General Water Licence Application
(Application for a new Water Licence)

Document Date: May 2011

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Month/Day/Year

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DOCUMENT MANAGEMENT

Original Document Date: April 2010

DOCUMENT AMENDMENTS

	Description	Date
(1)	Updated for public distribution as separate document from NWB Guide 4	June 2010
(2)	Updated NWB logos and reformatted table to allow rows to break across page	May 2011
(3)		
(4)		
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GENERAL WATER LICENCE APPLICATION
(APPLICATION FOR NEW WATER LICENCE)

The applicant is referred to the NWB's Guide 4: *Guide to Completing and Submitting a Water Licence Application for a New Licence* for more information about this application form.

LICENCE NO:
(for NWB use only)

1. APPLICANT (PROPOSED LICENSEE) CONTACT INFORMATION (name, address)

Dr. Jeffery M. Saarela
Canadian Museum of Nature, PO Box 3443, Stn. D, Ottawa, Ontario, K1Y 1X7 CANADA

Phone: **1.613.364.4080**
Fax: **1.613.364.4027**
e-mail: **jsaarela@mus-nature.ca**

2. APPLICANT REPRESENTATIVE CONTACT INFORMATION if different from Block 1 (name, address)

Phone: _____
Fax: _____
e-mail: _____
(Attach authorization letter.)

3. NAME OF PROJECT (including the name of the project location)

Project title: **Flora of the Canadian Arctic**
Project location: **Nunavut, Baffin Island: Katannilik Territorial Park; head of Barrier Inlet; Kimmirut and vicinity**

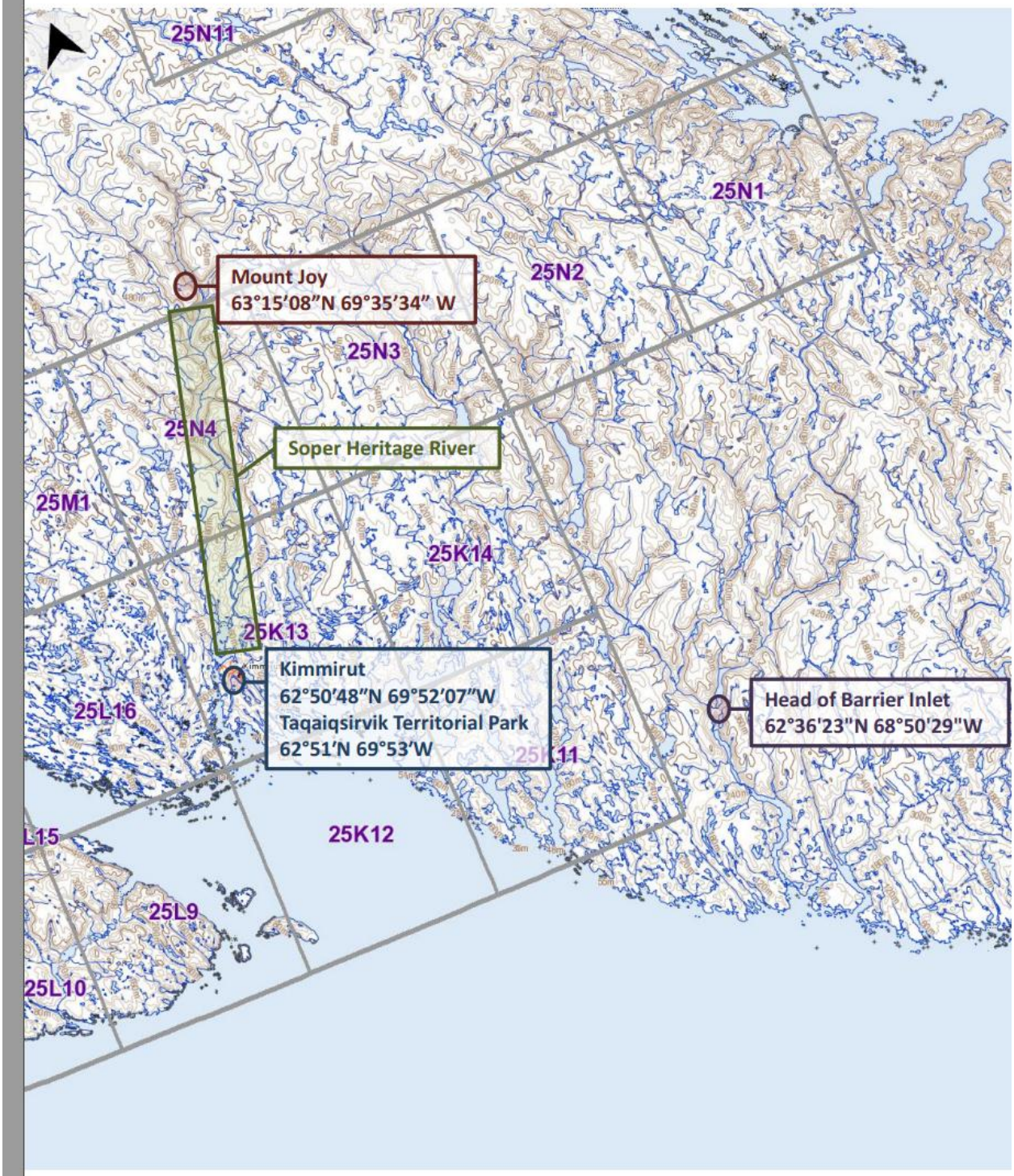
4. LOCATION OF UNDERTAKING

Project Extents
If helicopter resources are available (support pending), we will visit five to ten sites within the following region, which includes the sites for our proposed camps, listed below:

