



June 27, 2019

Christina Guillemette
Haines Junction District Office
Yukon Environmental and Socio-Economic Assessment Board

RE: YESAB Project #2019-0035
Aishihik Generating Station Relicensing 2019

Dear Ms. Guillemette:

I am pleased to attach the Champagne and Aishihik First Nations (CAFN) submission respecting the Yukon Energy Corporation (YEC) application for a three-year licence for the Aishihik Generating Station (AGS). Our submission is quite extensive and I believe it is important that you have the proper background to fully understand our submission and the significance of the moment we find ourselves in.

The construction of the Aishihik Generating Station began in 1972 and it has been operating since 1975 in the heart of our Traditional Territory. Our people have deep and long-standing concerns about the impacts the facility has had, and continues to have, on our land, waters, animals, people and way of life. From the beginning, we have made significant efforts to understand and minimize these impacts and bring Aishihik Lake and the Aishihik region back to health. Recently, these efforts have included entering into agreements with the Government of Yukon (Yukon) and YEC to work together to seek negotiated outcomes to resolve our concerns about the past, current and future operations of the facility. To make space for these negotiations, we have expressed our clear support for YEC's approach to seek only a three-year licence, rather than a longer-term licence. We say again, CAFN is fully committed to achieving resolution through negotiations and support the approval of a three-year licence to facilitate those negotiations.

The purpose of our submission is to explain CAFN's position on the issues that must be understood and addressed during the three-year licence period. Our goal is to make clear what is at stake for CAFN. As *Dän nätthe ada* (Chief), I speak on behalf of our government and our people, and share in our fundamental obligation to protect our lands, waters, fish, wildlife and way of life. Our submission is part of our continued efforts to represent our Citizens and fulfill our obligations as stewards of our Traditional Territory. I believe it will provide the Designated Office, Yukon and YEC with a good foundation to support the work we must do during the three-year licence period, and before the Designated Office must consider an application for a longer-term licence for the facility.

Our submission does not diminish our support for the completion of a YESAA assessment and granting of a three-year licence to allow for negotiations between CAFN, YEC and Yukon. We understand that the continued operation of the facility during the three-year period stands to have adverse impacts. However, we are prepared to tolerate those impacts because of their short duration and, more importantly, because commitments are now in place to develop durable solutions for the long-term operation of the facility.

We do not ask the Designated Office to make any findings on the content of the reports attached to our submission. We have not presented these as facts to be judged, or the final positions of CAFN. In many cases, these reports are still works-in-progress and reflect the ongoing work of CAFN to understand the impacts of the facility and to develop solutions acceptable to our people. Again, we have presented this information only to give the Designated Office a strong sense of what is at stake in the negotiations during the three-year licence period.

Finally, CAFN believes it is important that our work with YEC and Yukon proceed in a timely way. We do not wish to delay the assessment and regulatory processes for the three-year licence application. For this reason, and for the reasons explained above, we do not believe that our submission requires any further information from YEC and do not require a further round of information requests or seeking views and information. Rather, we must get down to the business of resolving our concerns through direct engagement with YEC and Yukon.

As an independent assessor, you have a critical role in helping to support CAFN efforts to protect our lands, waters, animals and way of life. We ask that you accept our submission as our expression of issues to be resolved for a good, and mutually acceptable long-term plan for the facility, and acknowledge and support the work we have committed to with YEC and Yukon to achieve this.

Gunat̓chish,
Signature Redacted

Dän nātthe ada Kaaxnox
Chief Steve Smith

CC: Hon. Ranj Pillai, Minister responsible for Yukon Energy Corporation
Chair Leslie Cabott, Yukon Energy Corporation
Assistant Deputy Minister Brian MacDonad, Aboriginal Relations, Yukon Executive Council Office
President/CEO Andrew Hall, Yukon Energy Corporation



CHAMPAGNE AND AISHIHIK FIRST NATIONS

**Champagne and Aishihik First Nations
Review and Recommendations
for
Yukon Energy Corporation's Aishihik Generating Station
Three-Year Renewal**

YESAB Project No. 2019-0035

Submitted June 27, 2019 to:

Yukon Environmental and Socio-economic Assessment Board

Haines Junction Designated Office

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Abbreviations and Terms

<i>Ädäts'ür Män</i>	Canyon Lake or Otter Lake
AGS	Aishihik Generating System
Äshèyi kwädän	Aishihik people
<i>Äshèyi Män</i>	Aishihik Lake
CEAA	Canadian Environmental Assessment Act
CAFN	Champagne and Aishihik First Nation
DFO	Department of Fisheries and Oceans Canada
DIA	Department of Indian Affairs
DIAND	Department of Indian Affairs and Northern Development
<i>Dzäna</i>	Muskrats
FAA	Fisheries Act Authorization
YG	Government of Yukon
DO	Haines Junction Designated Office
masl	metres above sea level
NCPC	Northern Canada Power Commission
NIWA	Northern Inland Waters Act
<i>Tsal</i>	Arctic Ground Squirrel
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
VC	Valued Components
YEC	Yukon Energy Corporation
YESAA	Yukon Environmental and Socio-economic Assessment Act
YESAB	Yukon Environmental and Socio-economic Assessment Board
YNB	Yukon Native Brotherhood
YWB	Yukon Water Board

1.0 Introduction

This report provides the Champagne and Aishihik First Nations' (CAFN) perspectives, positions and recommendations about Yukon Energy Corporation's (YEC) proposal for a three-year renewal of its permits for operation of the Aishihik Generating System (AGS) at *Äshèyi Män* (Aishihik Lake). CAFN prepared the report for consideration by the Haines Junction Designated Office (the "DO") during its evaluation of the project (No. 2019-0035) under the *Yukon Environmental and Socio-economic Assessment Act* (YESAA). The report identifies Valued Components (VCs) that CAFN considers important and summarizes many existing and ongoing impacts of AGS. Our report combines different mediums (e.g. video, quotes, photos and summary text) because we believe that these are important for conveying CAFN's views. When reviewing the different information being brought forward, it is important to keep in mind our submission is founded on the following principles¹:

- Respectful relationships: building and sustaining positive, respectful relationships through knowledge-sharing and engagement;
- Responsibility: recognize and respect responsibilities to the land and water;
- Acknowledging worldviews: recognize the value of different worldviews;
- Acknowledging caution and addressing uncertainty: uncertainty exists and there are limits to current technical understanding of cause and effect. Caution is needed in interpretation;
- Acknowledging the past: the past provides essential context and must be recognized.

CAFN has and continues to experience deep impacts associated with the presence and operation of AGS. *Äshèyi* is a cultural keystone place, with thousands of years of *Äshèyi kwädän* (Aishihik people) living and surviving in balance with the land and the water. AGS disrupted the social-ecological system, and has created irreversible harm to the people and the environment. We must find a path to restore *Äshèyi* – it is time for the lake and the people to heal.

The AGS was developed and began operating more than 40 years ago. We also know that YEC wishes to continue operations for the foreseeable future, and had in fact hoped to make application for a long-term renewal at this time. CAFN supports YEC's decision to seek a short-term renewal because it can provide an opportunity for CAFN to work with YEC and YG to address many longstanding concerns and issues related to the AGS before any long-term renewal.

All of the VCs and associated effects identified in this report and accompanying materials are critical for an assessment of any long-term renewal of AGS permits. For this short-term renewal however, CAFN believes that the potential for significant adverse effects can be addressed by procedural measures and scoping to provide flexibility for implementation of mitigation measures that can be undertaken within the constraints of YEC's proposed operating parameters. This report describes CAFN's rationale for these conclusions and provides specific recommendations about scoping and the procedural measures necessary.

CAFN's has completed substantial work to understand AGS related issues and effects. We have completed traditional knowledge research and scientific investigations. We have also engaged a team

¹ Adapted from Traditional Knowledge Principles (in YEC proposal Appendix 4C 1-C, Page 4C-220)

of experts to assist us in understanding the conditions and effects. We have attached a series of reports and memos to this report as appendices because they provide important background and details related to the content of this report. Our work on this project is ongoing and many of the appendices are works in progress. Also, the appendices are not constrained specifically to the proposed three-year renewal, but identify issues related to any long-term renewal. As such, the DO should consider the appendices as context for the content contained in this report. It is this report that states CAFN's conclusions, recommendations and positions with respect to the three-year renewal. CAFN is not asking the DO to consider the appendices in detail or address the findings and recommendations contained in them as part of the assessment of the three-year renewal. We expect that our discussions with YEC and YG during the period of the three-year renewal will provide an appropriate forum for further analysis of the content of the appendices.

This report includes the following sections:

- Section 2.0 provides legal context for the CAFN submission.
- Section 3.0 provides background information about *Äshèyi* and *Äshèyi kwädän* and about the proposed project.
- Section 4.0 describes CAFN's proposal for procedural mitigation that we recommend the DO apply to address potentially significant effects during the three-year renewal.
- Section 5.0 provides CAFN's interpretation and recommendations related to the scope of the project.
- Section 6.0 identifies CAFN's VCs and provides recommendations related to the scope of the assessment.
- Section 7.0 summarizes a range of AGS related effects on VCs.
- Section 8.0 summarizes CAFN's conclusions and recommendations.

2.0 Assessment Under YESAA

Although the AGS was constructed and commenced operations decades ago, this assessment of the activities associated with the facility, in support of YEC's current application for a three-year water licence renewal, is the first to take place under the YESAA.

YESAA is the Development Assessment legislation required by the Umbrella Final Agreement, and the enacted Final Agreements of Yukon First Nations including CAFN. As such YESAA serves to implement the requirements of Chapter 12 of the Agreements and the commitments in the Agreements as a whole. The objectives of Chapter 12 include providing for a development assessment process that:

- 12.1.1.1 recognizes and enhances, to the extent practicable, the traditional economy of Yukon Indian People and their special relationship with the wilderness Environment;
- 12.1.1.2 provides for guaranteed participation by Yukon Indian People and utilizes the knowledge and experience of Yukon Indian People in the development assessment process;
- 12.1.1.3 protects and promotes the well-being of Yukon Indian People and of their communities and of other Yukon residents and the interests of other Canadians; and

- 12.1.1.8 requires Project proponents to consider the environmental and socio-economic effects of Projects and Project alternatives and to incorporate appropriate mitigative measures in the design of Projects.

For the purposes of this assessment, CAFN draws the Yukon Environmental and Socio-economic Assessment Board's (YESAB, the "Board") attention to provisions of YESAA that parallel and implement the above, as well as additional sections that recognize the importance of First Nation rights, interests and participation, notably the following:

Purposes of Act

5(2) The purposes of this Act are

(g) to guarantee opportunities for the participation of Yukon Indian persons — and to make use of their knowledge and experience — in the assessment process;

Scientific and traditional knowledge

39 A designated office, the executive committee or a panel of the Board shall give full and fair consideration to scientific information, traditional knowledge and other information provided to it or obtained by it under this Act.

Matters to be considered

42 (1) In conducting an assessment of a project or existing project, a designated office, the executive committee or a panel of the Board shall take the following matters into consideration:

(g) the need to protect the rights of Yukon Indian persons under final agreements, the special relationship between Yukon Indian persons and the wilderness environment of Yukon, and the cultures, traditions, health and lifestyles of Yukon Indian persons and other residents of Yukon;

As stewards of its territory, CAFN asks the DO to undertake its assessment under YESAA recognizing the importance of CAFN participation and with attention to the manner in which CAFN seeks to have its rights and interests addressed in the context of this three-year license application as set out in this report.

3.0 Background and Context

3.1 Interpretation

Throughout this report and in appended reports, there are frequent references to the "Aishihik Area." This refers to the larger region that may be affected by the project and includes, but is not limited to: Aishihik Lake, Canyon (Otter) Lake, East Aishihik River, Aishihik River. It also includes the landscapes within the immediate vicinity of these waterbodies (e.g., connected wetlands and waterways, nearby uplands, trails, cabins and camps, etc.). We make no clear, definitive distinction to the distance of downstream effects of the project and for the purposes of context setting and identification of issues of

concern, our report makes reference to areas that are currently described outside of the geographic scope of the project (e.g., Dezadeash River, Sekulmun Lake). At times in this report, we also refer to the area as Aishihik or *Äshèyi*. References to the people of Aishihik or *Äshèyi* can sometimes refer to all CAFN citizens with connection to this broader area. We have made attempts to be more specific when discussing the history and people of Aishihik Village and that should be interpreted to mean a more focused geographic description. Similarly, we make an attempt to distinguish within the Aishihik general region when identifying issues specific to other locations (e.g., Chemi Village, Canyon Creek Village).

3.2 *Äshèyi Kwädän*

The experience and perspectives of the *Äshèyi kwädän* establish critical context for understanding the effects of the proposed continued operation of the AGS and the significance of those effects. As noted in *The Significance Spectrum and EIA Significance Determinations* (Ehrlich and Ross, 2015):

“... significance relies heavily on the values of the society related to the valued component for which the decision is being made,” and

“... where the potentially affected public includes primarily Aboriginal communities, social values of the potentially affected community should be an important factor in determining significance.”

With this in mind, CAFN’s submission to YESAB begins by sharing some of the voices of *Äshèyi*. These voices provide a glimpse into the stories and history of CAFN and its citizens, and their experience with the AGS. The following videos, also available on CAFN’s website at <https://cafn.ca/aishihik-relicensing-2019/>, are part of CAFN’s submission and begin to illustrate the history and the foundation for CAFN’s perspectives.

Name Redacted : <https://youtu.be/UCuneR-y5oo>

“We always end up back at Aishihik. You go to Vancouver and you live there for a while and then you go back to Aishihik. ... There’s gonna be no more Aishihik Lake. They’re gonna kill it. ... We need to look at how to save that land for future children.”

Name Redacted : <https://youtu.be/mOR0TwyrvVM>

“Ever since this dam has been built, we’ve had a lot of negative impacts that have happened to our people in regards to the village area, the fish, the wildlife around the lakes. And we’ve never really had meaningful input into the past processes that have happened ...”

In her video evidence, Name points out the special nature of *Äshèyi* and hints at the length of time over which CAFN citizens’ lives have depended on *Äshèyi*. *Äshèyi kwädän* chose this place because it sustained us, and in return we have been and continue to be the stewards of *Äshèyi*.

“...the reason our people chose the Aishihik Lake [and] Aishihik Village, was that it is a place where there’s rich wildlife. There are mountains in the back, here, where people used to hunt sheep, caribou, moose. And it’s also in a sheltered bay, from the prevailing winds from the north and the prevailing winds from the south. And it was also an easy place to access another lake,

the Sekulmun Lake. So it was an ideal spot for our people." – Name Redacted , 2003 (Appendix 1)

Appendix 1, the draft Traditional Knowledge Report prepared by CAFN in 2019 provides substantial additional information about the people of *Äshèyi* and their connection to the land and water.

CAFN and its citizens have disproportionately felt the effects of the AGS, which will likely continue as long as the AGS continues operating. As such, CAFN's perspectives are fundamental in understanding the significance of project effects, and the assessment needs to incorporate a meaningful view of impacts and their significance. For example, if one person is impacted by a project in a large city, that is not likely to be determined as significant. In the Yukon, if one key elder, or a CAFN citizen who holds a culturally important role in their family, clan, community, is impacted, these impacts could be significant with regards to cultural sustainability.

The importance of AGS related issues for CAFN is highlighted by resolutions passed at the CAFN General Assembly in 2017. These resolutions are attached as Appendix 2.

3.3 Cumulative Effects on *Äshèyi* and the *Äshèyi Kwädän*

The construction and operation of the AGS is among many events and activities that have affected *Äshèyi* and *Äshèyi Kwädän*. All of these event and activities, and their cumulative effects also provide important context for understanding the effects of the AGS. People's experiences and interpretation of the same events sometimes differ and this influences their perspectives about the project. For example, consider the following different experiences and interpretations about the development of the AGS.

