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ECCC File: 6500 000 004/005
NWB File: 8AC-ALT----

June 18, 2019

Via email: licensing@nwb-oen.ca

Richard Dwyer
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0

Dear Richard Dwyer:

**RE: 8AC-ALT---- – Department of National Defense – Canadian Forces Station
Alert Project – Renewal Application for Type A Water License – ECCC Final
Submission Comments**

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Water Board (NWB) regarding the above-mentioned Type A Water License Renewal Application. This letter and the attached Final Submission provides ECCC's expert advice based on our mandate in the context of the *Canadian Environmental Protection Act*, and the pollution prevention provisions of the Fisheries Act and identifies outstanding concerns and recommendations for consideration by the NWB.

ECCC notes that the current information provided from the Department of Defence (DND) does not adequately address our outstanding issues with:

- sewage treatment at the station;
- monitoring of the effluent; and
- water management at the station, and surface erosion and transport of suspended solids into the marine receiving environment.

ECCC suggests that this missing information from DND be provided prior to licence issuance for all parties to review.

Please contact Eva Walker at (867) 669-4744 or eva.walker@canada.ca if you need more information.

Sincerely,


for/ Andrea McLandress
Regional Director

Enclosure – Final Submission

cc: ECCC Review Team
Margaret Fairbairn, Manager Environmental Operations and Protection Directorate



Environment and
Climate Change Canada

Environnement et
Changement climatique Canada



ENVIRONMENT AND CLIMATE CHANGE
CANADA'S
FINAL SUBMISSION TO THE NUNAVUT
WATER BOARD

RESPECTING
THE TYPE A WATER LICENCE PERMIT
APPLICATION FOR
THE CANADIAN FORCES STATION
ALERT PROJECT
PROPOSED BY
DEPARTMENT OF
NATIONAL DEFENSE

June 18, 2019

Canada

**Department of National Defense Canadian Forces Station Alert Project
Environment and Climate Change Canada
Final Written Submission to the Nunavut Water Board**

Executive Summary

The Department of National Defense (DND) has applied for a Type A Water Licence (WL) for the Canadian Forces Station Alert Project (The Project) located on the eastern tip of Ellesmere Island, Nunavut. The Alert Station has previously held a Type B Water Licence but increased water use has resulted in the need for a Type A Water Licence.

In Nunavut, Environment and Climate Change Canada (ECCC) provides specialist expert information or knowledge to the Nunavut Water Board (NWB or the Board) as required under Article 13 of the *Nunavut Agreement*.

ECCC has participated in all phases of the WL application review process for the Project thus far, including submitting our Information Requests on August 26, 2016, Technical Review comments on July 20, 2018 and participating in the NWB Technical Meeting held on October 12, 2018. ECCC is continuing its participation in this Type A WL review by way of this Final Submission.

This Final Submission provides ECCC's expert advice based on our mandate in the context of the *Canadian Environmental Protection Act*, and the pollution prevention provisions of the *Fisheries Act* and identifies outstanding concerns and recommendations for consideration by the NWB.

ECCC's technical review comments and recommendations relate to sewage treatment at the station, monitoring of the effluent, water management at the station, and surface erosion and transport of suspended solids into the marine receiving environment.

List of Acronyms

CEPA	Canadian Environmental Protection Act
CFS	Canadian Forces Station
CIRNAC	Crown Indigenous Relations and Northern Affairs Canada
DND	Department of National Defense
ECCC	Environment and Climate Change Canada
NWB	Nunavut Water Board
SARA	Species at Risk Act
TSS	Total Suspended Solids
WL	Water Licence

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1.0 Introduction

The Department of National Defense (DND) has applied for a Type A Water Licence (WL) for the Canadian Forces Station Alert Project (The Project) located on the eastern tip of Ellesmere Island, Nunavut. The Alert Station has previously held a Type B Water Licence, but increased water use has resulted in the need for a Type A Water Licence.

In Nunavut, ECCC provides specialist expert information or knowledge to the Nunavut Water Board (NWB) as required under Article 13 of the Nunavut Agreement.

