velocity at ground level is obtained by subtracting the velocity at ground level with stoplog weirs from the velocity at ground level with mechanized sluice gates. This map presents the localization of where velocities vary depending on the type of gate. It shows that velocities vary little for scenario A, while for scenario B, velocities are increased in some places and reduced in others.

Table 6 presents the distribution of the area downstream of the dam that falls within different ranges of velocities at ground level. A total area of 16,534 m² downstream of the dam is analyzed.

The category $V = 0.5$ to 1.5 m/s represents the zones where the flow velocity would be suitable for sturgeon spawning, while the categories $V < 0.5$ m/s and $V > 1.5$ m/s respectively represent the zones where the flow velocity would be too slow and too fast.

Table 6: Area Downstream of the Dam Classified by Velocity at Ground Level Range (V)

Scenario	Type of gate	Area downstream of the dam (m ²)		
		V < 0.5 m/s	V = 0.5 to 1.5 m/s	V > 1.5 m/s
A	Stoplog weir	7405 (45%)	5733 (35%)	3396 (21%)
	Mechanized sluice gate	5110 (31%)	6215 (38%)	5209 (32%)
B	Stoplog weir	2515 (15%)	7413 (45%)	6606 (40%)
	Mechanized sluice gate	3653 (22%)	5500 (33%)	7381 (45%)

The results presented in Table 6 lead to the following conclusions:

- Under average conditions during the sturgeon spawning period (scenario A), the area where the velocity at ground level is suitable for sturgeon spawning is slightly increased. This allows us to conclude that under normal flow conditions, the sturgeon spawning habitat area is maintained with mechanized sluice gates.
- Under flood conditions (scenario B), the distribution of the area among the three velocity classes varies depending on the type of gate, but the area with flow velocity suitable for sturgeon spawning remains favorable with mechanized sluice gates as it remains larger than the confirmed TT-006 spawning ground area.

Table 7 presents the distribution of the area of the TT-006 spawning ground that falls within different ranges of velocities at ground level. Its total area is 4,958 m².

Table 7: Area of the TT-006 Spawning Ground Classified by Velocity at Ground Level Range (V)

Scenario	Type of gate	Spawning ground area TT-006 (m ²)		
		V < 0.5 m/s	V = 0.5 to 1.5 m/s	V > 1.5 m/s
A	Stoplog weir	2374 (48%)	1410 (28%)	1174 (24%)
	Mechanized sluice gate	2189 (44%)	1079 (22%)	1690 (34%)
B	Stoplog weir	456 (9%)	1713 (35%)	2789 (56%)
	Mechanized sluice gate	255 (5%)	1183 (24%)	3520 (71%)

TECHNICAL MEMORANDUM

The results presented in Table 7 lead to the following conclusions:

- The location of the current confirmed TT-006 spawning ground downstream of the dam does not correspond to a site where the simulated velocity at ground level is predominantly 0.5 to 1.5 m/s under the modeled conditions, regardless of the type of gate.
- The areas by velocity class differ slightly in the two scenarios depending on the type of gate within the current TT-006 spawning ground, but generally remain in the same order of magnitude.
- Depending on the dam's operating mode, suitable spawning sites may vary, and analyzing the entire modeled area downstream of the dam seems more appropriate than focusing on the TT-006 spawning ground.

In summary, the results of the 3D hydraulic simulations show differences in velocity patterns depending on the type of gate. However, these results must be analyzed considering the underlying assumptions, uncertainties, and limitations. The results still allow us to conclude that the type of gate does not have a significant impact on the flow velocities downstream of the dam, particularly at ground level. The impact of choosing mechanized sluice gates compared to stoplog weirs is marginal on the habitat of the Lake Sturgeon downstream of the Timiskaming Quebec Dam.

6 RESPONSE TO QUESTION IAAC-2-13 AND CONCLUSION

Based on the analysis presented above, the answers to the three parts of question IAAC-2-13 are as follows:

A) Provide information on the biophysical effects of the change in the flow patterns downstream of the dam-bridge related to the gate system.

This technical memorandum provides information on the biophysical effects of changes in water flow profiles downstream of the dam-bridge related to the gate system.

The conclusion is that the type of gate does not have a significant impact on the flow velocities downstream of the dam, particularly at ground level. The velocities simulated using a 3D hydraulic model show that the ground level flow of the Ottawa River downstream of the Timiskaming Quebec Dam is little affected by the type of gate, especially under normal flow conditions. The area suitable for Lake Sturgeon spawning is minimally impacted by the choice of gate type for the future dam.

B) Provide more information and references on potential effects on spawning grounds and fish passage.

This technical memorandum provides more information on the potential effects on spawning grounds. Fish passage is not directly impacted by the type of gate of the future dam.

The COSEWIC (2017) and Moisan and Laflamme (1999) reports and the references cited by these reports are reference documents regarding the Lake Sturgeon in Canada and Quebec.

C) Provide evidence of where incubation and larval drift occur and an estimate of variation in water flow patterns at that location.

The project's EIS presents the locations where incubation occurs, specifically at the spawning sites, in a gravel substrate (Tetra Tech, 2023). After hatching, the larvae drift downstream to areas where fine sediments, such as sand, tend to deposit (COSEWIC, 2017).

This technical memorandum describes the variation in water flow patterns in the area that could be impacted by the choice of gate type. Changes in flow patterns are observed from the results of the 3D hydraulic simulations, but the areas suitable for spawning are minimally impacted, and larval drift will occur towards calm flow sites, regardless of the gate type chosen.

TECHNICAL MEMORANDUM

Prepared by:

Verified by:

Gabriel Rouleau, P. Eng.
OIQ No. 6009939
Tetra Tech QI Inc.

Jean Gauthier, P. Eng., M.Sc.
OIQ No. 106813
Tetra Tech QI Inc.

Approved by:

Martin Dorais, M. Env., VEA®, VPSGE®, ENV-SP®
Tetra Tech QI Inc.

APPENDIXES:

APPENDIX A Maps From the Environmental Impact Statement (EIS)

APPENDIX B Results of Hydraulic Simulations for Scenario A – Stoplog Weir

APPENDIX C Results of Hydraulic Simulations for Scenario A – Mechanized Sluice Gate

APPENDIX D Results of Hydraulic Simulations for Scenario B – Stoplog Weir

APPENDIX E Results of Hydraulic Simulations for Scenario B – Mechanized Sluice Gate

APPENDIX F Analysis Maps of Velocities at Ground Level Downstream of the Proposed Dam

TECHNICAL MEMORANDUM

7 BIBLIOGRAPHY

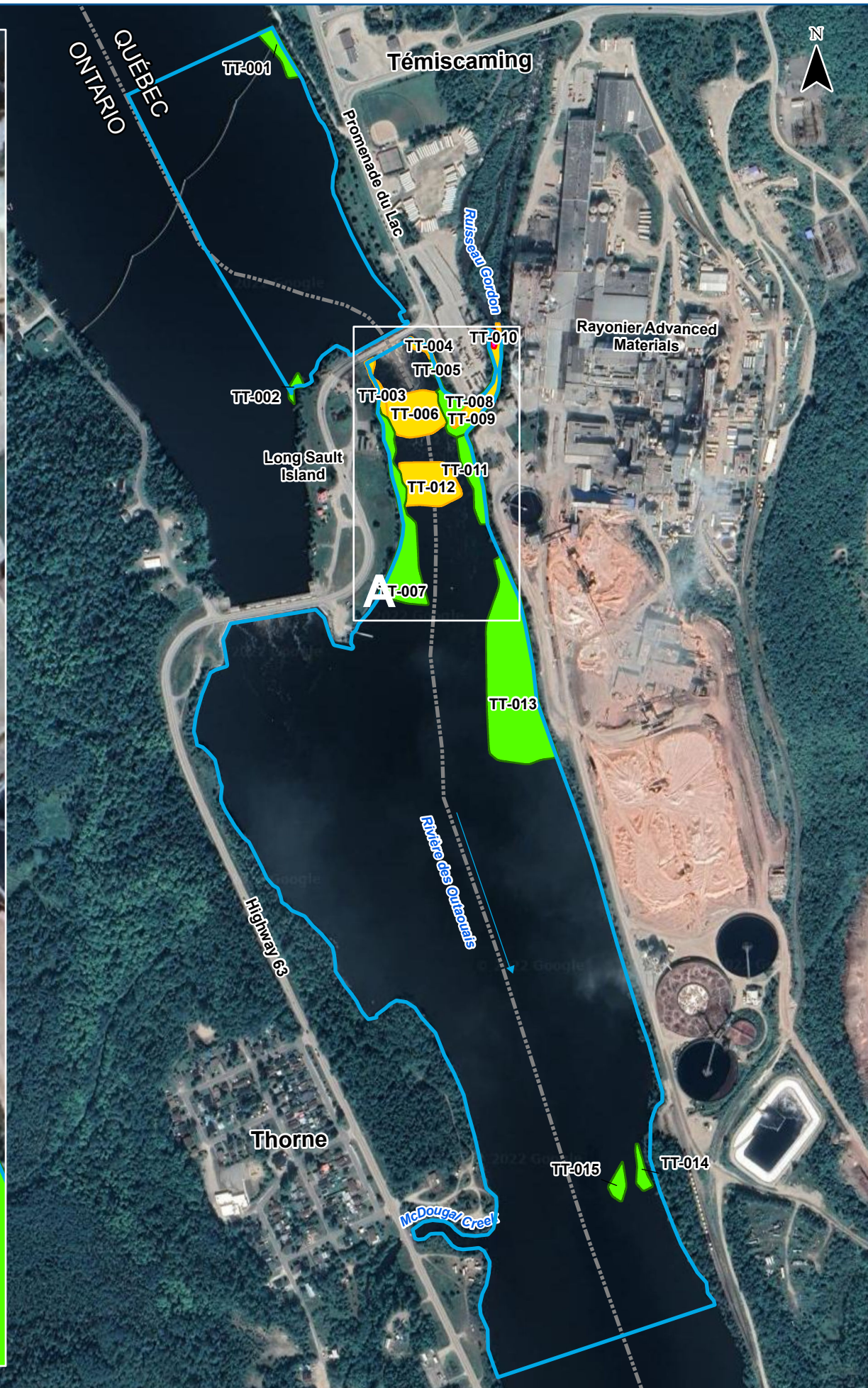
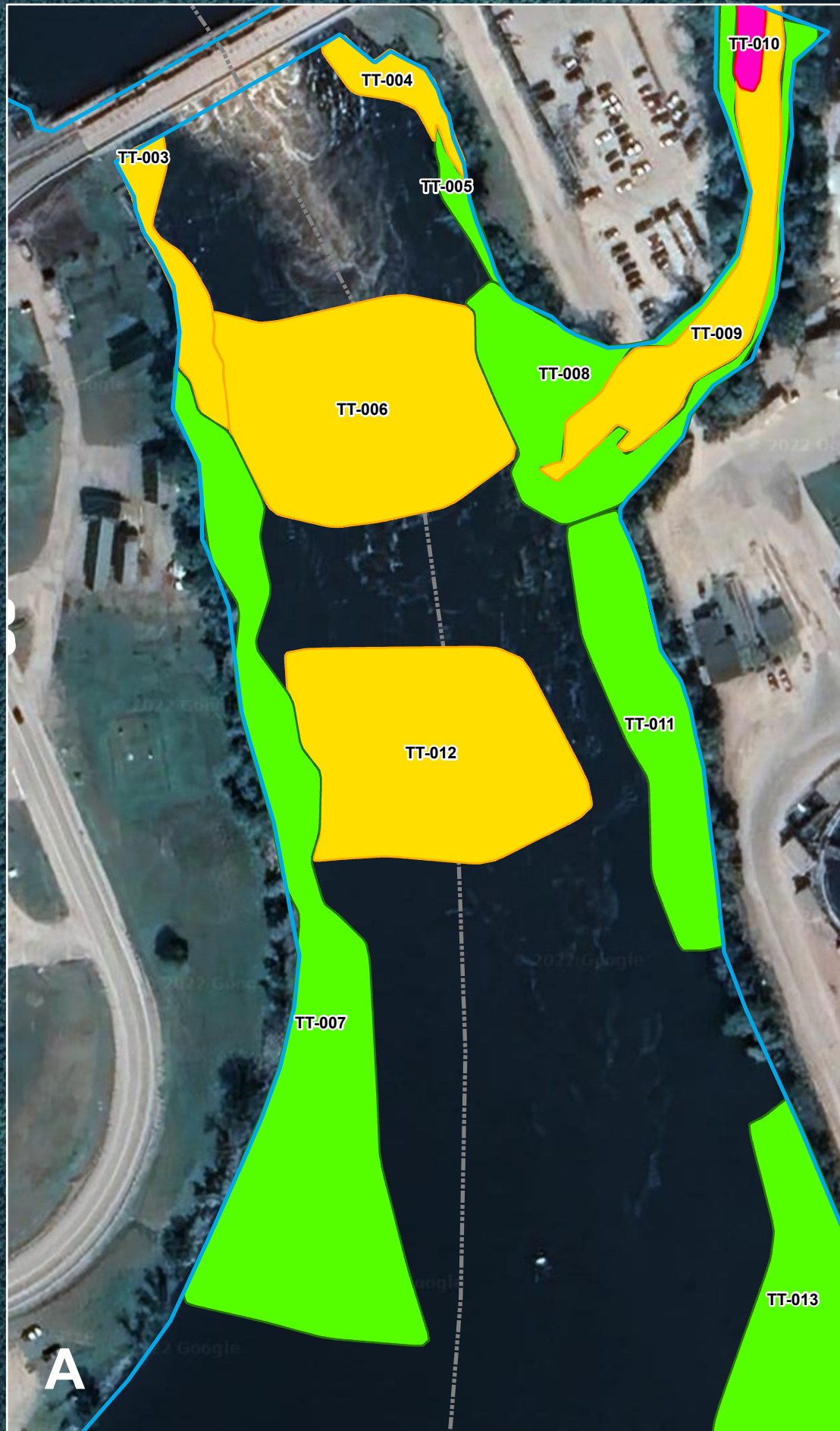
- COSEWIC. 2017. Lake sturgeon (*Acipenser fulvescens*) COSEWIC assessment and status report, Western Hudson Bay populations, Saskatchewan-Nelson River populations, Southern Hudson Bay/James Bay populations, and Great Lakes/Upper St. Lawrence populations in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxxi + 177 p.
- MOISAN, M. and H. LAFLAMME. 1999. “*Rapport sur la situation de l’esturgeon jaune (Acipenser fulvescens) au Québec*” (*Status Report on the Lake Sturgeon (Acipenser Fulvescens) in Quebec*). Natural Resources and Forests, Wildlife and Habitats Branch, Quebec. 68 p.
- Tetra Tech. (2017). “*Remplacement du barrage Témiscamingue situé sur la rivière des Outaouais – SR.2.2.H – Analyse des aspects hydrauliques*” (*Timiskaming Dam Replacement on the Ottawa River – SR.2.2.H – Analysis of hydraulic aspects*). Report submitted to PSPC. 30 p. + appendix.
- Tetra Tech. (2018). “*Remplacement du barrage Témiscamingue situé sur la rivière des Outaouais – SR.5 – Plan de gestion des eaux de construction*” (*Timiskaming Dam Replacement on the Ottawa River – SR.5 – Construction Water Management Plan*). Report submitted to PSPC. 9 p. + appendix.
- Tetra Tech. (2023) *Environmental Impact Statement – Timiskaming Dam-Bridge of Quebec Replacement Project*. Revision 03.