First, the experience and interpretation of Frank Mooney, the Yukon manager of the Northern Canada Power Commission (NCPCC) during the planning and development of the AGS:

"Your friend[s] ... fears are groundless. I can assure you that we will not be allowed to flood that [Aishihik] village. First of all, let me tell you that there's nobody actually living there. Nobody at all. There may be about a dozen cabins and a few people go out there in summer to fish."

...

"But we're only going to raise Aishihik Lake four feet above historic high, so probably we're only going to flood out two old cabins. When we were planning this thing, we made one visit after another out there to the village. We laid out a red line and a yellow line along the shore and we said, 'Now here's the lowest level we'll draw down to, and here's the highest level we'll raise her. It's not going to be raised any higher than that.' And they all saw it. But whenever you talk to any of the Indian people, now, they say, 'You flood mountains, eh?' Of course we're not going to flood out the mountains. They're a thousand feet above the lake or more. But you can't make them understand that." – Frank Mooney, President of Northern Canada Power Commission, 1975 (Hope, 1975)

Second, the experience and interpretation of a CAFN citizen from *Äshèyi* about the planning and development of the AGS:

"We were all living in Aishihik when they first brought in the engineers...they came with a helicopter and they landed in front of our house and these engineers needed somewhere to stay and we put them up in old Albert Isaac house...it's still standing...Name] is using it to store

horse feed now ...that's where we housed the engineers and we were living across from them...and the helicopter came... and we didn't know what they were doing. They just told us they were surveying around the land and the lake. They never said they were going to build a big dam on the other end and they would flood us out here...[They were] going to go ahead and do what they wanted...Gu'chun'...we didn't know [what they were doing]." (Appendix 1, AR-TK-OH-PIN19-2017-06-06, Paragraph 54)

This report, and associated reports in the appendices, are partly intended to expose the different perspectives and experiences.

Table 1, adapted from a chronology provided in Appendix 1 (Traditional Knowledge Report), summarizes some of the key events that have affected the people of Äshèyi. The Table also identifies Äshèyi people's experiences associated with those events.

Table 1. Events and Experiences at Äshèyi

Events and Developments	View from Äshèyi
1942 - 43	
Alaska Highway, Aishihik Road and Aishihik Airport built.	Several <i>Dän</i> men helped, employed in labour for construction of highway; shifted towards wage economy and associated changes from subsistence harvesting. Increased access to remote areas meant more Southern Tutchone children sent to residential schools returning to the area only in the summer months.
1950 – 1960	
Registration of traplines in the area for Southern Tutchone peoples.	
1953	
Initial staking and early exploration claim for Faro mine	
1960's	
<p style="text-align: center;">1960: Aishihik Airport closes</p> <p>1969: Cyprus Anvil mine opens and becomes largest private sector employer in Yukon and by mid '70s is the largest lead/zinc mine in Canada consuming 9.3 MWh (half of Whitehorse Dam capacity)</p>	<p>During the 1960's, many families from Aishihik were moved to Haines Junction against their will by Department of Indian Affairs (DIA) to allow for the administration of programs and services. The Aishihik Band amalgamated with the Champagne Band to become Champagne and Aishihik First Nations. First Nations living outside their traditional harvesting grounds were charged by game wardens for hunting to feed their families, become reliant on government rations.</p> <p>1969: Name family returns home to Aishihik Village (after being removed due to Federal government policy) to live permanently and home-school their children.</p>
1970's	
<p>1970: NCPC requires additional 10 MW of diesel to cope with increased peak loads. Pre-survey began.</p> <p>1971: NCPC conducts field surveys at potential hydro sites, identifies Aishihik, applies for Water License, Department of Indian Affairs and Northern Development (DIAND) requests delay until new legislation</p> <p>1972: <i>Northern Inland Waters Act (NIWA)</i> comes into effect, NCPC commissions environmental studies, studies completed in 7 weeks (Preliminary Environmental Impact Statement), first hearing at Water Board results in additional information needed</p>	<p>Name family houses the engineers during the winter months that had begun investigating the area for the hydro-development. They supported the engineers and supplied one with a pair of moccasins to keep his feet warm. Engineers assured the people at Aishihik that the dam would not have any impacts on their lives or Village.</p> <p>1972: Intervenors opposing the project at Yukon Water Board (YWB): ChiefName (CAFN), ChiefName (Yukon Native Brotherhood (YNB)), Name (Yukon Association of non-Status Indians) oppose project and argue for government to first deal with land claims.</p>

Table 1. Events and Experiences at Äshèyi

Events and Developments	View from Äshèyi
<p>1973: NCPC 2nd application requesting greater flows; water licence for construction issued, construction begins</p> <p>1975: construction completed (\$39 million with \$22 million in cost overruns); NCPC exceeds water licence full supply level, requests more storage which is granted via third Water Board hearing</p>	<p>1975: Flooding at Aishihik Village in July, Spirit house lost to Lake, other Spirit houses endangered, dock inundated, freshwater spring at Village rendered useless, several structures partially inundated, accessibility to cabins cut off. Massive silting and erosion of shoreline impacting fish and wildlife populations. No warning of the flood was given to Aishihik peoples.</p> <p>1976: YNB files claim for \$4,850,000 for damages to Aishihik Village but was not awarded any damages.</p>
1980's	
<p>1984-1986: Series of studies: Aishihik Lake Resource Surveys carried out to explore cultural and environmental significance of region. Through the studies, the area is identified as “culturally significant” and “ecologically” significant.</p> <p>1987: Yukon Energy takes over management of Aishihik Hydro Facility.</p> <p>1988: Woodland bison are reintroduced to Aishihik area.</p>	
1990's	
<p>1991: YEC applies for amendment to water license to propose permanent removal of “aesthetic flow requirement” over Otter Falls. YWB requests comprehensive environmental studies be prepared in anticipation of license renewal (set to expire Sept 30, 2002).</p> <p>1992: YEC submits proposed program of studies to YWB. YEC and Department of Fisheries and Oceans Canada (DFO) experiment with establishing winter flows over Otter Falls to amend aesthetic flow requirements; YEC constructs gravel berm east of Aishihik Village and in front of Old Village to prevent further erosion.</p> <p>1993: Technical Advisory Group (TAG) formed at direction of YWB to YEC; Rainbow trout introduced into Otter Pond</p> <p>1993-1997: TAG meets approx. 25 times. Studies carried out incl.: fisheries, aquatic wildlife, geomorphology, socio-economics, heritage and hydrology</p> <p>1999: YEC submits EA to DIAND for review under the <i>Canadian Environmental Assessment Act</i> (CEAA).</p>	<p>CAFN establishes and ratifies its Final and Self-Government Agreements with Canada and the Yukon</p> <p>CAFN participates in a range of studies and prepares for the new relicensing process</p>
2000's	
<p>Sept 2002: YEC Water license expires.</p>	<p>2002: Compensation made to CAFN government in the amount of \$270K for heritage camps and drinking water.</p>

Table 1. Events and Experiences at Äshèyi

Events and Developments	View from Äshèyi
<p>Nov 2002: Water licence granted by YWB (2002-2019); YWB authorizes YEC to install third turbine with 7MW capacity. YEC is authorized to operate only 2 turbines at any one time.</p> <p>2007: Index gill-netting survey performed on Lake Whitefish.</p>	<p>YWB compensation made directly to 35 CAFN citizens totaling a sum of \$45K.</p>
2010's	
<p>2011: YEC installs third turbine and receives authorization to operate three turbines</p> <p>2018: YEC informs CAFN they will be moving ahead with Water Licence application for same licence conditions; terminates co-management protocol agreement</p> <p>2019: YEC submits 3-year proposal to YESAB</p>	<p>2011: CAFN signs first protocol agreement with YEC</p> <p>2016: CAFN signs co-management protocol agreement with YEC</p>

3.4 Project Description

The current project stores water in *Äshèyi Män* (Aishihik Lake) with use of a control station at the south end of the lake and uses *Ädäts'ür Män* (Canyon Lake or Otter Lake) as a head pond with another control station at the south end of that lake. Water for power generation is diverted along a power canal to the penstock that feeds the AGS turbines. Water from *Ädäts'ür Män* that is not required for power generation flows over the dam and rejoins the East Aishihik River. Water leaves the Generating Station via a tailrace that combines with flows from the East Aishihik River and West Aishihik River to form the mainstem of the Aishihik River. These are the headwaters of the Aisek watershed. Figure 1 is a map of the study area considered in the Traditional Knowledge study and shows the lakes and rivers that are affected by the AGS and where activities associated with the project occur. Figure 2 illustrates the relationship between project components.

YEC proposes a three-year renewal of its permits for the AGS, with water management constraints that are the same as those specified in the current permits. For the three-year renewal, YEC proposes to maintain water levels in *Äshèyi Män* within a storage range of 2.16 m, with a low supply level of 913.0 metres above sea level (masl) and a full supply level of 915.16 masl. The water licence and Fisheries Act Authorization (FAA) set additional restrictions on the low supply level, intended to avoid and mitigate adverse effects on whitefish. These include a limitation that water levels may only fall below 913.7 masl for 2 out of any 5 years, and a requirement for a 10-year rolling average of annual low water levels of no less than 913.7 masl.

For *Ädäts'ür Män* YEC proposes to maintain water levels within a storage range of 1.55 m, with a low supply level of 905.87 masl and a full supply level of 907.42 masl.

The water licence and FAA also define minimum flows for the rivers, and an additional aesthetic flow over Otter Falls in the summer for tourism reasons.



Figure 1. Lakes and Rivers Affected by AGS and AGS Activities

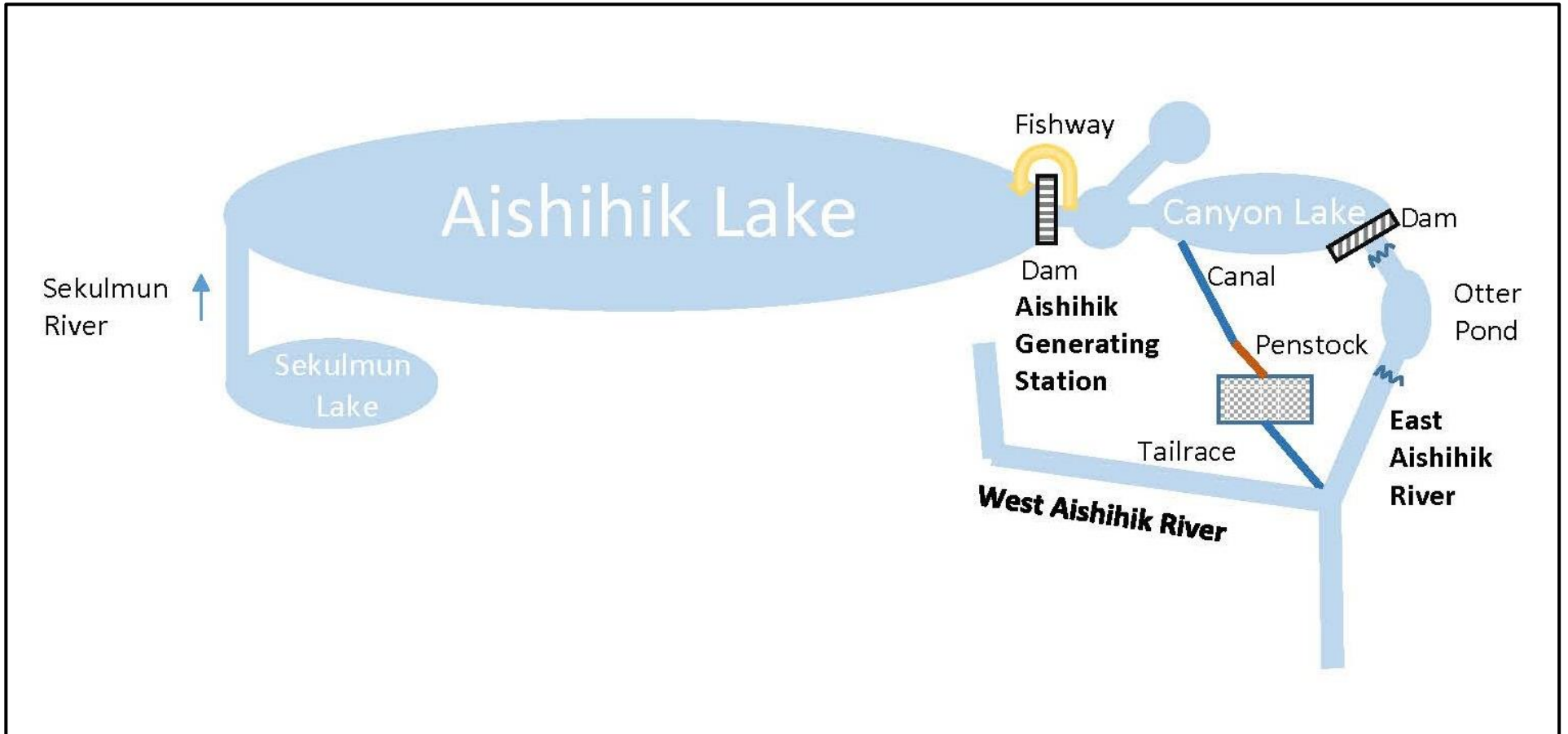


Figure 2. Simplified Relationship of AGS Hydrology

Figure 3 illustrates past water levels on Aishihik Lake throughout the operating period, and the relationship to natural and regulated water levels. Blue lines are actual measured water levels. The lower red is low supply level which changed from 912.42 to 913.00 masl when the water licence was renewed in 2002. The upper red is full supply level, 915.16 masl. The yellow dotted line indicates 10 year rolling average restriction (Fisheries Act Authorization, 2002), 913.70 masl. The black dotted lines indicate interpreted natural high (914.90) and low (914.25) water levels based on water level data recorded in 1971-1975.

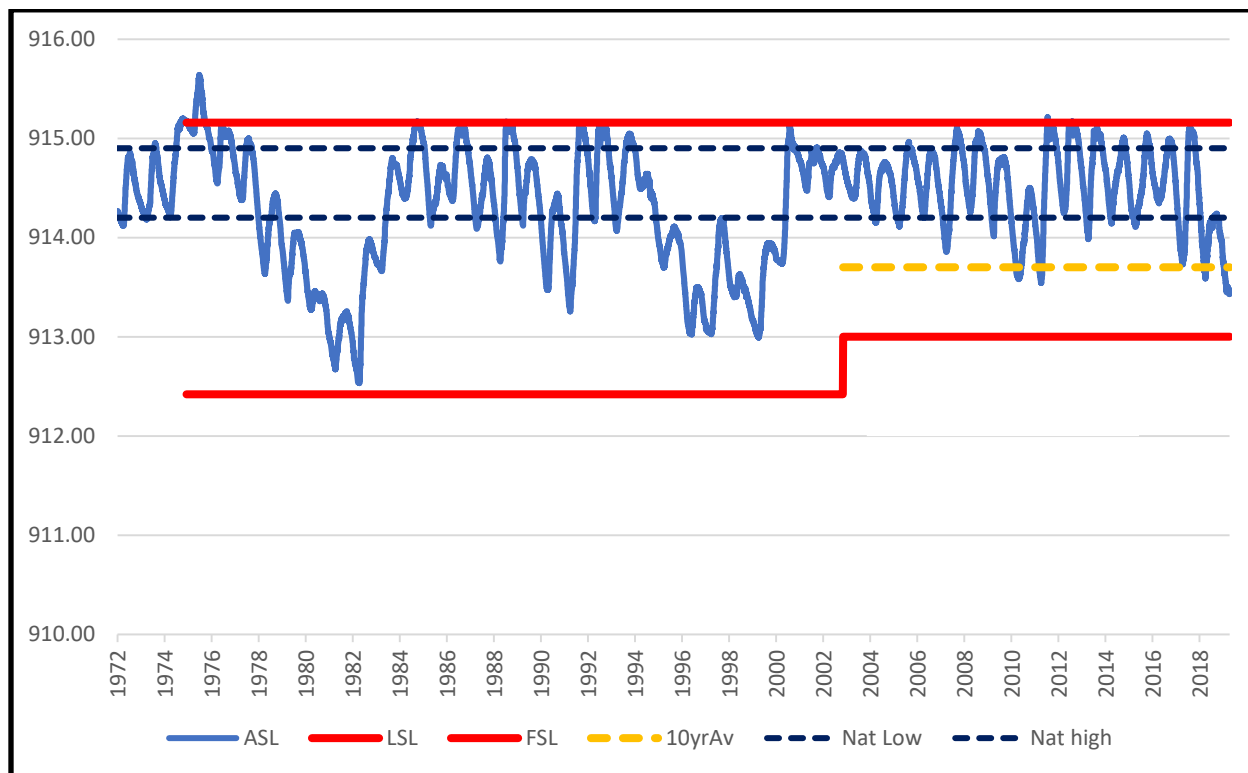


Figure 3. Aishihik Lake Water Levels 1972-2019 in Metres above Sea Level (masl)

YEC’s Project Proposal includes predictions of water levels during the three-year renewal based on assumptions about climate conditions, electrical loads, and the role of the AGS in the electrical grid.