NW:	Latitude: (**63°11'32"N**)	Longitude: (**70°16'39"W**)
NE:	Latitude: (**62°57'42"N**)	Longitude: (**67°00'47"W**)
SE:	Latitude: (**62°04'31"N**)	Longitude: (**66°59'39"W**)
SW:	Latitude: (**62°33'21"N**)	Longitude: (**70°39'50"W**)

Camp Location(s):
Katannilik Territorial Park: Mount Joy (63°15'08"N 69°35'34" W) to Kimmirut (62°50′48″N 069°52′07″W); we will establish five to seven camps along this stretch of the Soper Heritage River.
Head of Barrier Inlet: Latitude: 62° 36' 23"N Longitude: 68° 50' 29"W
Taqaiqsirvik Territorial Park (Campground), Kimmirut: Latitude: 62°51′N Latitude: 069°53′W

5. MAP - Attach a topographical map, indicating the main components of the undertaking.
NTS Map Sheet No.: _**based on Map 25L (Big Island), 25 M (Markham Bay), 25N (Frobisher) and 25K (Lake Harbour).** Map Scale: **1: 300 000**.



6. NATURE OF INTEREST IN THE LAND - Check any of the following that are applicable to the proposed undertaking (at least one box under the 'Surface' header must be checked).

Sub-surface

☐ Mineral Lease from Nunavut Tunngavik Incorporated (NTI)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Mineral Lease from Indian and Northern Affairs Canada (INAC)
Date (expected date) of issuance: _____ Date of expiry: _____

Surface

☐ Crown Land Use Authorization from Indian and Northern Affairs Canada (INAC)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Inuit Owned Land (IOL) Authorization from Kitikmeot Inuit Association (KIA)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ IOL Authorization from Kivalliq Inuit Association (KivIA)
Date (expected date) of issuance: _____ Date of expiry: _____

☒ IOL Authorization from Qikiqtani Inuit Association (QIA)
Date (expected date) of issuance: **Submitted March 2012; expected June 2012** Date of expiry:

☐ Commissioner's Land Use Authorization
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Other: _____
Date (expected date) of issuance: _____ Date of expiry: _____

Name of entity(s) holding authorizations:
_____

7. NUNAVUT PLANNING COMMISSION (NPC) DETERMINATION

Indicate the land use planning area in which the project is located.

☐ North Baffin
☒ South Baffin
☐ Akunniq
☐ Keewatin
☐ Sanikiluaq
☐ West Kitikmeot

Is a land use plan conformity determination required?

☐ Yes ☒ No **There is no Approved Land Use Plan for South Baffin**

If Yes, indicate date issued and attach copy _____
If No, provide written confirmation from NPC confirming that a land use plan conformity review is not required.

The correspondence below with Brian Aglukark (NPC) indicates that a NPC conformity review is not required:
From: Brian Aglukark [mailto:aglukark@nunavut.ca]
Sent: March-09-12 12:44 PM

To: Jeff Saarela
Cc: Phyllis Beaulieu
Subject: RE: NPC land use plan conformity determination: question
Good morning,
Email to confirm that the proposal described below falls outside an approved planning boundary, therefore no conformity review is required by the NPC. Any questions and or concerns, pleae do not hesitate.
Brian Aglukark, NPC
Arviat

8. NUNAVUT IMPACT REVIEW BOARD (NIRB) DETERMINATION

Is an Article 12 Part 4 screening determination required?

☐ Yes ☒ No

If Yes, indicate date issued and attach copy _____
If No, provide written confirmation from NIRB confirming that a screening determination is not required.

The correspondence below with Derek Ehaloak (NIRB) indicates that a separate NIRB screening determination is not required:

From: Jeff Saarela [mailto:jsaarela@mus-nature.ca]
Sent: March-08-12 9:47 AM
To: info@nirb.ca
Subject: NIRB licence question (Saarela / Canadian Museum of Nature)
Hello,
I am working on a water licence application for the Nunavut Water Board. I am trying to determine if I need to apply to the Nunavut Impact Review Board for a licence for my small team of researchers to conduct botanical research (plant collecting) on southern Baffin Island in July 2012.

My Wildlife Research permit application is attached, for reference. Please let me know if I need to proceed and prepare the NIRB licence application.

Thank you,
Jeff Saarela

Response:
Hello Jeff,
Thanks for your application.