PRELIMINARY

TECHNICAL MEMORANDUM

PRELIMINARY

APPENDIX A **Maps From the Environmental Impact Statement (EIS)**



LÉGENDE/LEGEND:

Type de frayère identifiée/
Type of spawning ground identified

- Lithophile en eaux vives/Lithophile in calm waters
- Lithophile en eaux calmes/Lithophile in calm waters
- Phytolithophile/Phytolithophile

Nom/Name	Superficie (m²)/ Area (m²)
TT-001	1619
TT-002	464
TT-003	830
TT-004	540
TT-005	248
TT-006	4958
TT-007	7484
TT-008	3104
TT-009	2094
TT-010	209
TT-011	2676
TT-012	4960
TT-013	19501
TT-014	877
TT-015	946

Autres/Others

- Limite provinciale/Provincial border
- Milieu aquatique/Aquatic environment

Référence spatiale/Spatial Reference: NAD 1983 MTM 10
Sources:
Image satellitaire/Satellite imagery: GoogleMaps-Satellite, Août 2021

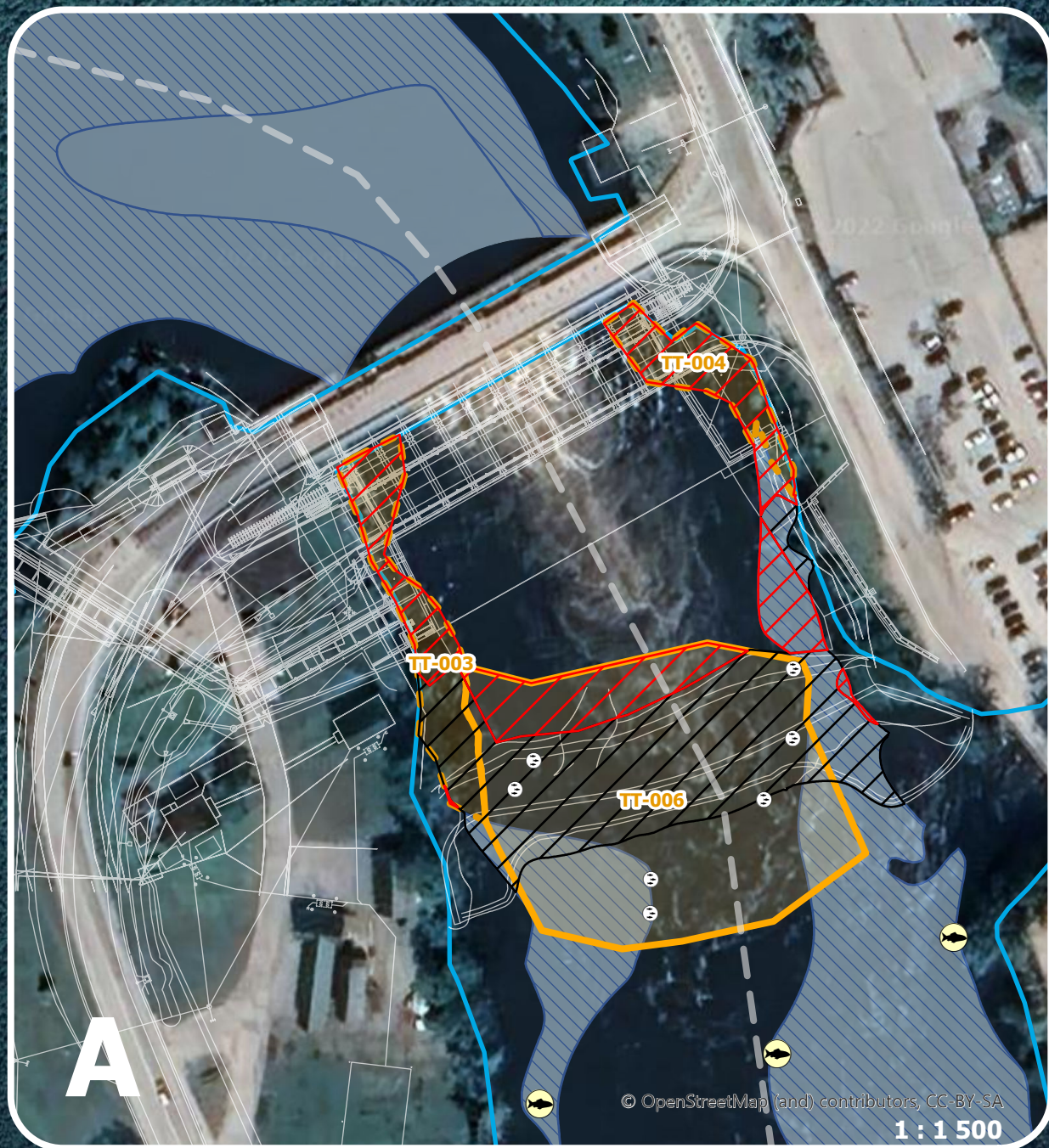


Projet de remplacement du barrage Témiscamingue
du côté du Québec / Timiskaming Quebec Dam
Replacement Project

**Frayères potentielles et confirmées
en 2021**
**Potential and confirmed spawning grounds
in 2021**

CARTOGRAPHIE/CARTOGRAPHY L-P LAVOIE	DATE 2022-02-25
NO. PROJET/PROJECT NO. 32760TT	CARTE/MAP 12.22
ÉCHELLE/SCALE 0 125 250 375 500 m	

Description	Area/Aire (m ²)	Encroachment/Empiètements						
		Permanent		Temporaire		Total		
		m ²	%	m ²	%	m ²	%	
Spawning area/ Frayère	Potential Spawning/ Frayère potentielle	1367	1030	75.3	333	24.4	1363	99.7
	Confirmed Spawning/ Frayère confirmée	7468	702	9.4	2385	31.9	3087	41.3
	Total	8 835	1 732	19.6	2 718	30.8	4 450	50.4
Habitat/ Habitat	Fall and winter refuge/ Refuge automnal et hivernal	439609	371	0.1	747	0.2	1118	0.3
	Nursery and Rearing Habitats/Aire d'alevinage et de croissance	119280	372	0.3	747	0.6	1119	0.9
	Total	558889	743	0.1	1494	0.3	2237	0.4



LEGEND/LÉGENDE:

Catches/Captures

- Adult with milt/Adultes en laitance
- Eggs/Oeufs
- Adults/Adultes

Spawning area/Aire de fraie

- Confirmed Spawning/Frayère confirmée

Potential Habitat/Habitat potentiel

- Potential Spawning/Frayère potentielle
- Nursery and Rearing Habitats/Aire d'alevinage et de croissance
- Fall and winter refuge/ Refuge automnal et hivernal

Encroachment/Empiètements

- Permanent/Permanent
- Temporary/Temporaire

Autres/Others

- Aquatic environment/ Milieu aquatique
- Provincial border/Limite provinciale
- Planned infrastructures/Infrastructures projetées

Référence spatiale/Spatial Reference: NAD 1983 CSRS MTM 10

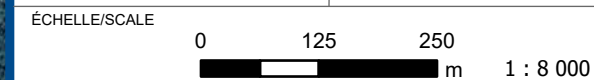
Sources:
Image satellitaire/Satellite imagery: GoogleMaps-Satellite, Août 2021
Hatch, 2017, 2018; Biofilia, 2016.