3.5 Uncertainty about Conditions and Effects

CAFN Worldview – The Need to Proceed with Caution

“Our landscapes – and the lifeforces contained within – are active, sometimes violent, and often unpredictable. For all that we can learn through our life on the land and our stories, there is so much more that we can’t ever know or control. To manage for this uncertainty, we observe adùulj.” (Appendix 1, Traditional Knowledge Report)

“There are lots of dangerous spots out there [on the land]. You’re not supposed to touch anything, break anything, dig up anything or whatever.” (Name ., n.d., Appendix 3)

As described in other sections of this report and the attached appendices, there are many data gaps and uncertainties in our understanding of environmental/socio-economic conditions and effects of the AGS. Planning for a long-term renewal will benefit from ongoing research and investigation. But no matter how much we know and study and learn about *Āshèyi*, there is always so much that we can never know or learn. The land, water, air, fish, birds, wildlife, people and all the other parts are interconnected and we can never fully understand how changes in one may affect another. Joella Hogan’s report “The Land is What Gives Us Energy – Social and Cultural Impact Study for Aishihik Dam Relicensing,” attached as Appendix 3, summarizes the perspectives of *Āshèyi kwädän* about people’s ability to understand the world:

“Perhaps the biggest message from the people and the work that has been done, is about how much we don’t know. The elders and community members have shared that they are seeing so many changes on the landscape since the constriction of the dam. This unpredictability has serious implications for the people who live and survive off of the land.”

Given the shortfalls in our knowledge and understanding, and the uncertainties about what we don’t know, following *adùulj* tells us we must proceed with caution and humility.

Scientific Data Gaps and Uncertainties

CAFN’s consultants have identified many areas where we lack information that is needed to support evaluation of effects and decision-making about how to implement the project. For example, Appendix 4, “*Developing a 3-Yr Workplan Leading up to the 2022 Relicensing of Aishihik Generating Station – Questions and Ideas for Working Group Consideration*,” prepared by Gottfried Pestal on behalf of CAFN, highlights a series of questions related to Whitefish that warrant further consideration as planning for long-term licensing proceeds. Reports prepared by other consultants identify areas of uncertainty for a variety of environmental and social components. With the procedural mitigation described in Section 4.0 of this report, many of these issues can be addressed during the three-year period, to support future relicensing processes.

Even for the three-year renewal, there are some important limitations and uncertainties that must be considered when trying to predict the future conditions and effects.

Water Levels – Past versus Predicted

The distinction between the actual water levels experienced under the existing licence and the allowable range – in both the existing licence and the proposed project – is an important limitation to be cognizant of in respect of the project description and the assessment of activities and effects. Figure 3 illustrates that water levels since 2002 have not spanned the full range allowed in the water licence. For example, from 2001-2014 low supply levels have only gone below 913.7 twice. From 2001 to 2019, water levels have never reached the low supply level and have only begun to approach it in the recent years (e.g. 913.4 in May 2019). Therefore, the existing conditions and effects may not be representative of the effects that could occur if climatic conditions and energy demand during the proposed three-year renewal lead to more aggressive use of the allowable water level range. Appendix 5 provides a more detailed comparison of water levels experienced during operations under the current licence and those predicted by YEC for long-term future operations using the same water management constraints.

Defining Natural Water Levels

A further limitation is that we do not have a good understanding natural water levels. Collection of lake level data began in 1971. Although the AGS was not commissioned until 1975, construction on AGS started in 1972, with activities such as dredging, rerouting water, and coffer dams potentially altering lake levels. Reliable pre-project data is therefore only available for 1 year, with an additional 2 years where effects of construction activities are unknown. As noted in D. D. Andres “*Review of Ice-Related Issues*,” attached as Appendix 6 and completed on behalf of CAFN, Acres International Ltd. carried out modelling in 1998 to develop an interpretation of natural water levels. The Andres report highlights the importance of updating this modelling to support planning for future relicensing. At this stage, it is important to use caution when interpreting the pre-project ‘natural water levels’ and to listen to the knowledge provided by those with a deep understanding of pre-project conditions.

Modelling Uncertainties

There are many uncertainties to projecting both expected annual variability of water balance (e.g., wet and dry years) and for estimating energy demand. These factors, are further complicated by the role of the Aishihik Generating Station as part of an integrated energy generation system. Conditions and operations for other generating stations can have a large influence on water use and water levels at Aishihik. For instance, dry conditions in the Mayo Lake area led to reduced generation from the Mayo generating station in 2016/17 which resulted in increased energy production and drawdown at Aishihik Lake. This can have multi-year effects on water levels and Aishihik Lake.

The predictions and effects assessment supporting YEC’s proposal for a three-year renewal are highly dependent on the accuracy of the modeling outputs for lake levels and streamflows. YEC uses a power benefit optimization program (LT VISTA – Hatch®) that provides tabular and graphic outputs from lake level and inflow estimates. The results are highly dependent on YEC’s assumptions about power demand (i.e., load estimates), which in turn, are based on exercises like the recently developed 2016 Resource Plan that YEC filed with the Public Utilities Board. Appendix 16 examines some of the underlying assumptions and factors that should be understood as part of the setting of the context for the project operations and its effects on the Aishihik area.

4.0 Three-Year Renewal: Procedural Mitigation

From the outset, the construction and operation of the AGS has adversely affected CAFN citizens, lands, resources and water. The scope of effects and their significance have varied through the life of the project, but as described in this submission, adverse environmental and socio-economic effects are ongoing and are expected to continue through the period of the three-year renewal.

However, CAFN considers the proposed three-year licence renewal as an interim procedural mitigation to address adverse effects of the project that would otherwise be considered significant. This procedural mitigation is founded on CAFN’s acceptance that YG and YEC will work with CAFN during the three-year period including to:

- establish YEC/CAFN cooperative and collaborative processes to begin addressing the social legacy of the project by building a foundation of respect and trust among the parties;

- develop and implement mitigation and monitoring measures for downstream activities and effects;
- design and undertake research, investigations and analysis that are needed to develop a comprehensive understanding of environmental and socio-economic conditions and potential effects of long-term AGS operation, and define appropriate mitigation mechanisms to address effects.

The continued operation of the AGS with water management parameters that remain unchanged from the existing approvals will lead to continuation of effects that have occurred during previous operations and are occurring now. CAFN citizens have made it clear to us that *Äshèyi Män* is sick. CAFN recognizes that some effects could worsen during the three-year period if the water inflows and/or electrical load demands lead to more aggressive use of the allowable water level ranges than has occurred since the previous licence renewal. Also, we are concerned about the effects on our citizens, especially our elders who have waited a long time to have their concerns about effects on *Äshèyi* addressed, and who may have limited time left to benefit from future restoration of *Äshèyi*. Nonetheless, the renewal period is short in comparison to the historic operation of the AGS. CAFN considers the ongoing effects to be tolerable for only this short duration. We can tolerate the effects because YEC and Government of Yukon (YG) have agreed to work with us during that period to discuss and resolve issues. We believe the commitments from YG and YEC are genuine. It is our expectation that we will collaboratively use the time to investigate and characterize the effects, and develop appropriate operating regimes and mitigation measures to help relieve the pressure on, and restore the health of, *Äshèyi*. Thus, despite our concerns we believe the significance of most ongoing effects of the AGS for this limited period can be addressed by establishing appropriate processes to resolve the issues for the longer-term. All other potentially significant effects for the three-year renewal can be addressed by other specific recommendations in this report.

Recommendation 1: In addition to other specific recommendations in this submission, CAFN recommends that the DO should acknowledge and incorporate process-based mitigation to address existing and ongoing effects of the AGS and associated activities for the duration of the three-year renewal. With that approach, the Evaluation Report should:

- Acknowledge the effects that the AGS has had and may have on a range of environmental and socio-economic values and conditions;
- When evaluating significance, recognize that the three-year limited duration of the proposed renewal reduces the significance of potential effects; and
- Address the significance of adverse effects by including conditions that require, in collaboration with CAFN:
 - Further investigation and characterization of effects of the AGS, and
 - Development of future operating regimes and mitigation measures intended to directly address adverse environmental and socio-economic effects of the AGS.

5.0 Scope of Project

The scope of the project being assessed in the YESAA assessment was a topic of discourse during the adequacy review phase. This is not surprising because YEC developed many of its documents to support a 25-year renewal of its licence rather than the three-year renewal that is now under consideration.

The DO's interpretation of the scope is described in the public notice for the project. CAFN agrees with the DO's general statement of project scope, that the project is the continued operation and maintenance of the Aishihik Hydroelectric Generating Station for a period of three years in accordance with the same water management conditions that are currently in place. This is the general scope that CAFN has considered during our review and evaluation of potential effects of the proposed three-year renewal. We have not considered the effects of continued operation beyond the three-year period, and it is our expectation that such effects will be thoroughly considered in a subsequent, comprehensive YESAA assessment before any authorization is granted for operation beyond three years.

The DO's statement of project scope also identifies various ancillary activities and monitoring programs. CAFN agrees that these activities should be included in the scope of the project for assessment of the three-year renewal. CAFN's understanding is that the monitoring programs in this three-year period will have many objectives, including at least the following:

- To characterize current environmental and socio-economic conditions, and understand past and existing effects of the AGS.
- To characterize and understand ongoing effects of the continued operation of the AGS.
- To support prediction of future effects, and design of appropriate mitigation responses.
- To support decision-making for the purposes of adaptive management responses.

In its description of project scope, the DO also delineates a geographic area and includes a list of activities that do not form part scope for the three-year renewal. The DO's list excludes the implementation of any flow management actions to address downstream erosion, sedimentation, icing, and other issues: *"...there will be ... no winter downstream flow management to reduce winter overflow, related flooding and improve ice conditions on the lower Aishihik River."* CAFN and YEC have agreed that downstream flow management should be a focus of a monitoring and adaptive management plan, and that actions should be considered and implemented in the three-year period. We expect that this mitigation approach can address the significance of adverse effects occurring in the Aishihik River over the three-year period. These actions would be voluntary actions taken within the constraints of the conditions of the existing licence and authorization. The adjustment of water management within the existing regulatory constraints is similar to the approach that has been applied at both Whitehorse Rapids and Mayo River hydro facilities in the past.

The DO's list also excludes a wide range of monitoring activities because YEC has indicated that these monitoring activities would not be part of the effects monitoring during the three-year renewal. However, effects monitoring is only one of the purposes of monitoring that will be required over the next three years. The development of a proposal for a long-term renewal will require monitoring for a wide range of environmental and socio-economic components. The three-year renewal is intended to provide an opportunity to develop a better understanding of issues and concerns, and develop methods

to address them. This information will be needed to support CAFN/YG/YEC collaborative efforts to develop effective mitigation for inclusion in any proposal for long-term renewal. Constraining the scope of monitoring that can be conducted could limit the effectiveness of the three-year renewal period. In addition, some of the monitoring that is excluded (e.g., monitoring of downstream riparian vegetation) may be critical for effective implementation of an adaptive management plan for mitigating downstream effects.

CAFN was concerned that the exclusions may constrain the proponent's flexibility to cooperate with us during the three-year period to implement critical mitigation measures or conduct monitoring that will be needed to achieve the overall objectives of the three-year renewal. However, we have discussed this with YEC and it has confirmed that its agreement with the scope defined by the DO will not limit its capacity to consider and undertake monitoring and mitigation within the constraints of the water management parameters of the licence. YEC has also confirmed its understanding that the exclusion of these matters from the scope of the assessment for the three-year renewal would not extend to any assessment for a long-term renewal.

Based on YEC's clarifications, CAFN accepts that the assessment can proceed based on the DO's interpretation of the scope of the project. It would be beneficial for the Evaluation Report to confirm that the DO agrees with YEC's conclusions about its flexibility to conduct monitoring and mitigation within the constraints of the water management parameters, and that the exclusion of these matters from the scope is limited to the three-year renewal.

6.0 Scope of Assessment

6.1 Valued Components – What Matters

YEC lists its proposed VCs and Intermediate Components (ICs) in Tables 7.2-1 and 7.3-1 of its Project Proposal. As noted in the Project Proposal, YEC sought and considered input from CAFN to support selection of VCs. CAFN agrees that the components identified by YEC are VCs and should be considered in the assessment. Nonetheless, YEC's final list of proposed VCs does not address the full range of environmental and socio-economic components that CAFN considers relevant for assessment of the ongoing operation of the AGS.

Because of the importance of *Āshèyi* for CAFN citizens, we have expended significant effort to identify the VCs associated with the area and the project. The effects of past operations have offered an opportunity for us to reflect on the types of effects and issues that have arisen, and the environmental and socio-economic components they have affected. Discussions with community members have highlighted current concerns and values, many of which are impacted by past effects, and potential future effects. For example, people often express concern that decisions about the AGS that have adverse effects on them are made without their participation, making it clear that they consider self-determination as a key VC. Similarly, people often express concern about how the AGS affects their ability to teach younger generations about important parts of CAFN culture, demonstrating that cultural sustainability is another key VC. In this way, the consideration of past effects and potential pathways for future effects has guided us in the identification of CAFN's VCs associated with *Āshèyi* and operation of

the AGS. The following appendices provide summaries of some CAFN discussions that helped to support identification of VCs:

- Appendix 7: “Champagne and Aishihik Community Advisory Committee (CACAC) Priorities/Recommendations – March 26, 2018” summarizes recommendations from a CAFN advisory body for the AGS relicensing. The CACAC provided a forum for CAFN to gather community input during participation in the Protocol Agreement with YEC.
- Appendix 8: “Aishihik Hydro Relicensing, CAFN Relicensing Objectives.” Slater Environmental Memorandum dated June 13, 2018. This memo summarizes results of two workshops with CAFN citizens, held to discuss objectives for *Āshèyi* and AGS relicensing.
- Appendix 9: “Aishihik Relicensing Alternative Evaluation Workshop – September 5-7, 2018.” Slater Environmental Memorandum dated October 5, 2018. Sections 4.0 and 5.0 of this memo summarize key information, knowledge and lessons from the workshop.

Table 2 lists CAFN’s VCs and sub-components, and provides a short rationale for CAFN’s identification of each VC. The Table also identifies a selection of rights and interests associated with each of the VCs and sub-components. CAFN has identified this more comprehensive list of VCs because it is important to understand the effects of the AGS on this broader range of environmental and socio-economic components. However, CAFN also recognizes that there are many complexities associated with characterizing effects on these VCs, and establishing mitigation to address effects. Characterizing and evaluating effects on these VCs will be needed for any long-term renewal, but is not achievable or necessary in the context of the proposed three-year renewal. CAFN has concluded that the procedural mitigation offered by the three-year renewal provides an opportunity to complete the work needed to more fully understand existing and potential effects on the VCs and develop appropriate mitigation to address ongoing and potential future effects. A further advantage of the procedural mitigation approach is that the three-year renewal may offer opportunities to pre-implement mitigation measures (e.g., mechanisms to involve CAFN in decision-making) and begin to test their effectiveness.