It looks like you may need to apply for permits from the Canadian Wildlife Service (CWS) and the Nunavut Research Institute (NRI). Depending on which region the project activities are located in, you may also need to apply with the Nunavut Planning Commission (NPC). Please contact them to see if they require applications. If that is the case, they will forward your application to us.
CWS: Jason Akearok – Jason.akearok@ec.gc.ca
NRI: Mosha Cote – Mosha.Cote@arcticcollege.ca
NPC: Brian Aglukark – Aglukark@nunavut.ca

Best regards,
Derek Ehaloak
Environmental Administrator
Nunavut Impact Review Board, P.O. Box 1360 (29 Mitik), Cambridge Bay, NU, X0B 0C0
Phone: 867-983-4600, Fax: 867-983-2594, E-mail: info@nirb.ca, Web: www.nirb.ca
Public Registry: ftp.nirb.ca

9. DESCRIPTION OF UNDERTAKING – List and attach plans and drawings or project proposal.

FLORA OF THE CANADIAN ARCTIC

Arctic Plant Research

Species inventories and identifications are important for investigating the effects of global warming on arctic ecosystems. The composition and distribution of the Canadian Arctic flora is likely to experience a dramatic shift in the coming century in response to environmental change, but comprehensive present-day floristic data, necessary to track future change, is lacking for many Arctic regions. There are many

gaps in current knowledge of the diversity and distribution of the Canadian Arctic flora. Some regions have never been explored botanically, and many remain poorly and incompletely studied. We are still discovering plant species new to science on the arctic islands (e.g., *Puccinellia banksiensis* Consaul), documenting many range extensions, and refining species circumscriptions. Accurate information on current distributions of species and robust identification tools are critical for understanding the impact of climate change on arctic plant species and plant communities. This project will provide comprehensive baseline data on arctic plants (taxonomy, distribution, ecology), with the goal of producing a complete Canadian Arctic Flora. It builds on our extensive, ongoing work on the arctic flora (see Publications listed in section 23 below), and continues the strong, century-long tradition of arctic botany at the Canadian Museum of Nature (CMN), the only Canadian institution with major plant systematic research activities in the Arctic.

We aim to gain a more complete understanding of the present state of the distribution and composition of the Canadian arctic flora, to expand the knowledge base for understanding the broad-scale impacts of environmental change on the arctic flora, and to develop a DNA-based identification system (DNA barcoding) for arctic plants. In 2011 we started a new project to produce the first Arctic Flora of Canada and Alaska, a flora that will treat all vascular plants in the entire Canadian Arctic and the North Slope of Alaska (http://arcticplants.myspecies.info/). All specimens that we collect in 2012 will be incorporated into the Arctic Flora, and new information about the diversity and distribution about the flora of southern Baffin Island (e.g., major range extensions, additions to the flora of the island, etc.) will be published in a peer-reviewed journal.

Our current research team has been conducting comprehensive floristic studies in the Arctic since 2008. We have worked in three areas so far: (1) Southwestern Victoria Island, Nunavut (Nunavut Wildlife Research Permit number WL 2008-1039) in 2008; (2) Tuktut National Park of Canada and Paulatuk and vicinity, Northwest Territories, in 2009; and (3) Uluhaktok and Minto Inlet, Victoria Island, Northwest Territories, in 2010. These trips yielded over 3000 new vascular plant collections, substantially increasing knowledge of the floras of Victoria Island, the western Arctic Archipelago, the Canadian Arctic, and Canada.

Proposed 2012 Fieldwork in Nunavut

Southern Baffin Island is one region in the Canadian Arctic Archipelago that has received relatively little botanical attention to date, yet, being on the southern coast and close to the mainland, may be one of the first areas in the Arctic Islands to experience predicted changes associated with climate warming. We propose to focus our 2012 fieldwork on southern Baffin Island, in the Kimmirut area and to the east of Kimmirut along the Meta Incognita Peninsula. This region is the most floristically diverse area of southern Baffin Island, yet its flora is documented fairly poorly. The majority of the existing collections from this area were made in the 1920s by J. Dewey Soper and M. O. Malte with imprecise collection localities, and no comprehensive studies of the flora of the region have been conducted. Several low arctic species known from the Kimmirut area, documented in the region by only one or a few plant collections, are not otherwise documented as occurring on Baffin Island (Aiken et al. 2007). Given its low arctic floristic affinities, we expect the flora of the region to be more diverse than is currently known.

We propose to study the flora of southern Baffin Island in three main areas: (1) along the Soper River from Mount Joy to Kimmirut, (2) in the vicinity of Kimmirut, and (3) in the vicinity of a remote camp at the head of Barrier Inlet 60 km SE of Kimmirut. We will travel from Mount Joy to Kimmirut by canoe, camping along the way, and will undertake field research in the vicinities of each camp by foot. At the Barrier Inlet camp and in Kimmirut we will undertake field research by foot, and at remote and ecologically diverse sites reached by helicopter, if such support is available to us.

We will document all vascular plants and bryophytes in the region by completing plant inventories of each of the main study areas, and will collect data on conservation status, ecology, distribution, and population variation as appropriate. All of these data will be useful for long-term monitoring of potential changes in species diversity in the future. Approximately 1000 vascular plant and 1000 bryophyte specimens will be collected, photographed, and studied in the field. Collections will be deposited at the National Herbarium of Canada (Canadian Museum of Nature), and duplicate specimens will be

distributed to national and international herbaria, all contributing to the permanent scientific record documenting the distributions of Arctic plant species in time and space.

Plant Collecting Methods
We document plant biodiversity by exploring as many different habitats as possible, and spending time in each habitat to find all the different species that are present. We make collections of all the species at a site, with the aim of comprehensively documenting with voucher specimens the local plant diversity. We collect plants specimens using a plant press, the standard method that botanists have used for several centuries. Once collected, plant specimens are arranged into sheets of newspaper, placed between two pieces of cardboard, piled up, and tightened with two straps. The specimens are flattened and dry in the press; once dry they will last for centuries when stored in a herbarium (dried plant collection).