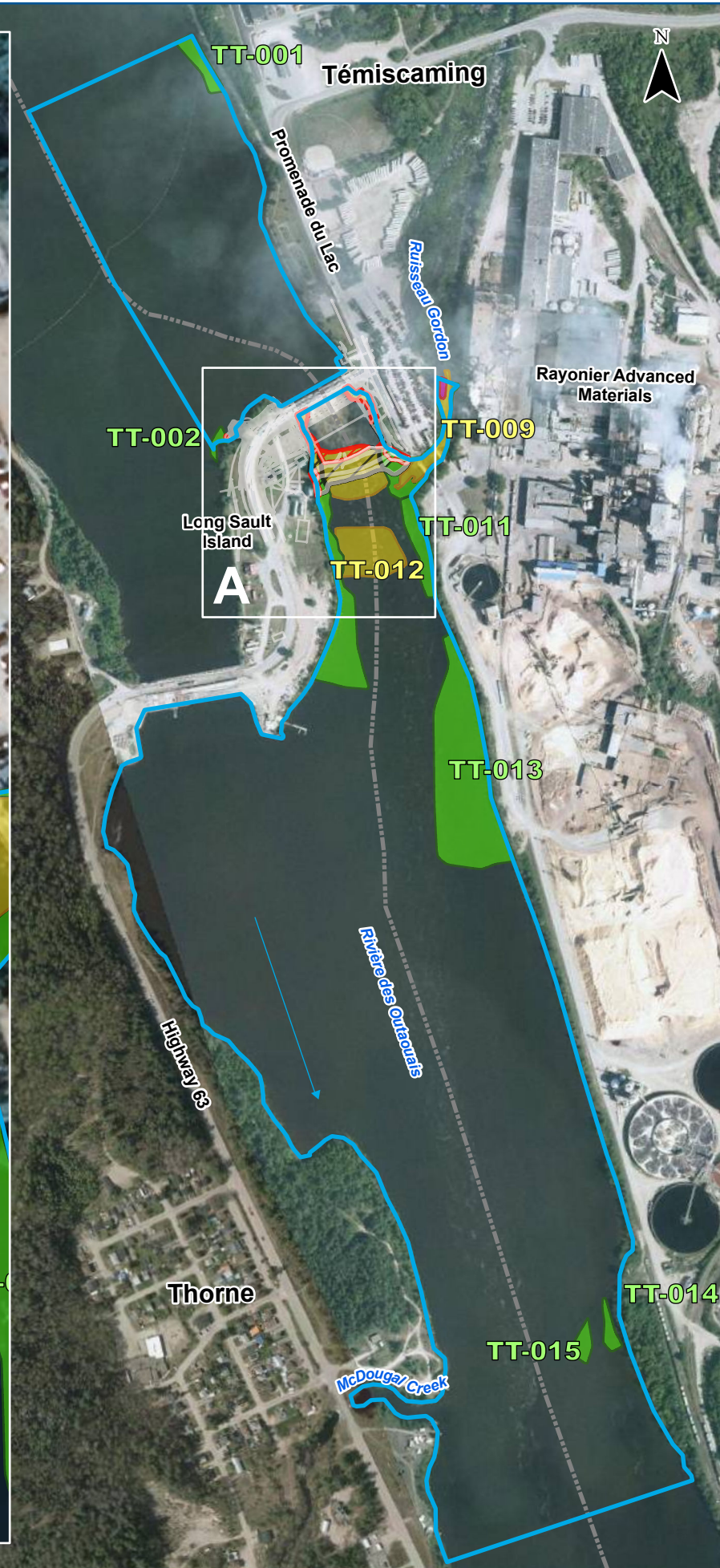
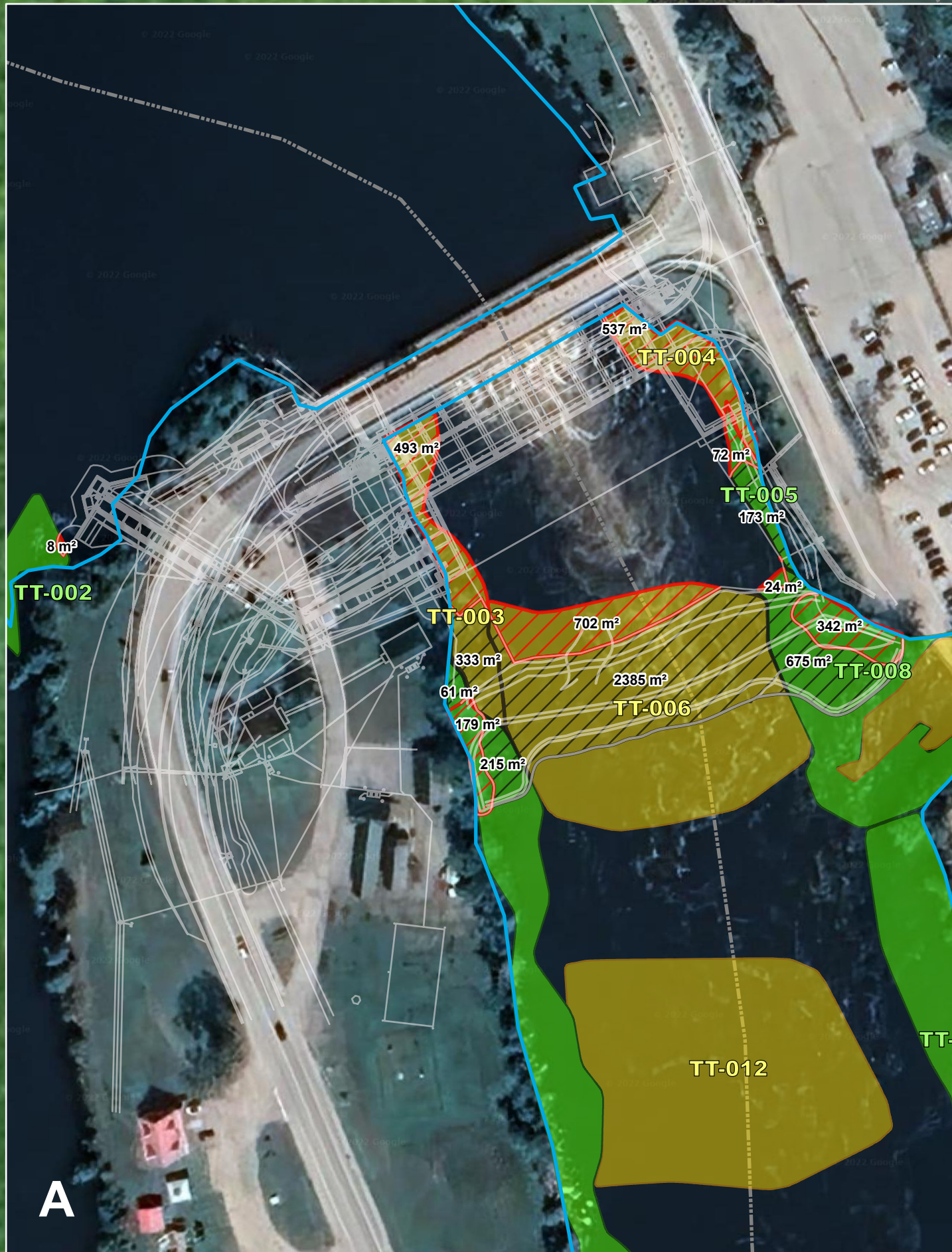
Timiskaming Quebec Dam Replacement Project /
Projet de remplacement du barrage Témiscamingue
du côté du Québec

**Confirmed and Potential Habitats for Lake Sturgeon /
Habitats confirmés et potentiels de l'esturgeon jaune**

CARTOGRAPHIE/CARTOGRAPHY	DATE
P. Giroux	2023-01-09
NO. PROJET/PROJECT NO. 32760TT	CARTE/MAP 12.22a



Path: \\fcs49f53\PI\Req\32760TT\DOC-PROJ\60160CRO\ArcGIS\ArcGIS Pro\32760TT_Zones_etudes\32760TT_Peches2021.aprx



LÉGENDE/LEGEND:

- Type de frayère identifiée/
Type of spawning ground identified**
- Lithophile en eaux vives/Whitewater lithophile
 - Lithophile en eaux calmes/Lithophile in calm waters
 - Phytolithophile/Phytolithophile

- Empiètements/Encroachment**
- Permanent/Permanent
 - Temporaire/Temporary

- Autres/Others**
- Limite provinciale/Provincial border
 - Milieu aquatique/Aquatic environment
 - Infrastructures projetées/Planned infrastructures

Référence spatiale/Spatial Reference: NAD 1983 CSRS MTM 10
Sources:
Image satellitaire/Satellite imagery: GoogleMaps-Satellite, Août 2021



CLIENT

Services publics et Approvisionnement Canada / Public Services and Procurement Canada

Projet de remplacement du barrage Témiscamingue du côté du Québec/ Timiskaming Quebec Dam Replacement Project

**Empiètements sur les frayères - Option 1
Encroachment on spawning areas - Option 1**

CARTOGRAPHIE/CARTOGRAPHY L-P LAVOIE	DATE 2022-09-23
NO. PROJET/PROJECT NO. 32760TT	CARTE/MAP 12.28
ÉCHELLE/SCALE 0 125 250 375 500 m	

PRELIMINARY

APPENDIX B
Results of Hydraulic Simulations for Scenario A – Stoplog Weir

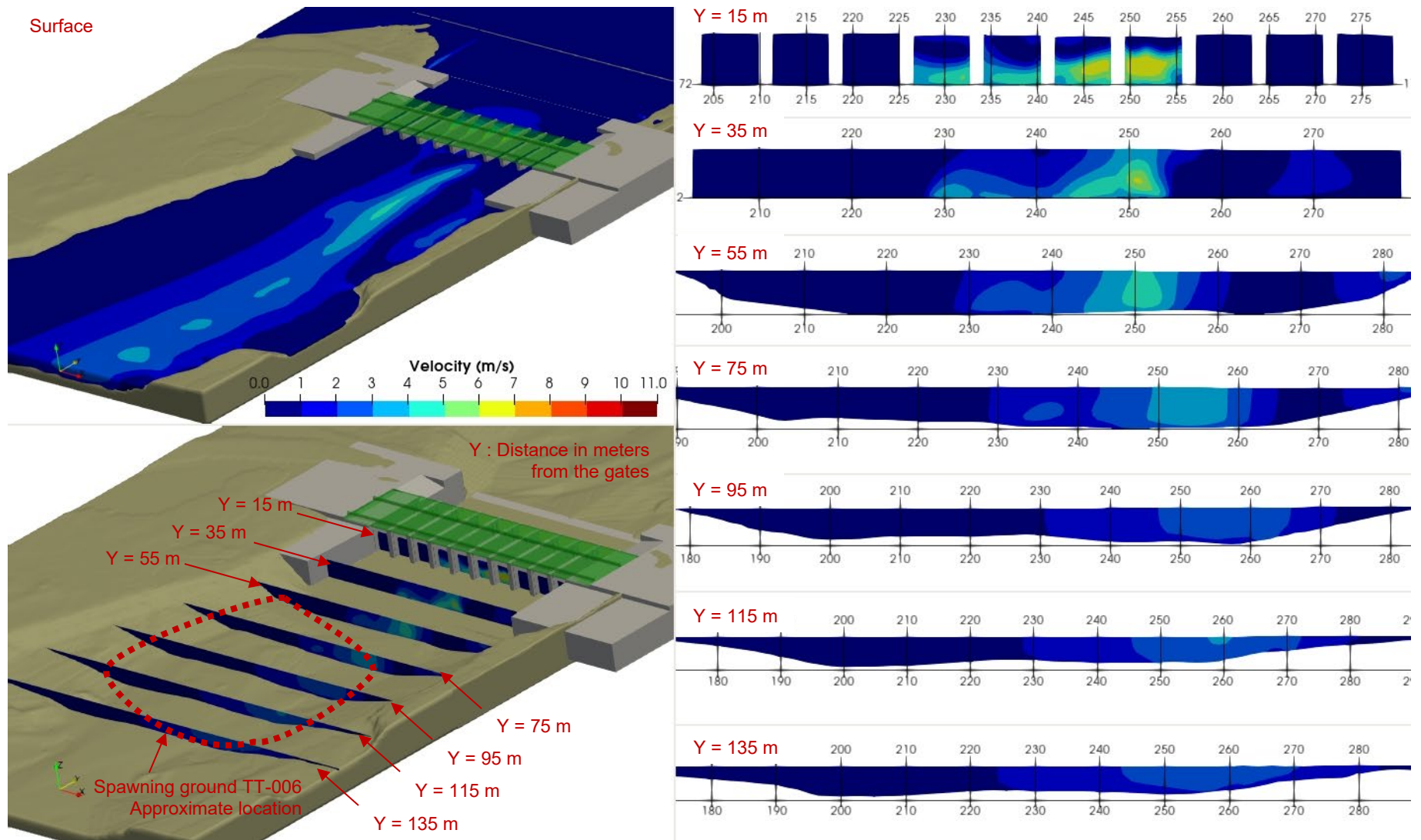


Figure 1 : Calculated Velocities – Orthogonal Views and Cross-Streams – Scenario A – Stoplog Weir