Table 2. CAFN Valued Components for Ähèyi and the AGS

Valued Component	Rationale	Type	Sub-Component	Selected Rights and Interests
<p style="text-align: center;">CAFN Self-Determination</p>	<p>One of the most common concerns expressed by CAFN citizens is that decisions about AGS are made against their will and/or without their participation. Similar effects could continue in the future if AGS management and decision-making remains unchanged. Self-determination is also a right identified in the UNDRIP²</p>	Individual	Liberty, security and comfort of CAFN citizens in engaging in subsistence activities	16.1.1.5 to guarantee the rights of Yukon Indian People to harvest 16.1.1.9 to honour the Harvesting and Fish and Wildlife management customs of Yukon Indian People and to provide for the Yukon Indian People’s ongoing needs for Fish and Wildlife
			Ability and comfort re-access to the land and water in all seasons	6.2.1 A Yukon Indian Person has and a Yukon First Nations has a right of access...6.2.1.2 the access is for the purpose of Harvesting Fish and Wildlife in accordance with Chapter 16 – Fish and Wildlife
			Ability to pursue traditional and cultural practices	CACAC Priority 5: Support and enhance community development and cultural well-being 16.1.1.3 to preserve and enhance the culture, identity and values of Yukon Indian People 16.1.1.5 to guarantee the rights of Yukon Indian People to harvest
		Community	Participation of CAFN government in project decision-making	CACAC Priority 3: Improve management processes and decision making
			Consistency with spirit and intent of treaties	CAFN Final Agreement (FA)
			Free, prior and informed consent re effects on people or land and water	UNDRIP
			CAFN traditional economy	12.1.1 recognizes and enhances...the traditional economy of Yukon Indian People and their special relationship with the wilderness Environment 12.4.2.2 the need to protect the cultures, traditions, health and lifestyles of Yukon Indian People and of other residents of the Yukon
			CAFN employment and business opportunities	22.1.1.1 to provide Yukon Indian People with opportunities to participate in the Yukon economy 22.1.1.2 to develop economic self-reliance for Yukon Indian People
			CAFN recreational opportunities	12.4.2.2 the need to protect the cultures, traditions, health and lifestyles of Yukon Indian People and of other residents of the Yukon
			Revenue generating opportunities	22.1.3 to ensure that Yukon Indian People obtain economic benefits that flow directly from the Settlement Agreements

² United Nations Declaration on the Rights of Indigenous Peoples

Table 2. CAFN Valued Components for Ähèyi and the AGS

Valued Component	Rationale	Type	Sub-Component	Selected Rights and Interests
			Promote/teach/share/use CAFN traditional knowledge to inform decision-making	12.1.1.2 provides for guaranteed participation by Yukon Indian People and utilizes the knowledge and experience of the Yukon Indian People in the development assessment process 16.1.1.7 to integrate the relevant knowledge and experience of both Yukon Indian People and of the scientific communities in order to achieve Conservation
			Maintain water quality and flow for cultural uses	14.1.1 The objective of this chapter is to maintain the Water of the Yukon in a natural condition while providing for its sustainable use. “Traditional Use” means the Use of Water, without substantially altering the quality, quantity or rate of flow, including seasonal rate of flow, by a Yukon Indian Person for trapping and non-commercial Harvesting, including transportation relating to such trapping and Harvesting for traditional heritage, cultural and spiritual purposes.
Project Social Legacy and Community well-being	CAFN citizens often express their lack of trust in the proponent and information provided by the proponent. They also express concern about how the past and ongoing effects of the project affect the community and people’s connection to the land and water. Finally, they often highlight the need for reconciliation – including addressing the legacies of the AGS. Addressing the legacies of the project (both environmental and social) is closely linked with the well-being of the communities affected by the AGS.	Institutional Relationships	Confidence in project decision-making	CACAC Priority 3: Improve management processes and decision making Sept Workshop memo
			Trust in project leadership	
			Trust in monitoring programs and results	
		Relationships to Land and Water	CAFN people’s connection to land and water	12.4.2 YDAB and each DO shall consider the following matters when carrying out their functions: 12.4.2.1 the need to protect the special relationship between Yukon Indian People and the Yukon wilderness Environment 12.4.2.2 the need to protect the cultures, traditions, health and lifestyles of Yukon Indian People and of other residents of the Yukon 6.4.3 The right of access provided in 6.4.1 and 6.4.2 shall be subject to the conditions that there shall be no: 5.4.3.3 unnecessary interference with the use and peaceful enjoyment of its Settlement Land by the Yukon First Nation CACAC Priority 1: Restore and maintain healthy lakes, rivers, wetlands and surrounding habitats CACAC Priority 2: Protect, enhance and restore the village
			CAFN people’s ability to pursue traditional land use and activities	
			CAFN people’s ability to pursue recreational and other land use	

Table 2. CAFN Valued Components for Ähèyi and the AGS

Valued Component	Rationale	Type	Sub-Component	Selected Rights and Interests
		Relationships with Ancestors	Connection to heritage and identity	12.1.1 recognizes and enhances...the traditional economy of Yukon Indian People and their special relationship with the wilderness Environment 13.1.1.11 to recognize that oral history is a valid and relevant form of research
		Reconciliation and Impact Equity	Resolution of legacy issues and claims	CACAC Priority 2: Protect, enhance and restore the village CACAC Priority 3: Improve management processes and decision making CACAC Priority 4: Improve infrastructure
			Future relationship with YEC	CACAC Priority 5: Support and enhance community development and cultural well-being Sept Workshop memo
			Impact equity	Social Impact report
Public Health and Safety	People have a wide range of concerns about safety when using and accessing Äshèyi and areas affected by the AGS.	Safe access	Safe access and navigation on open water and ice conditions Safe access to shoreline and trails	6.2.1 A Yukon Indian Person has and a Yukon First Nations has a right of access...6.2.1.2 the access is for the purpose of Harvesting Fish and Wildlife in accordance with Chapter 16 – Fish and Wildlife
Traditional, Local and Regional Economy	CAFN citizens and government commonly express concern about how AGS has affected the traditional economy, the past and ongoing lack of opportunities and benefits for CAFN, and the inequity between those who benefit from the AGS and those who experience the most effects.	Local Economy	CAFN traditional economy	FA Ch 12 – see above
			CAFN employment and business opportunities	22.1.1.1 to provide Yukon Indian People with opportunities to participate in the Yukon economy 22.1.1.2 to develop economic self-reliance for Yukon Indian People
			Revenue generating opportunities	CACAC Priority 5: Support and enhance community development and cultural well-being
			Balancing of benefits and effects	22.1.3 to ensure that Yukon Indian People obtain economic benefits that flow directly from the Settlement Agreements
		Regional Economy	Utility rates Affordable and reliable power to CAFN citizens and businesses	

Table 2. CAFN Valued Components for Ähèyi and the AGS

Valued Component	Rationale	Type	Sub-Component	Selected Rights and Interests	
Environmental and Cultural Integrity, and Productive Capacity of CAFN Traditional Lands	CAFN have been stewards of our traditional lands for thousands of years and will continue to be for many generations into the future. Our land and our culture are inseparable and any evaluation of effects needs to consider the environmental and cultural integrity holistically. The VC includes many of the biophysical VCs identified by YEC, but incorporates the inherently connected cultural aspects.	Cultural Integrity/ Sustainability	Traditional knowledge perspectives about environmental and cultural integrity and productive capacity	12.4.2 YDAB and each DO shall consider the following matters when carrying out their functions: 12.4.2.1 the need to protect the special relationship between Yukon Indian People and the Yukon wilderness Environment 12.4.2.2 the need to protect the cultures, traditions, health and lifestyles of Yukon Indian People and of other residents of the Yukon	
			CAFN people’s connection to the land and water	CACAC Priority 1: Restore and maintain healthy lakes, rivers, wetlands and surrounding habitats CACAC Priority 2: Protect, enhance and restore the village	
		Fish and Fish Habitat	Upstream fish and fish habitat	16.1.1.5 to guarantee the rights of Yukon Indian People to harvest 16.1.1.9 to honour the Harvesting and Fish and Wildlife management customs of Yukon Indian People and to provide for the Yukon Indian People’s ongoing needs for Fish and Wildlife 17.2.1 Subject to its Settlement Agreement, each Yukon First Nation shall own, manage, allocate and protect the Forest Resources on its Settlement Land.	
			Downstream fish and fish habitat		
		Wildlife and Wildlife Habitat	Upstream wildlife and habitat		
			Downstream vegetation		
		Plant communities	Vegetation and plant communities		
		Heritage Resources	Heritage sites surrounding the reservoir		13.1.1.8 to identify and mitigation the impact of development upon Heritage Resources through integrated resource management including land use planning and development assessment processes CACAC Priority 2: Protect, enhance and restore the village
			Heritage sites downstream		
			Sites of cultural significance		
Global climate stability	Maintain global climate conditions				

6.2 Geographic Boundaries

The AGS has led to water and aquatic changes that extend beyond Aishihik Lake and Aishihik River in both upstream and downstream directions. In its May 21, 2019 response to the Designated Office's May 17, 2019 Information Request, YEC clarifies its interpretation of the areas affected by AGS operations and states:

“The extent of upstream area included in the Project Location is better terminated in the lower part of the Sekulmun River, where the in-river weir is located. Sekulmun Lake provides natural (unregualted) storage of water, but is not influenced by the AGS operations and therefore should not be included in the Project's footprint.”

The information in YEC's proposal supports the assertion that water levels in Sekulmun Lake are not likely to be directly influenced by water level management on Aishihik Lake. However, the HEC RAS analysis described in Appendix F of Appendix 5A in the Project Proposal indicates that water levels in Sekulmun River can be directly influenced by Aishihik Lake levels throughout most of its 7 km length. These influences extend to connected ponds in the Sekulmun wetlands. The in-river weir is located just upstream of where the Sekulmun River enters Aishihik Lake. Establishing the weir as the upstream limit for consideration of effects would exclude consideration of some important existing and potential effects.

At the downstream end, YEC has proposed that effects downstream of the confluence of the Aishihik River with the Dezadeash River do not warrant consideration in the assessment. CAFN does not agree with this proposed limitation. For example, approximately 50% of the winter flow volumes in the Dezadeash River at Haines Junction (measured at the Water Survey of Canada Hydrometric Station near the Haines Highway bridge) are sourced from the discharge volumes of the AGS. Water levels fluctuations on a daily basis can be as much as 20 - 25 cm when the AGS is used for load following in winter. Direct measurable changes in water flows occur at least as far downstream as the confluence of the Dezadeash and Kaskawulsh Rivers.

While the assessment of effects for long-term operation of the AGS should consider all areas in which the AGS may cause adverse effects, CAFN has concluded that an expansion of geographic boundaries is not required for the three-year renewal. For any long-term renewal however, the geographic boundaries for the assessment should be expanded to include additional upstream and downstream areas where activities, water level and flow management for the AGS leads to measurable, direct changes in water flows and levels. For the three-year renewal, CAFN is prepared to tolerate the effects in these areas because they will have limited duration and because we expect to consider these areas and identify any necessary measures to address effects in these areas as part of the process described in the procedural mitigation (Section 4 of this report).

6.3 Baseline Conditions and Effects of Historic AGS Activities

In the description of assessment methodology in Project Proposal Chapter 7, YEC states that it is relying on current conditions as a baseline for conducting the assessment:

“Project effects for each VC are the anticipated conditions with the Project during the new licence term compared to existing or baseline conditions today, and considering any observed trends, in areas affected by the AGS and the Existing Licence.”

YEC goes on to state that past effects are considered in the assessment because the current conditions already incorporate any effects that have occurred from past operations. This approach to environmental and socio-economic assessment can only be effective if it is combined with an evaluation of the extent to which existing conditions have changed from pre-project baseline conditions, and whether those changes represent significant adverse effects. The assessment presented in the Project Proposal does not demonstrate that this has been achieved.

For example, the assessment endpoints identified for the Fish and Fish Habitat VC are to “maintain healthy and sustainable fish populations.” These endpoints are based on YEC’s interpretation that current fish populations are healthy and sustainable, but lack a comparison between the current “healthy and sustainable” fish populations and those that may have been present prior to project development.

Nicholas de Graff of Can-nic-a-nick Environmental reviewed the Project Proposal on behalf of CAFN. de Graff’s review report is provided as Appendix 10. de Graff discusses the effects of early AGS operations on Whitefish and agrees that the YEC data indicate that the fish appear to be recovering. But he notes that “we have limited information to understand how the recovery compares to the conditions before construction of the AGS because the project developers did not characterize these conditions” and that “traditional knowledge holders indicate that fish populations in the lake and traditional use activities continue to be affected by the changes arising from the AGS.”

de Graff also discusses the issue of fish passage and notes that the current facilities and operations have compromised the free movement of fish in the Aishihik system. This constitutes a substantial change from pre-project conditions. While the current conditions may support what is depicted as “healthy and sustainable” fish populations relative to periods of more extreme impact, this does not mean that current conditions should be considered acceptable, or that significant adverse effects are not part of the current conditions.

As we have throughout planning processes for the AGS, CAFN continues to consider pre-project conditions as the “baseline” for this project. For thousands of years before AGS, *Āshèyi* was a healthy lake and a healthy community which served as the regional hub for many Yukon First Nations. This is the baseline that has changed and will continue to change with AGS and therefore must be the baseline considered.

7.0 Existing and Ongoing Effects

As noted in Sections 3 and 4 of this report, there are existing and ongoing effects of AGS that are presently impacting *Āshèyi* and CAFN. We expect many of these effects to continue to impact CAFN and its citizens throughout the 3-year period. However, as stated in Section 4.0, CAFN has concluded that potentially significant effects can be mitigated for the period of this short-term renewal by the

procedural mitigation providing CAFN, YG and YEC with an opportunity to collaboratively plan for addressing existing and ongoing effects as part of a future long-term renewal.

The purpose of this section of our report is to identify and summarize the range of effects on VCs that will need to be addressed to support a YESAA assessment for a long-term renewal. Our intention is that this will assist the DO to understand matters that must be addressed during the three-year procedural mitigation period, so that the work completed during the three-year period will support a future comprehensive assessment for a long-term renewal.

CAFN's characterization and interpretation of effects described in this section of our report of course rely heavily on the traditional knowledge of the people of *Āshèyi*, as described in Appendix 1, the Traditional Knowledge Report. In addition, CAFN relies on a team of experts to support our ongoing review of information related to the AGS and our own research and investigations about *Āshèyi*, and to strengthen our participation in processes and discussions with other governments. Several members of our team reviewed the Project Proposal and have provided reports that summarize the findings and recommendations from their reviews. Our experts' reports are attached as appendices, but in accordance with the proposed procedural mitigation, CAFN is not asking the DO to consider the details of these reports in reaching conclusions about the effects of the three-year renewal. In many cases investigation, review and analysis of issues and concerns is ongoing, and therefore the findings and recommendations may be further developed and refined as we work with YEC, YG and other parties during the three-year period. Nonetheless, the reports provide a clear indication of the broad scope of issues and effects that need to be addressed when planning for the long-term renewal. We have attached the following reports to provide context for CAFN's position that is described in this report:

- Appendix 3: "The Land is What Gives Us Energy: Social & Cultural Impact Study for Aishihik Dam Relicensing." Joella Hogan. June 2019. This review and research report focus on understanding social and cultural conditions and effects.
- Appendix 4: "Developing a 3-yr Workplan Leading up to the 2022 Relicensing of the Aishihik Generating Station (AGS), Questions & Ideas for Working Group Consideration." SOLV Consulting, Gottfried Pestal. April 18, 2019. This memo provides a series of recommendations for issues that need to be addressed as planning progresses for long-term operation of the AGS.
- Appendix 6: "Review of Ice-Related Issues, Yukon Energy Corporation Project Proposal 2019-0035." D. D. Andres. June 2019. The Andres review is focused on ice-related issues in rivers, and associated modelling requirements.
- Appendix 10: "Characterization of Fish and Fish Habitat Effects – Aishihik Lake, Yukon." Can-nick-a-nick Environmental Services, Nicholas de Graff. May 30, 2019. The de Graff review is focused on the conditions of and effects on fish and fish habitat in areas upstream of the generating facility.
- Appendix 11: "Fish and Fish Habitat in the Aishihik Region." AvF Restoration and Development, Al von Finster. June 10, 2019. The von Finster review is focused on fish and fish habitat in rivers affected by the AGS.