For each collection event we:

- Collect a few to several individuals of a species (depending on the size of an individual, and how common the species is locally). If a species is not common, we collect only enough material (i.e., enough for one or two herbarium sheets) to properly document its occurrence at the site. If a species is rare, we do not collect any specimens, and document its occurrence only with photographs.
- Record detailed notes on the location of the species, its local growing conditions, and other species that grow at the site. In a subset of instances we take photographs of the species growing in its natural state.
- Preserve a small amount of leaf tissue in silica gel (a dessicant), which rapidly dries the genetic material in the leaf tissue in a way that is suitable for later study (e.g., DNA sequencing) in the molecular laboratory.

Transportation in the Field
Transportation to field camps and study sites will be provided by PCSP (twin otter and helicopter); transportation in the vicinity of each camp will be by foot. While in Katannilik Territorial Park we will travel an approximately 60 km stretch of the Soper River by canoe, over a three week period. During this period we will establish five to seven camps, spending an average of three days at each camp and exploring the flora around each camp site. We plan to have one camp at the head of Barrier Inlet for one week, and a final camp in Kimmirut at Taqaiqsirvik Territorial Park (Campground). Accommodation will be in small backpacking tents. No permanent or large temporary structures will be erected; impact will be minimal. All items associated with the project will be removed at the end of each camp stay.

10. **OPTIONS** – Provide a brief explanation of the alternative methods or locations that were considered to carry out the project.

We have been conducting plant inventories in botanically understudied regions of the Canadian Arctic for several seasons. Southern Baffin Island is one such area where plant diversity has not been studied in detail. We considered working in areas of southern Baffin Island other than those listed here (e.g., such as near the southeastern tip of Meta Incognita Peninsula (62°06'15"N, 67°17'27"W)), but other regions are more difficult to access. The proposed sites were chosen because they are close to the communities of Iqaluit and Kimmirut, and thus easier to access.

11. **CLASSIFICATION OF PRIMARY UNDERTAKING -** Indicate the primary classification of undertaking by checking one of the following boxes.

☐ Industrial ☐ Agricultural
☐ Mining and Milling (includes exploration/drilling/exploration camps)
☐ Conservation
☐ Municipal (includes camps/lodges) ☐ Recreational
☐ Power ☒ Miscellaneous (describe below):

We will be conducting botanical research and collecting plant specimens to document the biodiversity and distribution of plants on southern Baffin Island, in the regions in which we plan to work (see project proposal above).

See Schedule II of *Northwest Territories Waters Regulations* for Description of Undertakings.

Information in accordance with applicable Supplemental Information Guidelines (SIG) must be submitted with a New Water Licence Application. Indicate which SIG(s) are applicable to your application.

- ☐ Hydrostatic Testing
- ☐ Tannery
- ☐ Tourist / Remote Camp
- ☐ Landfarm & On-Site Storage of Hydrocarbon Contaminated Soil
- ☐ Onshore Oil and Gas Exploration Drilling
- ☐ Mineral Exploration / Remote Camp
- ☐ Advanced Exploration
- ☐ Mine Development
- ☐ Municipal
- ☒ General Water Works (**Completed SIG is attached**)
- ☐ Power

12. **WATER USE -** Check the appropriate box(s) to indicate the type(s) of water use(s) being applied for.

- ☒ To obtain water for camp/ municipal purposes
- ☐ To obtain water for industrial purposes
- ☐ To divert a watercourse
- ☒ To cross a watercourse
- ☐ To modify the bed or bank of a watercourse
- ☐ To alter the flow of, or store water
- ☐ Flood control
- ☐ Other: _____

13. **QUANTITY AND QUALITY OF WATER INVOLVED -** For each type of water use indicated in Block 12, provide the source of water, the quality of the water source and available capacity, the estimated quantity to be used in cubic meters per day, method of extraction, as well as the quantities and qualities of water to be returned to source.

Name of water source(s) (show location(s) on map):

1. **Soper Heritage River:** Over a three week period in July 2012 we will be travelling by canoe some 60 km along this river, from Mt. Joy to Kimmirut. The Soper Heritage River will be our main water source.

2. **Small unnamed river entering Barrier Inlet (62°36'20" N 68°50'50"W) and adjacent unnamed small lake (62°36'97"N 68°48'47"W).** We will use the small river and possibly the adjacent lake as water sources. We will cross the small unnamed river during day hikes. [**See inset on map on next page**]

3. **Taqaiqsirvik Territorial Park (Campground)**, **Kimmirut.** When staying at this campground, we will get our water from municipal sources in Kimmirut.

Describe the quality of the water source(s) and the available capacity: _The Soper River is a fairly large river with significant capacity. The unnamed lake and river at near the head of Barrier Inlet appear to be sizable on the topo map (see next page); we are not aware of published information on these latter water sources.