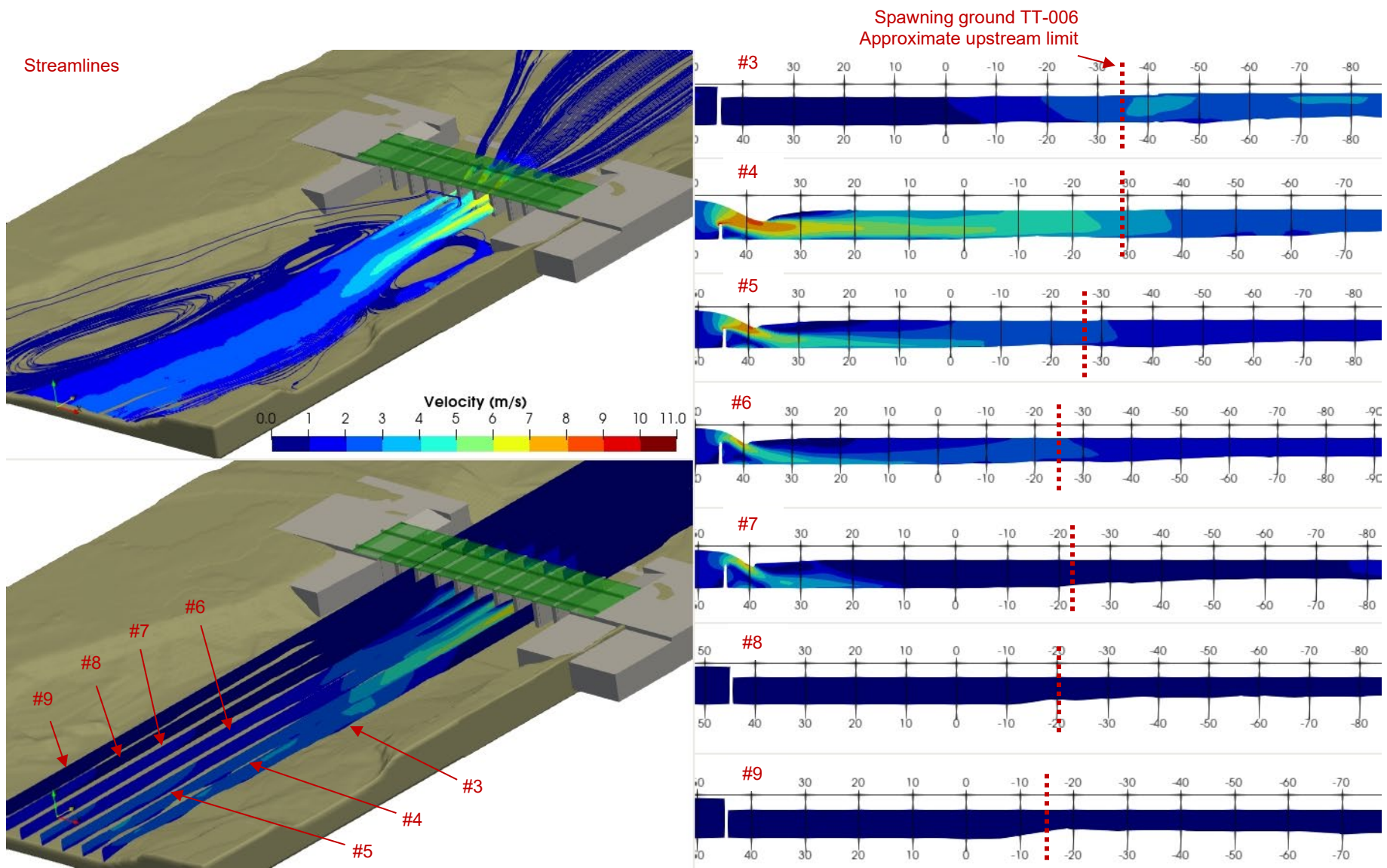
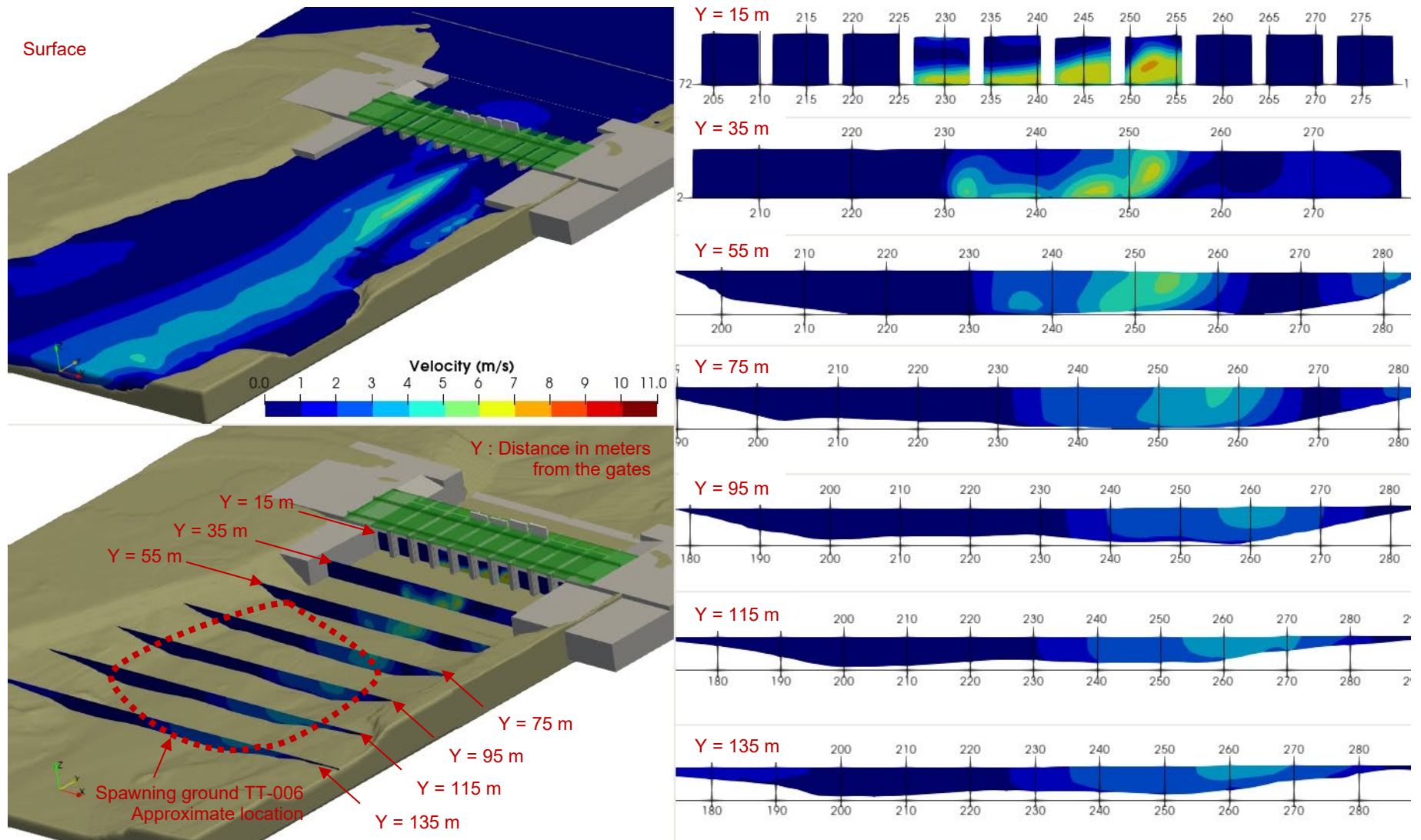


Figure 2 : Calculated Velocities – Orthogonal Views and Longitudinal Profiles – Scenario A – Stoplog Weir

PRELIMINARY

APPENDIX C
Results of Hydraulic Simulations for Scenario A –
Mechanized Sluice Gate



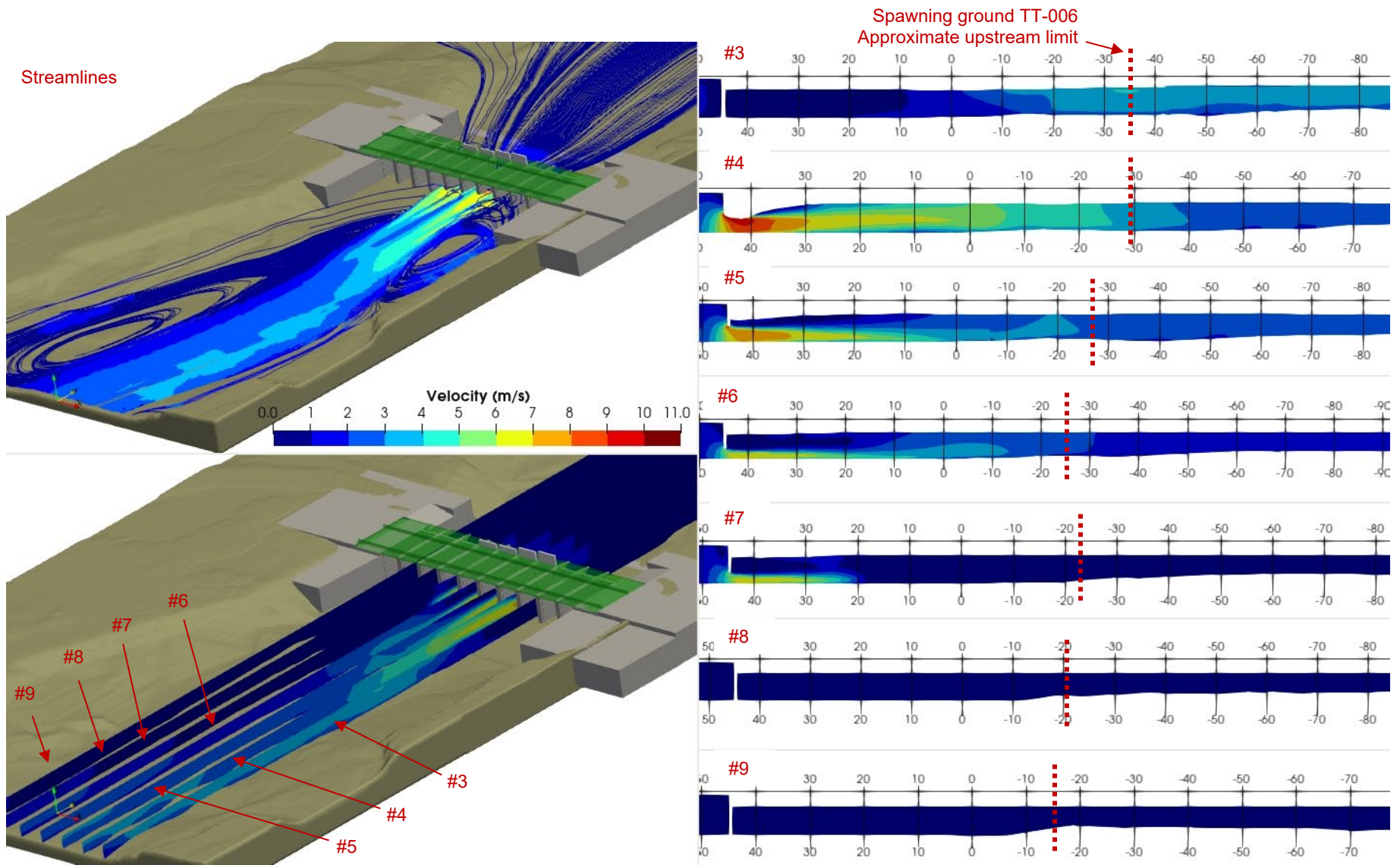


Figure 4 : Calculated Velocities – Orthogonal Views and Longitudinal Profiles – Scenario A – Mechanized Sluice Gate

PRELIMINARY

APPENDIX D
Results of Hydraulic Simulations for Scenario B – Stoplog Weir

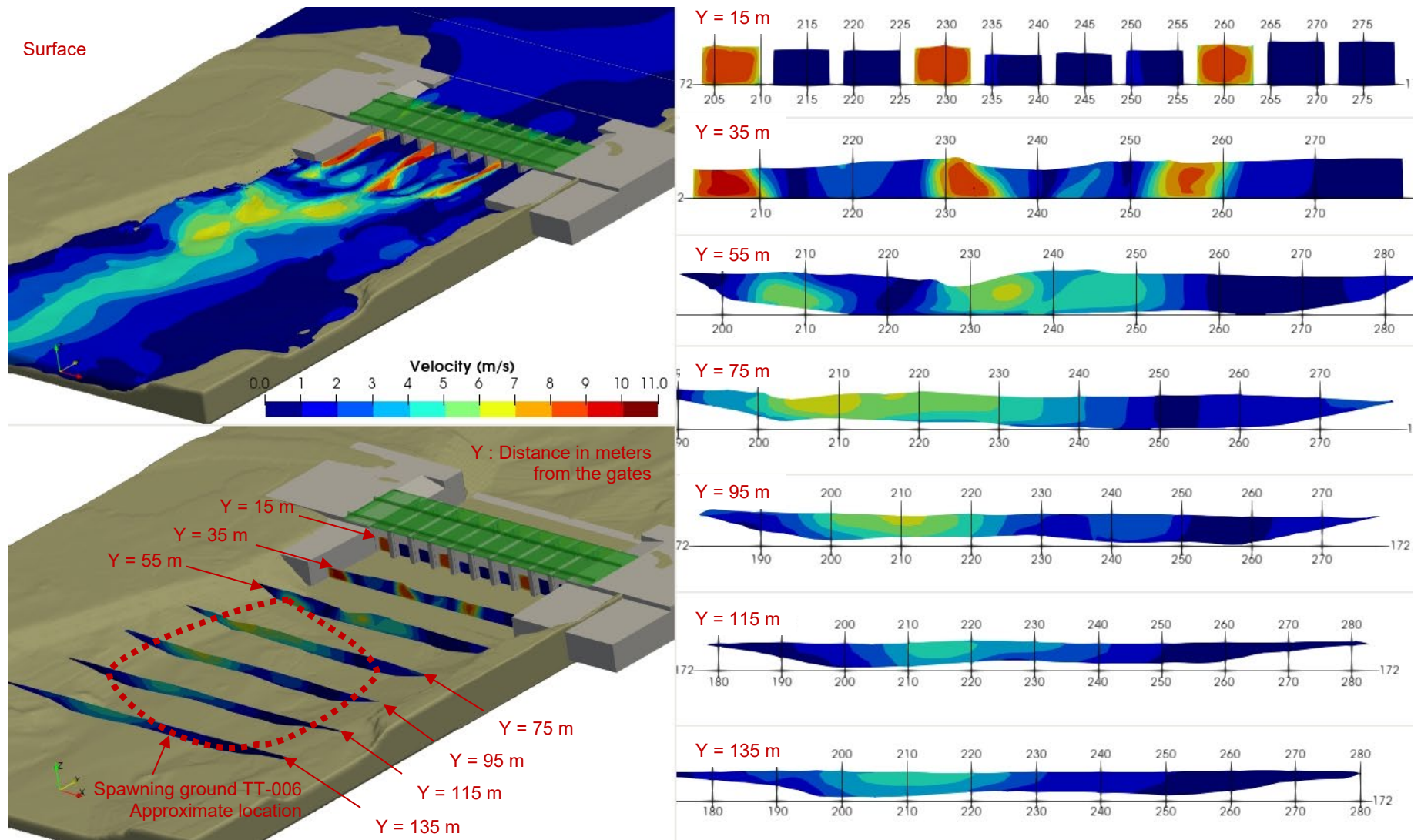


Figure 5 : Calculated Velocities – Orthogonal Views and Cross-Streams – Scenario B – Stoplog Weir