- Appendix 12: “Technical Review of Lake Whitefish Index Net Survey Data from Aishihik and Canyon lakes, Yukon.” SOLV Consulting, Gottfried Pestal. June 11, 2019. The Pestal review focuses on interpretation of fish-related data.
- Appendix 13: “Sediment Transport Downstream of the Aishihik Generating Station, Observations and Recommendations.” M. Miles and Associates Ltd., Mike Miles, and Dave Andres. May 2019.
- Appendix 14: “Rigorous Adaptive Management Within the Context of YEC’s AGS Project.” M. Miles and Associates Ltd., Mike Miles. June 19, 2019.
- Appendix 15: “Hydrologic comments with respect to Aishihik Renewal / Environmental Impact Assessment.” Patrick Hudson, Hydrologic Inc. June 2019.
- Appendix 16: “Aishihik relicensing – comments on YEC’s 3-year water licence application to YESAB.” John Maissan. April 25, 2019.

In addition to reviewing YEC’s documentation, CAFN with the support of its consultants has also completed its own research to support our understanding of conditions at *Äshèyi*. We have included the following reports that summarize some of our findings:

- Appendix 17: “Sekulmun Wetlands Survey – April 14, 2019.” Can-nic-a-nick Environmental, Nicholas de Graff. May 30, 2019.
- Appendix 18: “Summary of Spring Observations Aishihik and Dezadeash Rivers, April 7, 2018.” M. Miles and Associates Ltd., Mike Miles. June 30, 2018.
- Appendix 19: “Summary of Spring Observations Aishihik and Dezadeash Rivers, April 8 & 9, 2019.” M. Miles and Associates Ltd., Mike Miles, and Dave Andres. June 14, 2019.
- Appendix 20: “Aishihik Field Trip, Low Water Level Reconnaissance.” Roger Brown, CAFN. June 25, 2019.
- Appendix 21: “Aishihik Field Trip 2, Aishihik Village Bay and Sekulmun Wetlands and River Reconnaissance.” Roger Brown, CAFN. June 25, 2019.
- Appendix 22: “CAFN Compendium of Photos YEC Aishihik Project.” Roger Brown, CAFN. June 2019.
- Appendix 23: “Aishihik Field Trip, North End Ice Thickness Measures.” Roger Brown, CAFN. April 2018.
- Appendix 24: “Canyon Creek Inspection of Aishihik River and Ice Overflow Issues.” Roger Brown, CAFN.

The following sections summarize some of the key effects of the AGS on each of the VCs identified in Section 6.1.

7.1 Self-determination

Appendix 3, *The Land is What Gives Us Energy*, provides a detailed description of CAFN views about the status of our vision for self-determination, and an analysis of the effects of the AGS on our self-determination.

“We are not in full agreement to the construction of the project. Therefore, we will not give our consent at this time.” – Chief Name _____, 1972

"This project here that you are talking about - no one has asked any of the Indian people here, would they like it - in their native tongue. We have interpreters here that Mr. Chairman could have called upon and asked them whether they would like to see the project go through or not. I think, it is my view, that these people are human beings and they are living on their ancestor's home and country." – Chief Name , 1972

"They just told us they were surveying around the land and the lake. They never said they were going to build a big dam on the other end and they would flood us out here...[They were] going to go ahead and do what they wanted...Gu'chun'...we didn't know [what they were doing]."
(Appendix 1, AR-TK-OH-PIN19-2017-06-06, Paragraph 54)

As the above quotes illustrate, the AGS project was built without CAFN's consent in the 1970's. It was likely also built without CAFN people even having a clear understanding of what was going to happen:

"The developers of the AGS did not effectively overcome the language barrier faced by the leaders of the Aishihik people when they proposed and developed the AGS. Leaders likely did not understand what was going to happen, let alone what the implications might be for their people." (Appendix 9, Aishihik Relicensing Alternatives Evaluation Workshop)

At the time of project development CAFN leadership requested a delay so that land claims could be finalized before the developers undertook a large project which would have large effects on CAFN and its citizens. Despite the opposition from CAFN, governments approved the project and the developer went ahead, with little consideration for effects on CAFN lands and people.

CAFN expressed concerns about AGS before it was built, and on an ongoing basis after they began to experience direct and indirect effects. CAFN has continued to express concerns at every opportunity since the 1970's, demonstrating that many issues have never been substantially addressed. CAFN people feel that their views have not been substantively considered in AGS decision-making despite them bearing the brunt of adverse effects.

CAFN citizens' concerns about fish and fishing areas provide a relevant example. CAFN expressed grave concern pre-project in 1973 about the potential effects of the dam and its operation on fish and the areas that people used for fishing. CAFN and citizens repeated these concerns during the 2001/2002 relicensing process, and again in the *Āshèyi* Traditional Knowledge project in 2017. The repetition of specific concerns and impacts through time indicates saturation and the lack of reception by other parties to understand and find resolution.

*"I have talked to the older people and they said that the fishing areas will be different, the spawning areas will be different because right now the fish are spawning at certain creeks and certain areas and certain flats of the lake and they said they will be changed." –Name Redacted
1973 (Appendix 1)*

"Fishing.... I use fish mostly for food, dry some for winter use. I give some fish to the elders who can't go out and fish anymore. The fish spawning place around the village was affected. Also when the water level was low, it just left mud pad around the village bay. So the fish is not the same anymore since the dam was put in." –Name Redacted , 2003

"It affects their spawning grounds, you know. The abundance of the food, that's where they feed. It might affect the cycles of you know whatever they [eat], I think they eat little small

snails you know, that are in the mud beds and the lakes. And when the water level drops you know it pushes their habitat further out where they're not accessible – not accessing the – their food.” (Appendix 1, AR-TK-OH-PIN01-2017-07-21, Paragraph 203) (Appendix 1, Traditional Knowledge Report)

The Protocol Agreement (2016) and the Terms of Reference for the Aishihik Advisory Committee were intended to provide greater space for CAFN to have an active role in the decision-making about the AGS.

“Yukon Energy is committed to embarking on a new approach to managing its operations, by seeking and formalizing partnerships for joint consensus-based decision making with Champagne and Aishihik First Nations...” (Aishihik Advisory Committee Terms of Reference)

Unfortunately, the implementation of the Protocol Agreement was short-lived and did not lead to substantial changes in CAFN’s direct participation in decision-making.

From the outset, the AGS has led to substantial deterioration of the self-determination VC for CAFN and its citizens. In the current condition, we have little control over AGS related decisions that continue to adversely affect us and our land. While rebuilding the relationships will be a long process, YEC’s and YG’s commitments to collaborate with us during the three-year period to find solutions for long-standing CAFN issues related to the AGS is a step in the right direction. We believe that this approach, if implemented in good faith, can begin to address the significant effects that have already occurred for CAFN self-determination.

Recommendation 2: The Evaluation Report should recognize the importance of CAFN self-determination as a VC, and include a condition that requires YEC to explore methods for sharing decision-making with CAFN when decisions may affect CAFN government, people, resources and/or lands. During the three-year period this should include, for example, collaborative design and implementation of an adaptive management plan for addressing adverse effects that have occurred in areas downstream of the powerhouse.

7.2 Project Social Legacy and Community Well-being

7.2.1 Institutional Relationships

The results of the September 2018 Alternatives Evaluation Workshop (Appendix 9) illustrate that CAFN citizens have little trust in the decision-making and leadership for the AGS. This has led to a lack of trust in the results of monitoring programs and environmental investigations related to relicensing. The conclusions of the Traditional Knowledge Report (Appendix 1) confirm CAFN citizens’ concerns about the current status of the trust-based relationships:

“After the early September workshop, a meeting of the Aishihik Advisory Committee was held on September 25th, 2018, and did not achieve consensus on an operational alternative for lake levels. On September 26th, 2018, YEC informed CAFN government that it would proceed on its own with its desired operational alternative (“Operational Alternative 3”, or status quo minus the 10-year rolling average restriction). This effectively terminated the Protocol Agreement and the parties have not been working together to date. The failure of the Protocol Agreement has damaged the relationship between YEC and CAFN, and this relationship will take time to rebuild. Moving forward, it is important for CAFN government and Dän that the past management of the AGS is properly addressed first, to enable us to trust in a better future and co-management of AGS and Äshèyi Män.”

The lack of trust is a contributing factor in some key recommendations from the CACAC (Appendix 7) for improvement of management processes and decision-making, including:

“Need CAFN people to be involved in the design and operation of a monitoring program, to watch and be stewards of the environment and operations. There should be paid positions with CAFN and YEC for CAFN people to be the monitors.

There needs to be explicit compliance and accountability so that there are changes to the operations according to the results of the monitoring. More frequent reviews and implementation of adaptive management are required to building a better relationship moving forward.

Monitoring and management planning needs to respect and use CAFN traditional decision making processes and apply CAFN traditional knowledge, along with rigorous and defensible scientific research.”

The lack of trust and the deteriorated institutional relationships highlight the importance of measures that include collaborative efforts that will support restoration of the relationships between CAFN and YEC.

7.2.2 Relationships to Land, Water, Ancestors

AGS has put relationships in peril. The relationships to land and water that used to sustain *Āshèyi kwädän* became altered, some beyond adaptation (e.g. harvest areas no longer used). Cultural integrity or relationships with ancestors have also been put at risk because the ability to practice traditions and keep culture living is diminished when practices are not possible. Part 4 of the *Āshèyi* Traditional Knowledge report outlines the ways in which cultural survival has been put at risk, including the relationships and cultural knowledge and practices that shape CAFN worldview.

“Today there isn't much muskrat and beaver to trap. This loss is the greatest. This is my lifestyle, trapping, hunting and fishing. It makes me sad that my grandchildren will not be able to come out with me and trap the muskrats and beaver.” –Name Redacted, 2003

Prior to relocation and AGS, there was strength in the relationship to the land (Appendix 3). The duration of time on the land, ability to be on the land in its pre-project condition and resulting knowledge transfer relationships (e.g. youth and elders) have changed and deteriorated, resulting in knowledge loss for younger generations. This has made people fearful of further impacts to the region, and highlighted the need for listening and understanding about the concerns and priorities of CAFN.

As described in Section 7.3 (Public Health and Safety) for example, the bay at Aishihik Village once provided a safe, sheltered location for elders to teach youth and children about fish and fishing. The Traditional Knowledge Report (Appendix 1) provides details about people’s past experiences in this area. But, the water level fluctuations associated with AGS operations have dramatically changed the character of the bay and its aquatic ecosystem. This sheltered location no longer serves as a suitable location for intergenerational knowledge transfer.

Appendix 3, The Land is What Gives Us Energy, and Appendix 1, the Traditional Knowledge Report, provide additional details about how the AGS has affected CAFN’s relationships to the land, the water and our ancestors.

"Impacts of Aishihik Dam on Relationships to the Land. Duration of time on the land has changed. Knowledge of places, names and stories is being lost. Difficult to access traditional foods at Aishihik. People are fearful of future development projects in CAFN TT." (Appendix 3)

7.2.3 Reconciliation and Impact Equity

"They say that the Yukon is rich but the original people, the Yukon people, have not benefitted directly from these resources. So far the young people have had many empty promises given to them from mining industries and other major industrial developments and yet we see ourselves in the same predicament on a day to day basis of our lives." –Chief Name , 1973

Chief Name 1973 statement illustrates the issue of impact equity, something that has continued to plague the AGS/CAFN relationship: the project has brought large benefits to Yukon as a whole, but CAFN and its citizens have endured the vast majority of the adverse effects. The issue continues to be a concern for CAFN citizens and led to them identifying the following objective for any licence renewal:

"Provide benefits for CAFN and its citizens, to address the imbalance of benefits/costs accrued to CAFN and its citizens." (Appendix 8, Aishihik Hydro Relicensing CAFN Relicensing Objectives.)

Healing and reconciliation must be part of any long-term solution for the AGS, so as to not further endanger the spiritual health of the community (Appendix 3, The Land is What Gives Us Energy). Unresolved trauma is resurfaced with every relicensing, every visit to *Āshèyi*, every meeting with false promises, and every denial of the concerns expressed by CAFN. The stories and anguish shared in Appendix 3, The Land is What Gives Us Energy, and Appendix 1, the Traditional Knowledge Report, highlight the importance of reconciliation as a key component of any effective resolution for long-term AGS related issues and concerns.

As noted in Section 7.1 (Self-Determination), the rebuilding of relationships will be a long-term process, but it is an important way to start reconciliation. The recommendation provided in Section 7.1 is an important step to take during the three-year renewal. Other reconciliation measures will be developed to support a long-term renewal.

7.3 Public Health and Safety

CAFN citizens' safe access to traditional and subsistence use areas is restricted due to project activities. YEC constructed a boat launch ramp at Aishihik Village as a mitigation requirement that arose from the previous relicensing. This boat launch ramp provides access to the lake when low water levels associated with the AGS dewater much of the bay at Aishihik Village. However, accessing the lake at the boat launch only addresses a small part of the overall access issue. People's access to many areas on and around the lake is hampered by AGS related water levels and ice conditions. For example, low water levels as shown in Figure 4 can result in inaccessibility of shoreline/rivers because the dewatered areas between the vegetated shoreline edge and the water are not suitable for boats to land. Access issues are widespread and affect many of CAFN's rights that depend on access to land and water. It is not practical to resolve the widespread issues with individual physical mitigation approaches like construction of boat launches.



Figure 4. Dewatered shorelines during low water conditions make landing with boats difficult or impossible. (May 16, 2019. Water level 913.43 masl.)

During May 2019 site visits, CAFN observed and assessed navigation challenges on the Sekulmun River, and confirmed the observations of CAFN citizens that navigation in this area is adversely affected by conditions in the river and at its mouth in Aishihik Lake, even at levels, well above the low supply level. Observations are described in field reports prepared by CAFN, attached as Appendices 20 and 21.

At a level of approximately 913.43 on May 17, 2019:

“We attempted to access the mouth of the Sekulmun River and found a large area of sediment deposition prevented motorboat access. Water was too shallow to proceed.” (Appendix 20)

At a level of approximately 913.50 masl on May 30, 2019:

“Key observation is that the navigation is okay for a canoe but larger boats with motors would have difficulty navigating a channel. There was no clear and obvious deeper channel to follow for a larger boat. The older channel known to be located between two deposits of sediment at the outlet fan was relatively shallow (25-45 cm) and lower water conditions (e.g., near the license low of 913.0m) would certainly pose a significant navigational barrier to access this key area in springtime by boat. Current conditions are already a barrier to access.” (Appendix 21)

The name *Äshèyi* means ‘under the tail’, which according to traditional knowledge indicates the small bay near the village at the north end of the lake. This bay provided a sheltered, safe location to set nets,

exercise traditional harvest rights and pass cultural knowledge from generation to generation. Since 1975, AGS operations have caused annual flooding and dewatering of the bay and it no longer provides adequate habitat for fish. CAFN people must travel further out into the main area of the lake to fish, an area which is less sheltered and less safe. Figure 5 shows the bay at Aishihik Village in May 2019 with water levels at 913.4. The bay is largely dewatered with no sufficient habitat for fish. The substrate is scoured after another winter of ice sitting on the lake bottom.