Provide the overall estimated quantity of water to be used: **5L/day x 6 people = 30 L/day = 0.03 m^3/day**

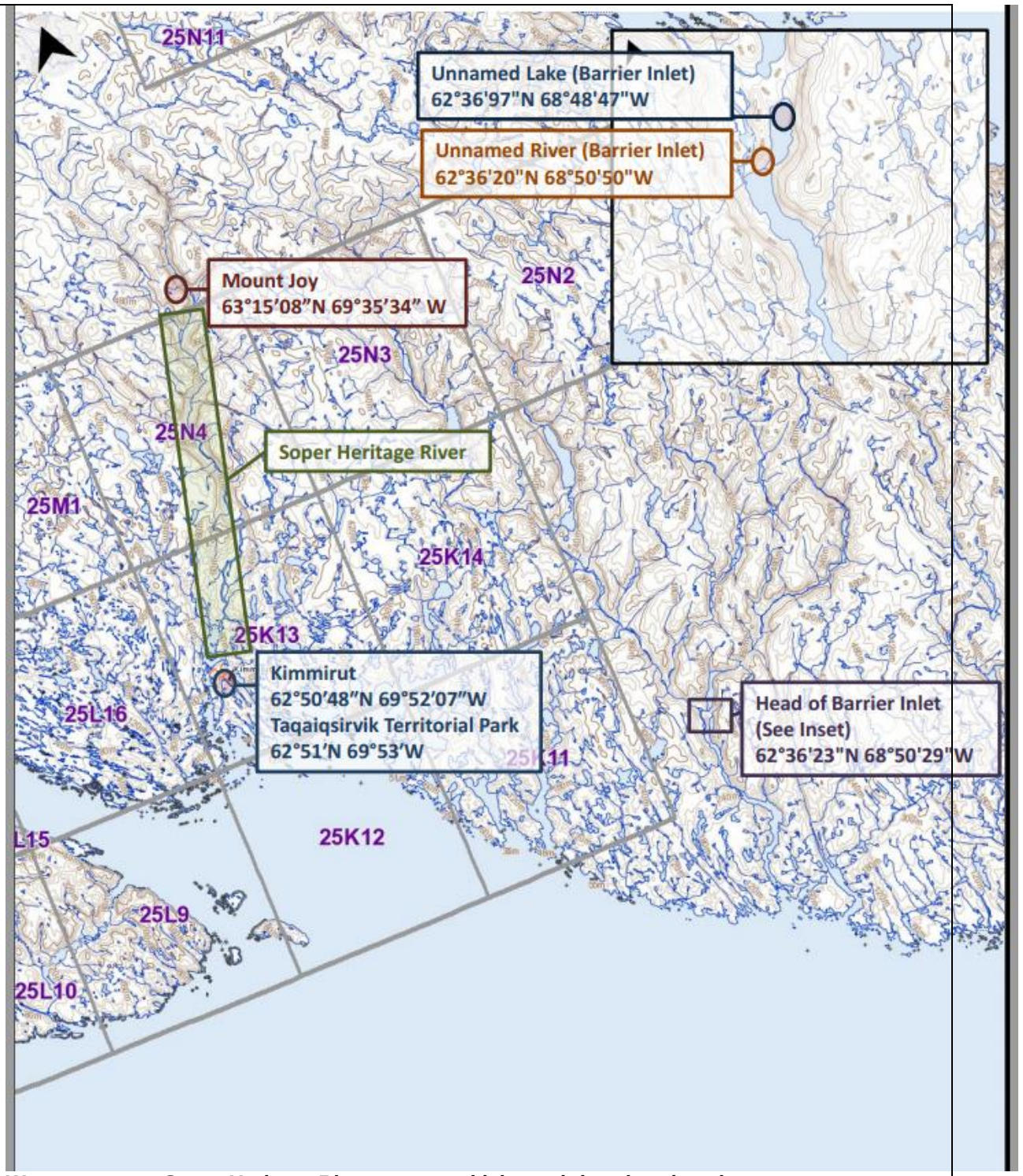
Provide the estimated quantity(s) of water to be used from each source: **Soper River:** 30 L/day x 21 days = 630 L = 0.63 m^3 ; **Unnamed river and adjacent unnamed lake at head of Barrier Inlet:** 30 L/day x 7 days = 210 L = 0.21 m^3

Indicate the estimated quantities to be used for each purpose (camp, drilling, etc.): **All water will be used for camp (domestic) purposes.**

Describe the method of extraction(s): **bucket, small hand-held backpacking water filter**

Estimated quantity(s) of water returned to source(s): **0 m^3/day**

Describe the quality of water(s) returned to source(s): **n/a**



Water sources: Soper Heritage River, unnamed lake and river (see inset).

14. **WASTE** – Check the appropriate box(s) to indicate the types of waste(s) generated and deposited.

☒ Sewage ☐ Waste oil

☐ Solid Waste ☒ Greywater
☐ Hazardous ☐ Sludges
☐ Bulky Items/Scrap Metal ☐ Contaminated soil and/or water
☐ Animal Waste
☐ Other (describe): _____

15. QUANTITY AND QUALITY OF WASTE INVOLVED – For each type of waste indicated in Block 14, describe its composition, quantity in cubic meters/day, method of treatment and method of disposal.