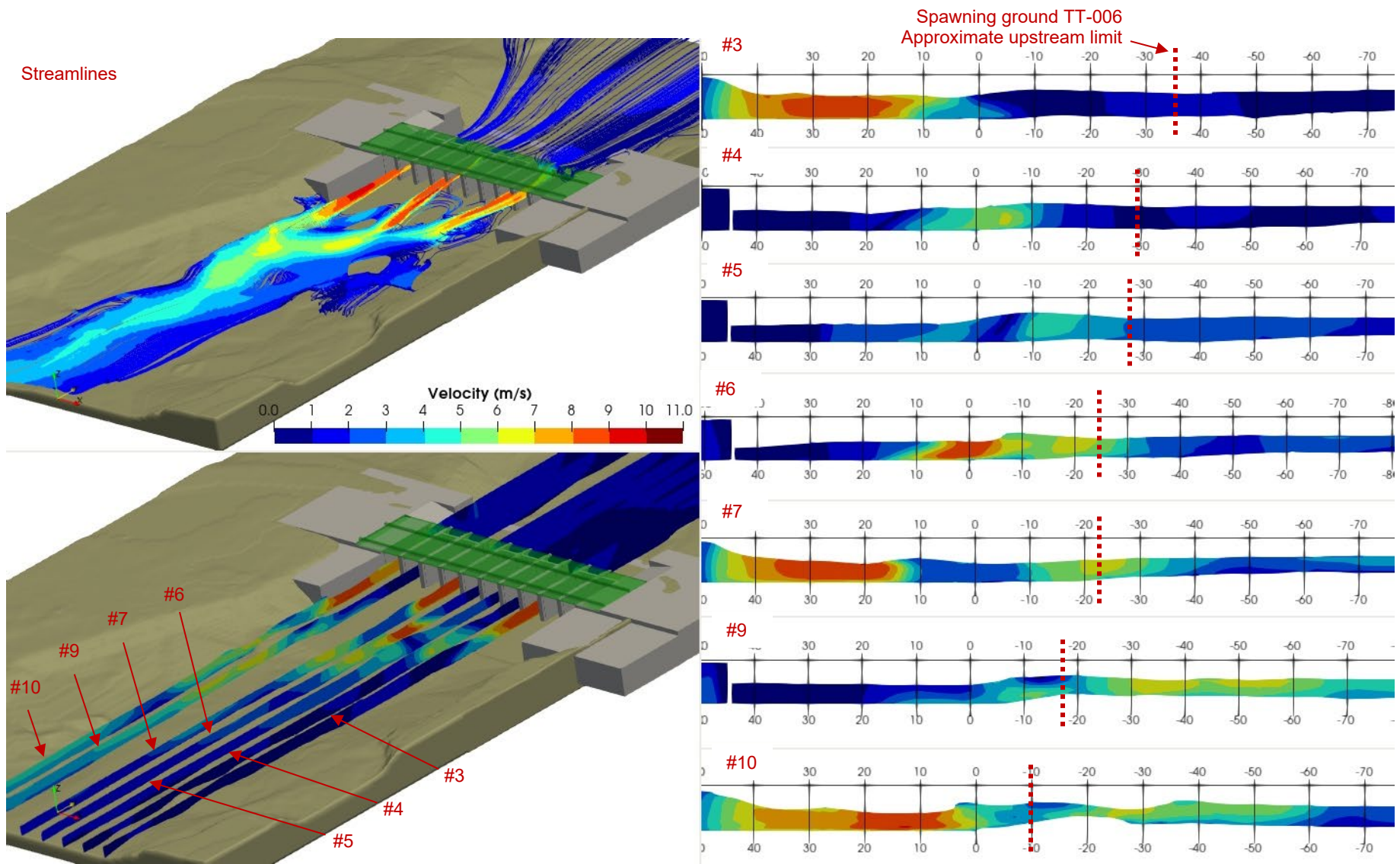


Figure 6 : Calculated Velocities – Orthogonal Views and Longitudinal Profiles – Scenario B – Stoplog Weir

PRELIMINARY

APPENDIX E
Results of Hydraulic Simulations for Scenario B –
Mechanized Sluice Gate

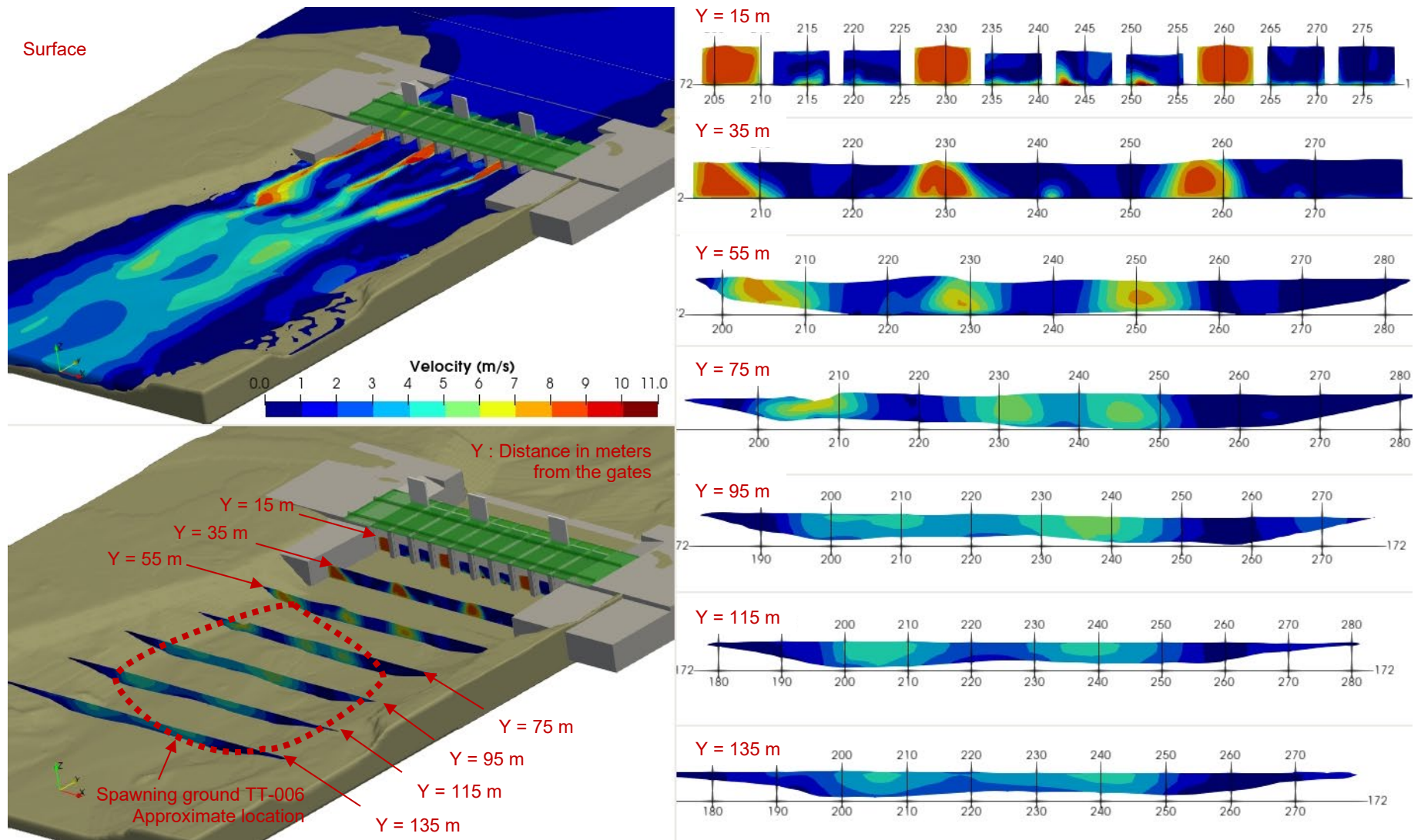


Figure 7 : Calculated Velocities – Orthogonal Views and Cross-Streams – Scenario B – Mechanized Sluice Gate