Figure 5. The village bay in May 2019 at water level 913.4 masl, looking towards the north end of Aishihik Lake. (CAFN)

"The banks in front of the Village are eroding, the water supply has been drowned and lost to us. One of the graves in our graveyard has been washed away and another one is in danger, water is appearing in low spots in our village where it did not appear previously, obviously due to seepage and raised water table, our wharf has been rendered useless, an island in front of our village which once contained many birds such as seagulls, arctic terns and various kinds of ducks is underwater." –CAFN, 1975

Conditions in the downstream environment have prevented safe passage in all seasons. Fluctuating water flows, erosion and sedimentation, flooding, icing and other operational activities have made many areas downstream of Aishihik Lake impassable or inaccessible seasonally and/or year-round. These conditions continue to limit safe access to culturally important areas and curtail traditional and subsistence activities.

Appendix 3, The Land is What Gives Us Energy, and Appendix 1, the Traditional Knowledge Report, provide additional details about how the AGS has affected people's access to their traditional use areas.

"People lack the confidence to travel in the area due to a lack of knowledge, skill etc. Loss of income from not being able to trap where they used to and/or decrease in numbers from altered landscape. Icing on the river has affected how people travel and prevented some from travelling at all." (Appendix 3)

Appendices 18 (Miles and Associates Field Report 2018) and 22 (CAFN Compendium of Photos), provide visual and descriptive evidence of some of these effects.

7.4 Traditional, Local and Regional Economy

The construction and operation of the AGS had immediate effects on the CAFN traditional economy. These effects have been a long-term source of concern for CAFN and the people of Āshèyi.

"Our trappers have suffered damage due to the furbearing animals moving out of their territories." –CAFN, 1975

Name : *"...I guess my question is when can these people be expected to get back to their traditional harvesting rights? Like for the lake to be able to handle both a traditional harvest"----*

Name : *"I think it will be a while before--based on the low abundance of adult whitefish in the system...but it is not going to be in the next two or three years".* –CAFN, 2001

Despite promises of economic opportunities, throughout its life the AGS has failed to provide any substantial economic opportunities for CAFN or our citizens.

"The hydro facility was built from 1972-1975. And there were, at that time, a number of people hired as slashers. They had contracts to cut certain sections of trees around the lake. But, after that, there were no more jobs for the people, no more economical opportunities. The people that ran the facility, and have run it since it was built, have been non-First Nations people. ...there has been no training for anybody within Champagne-Aishihik to run this facility, or to help run the facility." – Chief Name , 2003

The lack of benefits continues to be a key issue raised by CAFN citizens as confirmed in the Traditional Knowledge Report (Appendix 1) and in The Land is What Gives Us Energy (Appendix 3):

"There are no Agreements with CAFN for preferential hiring within CAFN TT. A few CAFN were hired during the construction of the dam and over the years some men have been linemen. There have also been some contracts for road maintenance. AGS has a long history with mining and all new developments will be connected to the Yukon grid and drawing from Aishihik (recently Victoria Gold was added). Overall, there is a lack of economic opportunities for CAFN members." (Appendix 3)

The current concerns about the effects on traditional economic activities and the lack of benefits led CAFN to address both of these in its objectives for AGS relicensing (Appendix 8). For example:

“Restore CAFN connection to the land and water and participation in traditional and cultural activities in areas affected by the Aishihik hydro project.

Provide benefits for CAFN and its citizens, to address the imbalance of benefits/costs accrued to CAFN and its citizens.”

The adverse effects on CAFN traditional economy, and the lack of AGS related benefits for CAFN and its citizens who bear the brunt of effects from the AGS are clearly not acceptable for a long-term licence renewal. However, as described in Section 4.0 of this report, YEC and YG have agreed to work with CAFN during the term of the three-year renewal to address many outstanding issues. Both YEC and YG have agreed that the scope of discussions includes measures to address economic effects and benefits.

7.5 Environmental and Cultural Integrity, and Productive Capacity of CAFN Traditional Lands

CAFN identified “Environmental and Cultural Integrity, and Productive Capacity of CAFN Traditional Lands” as a holistic VC that reflects the CAFN worldview and recognizes the complex, inter-relationships between all parts of our world of which people are just one part. Part 4 of the Traditional Knowledge Report (Appendix 1) describes the sacred ecology that is a foundation of our cultural survival:

“Sacred ecology involves the health of lands, waters, plants and animals and land-based relationships of Dän that are integral to the well-being of Dän, Dän k’e, and dákeyi. Lands and waters form the base of the physical and spiritual existence of Dän and inform how we are on the land and give back to the land.

“There is no separation between nature and culture.” (Berkes, 1999)

Relationships with the land include local knowledge of the dákeyi (our country), chu (water), and nena (plants) as well as traditional “management” systems which are embedded in a larger moral and ethical context (Berkes, 1999). Implementing this knowledge and these systems requires an active and living understanding of Dän k’e.”

To address the complex nature of the VC, we have considered it through our Traditional Knowledge Study, and by seeking input from our team of scientific, engineering and cultural experts. Summaries of key issues are described in this report with specific findings described in the attached appendices.

Part 4 of the Traditional Knowledge Report (Appendix 1) provides a good summary of CAFN perspectives about the overall status of the environmental and cultural integrity of Äshèyi, and the potential effects on the sustainability of our culture.

“The integrity of nän, chu, and nena has been compromised by the Aishihik Generating System. The ability of Dän to ‘live and survive by this land’ was ignored and oppressed when it was built without our consent, and the practice of not listening to Dän about dákeyi (our country) persist.

The spirituality of chu (water), the power of the lake, is lowered when it is treated as a reservoir. The water is manufactured – it moves up and down and is filtered through systems that interfere with its ability to self-sustain and heal from damages. It does not provide the same energy to Äshèyi kwädän as it has in the past, including physical and spiritual nourishment.

Dän are unable to practice culture when the system is treated this way. We have repeated ourselves over and over since before this project was commissioned. The same impacts have been told through time, and remained unresolved.

“Well, what can you do? You tell people, you tell your story, what, nothing is done, and you just feel helpless, you know?” (Name , 2017)

“We’ve never really had meaningful input into the past processes that have happened in the relicensing... and the different meetings that have happened on Aishihik Lake” (Chief Name , CAFN, 2018)

Our vision is to preserve and protect our cultural integrity through being stewards, caretakers, protectors, and defenders. It is time for the lake to heal, for the people to heal. Healing can only begin by making space for *Dän* to retain their rightful role as stewards in accordance with *adùulj*.

“The lake is the most important thing in human life there. They should let poor old Aishihik heal and look for other alternatives” (Elder Name Redacted , CAFN, 2019)

Appendices 1 and 3 (TK report and Hogan Report) provide additional details about status and concerns related to the overall environmental and cultural integrity of CAFN lands and resources.

Overall, CAFN’s traditional knowledge as well as scientific information leads us to the conclusion that the AGS has already had many severe adverse effects on the environmental and cultural integrity of our traditional lands and resources. The manufacturing of water levels for energy production has degraded the ecosystem integrity and sustainability of Aishihik. There are frequent floods and droughts outside of natural lake levels, and the annual timing of these events is opposite to what occurred pre-project. These ecosystem unbalances have made Aishihik unrecognizable to the people who live and survive by the land. We expect many effects to continue during the three-year renewal. However, the effects are not likely to worsen significantly during this period, and CAFN expects that the procedural mitigation described in Section 4.0 of this report will provide us with an opportunity to define a path forward that will help to restore *Äshèyi*.

The following sections summarize conditions, effects and concerns related to specific environmental components. Many of these components are the same ones addressed in YEC’s assessment of effects of the AGS.

7.5.1 Water and Terrain Stability

The AGS is primarily a water management project, and therefore the project has had and will continue to have adverse effects on water and the adjacent lands, including Settlement Land. Several CAFN consultants address effects on water and adjacent land in their reports, including:

- Appendix 6: “Review of Ice-Related Issues, Yukon Energy Corporation Project Proposal 2019-0035.” D. D. Andres. June 2019. The Andres review is focused on ice-related issues in rivers, and associated modelling requirements.

- Appendix 11: “Fish and Fish Habitat in the Aishihik Region.” AvF Restoration and Development, Al von Finster. June 10, 2019. The von Finster review is focused on fish and fish habitat in rivers affected by the AGS.
- Appendix 13: “Sediment Transport Downstream of the Aishihik Generating Station, Observations and Recommendations.” M. Miles and Associates Ltd., Mike Miles, and Dave Andres. May 2019.
- Appendix 15: “Hydrologic comments with respect to Aishihik Renewal / Environmental Impact Assessment.” Patrick Hudson, Hydrologic Inc. June 2019.
- Appendix 17: “Sekulmun Wetlands Survey – April 14, 2019.” Can-nic-a-nick Environmental, Nicholas de Graff. May 30, 2019.
- Appendix 18: “Summary of Spring Observations Aishihik and Dezadeash Rivers, April 7, 2018.” M. Miles and Associates Ltd., Mike Miles. June 30, 2018.
- Appendix 19: “Summary of Spring Observations Aishihik and Dezadeash Rivers, April 8 & 9, 2019.” M. Miles and Associates Ltd., Mike Miles, and Dave Andres. June 14, 2019.

Appendix 13 describes some of the severe effects that have and are occurring in the Aishihik River downstream of the AGS, including effects that are occurring on Settlement Land:

“During periods of elevated discharge from the AGS, the streamflow downstream of the tailrace can exceed the conveyance capacity of the ice-covered channel and water can flow through these cracks to pond on the ice surface or overflow onto the adjacent flood plain. Field observations indicate that this water can be very turbid. Deposits of fine sediment were commonly observed on both the ice surface and overlying the gravel bed of the river. The residual ice deposits along the channel banks also provide an indication of the frequency of high turbidity events, as recorded by sediment deposits within the ice profile. These materials were fine textured and would be readily transported as suspended sediment load.”

“... post-regulation adjustments in channel regime geometry have caused the Aishihik River channel to generally become straighter and wider. This implies that considerable bank erosion has occurred and this will have increased rates of both coarser textured bedload and finer textured suspended sediment transport.”

Appendix 11 confirms similar findings:

“In 2013 the CAFN identified that the channel of the Aishihik River had shortened, and the un-vegetated channel width had increased and become more homogenous in plan and profile. The reduction in channel length increased the gradient. These were subsequently confirmed by Palmer Environmental Consulting Group geomorphologists. The operation of the AGS, and particularly the large diurnal variations in flows and the increased ice cover on the channel and across the valley bottom, are thought to be the major causes of these changes. The river channel and the fish habitats that it supported were essentially transformed.”

“Observations reported in the spring of 2018 and 2019 indicated that sediment contribution to the Aishihik River from an eroding terrace located 3 km (the KM 3 site) downstream of the AGS

tailrace was significant. The sediment released from the KM 3 site was detectable downstream of the Kathleen River confluence with the Dezadeash River, a distance of 62 km.”

Appendices 18 and 19 describe conditions observed on the Aishihik River respectively in spring 2018 and 2019. The report document how winter flow and ice conditions continue to affect the downstream ecosystems, Settlement Land, and other VCs.

Appendix 23, a report by CAFN, provides observations on ice thickness in the Aishihik River in 2018. Appendix 24, a report by CAFN on overbank ice issues on the Aishihik River in Canyon Creek describes some of the effects that are occurring on Settlement Land.

In Appendix 6, Andres asserts that implementation of an adaptive management plan is needed to address the significance of adverse effects that have occurred and would continue in the downstream ecosystem:

“Given that the effects of operations at AGS on the ice regime cannot be deemed to be “not significant”, YEC has proposed that the impacts of the project can be moved into the “not significant” category by introducing adaptive management protocols into the winter operating procedures.”

CAFN agrees that the proposed continued operation of the AGS and associated activities will cause further adverse effects in areas downstream of the powerhouse, including on our Settlement Land. We also agree that these potential effects should be addressed by the design and implementation of a monitoring and adaptive management plan. YEC describes a proposed program in Chapter 8 of its Project Proposal, including a framework for collaborating with CAFN on the development and implementation of the program. CAFN considers this to be a critical component of the proposed three-year renewal. Not only will it provide an opportunity to begin addressing the significance of existing adverse effects of the AGS, but it will also provide a forum for YEC and CAFN to begin addressing issues that affect important VCs that are affected by relationships.

Several appendices including the Andres report (Appendix 6), the Miles adaptive management memo (Appendix 14), the Pestal report on developing a three-year workplan (Appendix 4) and the Maissan report (Appendix 16) provide guidance and recommendations related to the development of a monitoring and adaptive management plan. CAFN expects to have an opportunity to work with YEC to consider and incorporate this input during the development and implementation of a monitoring and adaptive management plan for the three-year renewal period, and also for a plan that may apply in any long-term renewal.

Recommendation 3: The Evaluation Report should recognize the ongoing effects that AGS flow management and operational practices cause in areas downstream of the AGS including on Settlement Land. Continued operation consistent with past operational practices would continue to cause adverse effects during the three-year period unless actions are taken to reduce and control effects. The significance of adverse effects in the downstream can be addressed by the design and implementation, in collaboration with CAFN, of a monitoring and adaptive management plan with objectives of stopping further deterioration of fish and wildlife habitat and setting the ecosystem on a trajectory towards

recovery. The Evaluation Report should incorporate conditions that define the need for this proposed approach to mitigating potential effects.

AGS operations also affect water in area upstream of the powerhouse. For example, de Graff investigated conditions in some ponds in the Sekulmun wetlands in spring 2019, as described in Appendix 17. He noted adverse effects on water quality in some areas:

“Pond 22 had low concentrations of dissolved oxygen and high concentrations of hydrogen sulfide that were considered toxic to salmonids (DFO 2011). Water depth was limited to several centimeters below the bottom of the ice and combined with the poor water quality likely precluded fish from overwintering in this pond. Not a single muskrat pushup was observed on pond 22. The underwater camera was not deployed at the water in the auger hole was highly turbid.”

Also, the Hudson report (Appendix 15) expresses concern about shoreline erosion and its potential effects on Aishihik Lake.

CAFN has previously identified a wide range of effects on water and the aquatic ecosystem. Our consultants’ reports raise many ongoing concerns. Effects in some key areas are further illustrated in Appendix 22, a compendium report on game camera imagery collected by CAFN. In accordance with the procedural mitigation approach described in Section 4 of this report, CAFN expects that YEC’s and YG’s commitments to work with us during the three-year period will provide us with an appropriate opportunity to address adverse effects.

7.5.2 Vegetation

The AGS has led to substantial changes in vegetation and wildlife habitat in areas downstream of the powerhouse. For example, the von Finster report (Appendix 11) describes some of these effects:

“Channel shifting has occurred through areas that supported old growth spruce forests. The presence of an increased ice cover reduces the channel conveyance capacity. It can cause elevated river discharges to enter onto- and through the forest as it flows across the valley flat. The presence of increased ice cover on the valley flat can also delay development of ice-free conditions in the forest by a month or more in the spring and early summer. This can adversely affect the health of the riparian and off channel forests and their understory vegetation.”

The water management regime on Aishihik Lake has also changed the aquatic vegetation conditions. CAFN citizens frequently express concern about the prevalence of tall plants in some areas near Aishihik Village. The plant communities affect people’s ability to access the lake and also influence the fish communities.

The changes in vegetation conditions in all areas influenced by the AGS affect CAFN’s harvest rights and rights to access and use traditional lands. Section 7.5.4 on wildlife and wildlife habitat provides some additional information about effects on vegetation.