Environment and Climate Change Canada (ECCC) submitted Information Requests on August 26, 2016, Technical Review to the NWB on July 20, 2018 and participated in the NWB Technical Meeting on October 2, 2018. Environment and Climate Change Canada (ECCC) has participated in the NWB and is continuing its participation in this Type A WL review by way of this Final Submission.

The comments and recommendations provided are based on ECCC's mandate in the context of the *Canadian Environmental Protection Act* (CEPA), and the pollution prevention provisions of the *Fisheries Act*.

A summary of ECCC's mandate and legislation is provided in Section 2.0. ECCC's technical review comments and recommendations are provided in Section 3.0 and Acknowledgments in Section 4.0.

ECCC's technical review comments and recommendations relate to sewage treatment at the station, monitoring of the effluent, water management at the station, and surface erosion and transport of suspended solids into the marine receiving environment.

2.0 Environment Climate Change Canada's Mandate, Roles, and Responsibilities

ECCC's mandate is determined by the statutes and regulations under the responsibility of the Minister of Environment and Climate Change. ECCC's mandate covers matters such as the preservation and enhancement of the quality of the natural environment (including water, air and soil quality, and the coordination of the relevant policies and programs of the Government of Canada), renewable resources (including migratory birds and other non-domestic flora and fauna), meteorology, and the enforcement of rules and regulations. ECCC provides its specialist advice for reviews of projects in Nunavut in the context of the Canadian Environmental Protection Act (CEPA), the pollution prevention provisions of the *Fisheries Act*, *Species at Risk Act* (SARA), and the *Migratory Birds Convention Act* (MBCA).

ECCC administers the pollution prevention provisions of the *Fisheries Act*, which prohibits the deposit of a deleterious substance into fish-bearing waters or to a place where those substances might enter such waters. ECCC also participates in the regulation of toxic chemicals and the development and implementation of environmental quality guidelines pursuant to CEPA.

ECCC is responsible for protecting and conserving migratory bird populations and individuals under the MBCA. ECCC also administers SARA in cooperation with Fisheries and Oceans Canada, and the Parks Canada Agency to prevent wildlife species from becoming extirpated or extinct, provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity, and to manage species of special concern to prevent them from becoming threatened, endangered or extirpated.

Additional information on ECCC's mandate are available at: <https://www.canada.ca/en/environment-climate-change/corporate/acts-regulations/acts-administered.html>.

3.0 Environment Climate Change Canada's Technical Review Comments

This Final Submission summarizes the results of ECCC's Technical Review of the Type A Water Licence application and the additional information provided by the Department of National Defense (DND) following the NWB Technical Meeting on October 2, 2018. ECCC's technical review comments and recommendations relate to sewage treatment at the station, monitoring of the effluent, water management at the station, and surface erosion and transport of suspended solids into the marine receiving environment.

3.1 ECCC# 1 – Sewage Treatment Upgrades

References

- Letter from DND to the NWB dated Aug. 3, 2018 Subject: Response to ECCC Technical Review Comments
- Feb. 28, 2019 email to the NWB from Andrew Tam, DND
- DND Submission to the NWB (undated; unsigned) submitted Mar. 7, 2019: 2 page Tech Memo - Sewage Treatment Options.
- DND Submission to the NWB from G. McKay Mar. 4 2019: 1 page email - Alert Sewage Treatment Proposal

Proponent's Conclusion

In the August 3, 2018 letter from DND to the NWB, in response to ECCC's technical submission comment ECCC#1, DND stated that:

“...currently, DND is supporting a study by the DND/Canadian Forces I Engineering Support Unit for the design and addition of a packaged and engineered Sewage Treatment Plant that will be optimized to treat CFS Alert's effluent, prior to discharge into the Sewage Terrace Treatment Facility. The study will also investigate options to optimize the existing terraced wetland system to improve the treatment performance, with the intent to ensure the final effluent discharge is protective of marine environments. At the time of this response, timelines and detailed information are unavailable; however, once plans, designs, and project timelines are firmly established, DND will submit a Proposed Modification in writing to the NWB, in compliance and adherence to Part F: Conditions

Applying to Modifications and Construction of CFS Alert's current Water Licence."