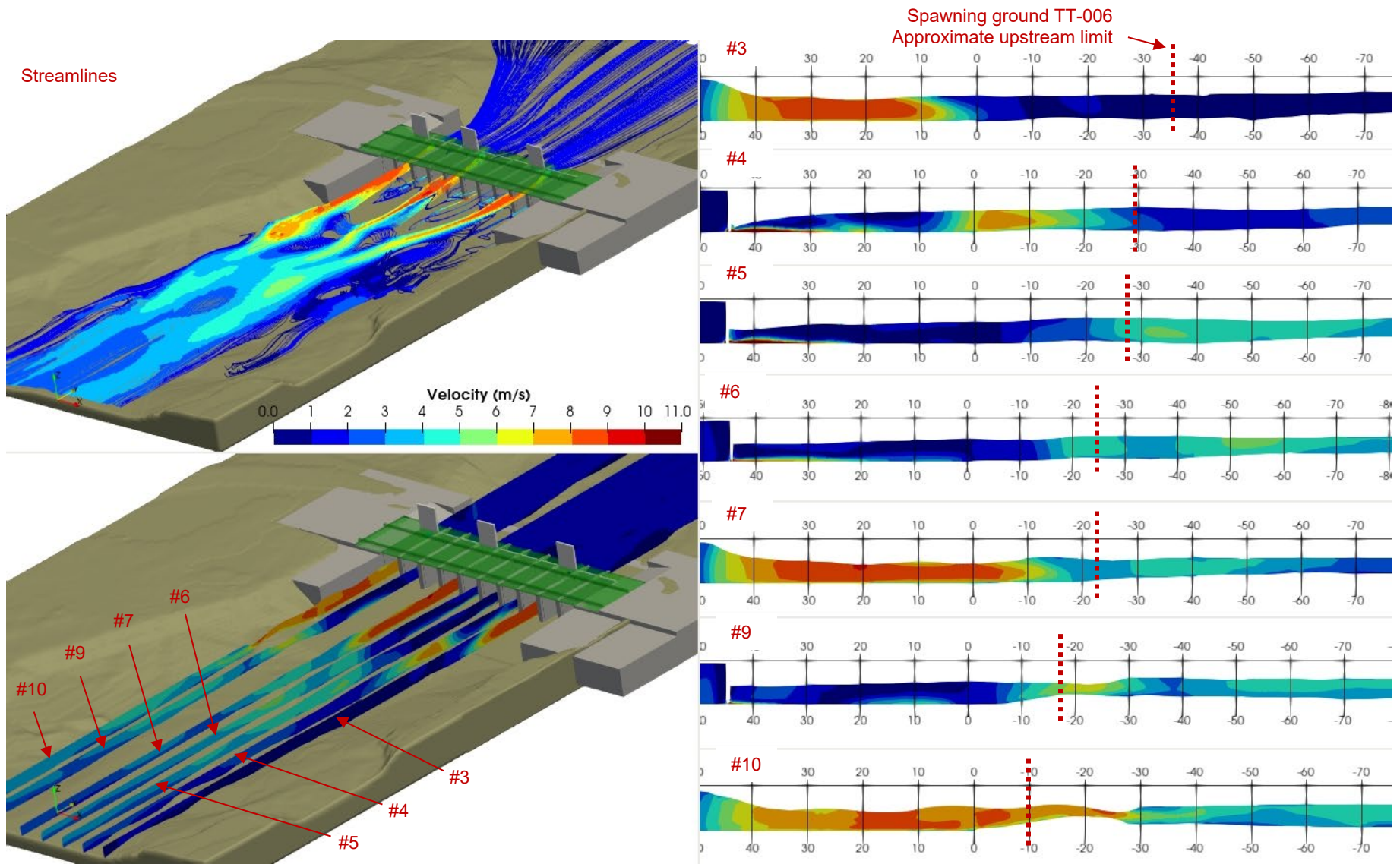


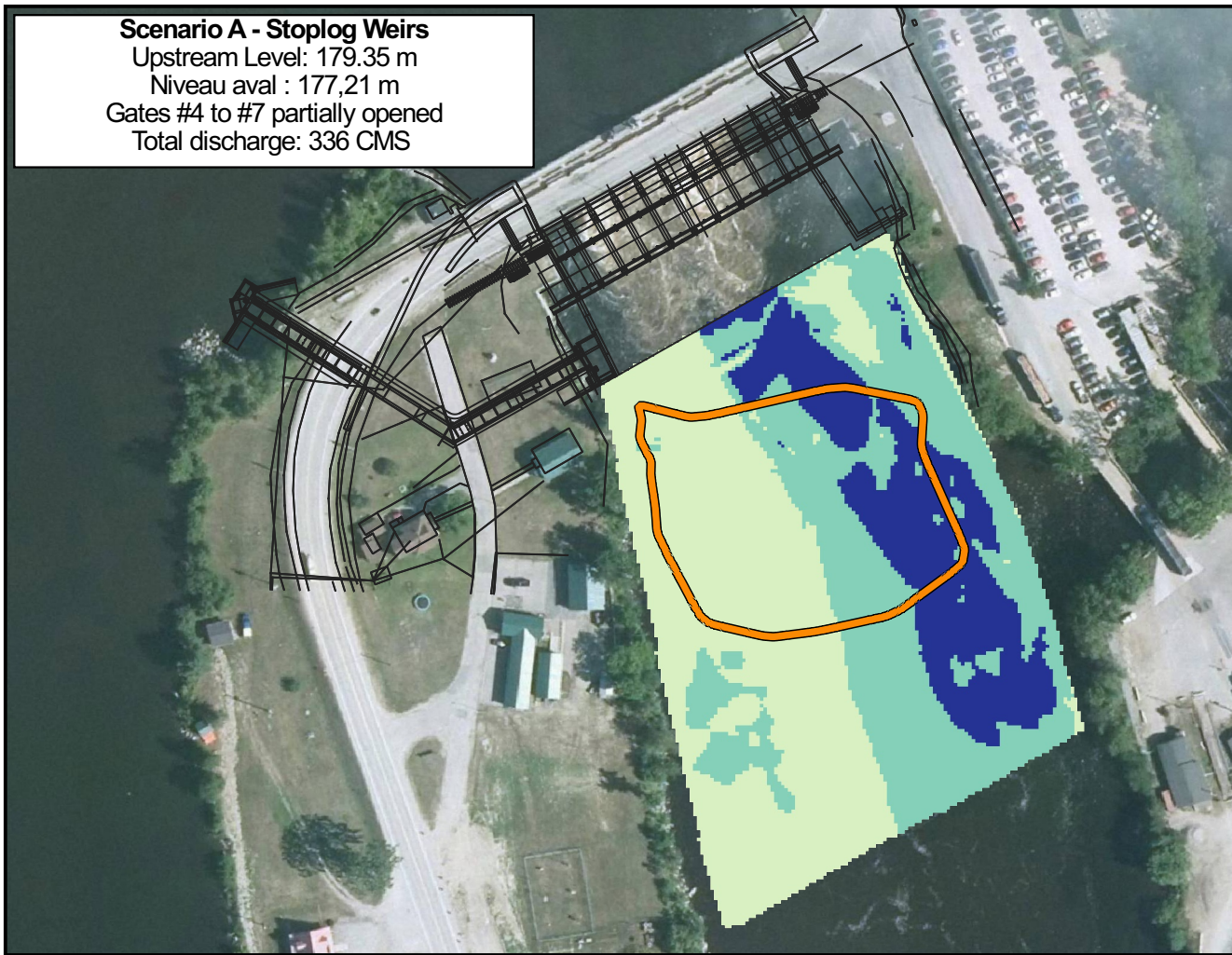
Figure 8 : Calculated Velocities – Orthogonal Views and Longitudinal Profiles – Scenario B – Mechanized Sluice Gate

PRELIMINARY

APPENDIX F
Analysis Maps of Velocities at Ground Level
Downstream of the Proposed Dam

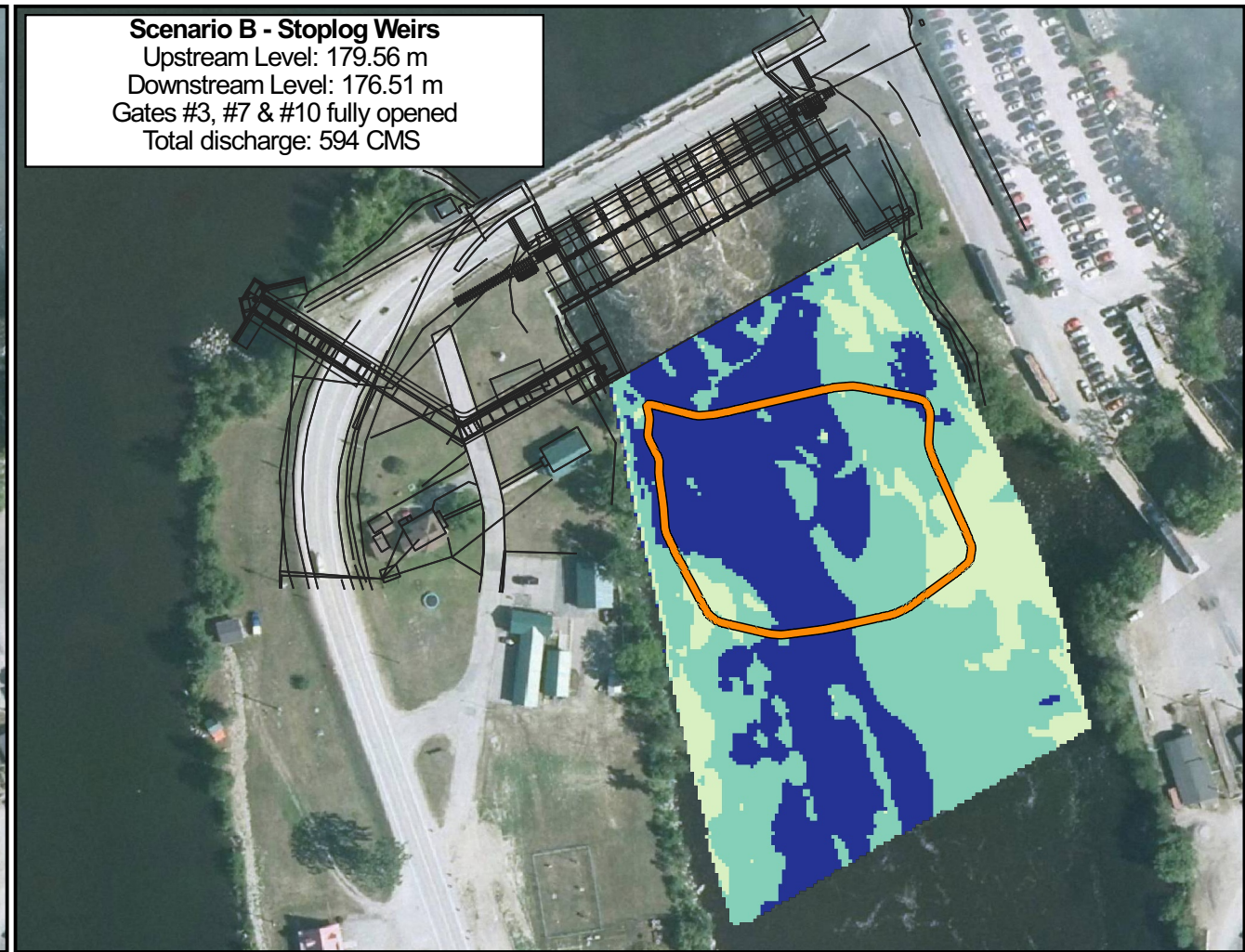
Scenario A - Stoplog Weirs

Upstream Level: 179.35 m
Niveau aval : 177,21 m
Gates #4 to #7 partially opened
Total discharge: 336 CMS



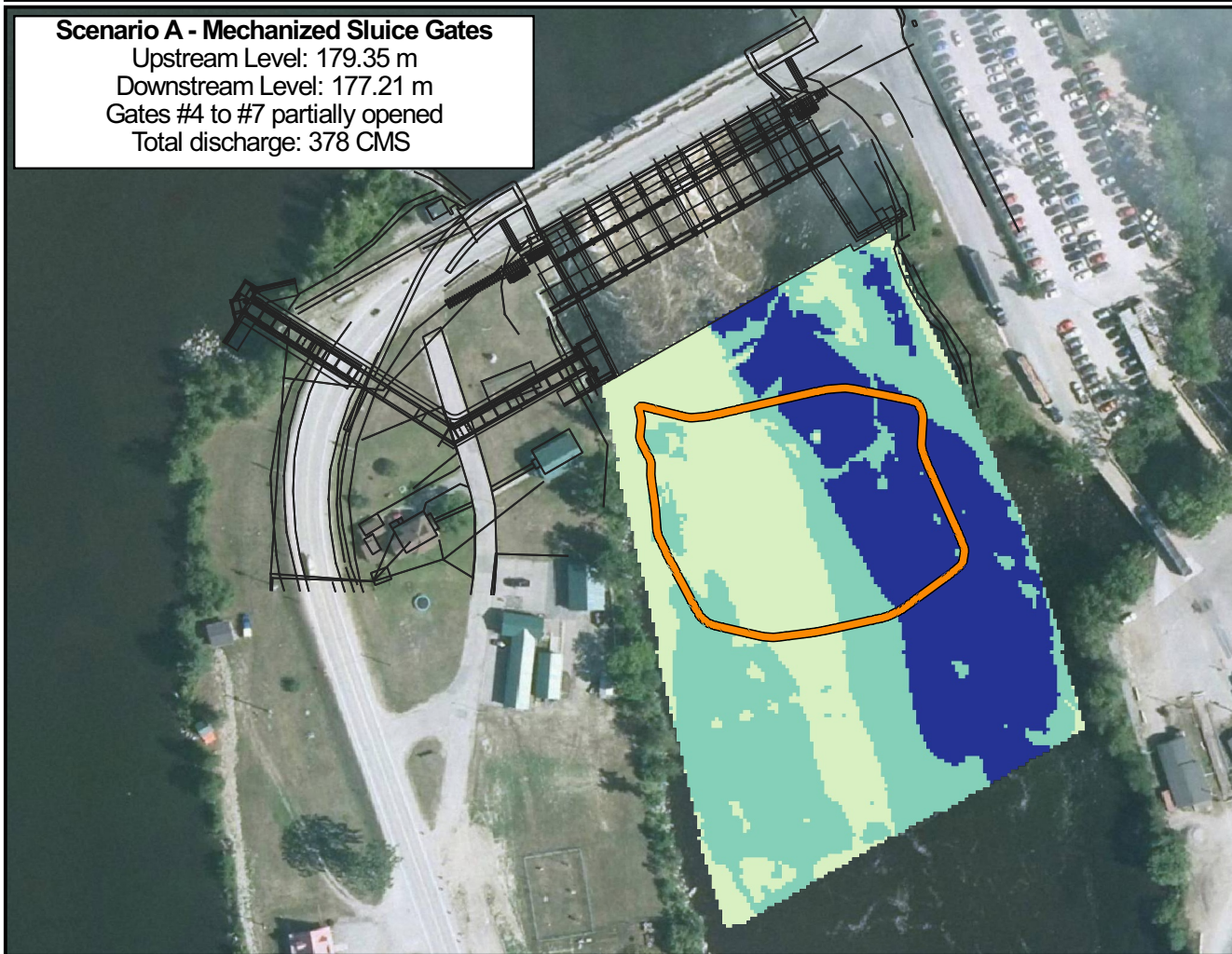
Scenario B - Stoplog Weirs

Upstream Level: 179.56 m
Downstream Level: 176.51 m
Gates #3, #7 & #10 fully opened
Total discharge: 594 CMS