7.5.3 Fish and Fish Habitat

In a research project investigating concepts of integrated watershed management in the Aishihik region, Nadia Joe (2014) interviewed many Äshèyi kwädän about the importance of the area. Citizens characterized how Äshèyi is there because there are so many crucial resources for surviving well on the land. In particular, people placed a heavy emphasis on the importance of fish. Margaret Workman also emphasized how important the health of the lake is, and the importance of the fish to the survival for future generations.

Appendix 1, the Traditional Knowledge Report, has extensive information about the concerns and observed effects on fish, the reliance on many species of fish, including not only Lake Whitefish and Lake Trout, but round whitefish, grayling, lingcod and suckers, and occasionally pike. The Traditional Knowledge Report and earlier research on the traditional knowledge about the fish of the Aishihik area, document much stronger populations of fish before the construction of the dam, a long-term absence of any lingcod when that species was previously regularly harvested in the winter. Notes have been made about damage to spawning beds, changes to ‘fish trails’, reduced quality of fish (e.g., silt in scales, soft flesh, parasites), warmer waters, changes in the abundance of different species (e.g., too many jackfish [northern pike] feeding on young whitefish), and stranding of fish in puddles and backwaters that are cut off by low waters. These are just a few examples. Parts 2 and 3 of Appendix 1 provide additional details about conditions, effects and changes for fish and fish habitat.

Appendices 10, 11 and 12, reports by de Graff, von Finster and Pestal also provide details about effects on fish and fish habitat. Summaries of some effects are described in the following sections.

“My mother has told me a story, where she and Name , another elder that passed on - my mom is still alive, she's 97 now - but her and Name , right at the mouth here, used to tie two fish nets together and, on a big raft, they would go out, with one end of the fish net tied to the shore [of Stevens' Lake], they would take the raft out and kind of form a seine line, and when they got near the shore...they would hand off the one end to the other people, and they would come out with about 300 fish in one drag. So the fish population, before the dam, from the stories that we hear from our people, there was an abundance of fish in the area.” ---- “The historical fisheries...Aishihik was known for having a lake fishery of the highest qualities. Fisheries supported 10-15 families, and their dogs. Name , an Aishihik elder who passed on, he mentioned that, in the winter, the amount of fish that was caught was stacked up like cordwood. Because it was in the fall that they fished, when the whitefish spawned, and so the fish were piled up like cordwood so that they could feed themselves and their dogs all winter. And they had to check their fish nets two or three times a day, because, if they didn't do that, then the net would be too hard to pull in and get the fish out. So they had to check them many times a day.” – ChiefName , 2003

It is well documented in scientific literature that water fluctuations, particularly drawdowns, impact aquatic and terrestrial ecosystems. Littoral ecosystem integrity, and the ecosystem services that these environments provide, becomes vulnerable with water instability as described in Carmignani and Roy (2017) attached as Appendix 25, and also referenced in Appendix 10. CAFN and others identified before

the dam was built that there would be impacts to fish habitat and fish population, spawning and rearing areas and fish passage. Some specific effects are identified in the following sections.

Fish populations

Water levels have resulted in poor lake whitefish spawning success since commissioning in 1975. A CAFN Traditional Knowledge project in 1992 by Chief Name identified gaps in subsistence catches due to water management in Aishihik. It was confirmed by Yukon Government and Yukon Energy consultants that low water levels in the late 1970's and early 1980's caused year class failures in whitefish. The specific mechanism(s) by which water levels cause the year class failures remains unknown. In reaction to the studies, the current licence has an increased low water level however whitefish populations are still recovering from the legacy of disturbance:

“Aishihik Lake fish appear to be recovering from the direct physical effects of the construction of the AGS and past water management that have previously exposed and desiccated littoral communities throughout the lake.” (Appendix 10).

Due to the time between surveys and the survey methods, it is difficult to interpret results from the fish surveys. There is high variation within any given catch and depending on the size of the catch fish may have been excluded from the sample. It is possible that environmental factors and water level are additive effects (Appendix 12). The Pestal technical review (Appendix 12) considers the available data and proposes several possible hypotheses that may warrant further consideration or investigation given the current observations:

“The link between low water level and poor year-class strength was very strong in the 1991 survey, weaker in the 2007 survey, and not detected in the 2017 survey. There are alternative plausible hypotheses to explain these observations. Management decisions should consider the relative plausibility of alternative possible explanations, rather than just picking a single one.”

Pestal also raises the challenge of dealing with combinations of factors that may affect whitefish. For example, in a low water year if temperatures are also low the effect on fish would be more pronounced than the effect of low temperature alone.

There is a change in the proportion of mature fish (age 14+) in Aishihik and Canyon Lakes between 1990 and 2018. There is a larger role for mature/big fish in the fish population, and traditionally you are supposed to leave (not catch) big fish. Genetically mature fish also play an important role with regards to fecundity and reproductive success of populations.

Other than traditional knowledge, we have limited scientific information to understand how current recovery conditions compare to the pre-project baseline conditions. Those who constructed AGS did not characterize these conditions. Traditional knowledge holders indicate fish populations in the lake continue to be impacted by changes due to AGS.

Spawning and rearing areas

There are two known whitefish spawning areas in Aishihik Lake that AGS has directly impacted: the Bay and the South end of the lake.

In between the old Aishihik village and the new, there is a small bay in which people used to fish in the fall to catch whitefish and harvest eggs.

Changes that have occurred since the AGS began have changed the conditions in the bay such that it is no longer suitable whitefish habitat. The substrate is now a thick mud – “mucky”. The shallow areas in the lake are all dry for extended periods of time in the early spring/summer – the ice drops throughout the winter until it is sitting on the ground (no water) and then when the ice melts the waterless ground is revealed. Appendix 23, CAFN’s report on ice thickness at the north end of Aishihik Lake in 2018 provides observations of ice sitting on the lake bottom.

Fish historically also spawned at the south end of Aishihik Lake (Appendix 10). Traditional knowledge indicates that spawning occurred in the late fall into December. This area was excavated during construction of the dam to allow greater drawdown of water on Aishihik Lake.

In some northern lakes, it has been observed that in the winter there are lowered dissolved oxygen levels and fish congregate near springs (Appendix 10). In naturally low water years (low precipitation), the decreased oxygen levels can cause increased mortality either directly or indirectly (e.g. increased predation). This effect may be exacerbated by anthropogenic drawdowns in the winter.

Aquatic substrates in littoral areas are not biologically suited to handle annual dewatering, freezing and increased erosion from wave action to exposed lake bottoms. These stressors are known to drive biotic changes to littoral areas. The vegetation in shallow areas that would persist in natural lake levels is now shifting in composition to other types of vegetation. This species composition shift is likely shifting the foodweb in some areas from one dominated by whitefish to one dominated by pike. This can have adverse effects on CAFN’s rights related to harvesting and subsistence uses.

Fish passage

Prior to project construction, fish traveled between the lakes and rivers. DFO assessments at the time indicated lake and round whitefish used spawning habitat at the south end of Aishihik. A fish ladder was built between Aishihik and Canyon Lakes to allow for fish passage, however it is unknown whether this mitigation was effective at any point and YEC’s recent studies confirm that it is likely not effective at present.

“...the fisheries boys told us there is some movement of whitefish and grayling between the lakes, so we built a fish ladder” –Name , 1976 (Hope, 1975)

CAFN observations in May 2019 indicate that the AGS facilities are still affecting fish passage:

“... observed large school of grayling pooling on the downstream side of the control structure with no evidence of fish attempting to use the fish way.” (Appendix 21)

There are long-term consequences of genetically isolating fish populations that can arise due to a range of anthropogenic disturbances (e.g. land conversion, roads, dams). In Appendix 10, de Graff describes effects associated with restrictions on free movement of fish:

“The fact that the free movement of fish between Aishihik and Canyon lakes has been compromised since the project was completed in the mid 1970s suggests the fish community in

Canyon Lake has now become isolated. ...The Aishihik Dam since construction in the mid 1970s has created a barrier to the free movement of fish and other aquatic organisms, which impedes the biotic exchange between Canyon and Aishihik lakes. This fundamental alteration has significant ecological ramifications over a range of spatial and temporal scales and is in sharp contrast to what is known of the importance of the Sekulmun River connecting Aishihik and Sekulmun lakes. The Sekulmun River is barrier free and past studies have concluded lake whitefish freely mix between lakes and have a similar age composition suggesting a common spawning location within Aishihik Lake. Whitefish and other fish species are also known to inhabit the ponds connected to the Sekulmun River throughout the open water season.”

River habitat

As described in Section 7.5.1, AGS operations have led to substantial changes and significant effects on the river channel downstream of the powerhouse. These changes have caused significant effects on fish habitat in this area. von Finster has observed the fish habitat conditions in the Aishihik River below the powerhouse, and reviewed information provided in the Project Proposal. In Appendix 11, von Finster concludes that *“the river channel and the fish habitats it supported were essentially transformed.”* He describes adverse effects on a range of key components of the aquatic ecosystem:

“Most or all of the structural diversity of the pre-project river has been lost. This has reduced its value to the fish populations that were thought to have used it as habitat prior to the hydro-electrical project. Overwintering is considered to have been the most affected. The shortened and straightened channel removed the deep pools in which the larger fish could over-winter. Large organic debris accumulations are now rare, and those that remain are filled with loose sediment and are not available to smaller fish. Where water flows along the channel bottom it varies in depth and velocity due to the effects of icing. An uncertain portion of the river flow travels between layers of ice. The river transports sediment and deposits it throughout the winter.”

“Aquatic invertebrates support most fish as food. Some fish species such as Arctic Grayling and Rainbow Trout feed to some extent on flying insects. Most or all other species do not, and feed on aquatic invertebrates. Aquatic invertebrates are generally most numerous and diverse in stable, clear water environments. Some will overwinter in ice-free- or under-ice water. Many will enter the stream bottom and overwinter in unfrozen sediments. Most dipterans, the true flies, overwinter as eggs and hatch in the spring. Many dipterans attach themselves to rocks on the stream bottom or on submerged large organic debris. They are unable to escape sudden increases in suspended or larger sediments which can clog their feeding apparatus, erode individuals from their attachments on the stream bottom or cover them beneath blankets of sediment. Streams subject to sudden and repeated episodes of sedimentation support less invertebrates than streams that remain clear. Additionally, many sight-feeding fish occupying turbid streams have to increase the energy they expend on the identification and pursuit of prey.”

Appendix 1, the Traditional Knowledge Report, provides several observations of affected fish habitat in the downstream environment, including knowledge that gulls used to always feed on young and small

fish along the river and now they no longer do. Residents rarely fish in the river now because of water quality issues and hazards such as the accumulation of deadfalls. More than 100 years ago, Edward Glave documented observing fish traps along the lower Aishihk river indicating there was historically a substantial history of harvest of fish resources in the region before settlement and before the dam.

Based on the current status of downstream fish habitat conditions, CAFN has concluded that the AGS has caused significant, adverse effects on this VC, and that the continued operation during the three-year period could cause further adverse effects if measures are not taken to mitigate effects. We expect that the procedural mitigation set out in Section 4 and the recommendation provided in Section 7.5.1 will be sufficient to address the significance of effects on river habitat during the three-year period.

7.5.4 Wildlife and Wildlife Habitat

Ecosystems, by definition, do not function as individual components but are made up of relationships. When an alteration is made, the entire system is affected due to this connectivity. Relationships between species and habitats have been, and continue to be, affected by AGS. Several species occur over large ranges. Some species, such as caribou, have different habitats depending on the time of year and inter-annually. Single system approaches to looking at the ecosystem do not work when considering impacts to species and their movements.

The following sections describe some ways in which the AGS has affected and may continue to affect wildlife and wildlife habitat. CAFN expects that effects on wildlife and wildlife habitat will continue during the three-year renewal. However, we believe that these effects can be adequately addressed by the procedural mitigation described in Section 4. We expect that the three-year period will provide time for us to work with YEC and YG to develop a better understanding of the conditions of and effects on wildlife, and define appropriate mitigation to address past and potential effects.

Wetlands

Wetlands in the study region have yet to be inventoried and classified, therefore we lack reliable metrics to examine the impact of drawdown on wetlands (Appendix 10). In Appendix 10, de Graff discusses the importance and scarcity of wetlands, and the need for a comprehensive inventory:

“The concentration of wetlands in the AGS study area is thought to be low and estimated to occupy less than 5 percent of the landcover. Therefore, the simple scarcity of these types of habitats makes them of greater significance on a regional basis. A thorough wetland inventory of the entire study area would be of great benefit in gaging their significance on the landscape from a regional perspective.”

Wetlands and other riparian and valley bottom habitats have experienced ongoing and documented impacts, including drying out, flooding, icing, sedimentation and erosion (Appendix 10 and Appendix 17). Appendix 17 provides a report of field investigations of wetland conditions, conducted on behalf of CAFN in spring 2019. CAFN Traditional Knowledge confirms concern about the condition of wetland areas and effects on the larger ecosystem, for example:

“Most of the lake around Aishihik Lake back where the moose hunting area used to be there mostly dried up now and I don’t know, I think it is the water level that is causing it.” (Appendix 1, AR-TK-OH-PIN19-2017-06-06, Paragraph 344)

Downstream Riparian Areas

In areas downstream of the powerhouse, the river environments have changed dramatically as a result of AGS operations and activities, as described in Appendices 6, 11 and 13. Over time, plant communities shift as plants adapted to stability are unable to cope. Some plants (e.g., trees) are not adapted to being flooded and iced in annually. There is ice scar evidence on the bark of tree trunks throughout the valley (Figure 6 and Figure 7). Most plants are also poorly adapted to be covered in sediment. Because the Aishihik River carries substantial sediment in winter (Appendices 13, 18 and 19), the ice that accumulates in the valley contains layers of sediment. As the ice melts, thick sediment is covers the plants. In addition to direct effects on the vegetation, sediment and dust accumulation has been shown in other regions to make plants unpalatable for wildlife and cause wear on animal teeth. Effects in the Aishihik River are unknown at this time because they have not been studied.



Figure 6. Heavy sediment deposits thawing from overbank ice build-up in upland forest area adjacent to Aishihik River near Canyon Creek (CAFN: April 2018).



Figure 7. Evidence of overbank ice build up and accelerated upland loss of forest resources – increased coarse woody debris input into Aishihik river (near Canyon Creek) (CAFN: April 2018).

Wildlife

Äshèyi is located where it is because it sustained *Äshèyi kwädän* for many generations. It also supported people from other areas who traveled to *Äshèyi* to fish, hunt and gather. It was a place of abundance. Since the AGS was constructed, wildlife is less abundant. *Äshèyi kwädän* and CAFN believe the land requires time to recover from intensive use over the past few decades.

Each wildlife species is adapted to the habitat they are evolved to survive in. Some species cannot tolerate instabilities to these habitats. Due to an assortment of environmental impacts, wildlife has been disturbed and displaced from *Äshèyi*. The alteration of habitats has made it so that wildlife passage is no longer possible for large portions of the year across AGS affected areas. In the short-term, this can lead to displacement of wildlife from preferred habitat areas. Long-term effects of barriers to wildlife movement include changes in population dynamics and habitat use, potential genetic isolation and/or loss of sub-populations. These effects and potential effects have not been studied in detail for the AGS.

In winter, the AGS related changes in flow regime cause year-round open water on parts of the river where it would not have previously occurred. Where there is ice, its inconsistency and instability in

cover and duration lead to wildlife avoiding the river. This has been documented via wildlife tracks that near the river ice but do not cross and instead continue along the river ice margin. There is little evidence that indicates wildlife use the river in winter, and much more evidence to indicate that instability and safety issues lead both people and wildlife to avoid the river in areas they would have used before AGS development.

In summer, the mud makes animal passage in areas such as the bay at Aishihik Village, and the canal impossible to the point of mortality. If wildlife choose to cross these shallow areas with soft sediment build up from erosion and permafrost thaw they are at risk. Erosion of lake and river shorelines also results in steep banks and a barrier to safe passage.