Type of Waste	Composition	Quantity Generated	Treatment Method	Disposal Method
Grey water	Cooking water and cleaning water	ca. 15 L / day	n/a	Will dump grey water at least 50 m from water sources
Sewage	Human excrement	Minimal (six people)	n/a	Will be buried

16. OTHER AUTHORIZATIONS – In addition to the sub-surface and surface land use authorizations provided in Block 6, indicate any other authorizations required in relation to the proposed undertaking. For each provide the following:

Authorization: _____

Administering Agency: _____

Project Activity: _____

Date (expected date) of issuance: _____ Date of expiry: _____

17. PREDICTED ENVIRONMENTAL IMPACTS OF UNDERTAKING AND PROPOSED MITIGATION MEASURES - Describe direct, indirect, and cumulative impacts related to water and waste.

None expected, as we will be using a very small volume of water (30 L per day), only for domestic purposes.

18. WATER RIGHTS OF EXISTING AND OTHER USERS OF WATER

Provide the names, addresses and nature of use for any known persons or properties that may be adversely affected by the proposed undertaking, including those that hold licences for water use in precedent to the application, domestic users, in-stream users, authorized waste depositors, owners of property, occupiers of property, and/or holders of outfitting concessions, registered trapline holders, and holders of other rights of a similar nature.

Advise the Board if compensation has been paid and/or agreement(s) for compensation have been reached with any existing or other users.

n/a

19. INUIT WATER RIGHTS

Advise the Board of any substantial affect of the quality, quantity or flow of waters flowing through Inuit Owned Land (IOL), and advise the Board if negotiations have commenced or an agreement to pay compensation for any loss or damage has been reached with one or more Designated Inuit Organization (DIO).

n/a

20. CONSULTATION – Provide a summary of any consultation meetings including when the meetings were held, where and with whom. Include a list of concerns expressed and measures to address concerns.

n/a

21. SECURITY INFORMATION

Provide an estimate of the total financial security for final reclamation equal to the total outstanding reclamation liability for land and water combined sufficient to cover the highest liability over the life of the undertaking. Estimates of reclamation costs must be based on the cost of having the necessary reclamation work done by a third party contractor if the operator defaults. The estimate must also include contingency factors appropriate to the particular work to be undertaken.

Where applicable, the financial security assessment should be prepared in a manner consistent with the principals respecting mine site reclamation and implementation found in the *Mine Site Reclamation Policy for Nunavut,* Indian and Northern Affairs Canada, 2002.

n/a

22. FINANCIAL INFORMATION

Provide a statement of financial responsibility.

If the applicant is a business entity, provide a list of the officers of the company.

If the applicant is a business entity attach a copy of the Certificate of Incorporation or evidence of registration of the company name.

n/a

23. STUDIES UNDERTAKEN TO DATE - List and attach copies of studies, reports, research, etc.

The following publications and presentations have resulted from the work of the Canadian Museum of Nature Arctic Botany research team since 2010.

Publications:

1. Saarela JM, Gillespie LJ, Consaul LL, Bull RD. 2012. Balsam poplar (Populus balsamifera; Salicaceae) beyond the treeline in the western Canadian mainland Arctic (Northwest Territories). Arctic, in press, accepted 10 June 2011.
2. Sokoloff, PC, Gillespie, LJ. 2011. Taxonomy of Fernald's Milkvetch - Astragalus robbinsii var. fernaldii (Fabaceae): molecular and morphological analyses support transfer to Astragalus eucosmus. Botany 90: 11-26.
3. Le Clerc-Blain, J., Starr, J.R., Bull, R.D. & Saarela, J.M. 2010. A regional approach to plant DNA

barcoding provides high species resolution of sedges (Carex and Kobresia, Cyperaceae) in the Canadian Arctic Archipelago. Molecular Ecology Resources 10: 69-91.
4. Consaul, L.L., L.J. Gillespie, and M.J. Waterway. 2010. Evolution in North American Arctic Puccinellia (Poaceae) based on nuclear ribosomal spacers and chloroplast DNA sequences. American Journal of Botany 97: 324-336.
5. Consaul, L.L., L.J. Gillespie, and M.J. Waterway. 2010. Polyploid speciation and evolution in arctic Puccinellia (Poaceae: Puccinelliinae) – A review. In O. Seberg, G. Petersen, A.S. Barfod, J.I. Davis (editors), Diversity, phylogeny, and evolution in the monocotyledons. Aarhus University Press, Aarhus, Denmark. Pp. 645-662.
6. Saarela, J.M., L.J. Gillespie, L.L. Consaul, and R.D. Bull. 2010. The Vascular Plant Flora of Tuktut Nogait National Park of Canada and Vicinity, Northwest Territories. Report submitted to Parks Canada, April 2010 (and made available to the NWT government). 149 pages + 5 appendices. [Manuscript in preparation for submission to peer-reviewed journal, Phytotaxa].