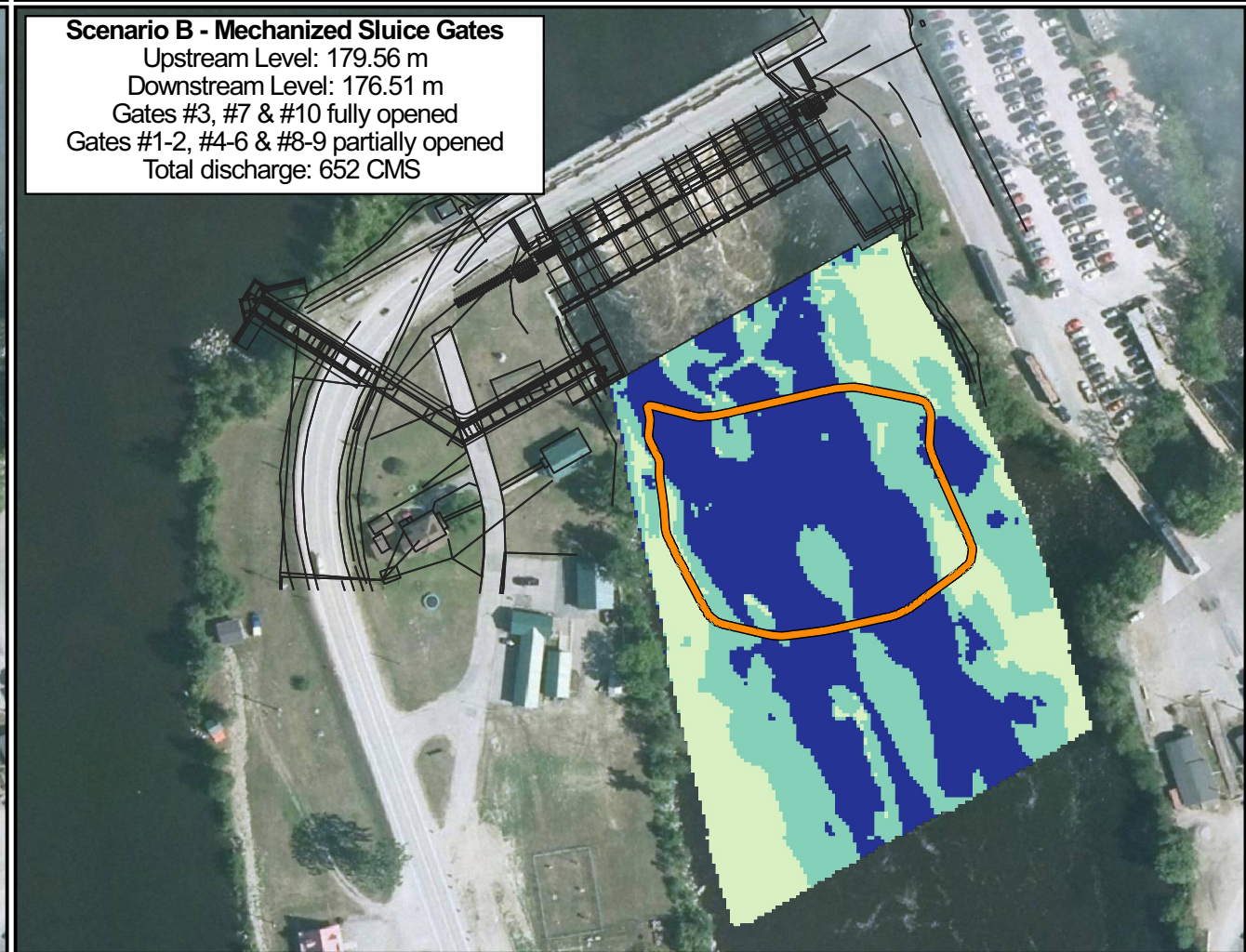
Scenario A - Mechanized Sluice Gates

Upstream Level: 179.35 m
Downstream Level: 177.21 m
Gates #4 to #7 partially opened
Total discharge: 378 CMS



Scenario B - Mechanized Sluice Gates

Upstream Level: 179.56 m
Downstream Level: 176.51 m
Gates #3, #7 & #10 fully opened
Gates #1-2, #4-6 & #8-9 partially opened
Total discharge: 652 CMS



LEGEND

Velocity at Ground Level (m/s)

- Light Green: <= 0,50
- Medium Green: 0,50 - 1,50
- Dark Blue: > 1,50

Proposed Dam

TT-006 Spawning Ground

Sources :
Service d'imagerie du gouvernement du Québec
© OpenStreetMap © MapTiler

North arrow and scale bar (0, 50, 100 m).
Scale: 1:2 000
NAD83(CSRS) / MTM zone 10

CLIENT

Public Services and Procurement Canada
Services publics et Approvisionnement Canada

CONSULTANT

PROJECT NO 32760TT
TECHNICAL TEAM
Jean Gauthier, P.Eng. M.Sc.
Gabriel Rouleau, P.Eng.
Charles Gagnon, Cartography

PROJECT

Timiskaming Dam-Bridge of Quebec Replacement Project

TITLE

Results of Velocity at Ground Level Downstream of the Proposed Dam

\\t.local\gfs\CAVolume2\Legacy\Hts349fs3\Pj_reg\32760TT\DOC-PROJ\60160\GIS\53095TT_20241121_Debordement_CG



APPENDIX G: Revised Table 20.1 (IAAC-2-1)

Table 20.1 Summary of Effects on the Human Environment

Valued Component affected	Area of federal jurisdiction (√)	Project Activity	Potential effects	Proposed mitigations or enhancements	Direction of Effect	Main criteria to determine the significance of effects					Significance of residual adverse effect	Likelihood of significance of residual adverse effect
						Magnitude	Geographical extent	Duration	Frequency	Reversibility		
Health and Socio-economic conditions and activities – AN, the AOO, AOPFN, MNO	Section 5(1) c) (i) of CEAA (2012)	Dam construction	Direct and indirect employment and business opportunities	<ol style="list-style-type: none"> 1. Prioritize local and Indigenous service providers and workers to optimize direct and indirect employment in the region 2. Encourage joint ventures when local capacity does not exist to create benefits for local and Indigenous communities 3. Ensure equal pay and employment opportunities 4. Encourage contractor to use qualified local and Indigenous-owned services 	Positive	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Health and Socio-economic conditions and activities – AN, the AOO, AOPFN, MNO	Section 5(1) c) (i) of CEAA (2012)	Dam construction	Barriers to employment	<ol style="list-style-type: none"> 1. Institute a zero-tolerance policy for racism and sexism 2. Provide cultural awareness and sensitivity training 3. Monitor Indigenous women and marginalized worker concerns and respond to issues as they arise 4. Institute confidential whistleblower / grievance system for the workplace 5. Encourage implementation of workplace diversity measures and incentives 6. Discuss and address barriers to employment during development of Indigenous Participation Plan (IPP) 	Negative	Low	Local	Medium	Continuous	Reversible	Non-significant	N/A

Valued Component affected	Area of federal jurisdiction (√)	Project Activity	Potential effects	Proposed mitigations or enhancements	Direction of Effect	Main criteria to determine the significance of effects					Significance of residual adverse effect	Likelihood of significance of residual adverse effect
						Magnitude	Geographical extent	Duration	Frequency	Reversibility		
Health and Socio-economic conditions and activities – AN, the AOO, AOPFN, MNO	Section 5(1) c (i) of CEAA (2012)	Dam construction	Skills and capacity development	<ol style="list-style-type: none"> 1. Develop IPP to support economic benefits, and to encourage the contractors to provide training and apprenticeship opportunities 2. Support environmental monitoring training to local, impacted Indigenous groups 3. Support creation and long-term sustained use of local Indigenous guardianship initiatives 4. Share monitoring results with Indigenous and non-Indigenous communities 5. Implement measures through IPP to ensure opportunities for local Indigenous groups to benefit 	Positive	N/A	N/A	N/A	N/A	N/A	Positive	N/A
Health and Socio-economic conditions and activities – AN, MNO [Confirm KFN, TFN, WLFN]	Section 5(1) c (ii) of CEAA (2012)	Dam construction	Decreased participation in cultural events /activities and traditional economy	<ol style="list-style-type: none"> 1. Provide cultural awareness and sensitivity training 2. Discuss cultural leave, and flex scheduling with Indigenous employees 3. Encourage wellness and family leave policies 4. Implement measures through IPP 	Negative	Low	Local	Medium	Cyclic	Reversible	Non-significant	N/A
Health and Socio-economic conditions and activities – AN, AOPFN,	Section 5(1) c (iii) of	Dam construction	Increased land use by non-Indigenous workers	<ol style="list-style-type: none"> 1. Give preference to local and Indigenous workers to minimize changes to harvesting 2. Provide cultural awareness and sensitivity training 	Negative	Low	Local	Medium	Cyclic	Reversible	Non-significant	N/A

Valued Component affected	Area of federal jurisdiction (✓)	Project Activity	Potential effects	Proposed mitigations or enhancements	Direction of Effect	Main criteria to determine the significance of effects					Significance of residual adverse effect	Likelihood of significance of residual adverse effect
						Magnitude	Geographical extent	Duration	Frequency	Reversibility		
MNO [Confirm KFN, TFN, WLFN]	CEAA (2012)			3. Ensure all workers are aware of, and follow, provincial rules and regulations regarding hunting and fishing; work with provincial conservation officers to monitor/enforce rules								
Health and Socio-economic conditions and activities – Non-Indigenous	Section 5(2) b (i) of CEAA (2012)	Dam construction	Direct and indirect employment and business opportunities	<ol style="list-style-type: none"> 1. Prioritize local and Indigenous service providers and workers to optimize direct and indirect employment in the region 2. Encourage joint ventures when local capacity does not exist to create benefits for local and Indigenous communities 3. Ensure equal pay and employment opportunities 4. Encourage contractor to use qualified local and Indigenous-owned services 	Positive	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Health and Socio-economic conditions and activities – Non-Indigenous	Section 5(2) b (i) of CEAA (2012)	Dam construction	Increased use of local businesses by construction workforce	<ol style="list-style-type: none"> 1. Encourage non-local workers to stay in local accommodations and use local businesses and services 2. Discuss workforce needs with local business organizations (Chambers of Commerce, etc.) so that they may provide goods and services that are needed / wanted by the workers 	Positive	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Health and Socio-economic conditions	Section 5(2) b (i) of CEAA (2012)	Dam construction	Disruption of community life due to construction	<ol style="list-style-type: none"> 1. Provide information about peak season availabilities to contractor to ensure best use 	Negative	Low	Local	Medium	Continuous	Reversible	Non-significant	N/A

Valued Component affected	Area of federal jurisdiction (√)	Project Activity	Potential effects	Proposed mitigations or enhancements	Direction of Effect	Main criteria to determine the significance of effects					Significance of residual adverse effect	Likelihood of significance of residual adverse effect
						Magnitude	Geographical extent	Duration	Frequency	Reversibility		
				9. Communicate early and regularly with contractor, local police, social services, and municipalities to establish working relationships and ongoing exchange of information, incident tracking, corrective actions, and other strategies, as required								
Health and Socio-economic conditions and activities – Non-Indigenous	Section 5(2) b (i) of CEEA (2012)	Dam construction	Change in population and demographics during construction	None proposed	Positive	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Health and Socio-economic conditions and activities – Non-Indigenous	Section 5(2) b (i) of CEEA (2012)	Dam construction	Increased demand on health care facilities during construction	<ol style="list-style-type: none"> 1. Ensure contractors have excellent safety records 2. Recommend employees access regular medical care in their own communities 3. Hire locally to avoid pressure on existing medical services by increasing the population 4. Enforce worksite best practices to reduce spread of contagious disease, as required 5. Implement testing or vaccination requirements, as required 6. Deliver a health and safety program for all workers before and during construction 	Negative	Low	Local	Medium	Cyclic	Reversible	Non-significant	N/A