To survey for these changes in wildlife behavior over a large area is challenging because conditions and wildlife uses are variable and episodic. A single aerial survey, as has been done to date for wildlife passage in the Aishihik River valley, cannot provide a representative picture of the wildlife behaviours and effects in relation to the conditions on the river. There are likely more impacts than single survey days can detect. Observations by those using the area for generations are more likely to elucidate the reality of the disturbed ecosystem and will be critical in understanding the effects and defining appropriate mitigation. CAFN expects that these effects will be considered and mitigation developed as we work with YEC and YG during the three-year renewal.

The following examples highlight some specific effects on, and concerns about, wildlife.

Moose

Moose browse on a variety of shrub species (*Salix* spp.) which occur in meadows and riparian areas. These species are relatively tolerant to intermittent or seasonal flooding, but cannot persist under long-term flood conditions. They are also not tolerant to having roots frozen in for the winter season. Conditions in the Aishihik River valley are leading to changes in availability and quality of browse. For moose, energetic consequences of these kinds of physiological disturbances can lead to alteration of growth patterns (e.g. height).

“And actually the moose habitat around the lake is changing too because the willow flats are either under water or they, once the willows get too much water it dies off eh. Some of the good moose habitats have been destroyed because of the dead willows and so the animals that live around the lake all of them have been affected.” (Appendix 1, AR-TK-OH-PIN11-2017-06-27, Paragraph 795)

Moose also inhabit large regions and travel throughout most the year, gathering in the fall for the rut. The ability of moose to travel their game trails around Aishihik is compromised by a number of AGS-related factors, including shoreline erosion, sedimentation, fluctuating flows and ice instability. Citizens have observed moose becoming trapped in the canal where the sediment is thick. Compared to pre-project, moose and other large mammals have not been able to move throughout the landscape. Evidence indicates that the unsafe conditions on the river may be acting as a barrier to movement in some areas.

Tsal

Tsal (arctic ground squirrel) develop multi-entrance burrows in generally shrub-free areas because they are visually adapted prey species (i.e., their defense adaptation is detecting a predator and escaping to their burrows, as opposed to snowshoe hares which are adapted to freeze and hide in shrubs). *Tsal* also use their burrows for hibernation in the winter. When they are in hibernation, they are in a low brain reactivity state. If their winter hibernation burrows are flooded or iced, it is unlikely they will have time to escape.

There are several areas identified in the *Äshèyi* region near lakes and rivers which have burrows, and these burrows are flooded/iced over in the winter. When sub-populations are isolated and undergo extirpation, the areas previously inhabited are unlikely to be re-inhabited if conditions continue to be unstable. For long durations the species will simply vacate their pre-existing burrows and continue to populate more stable habitats elsewhere.

There is an area near 9 Mile that CAFN citizens have identified as previously hosting a sub-population of *tsal*, as well as associated harvest camps. This sub-population is no longer present due to the icing effects in the Aishihik River valley. The change has affected traditional CAFN harvest rights.

Compromising the habitat stability of certain species introduces risks of direct and indirect fatality. There are additional energetic compromises of species having to find new habitats when their existing habitats are no longer available, and in the long-term wildlife will no longer utilize the region and seek a more stable habitat elsewhere. The AGS operations have likely adversely affected a number of sub-populations in the *Äshèyi* region.

Furbearers

“Trapping... We've always trapped to make a living.... This provides an income for me... From 1975, on the the level of the lake--the water was unstable... When the water level was dropped, under YEC, the level of the water in Aishihik Lake was pretty low. So muskrats and beaver could not survive. They were frozen out of their homes. It kills a lot of them that are caught under the ice when the water level drops.” –Name Redacted 2003

Dzäna (muskrats) are most abundant in water bodies with stable water levels and plentiful aquatic vegetation (BC Government, 1998). To provide adequate habitat, water levels must be deep enough to not freeze to the bottom in winter, and shallow enough to provide light for aquatic vegetation to grow. The depth constraints for *dzäna* means that they tend to inhabit shallow littoral areas that are at high risk from human-induced water level fluctuations.

In aquatic habitats affected by water level fluctuations, the *dzäna* have moved away to find more stable systems. Winter drawdown freezes *dzäna* out of their burrows – if there is no space for a *dzäna* to swim underneath the ice then there is no space for their safe access to pushups (feeding shelters) or burrows. *Dzäna* are known to abandon areas if the water freezes to the bottom or experiences summer drought (BC Government, 1998). Where CAFN people used to see *dzäna* abundant and trap them, there are now fewer to no *dzäna*, leading to effects on CAFN’s rights to harvest and conduct traditional activities.

Dzäna populations have only been estimated via aerial surveys. In 44 years since AGS commissioning, four aerial surveys have been done (1995, 1996, 2017, 2018). Methodologically this included one aerial pass over some shorelines and wetlands in the Aishihik area in the spring of each of the four years. Due to the cursory nature of the data, it is not possible to extrapolate what the condition of the *dzäna* population is or how it has changed as a result of AGS operations. Analyzing population trends requires more frequent surveys. However, the 2017-2018 population data when compared to 1995-1996 suggests a population decline (Appendix 5F, YEC Project Proposal).

We have no technical data to assist in interpreting population health for other aquatic mammals (e.g. beaver, otter), however given the condition and concern of the *dzäna* population and the ecosystem as a whole, it is likely other species are affected. During a May 2019 site visit we did observe potential effects on Beaver:

“We paddled past several abandoned beaver houses, many of which had their entranceways exposed which would normally be under water, indicating very low water levels in the river.”
(Appendix 20)

7.5.5 Heritage and Cultural Resources

The AGS’s effects on heritage and cultural resources has always been a major concern for CAFN and *Äshèyi dän*. The Traditional Knowledge Report (Appendix 1) and The Land is What Gives Us Energy (Appendix 3) include many descriptions of effects and concerns related to heritage and cultural values. While much of the damage has already occurred, the continued operation of the AGS has ongoing potential to adversely affect heritage and cultural resources and values and CAFN remains concerned about these effects. Nonetheless CAFN has concluded that the procedural mitigation described in Section 4 of this report will provide us with an opportunity to work with YEC and YG to understand and resolve potential effects on heritage and cultural resources as part of the any long-term renewal. As such CAFN has concluded that it can tolerate any effects that may occur during the three-year period, subject to ongoing and standard measures for identifying and mitigating effects on heritage values.

7.5.6 Global Climate Stability

Global climate stability is a VC that arises out of CAFN’s concerns related to human induced changes in global climate. YEC’s assessment considers greenhouse gas emissions as a VC, but CAFN believes that this substantially narrows the scope of issues that should be considered in relation to global climate stability. CAFN believes a much broader approach is required. The assessment should not be limited to how the AGS directly contributes to or reduces greenhouse gas emissions within the context of Yukon’s existing energy system and YEC’s current choices about how to supply energy. It should consider how the restoration of *Äshèyi* to address CAFN’s longstanding concerns can be part of an overall sustainable energy system. Also, as described in Appendix 15 there are complex relationships between the future performance of the AGS for energy generation and achieving other environmental and social objectives. Notably there are many ways in which the expected human-caused changes in global climate may affect the AGS and its effects on other VCs.

The broader consideration of global climate stability as a VC must be considered when assessing potential effects of any long-term renewal for the AGS. For the three-year renewal however, CAFN recognizes that the short duration means that analysis for this VC is not required.

8.0 CAFN Conclusions and Recommendations

CAFN has longstanding, significant concerns about the effects of the AGS on all of the VCs identified in Table 2. The construction and operation of the AGS and the activities associated with the AGS have had significant effects on many of the VCs. CAFN and *Äshèyi kwädän* have borne the brunt of effects from the AGS – effects on our land, our resources, our culture, our past and our future. But throughout the history of the project we have seen little benefit. We use electricity like other Yukoners, and we pay our hydro bills the same way, but the costs to us have been and continue to be much higher and many can never be repaid. Throughout the planning for AGS relicensing, including during our participation with YEC in the Protocol Agreement, CAFN has consistently been clear that long-term continuation of the current operations would lead to unacceptable, significant adverse effect on many of things that we value.

CAFN sees YEC's proposed three-year renewal as an opportunity to address the longstanding concerns we have with the AGS and its operation. YEC and YG have committed to work with CAFN in good faith to learn about the effects of the AGS and develop measures to address those effects. We believe that YG's and YEC's commitments are genuine and we have agreements with both parties about how to begin our discussions and about the broad scope of issues that must be addressed. We hope that YEC and YG will interpret these scopes liberally so that our discussions can provide an effective forum for discussing and addressing the wide range of complex effects and issues that have accumulated over more than 40 years of the project, and that continue with ongoing operation. With this process we expect YG and YEC to join us as we define and embark on the long path of restoration for *Äshèyi* and reconciliation for *Äshèyi dän*.

Section 7 of this report summarizes numerous effects and potential effects of the AGS, many of which would be significant for a long-term renewal. However, as stated in Section 4 of this report CAFN considers the ongoing effects to be tolerable for only this short duration. We can tolerate the effects because YEC and YG have agreed to collaborate with us to investigate and characterize the effects, and develop appropriate operating regimes and mitigation measures to help relieve the pressure on, and restore the health of, *Äshèyi*. Thus, we have concluded that the significance of most ongoing effects of the AGS for this limited period can be addressed by establishing appropriate processes (i.e., procedural mitigation) to resolve the issues for the longer-term. We propose that the DO proceed with its evaluation report on this same basis. It is our view that the DO currently has sufficient information to complete its assessment on this basis.

CAFN believes that effective implementation of the procedural mitigation relies, in part, on the DO and its assessment scope and conclusions for the three-year renewal. The procedural mitigation addresses potentially significant effects that may occur during the three-year period, for example on CAFN self-determination and ecological conditions in areas downstream of the powerhouse. To support effective

implementation of the procedural mitigation, including providing flexibility for implementation of mitigation measures, the Evaluation report should address the following recommendations.

Recommendation 1: In addition to other specific recommendations in this submission, CAFN recommends that the DO should acknowledge and incorporate process-based mitigation to address existing and ongoing effects of the AGS for the duration of the three-year renewal. With that approach, the Evaluation Report should:

- Acknowledge the effects that the AGS has had and may have on a range of environmental and socio-economic values and conditions;
- When evaluating significance, recognize that the three-year limited duration of the proposed renewal reduces the significance of potential effects; and
- Address potentially the significance of adverse effects by including conditions that require, in collaboration with CAFN:
 - Further investigation and characterization of effects of the AGS, and
 - Development of future operating regimes and mitigation measures intended to directly address adverse environmental and socio-economic effects of the AGS.

Recommendation 2: The Evaluation Report should recognize the importance of CAFN self-determination as a VC, and include a condition that requires YEC to explore methods for sharing decision-making with CAFN when decisions may affect CAFN government, people, and/or lands. During the three-year period this should include, for example, collaborative design and implementation of an adaptive management plan for addressing adverse effects that have occurred in areas downstream of the powerhouse.

Recommendation 3: The Evaluation Report should recognize the ongoing effects that AGS flow management and operational practices cause in areas downstream of the AGS including on Settlement Land. Continued operation consistent with past operational practices would continue to cause adverse effects during the three-year period unless actions are taken to reduce and control effects. The significance of adverse effects in the downstream can be addressed by the design and implementation, in collaboration with CAFN, of a monitoring and adaptive management plan with objectives of stopping further deterioration of fish and wildlife habitat and setting the ecosystem on a trajectory towards recovery. The Evaluation Report should incorporate conditions that define the need for this proposed approach to mitigating potential effects.

9.0 References

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- BC Government (1998) Inventory Methods for Beaver and Muskrat. Ministry of Environment, Lands and Parks, Resources Inventory Branch. The Province of British Columbia, Vancouver, BC, CAN.
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Appendix 1

CAFN Traditional Knowledge Report for the YEC AGS Three-Year Relicensing Project

Champagne and Aishihik First Nations

June 27, 2019

Appendix 2

CAFN General Assembly Resolutions: 2017-03 and 2017-04

July 2017

Appendix 3

The Land is What Gives Us Energy Social & Cultural Impact Study for
Yukon Energy Corporation's Aishihik Generating Station Relicensing
Project

Joella Hogan

June 2019

Appendix 4

Developing a 3-yr Workplan Leading up to the 2022 Relicensing of the Aishihik Generating Station (AGS): Questions & Ideas for Working Group Consideration

Gottfried Pestal, SOLV Consulting

April 18, 2019

Appendix 5

Comparison of Past and Predicted Aishihik Lake Water Levels

Roger Brown, CAFN

June 24, 2019

Appendix 6

Review of Ice-related Issues Yukon Energy Corporation Project Proposal
2019-0035

D.D. Andres

June 2019

Appendix 7

Champagne and Aishihik First Nations Advisory Committee (CACAC) Priorities/Recommendations

Champagne and Aishihik First Nations Advisory Committee
March 26, 2018

Appendix 8

Aishihik Hydro Relicensing, CAFN Relicensing Objectives

Bill Slater, Slater Environmental

June 13, 2018

Appendix 9

Aishihik Relicensing Alternative Evaluation Workshop – September 5-7,
2018

Bill Slater, Slater Environmental

October 5, 2018

Appendix 10

Characterization of Fish and Fish Habitat Effects – Aishihik Lake, Yukon

Nicholas de Graff, Can-nic-a-nick Environmental Services

May 30, 2019

Appendix 11

Fish and Fish Habitat in the Aishihik Region.

Al von Finster, AvF Restoration and Development

June 10, 2019

Appendix 12

Technical Review of Lake Whitefish Index Net Survey Data from Aishihik
and Canyon lakes, Yukon.

Gottfried Pestal, SOLV Consulting

June 11, 2019

Appendix 13

Sediment Transport Downstream of the Aishihik Generating Station, Observations and Recommendations

Mike Miles & Dave Andres, M. Miles and Associates Ltd.

May 2019

Appendix 14

Rigorous Adaptive Management within the Context of YEC's AGS Project

Mike Miles, M. Miles and Associates Ltd.

June 19, 2019

Appendix 15

Hydrologic comments with respect to Aishihik Renewal / Environmental
Impact Assessment

Patrick Hudson, Hydrologic Inc.

June 2019

Appendix 16

Aishihik relicensing – comments on YEC’s 3-year water licence
application to YESAB

John Maissan

April 25, 2019

Appendix 17

Sekulmun Wetlands Survey – April 14, 2019

Nicholas De Graff, Can-nic-a-nick Environmental Services

May 30, 2019

Appendix 18

Summary of Spring Observations Aishihik and Dezadeash Rivers, April 7,
2018

Mike Miles, M. Miles and Associates Ltd.

June 30, 2018

Appendix 19

Summary of Spring Observations Aishihik and Dezadeash Rivers: April 8 &
9, 2019

Mike Miles & David Andres, M. Miles and Associates Ltd.

June 14, 2019

Appendix 20

Aishihik Field Trip, Low Water Level Reconnaissance

Roger Brown, CAFN

June 25, 2019

Appendix 21

Aishihik Field Trip 2, Aishihik Village Bay and Sekulmun Wetlands and
River Reconnaissance

Roger Brown, CAFN

June 25, 2019

Appendix 22

CAFN Compendium of Photos YEC Aishihik Project

Roger Brown, CAFN

June 2019

Appendix 23

Aishihik Field Trip, North End Ice Thickness Measures

Roger Brown, CAFN

June 2019

Appendix 24

Canyon Creek Inspection of Aishihik River and Ice Overflow Issues

Roger Brown, CAFN

June 2019

Appendix 25

Ecological impacts of winter water level drawdowns on lake littoral zones: a review

Jason R. Carmignani & Allison H. Roy

June 27, 2017

Carmignani, J.R. & Roy, A.H. *Aquat Sci* (2017) 79: 803.
<https://doi.org/10.1007/s00027-017-0549-9>