Selected presentations:

1. Gillespie, LJ. 2011. Monitoring Red-Listed Arctic Plant Species. Conservation of Arctic Flora and Fauna (CAFF), Flora Group meeting. Akureryi, Iceland, Jan 31.
2. Gillespie, LJ. 2011. Flora of the Canadian Arctic: discoveries, DNA barcoding and a new flora project. Institut de Recherche en Biologie Végétale (IRBV), Université de Montréal, Feb 18.
3. Saarela, JM, LJ Gillespie, LL Consaul, RD Bull. 2011. New floristic discoveries and biodiversity of the western Canadian Arctic vascular plant flora. International Botanical Congress 2011, Melbourne, Australia, 17-29 July 2011.
4. Saarela, JM, LJ Gillespie, LL Consaul, JR Starr, RD Bull, PC Sokoloff. 2011. DNA barcoding the vascular plant flora of the Canadian Arctic. International Botanical Congress 2011, Melbourne, Australia, 17-29 July 2011.
5. Gillespie, L.J., J.M. Saarela, L.L. Consaul, RD Bull. 2010. Plant collecting by canoe: botanical explorations of Tuktut Nogait National Park and vicinity, Northwest Territories. 2010 SPNHC-CBA Joint Conference, Ottawa, ON, 31 May – 5 June
6. Saarela, J.M., L.J. Gillespie, R.D. Bull, B.N. Chouinard, P. Abraham, and J. Starr. 2010. DNA barcoding the vascular plant flora of the Canadian Arctic. Botany 2010: American Society of Plant Taxonomists / Botanical Society of America. Annual Meeting. August. Providence RI.
7. Aronsson, M., LJ Gillespie and S Ickert-Bond. 2011. Vascular plant Red List, Monitoring and Arctic Plant Portal. Conservation of Arctic Flora and Fauna (CAFF) biennial meeting. Akureryi, Iceland, Feb 2.
8. Gillespie, LJ. 2011. Flora of the Canadian Arctic: discoveries, DNA barcoding and a new flora project. Institut de Recherche en Biologie Végétale (IRBV), Université de Montréal, Feb 18.
9. Saarela, JM, LJ Gillespie, LL Consaul, RD Bull. 2011. New floristic discoveries and biodiversity of the western Canadian Arctic vascular plant flora. International Botanical Congress 2011, Melbourne, Australia, 17-29 July 2011. [e-poster] http://www.slideshare.net/jmsaarela/2011-saarela-et-al-ibc-2011-eposter-arctic-floristicsfinal
10. Saarela, JM, LJ Gillespie, LL Consaul, JR Starr, RD Bull, PC Sokoloff. 2011. DNA barcoding the vascular plant flora of the Canadian Arctic. International Botanical Congress 2011, Melbourne, Australia, 17-29 July 2011. http://www.slideshare.net/jmsaarela/2011-saarela-et-al-ibc-2011-eposter-dna-barcoding
11. Consaul LL, M Ip, D Charette, PM Catling, E Kattuk, S Kudluarok Jr, C Ekidlak, M Tsujimoto, N Doubleday. 2011. Traditional knowledge and botanical collections help to study climate change effects in the southern Arctic. Canadian Botanical Association, Annual Meeting. Halifax July 2011.
12. Abraham, P, BN Chouinard, JM Saarela, JR Starr. 2010. Plant DNA barcodes correctly identify all field collections of Carex and Kobresia (Cyperaceae) from the Canadian Arctic Archipelago. 2010 SPNHC-CBA Joint Conference, Ottawa, ON, 31 May – 5 June 2010.
13. Consaul, L.L., J.M. Saarela, L.J. Gillespie, and R.D. Bull, 2010. Vascular plant diversity in Canada's southern Arctic: new baseline data and significant floristic discoveries in Tuktut Nogait National Park and vicinity, Northwest Territories. 2010 SPNHC-CBA Joint Conference, Ottawa, ON, May31 –June 5 2010.
14. Consaul, L.L., J.M. Saarela, L.J. Gillespie, and R.D. Bull, 2010. Vascular plant diversity in Canada's southern Arctic: new baseline data and significant floristic discoveries in Tuktut Nogait National Park

and vicinity, Northwest Territories. American Society of Plant Taxonomists / Botanical Society of America, Annual Meeting. July 31 - August 4. Providence RI.
15. Consaul, L.L., Morgan A. Ip, Paul M. Catling, Sarah Kudluarok, Lucy M. Tookalook, and Nancy C. Doubleday. 2010. Native orchids as bioindicators in the southern Arctic. Canadian Botanical Association Conference, Ottawa, Ontario, May 31–June 5, 2010.
16. Consaul, L.L. Flora of the Arctic, adaptations for harsh environments. Manotick Horticultural Society. March 8, 2010.
17. Doubleday, N.C., S.G. Donaldson, M. Ip, D. Charette, B. Grimwood, L. Consaul, and S. Kudluarok. Photos and Plants Through Time. IPY Early Results Workshop. Ottawa, Feb 16, 2010.
18. Gillespie, L.J., J.M. Saarela, L.L. Consaul, RD Bull. 2010. Plant collecting by canoe: botanical explorations of Tuktut Nogait National Park and vicinity, Northwest Territories. 2010 SPNHC-CBA Joint Conference, Ottawa, ON, 31 May – 5 June.
19. Saarela, J.M., L.J. Gillespie, L.L. Consaul, R.D. Bull, B.N. Chouinard, P. Abraham, J.R. Starr. 2010. DNA barcoding the vascular plant flora of the Canadian Arctic. 2010 SPNHC-CBA Joint Conference, Ottawa, ON, 31 May – 5 June.
20. Saarela, J.M., L.J. Gillespie, R.D. Bull, B.N. Chouinard, P. Abraham, and J. Starr. 2010. DNA barcoding the vascular plant flora of the Canadian Arctic. Botany 2010: American Society of Plant Taxonomists / Botanical Society of America. Annual Meeting. August. Providence RI.
21. Saarela, J.M. DNA barcoding Canadian plants: grasses, sedges, and the flora of the Canadian Arctic. Canadian Food Inspection Agency, 20 May 2010. [Invited seminar]
22. Sokoloff, P.C., Gillespie, L.J. 2010. Systematics and conservation of Fernald's Milkvetch: cpDNA, AFLPs and morphometric analyses do not support taxonomic recognition 2010 SPNHC-CBA Joint Conference, Ottawa, ON, 31 May – 5 June.