Valued Component affected	Area of federal jurisdiction (√)	Project Activity	Potential effects	Proposed mitigations or enhancements	Direction of Effect	Main criteria to determine the significance of effects					Significance of residual adverse effect	Likelihood of significance of residual adverse effect
						Magnitude	Geographical extent	Duration	Frequency	Reversibility		
				<ol style="list-style-type: none"> 4. Involve interested Indigenous groups in archeological studies 5. PSPC will work with Indigenous groups prior to construction to prepare a protocol for the protection and management of any recovered artefacts based on the archaeological intervention plan 6. If artefacts are found, they will be held in trust by PSPC until the protocol can be implemented. 								
Health and Socio-economic conditions and activities – Non-Indigenous	Section 5(2) b (i) and (iv) of CEAA (2012)	Dam construction	Conflicts between recreation vehicles and pedestrian traffic on the dam	<ol style="list-style-type: none"> 1. Install appropriate fencing and signage to limit pedestrian-recreational vehicle conflicts on the walkway 	Negative	Low	Footprint	Permanent	Cyclic	Reversible	Non-significant	N/A
Physical and cultural heritage; Historical, archaeological, paleontological or architectural elements of importance –	Section 5(1) c (ii) and (iv) of CEAA (2012)	Dam construction	Physical and cultural heritage value of Long Sault Island	<ol style="list-style-type: none"> 1. Discuss opportunities with Indigenous groups for re-establishing natural vegetation on Long Sault Island 2. Invite Indigenous groups to harvest any trees and plants with cultural value prior to the construction of the new dam 3. Involve Indigenous groups in the planning, design, siting, installation and maintenance of a plaque or other permanent 	Negative	Medium	Footprint	Long-term	Continuous	Irreversible	Non-significant	N/A

Valued Component affected	Area of federal jurisdiction (√)	Project Activity	Potential effects	Proposed mitigations or enhancements	Direction of Effect	Main criteria to determine the significance of effects					Significance of residual adverse effect	Likelihood of significance of residual adverse effect
						Magnitude	Geographical extent	Duration	Frequency	Reversibility		
the AOO, AN, AOPFN, MNO				<p>structure that provides the history of the Ottawa River and Long Sault Island and their importance to Algonquin cultural and physical heritage and recognition of the Project on Algonquin territory</p> <p>4. Respect and allow space for Indigenous groups to conduct cultural ceremonies prior to the construction of the new dam to bring recognition and awareness to the historical alteration of the island and Ottawa River which may subsequently help to heal these historical impacts and build reconciliation with the impacted Indigenous groups</p> <p>5. Upon completion of the dam, erect signage and information to ensure proper acknowledgement of the significance of the area to the Algonquin Peoples</p>								
Physical and cultural heritage; Historical, archaeological, paleontological or architectural	<i>Section 5(1) c) (ii) and (iv) of CEAA (2012)</i>	Dam construction	Physical and cultural heritage value of Ottawa River	None proposed	Negative	Medium	Footprint	Long-term	Continuous	Irreversible	Non-significant	N/A

Valued Component affected	Area of federal jurisdiction (√)	Project Activity	Potential effects	Proposed mitigations or enhancements	Direction of Effect	Main criteria to determine the significance of effects					Significance of residual adverse effect	Likelihood of significance of residual adverse effect
						Magnitude	Geographical extent	Duration	Frequency	Reversibility		
elements of importance – AN, the AOO, AOPFN, MNO												
Current use of land and resource for traditional purpose – AN	Section 5(1) c (iii) of CEAA (2012)	Dam construction	Lights on dam affecting fish abundance and harvesting	1. Direct lights toward working area during construction	Negative	Low	Footprint	Medium	Cyclic	Reversible	Non-significant	N/A
Current use of land and resource for traditional purpose – AN	Section 5(1) c (iii) of CEAA (2012)	Dam construction	Perceived/real impacts on fish health due to contaminants	<ol style="list-style-type: none"> 1. Install turbidity curtain and remove sediments from behind it 2. Inspect turbidity curtain after it is installed 3. Monitor for organic mats downstream of the dam construction site within the Project area and remove if observed 4. Share information on water/fish quality 5. Share information on construction/demolition material composition and risks to health 6. Involve Indigenous groups in monitoring fish and fish habitat during construction and post-construction Project phases 7. Improve fish habitat through offsets approved by DFO 	Negative	Medium	Local	Medium	Continuous	Reversible	Non-significant	N/A

Valued Component affected	Area of federal jurisdiction (√)	Project Activity	Potential effects	Proposed mitigations or enhancements	Direction of Effect	Main criteria to determine the significance of effects					Significance of residual adverse effect	Likelihood of significance of residual adverse effect
						Magnitude	Geographical extent	Duration	Frequency	Reversibility		
				8. Include Indigenous knowledge in fish monitoring and species restoration or recovery activities, as appropriate								
Current use of land and resource for traditional purpose – the AOO, MNO	Section 5(1) c (iii) of CEAA (2012)	Dam construction	Perceived/real impacts on fish health due to contaminants	<ol style="list-style-type: none"> 1. Install turbidity curtain and remove sediments from behind it 2. Inspect turbidity curtain after it is installed 3. Share information on water/fish quality 4. Share information on construction/demolition material composition and risks to health 5. Improve fish habitat through offsets approved by DFO 6. Involve Indigenous groups in monitoring activities 7. Include Indigenous knowledge in fish monitoring and species restoration or recovery activities, as appropriate 	Negative	Low	Local	Medium	Continuous	Reversible	Non-significant	N/A
Current use of land and resource for traditional purpose – AN, the AOO, MNO	Section 5(1) c (iii) of CEAA (2012)	Dam construction	Changes to access to fishing areas near the dam from fencing and signage	<ol style="list-style-type: none"> 1. Provide cultural awareness and sensitivity training (including Indigenous rights) to Project workers involved in constructing the fencing and signage, as well as those communicating the safety features to Algonquins and other Indigenous communities 2. Communicate early and regularly with communities 	Negative	Low	Footprint	Long-term	Continuous	Irreversible	Non-significant	N/A

Valued Component affected	Area of federal jurisdiction (√)	Project Activity	Potential effects	Proposed mitigations or enhancements	Direction of Effect	Main criteria to determine the significance of effects					Significance of residual adverse effect	Likelihood of significance of residual adverse effect
						Magnitude	Geographical extent	Duration	Frequency	Reversibility		
the AOO, AOPFN, MNO	CEAA (2012)	operation	of certain species									
Current use of land and resource for traditional purpose – AN, the AOO, AOPFN, MNO	Section 5(1) c (iii) of CEAA (2012)	Dam construction and operation	Fish passage delayed until watershed wide plan in place and assessed	None proposed	Positive	NA	NA	NA	NA	NA	N/A	NA
Current use of land and resource for traditional purpose – AN, the AOO, AOPFN, MNO	Section 5(1) c (iii) of CEAA (2012)	Dam construction	Wildlife mortality from Project activity traffic	<ol style="list-style-type: none"> 1. Implement traffic control measures at the Project site, for example, speed limits 2. Monitor wildlife mortality during the Project activities and address issues if mortality rate is high 	Negative	Low	Local	Medium	Cyclic	Reversible	Non-significant	N/A
Current use of land and resource for traditional purpose – AN, the AOO	Section 5(1) c (iii) of CEAA (2012)	Dam construction and operation	Changes in health and abundance of wildlife that rely on fish	None proposed	Neutral	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Current use of land and resource for traditional purpose – the AOO MNO	Section 5(1) c (iii) of CEAA (2012)	Dam construction	Impacts of construction noise on wildlife and migratory birds and wildlife habitat	<ol style="list-style-type: none"> 1. Mitigations to avoid impacts to wildlife and migratory birds as noted in Chapter 12. 2. Keep noise pollution to a minimum and establish quiet hours, especially during the night to help provide a more suitable environment for wildlife, where possible (see 	Negative	Low	Local	Medium	Cyclic	Reversible	Non-significant	N/A

Valued Component affected	Area of federal jurisdiction (√)	Project Activity	Potential effects	Proposed mitigations or enhancements	Direction of Effect	Main criteria to determine the significance of effects					Significance of residual adverse effect	Likelihood of significance of residual adverse effect
						Magnitude	Geographical extent	Duration	Frequency	Reversibility		
				Section 11.2.3 for more measures related to noise).								
Current use of land and resource for traditional purposes - AN, AOPFN	Section 5(1) c) (iii) of CEAA (2012)	Dam construction	Impacts on wildlife that rely on fish	None proposed	Neutral	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Current use of land and resource for traditional purpose – AN, AOPFN, MNO	Section 5(1) c) (iii) of CEAA (2012)	Dam construction and operation	Plant and natural material harvesting	<ol style="list-style-type: none"> 1. Invite Indigenous groups to harvest any trees and plants of cultural value prior to the construction of the new dam 2. Discuss opportunities with Indigenous groups to re-establish natural vegetation on Long Sault Island which could include the following: <ol style="list-style-type: none"> a) Plant new pioneer species in disturbed areas, including thistle, asters, goldenrod, mugwort, dandelion, nettles, sumac, etc., to restore disturbed sites b) Discuss a species restoration plan with interested Indigenous communities, which could include a plant re-introduction strategy for all stages of restoration c) Make efforts to re-establish the Wolf Willow away from the 	Neutral	N/A	N/A	N/A	N/A	N/A	N/A	

Valued Component affected	Area of federal jurisdiction (√)	Project Activity	Potential effects	Proposed mitigations or enhancements	Direction of Effect	Main criteria to determine the significance of effects					Significance of residual adverse effect	Likelihood of significance of residual adverse effect
						Magnitude	Geographical extent	Duration	Frequency	Reversibility		
				<p>construction activities on Long Sault Island, so that Algonquins represented by the AOO can continue to harvest it for medicinal and ceremonial use</p> <p>d) Invite Indigenous communities to apply Indigenous knowledge to decision-making to determine which plants to seed, manage, and monitor in the Project footprint</p> <p>e) Communicate restoration activities through signage other appropriate communication methods</p> <p>f) Restrict access to planting sites while vulnerable to human disturbance</p> <p>g) Monitor growth rates of vegetation planted to support restoration and the development of habitat</p> <p>h) Include Indigenous groups in monitoring restored plants</p>								
Current use of land and resource for traditional	Section 5(1) c) (iii) of	Dam construction and	Physical removal and/or disturbance	1. Invite Indigenous groups to harvest any trees and plants of cultural value prior to the construction of the new dam	Negative	Low	Footprint	Medium	Punctual	Reversible	Non-significant	N/A

Valued Component affected	Area of federal jurisdiction (✓)	Project Activity	Potential effects	Proposed mitigations or enhancements	Direction of Effect	Main criteria to determine the significance of effects					Significance of residual adverse effect	Likelihood of significance of residual adverse effect
						Magnitude	Geographical extent	Duration	Frequency	Reversibility		
				<ul style="list-style-type: none"> monitor in the Project footprint e) Communicate restoration activities through signage other appropriate communication methods f) Restrict access to planting sites while vulnerable to human disturbance g) Monitor growth rates of vegetation planted to support restoration and the development of habitat h) Include Indigenous groups in monitoring restored plants 								
Current use of land and resource for traditional purpose – the AOO	Section 5(1) c) (iii) of CEAA (2012)	Dam construction and operation	Reduced harvesting of plants for food and medicine due to actual or perceived contamination of plants and medicines from dust, or plant absorption of chemicals	<ol style="list-style-type: none"> 1. Manage dust during construction with water 2. Restore any areas that do become contaminated by spills 3. Discuss a vegetation restoration plan with Indigenous groups for the Project footprint/construction areas and/or other parts of Long Sault Island 4. Install silt fence during construction to capture contaminants from running into the Ottawa River 5. Design roadway to include ditching and sedimentation 	Negative	Low	Local	Medium	Cyclic (seasonal)	Reversible	Non-significant	N/A

Valued Component affected	Area of federal jurisdiction (✓)	Project Activity	Potential effects	Proposed mitigations or enhancements	Direction of Effect	Main criteria to determine the significance of effects					Significance of residual adverse effect	Likelihood of significance of residual adverse effect
						Magnitude	Geographical extent	Duration	Frequency	Reversibility		
			from road runoff, or construction spills.	ponds to capture run-off of contaminants exists currently 6. Explore the creation of other areas that are accessible for harvesting medicinal plants so the need to harvest on this shoreline is reduced								
Current use of land and resource for traditional purpose – AN, the AOO, AOPFN, MNO	Section 5(1) c (iii) of CEAA (2012)	Dam construction and operations	Changes in water or land access or travel from Project activities	None proposed	Neutral	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Current use of land and resource for traditional purpose – AOPFN	Section 5(1) c (iii) of CEAA (2012)	Dam construction	Avoidance of the Ottawa River due to construction activities that may release contaminants in sediment and from dam construction materials	1. Monitor water quality changes during the Project activities 2. Provide water quality data to communities 3. Provide material safety information about dam components to AOPFN	Negative	Low	Local	Medium	Cyclic	Reversible	Non-significant	N/A
Current use of land and resource for traditional purpose – AN	Section 5(1) c (iii) of CEAA (2012)	Dam construction	Avoidance of the Ottawa River for drinking, swimming, and bathing	1. Involve Indigenous groups in monitoring water quality during construction Project phases 2. Provide water quality data to communities	Negative	Medium	Local	Medium	Cyclic	Reversible	Non-significant	N/A