Public presentations:

1. Saarela, JM. 2011. Flora of the Canadian Arctic. Canadian Museum of Nature Annual General Meeting. 3 November 2011. Victoria Memorial Museum Building, Canadian Museum of Nature, Ottawa.
2. Gillespie, LJ. 2010. Canadian Arctic Flora: Botanical Research at the CMN. Ottawa Field Naturalists Club, VMMB, Ottawa, Dec 14.
3. Saarela, JM. 2011. Botany in arctic Canada: The latest chapter in a 200 year adventure. Floristic discoveries and biodiversity of the western Canadian Arctic vascular plant flora. Meeting of the Field Botanists of Ontario, Victoria Memorial Museum Building, Canadian Museum of Nature, 8 April 2011.
4. Saarela, JM. 2010. Flora of the Canadian Arctic. Canadian Museum of Nature Annual Volunteer Appreciation Luncheon. December 2010. Victoria Memorial Museum Building, Canadian Museum of Nature.
5. Sokoloff, P. 2011. A series of five blog posts on the Museum's nature.ca blog (one of five published as of 13 Oct 2011; text for all five posts is complete)

24. PROPOSED TIME SCHEDULE – Indicate the proposed start and completion dates for each applicable phase of development (construction, operation, closure, and post closure).

Construction
Proposed Start Date: **n/a** (month/year) Proposed Completion Date: **n/a** month/year)

Operation
Proposed Start Date: **28 June 2012** (month/year) Proposed Completion Date: **31 July 2012** (month/year)

Closure
Proposed Start Date: _____**n/a**_____ (month/year) Proposed Completion Date: _____**n/a**_____ (month/year)

Post - Closure
Proposed Start Date: _____**n/a**_____ (month/year) Proposed Completion Date: _____**n/a**_____ (month/year)

For each applicable phase of development indicate which season(s) activities occur.

Construction
☐ Winter ☐ Spring ☐ Summer ☐ Fall ☐ All season **n/a**

Operation
☐ Winter ☐ Spring ☒ Summer ☐ Fall ☐ All season

Closure
☐ Winter ☐ Spring ☐ Summer ☐ Fall ☐ All season **n/a**

Post - Closure
☐ Winter ☐ Spring ☐ Summer ☐ Fall ☐ All season **n/a**

25. PROPOSED TERM OF LICENCE

Number of years (maximum of 25 years): _____< **1**_____ years

Requested Date of Issuance: **June 2012** (month/year) Requested Expiry Date: **September 2012** (month/year)

(The requested date of issuance must be at least three (3) months from the date of application for a type B water licence and at least one (1) year from the date of application for a type A water licence, to allow for processing of the water licence application. These timeframes are approximate and do not account for the time to complete any pre-licensing land use planning or development impact requirements, time for the applicant to prepare and submit a water licence application in accordance with any project specific guidelines issued by the NWB, or the time for the applicant to respond to requests for additional information. See the NWB's *Guide 5: Processing Water Licence Applications* for more information)

26. ANNUAL REPORTING – If not using the NWB's *Standardized Form for Annual Reporting*, provide details regarding the content of annual reports and a proposed outline or template of the annual report.

We will use the NWB's *Standardized Form for Annual Reporting*.

27. CHECKLIST – The following must be included with the application for the water licensing process to begin.

Written confirmation from the NPC confirming that NPC's requirements regarding land use plan conformity have been addressed.

☒ Yes **(n/a – see written confirmation above)** ☐ No If no, date expected ____

Written confirmation from the NIRB confirming that NIRB's requirements regarding development impact assessment have been addressed.

☒ Yes **(n/a – see written confirmation above)** ☐ No If no, date expected ___

Completed General Water Licence Application form.

☒ Yes **(current application, expected June 2012)** ☐ No If no, date expected

Information addressing Supplemental Information Guideline (SIG) , where applicable (see Block 11)

☒ Yes	☐ No	If no, date expected _____

English Summary of Application.

☐ Yes	☐ No	If no, date expected _____

Inuktitut and/or Inuinnaqtun Summary of Application.

☐ Yes	☐ No	If no, date expected _____

Application Fee of $30.00 CDN (Payee Receiver General for Canada).

☐ Yes	☐ No	If no, date expected _____

Water Use Fee Deposit of $30.00 CDN (Payee Receiver General for Canada). The actual water use fee will be calculated by the NWB based upon the amount of water authorized for use in accordance with the Regulations at the time of issuance of the licence.

☒ Yes	☐ No	If no, date expected _____

28. SIGNATURE

Jeffery M. Saarela	Research Scientist		
Name (Print)	**Title (Print)**	**Signature**	**Date**