On February 28, 2019, in an email to the NWB from Andrew Tam, DND stated:

"DND anticipates the final Technical Document (with all attachments) to be received in April, and DND will then submit the document and issue an accompanying letter stating the potential option selected and decision."

On March 7, 2019, DND provided a 'Technical Memo' and an email (dated March 4, 2019) to the NWB outlining three options for wastewater treatment at the Alert Station. A package treatment system, which discharges directly to the marine bay, was proposed, with improvements to the existing terrace wetland wastewater treatment system as a back up to a packaged treatment plant.

ECCC's Conclusion:

ECCC supports the installation of a treatment system that will be able to treat wastewater consistently to levels that are acceptable for marine discharge (e.g. meeting standards such as those set in the *Wastewater Effluent Systems Regulations* under the *Fisheries Act* for regions south of the 60th parallel).

DND has investigated options for package treatment plants, but did not provide details of the proposed treatment plant options. ECCC is not able to evaluate the feasibility of DND improving wastewater treatment at the Alert Station without technical specifications, treatment performance targets, and details on timing of installation.

DND provided a diagram showing placement of gabion berms in the terrace wetland wastewater treatment system, as an upgrade to improve treatment performance. However, there is no information on how the placement of the gabions will alter flow and afford enhanced treatment of the wastewater.

ECCC Recommendation(s):

ECCC recommends that DND provides:

- Details of the proposed package treatment plant under consideration, and the rationale for the conclusion that the system to be selected would be feasible to install and operate at Alert;
- Information on treatment capabilities of the selected package treatment plant, and the effluent quality targets;

- Details on timing of improvements to the terrace wetland wastewater treatment system and for installation and commissioning of a package treatment plant.

3.2 ECCC# 2 - Monitoring

References

- Letter from DND to the NWB dated Aug. 3, 2018 Subject: Response to ECCC Technical Review Comments

Proponent's Conclusion

In the August 3, 2018 letter from DND to the NWB in response to ECCC's technical submission, DND states that:

"DND is supportive of Recommendation ECCC #2 [for DND to enhance the frequency of effluent monitoring]. DND is incorporating Effluent Quality Monitoring into the standard contract statement of work and deliverables for the next Contractors that are operating the sewage terrace systems on a weekly frequency basis during the summer months for grab samples."

ECCC's Conclusion

The 2017 Annual Report included monitoring results for two effluent samples, collected in June and July of 2017. At the Technical Meeting on October 2, 2018 ECCC recommended that ongoing effluent characterization be improved with more frequent sample collection. Specifically, ECCC noted that there was substantial variability in effluent quality reported between 2015 and 2016 during more intensive monitoring. ECCC notes that the 2018 Annual Report has not been posted on the NWB Public Registry at the time of this submission; therefore, ECCC has not had the opportunity to evaluate monitoring effort for 2018.

ECCC is of the view that increased monitoring frequency will allow the DND to characterize the wastewater and track performance of the terrace wetland wastewater treatment system,

ECCC Recommendation(s):

ECCC recommends that the Type A WL include requirements for effluent quality monitoring at a frequency that will provide information on current treatment performance and characterize ongoing variability of the effluent in order to inform

the consideration of treatment systems under evaluation (e.g., weekly sampling to be conducted until results stabilize and / or a new system is in place).

3.3 ECCC# 3 – Site Water Management

References

- Letter from DND to the NWB dated Aug. 3, 2018 Subject: Response to ECCC Technical Review Comments
- DND Technical Meeting Commitment 6 – Provide Preliminary Site Water and Runoff Management Plan - Letter to NWB Dated April 30, 2019

Proponent's Conclusion

In the August 3, 2018 letter from DND to the NWB in response to ECCC's technical submission comment ECCC# 4, DND states that:

“Regarding Recommendation ECCC #4— Bleed Water: ECCC recommends for DND to clarify the status of bleed water. And options to reduce and/or equalize its use for optimizing treatment. DND is willing to support this Recommendation ECCC#4 and will investigate the potable water bleed system and standing operating procedures at the CFS Alert Water Treatment Plant this coming August 2018 for more information, and further assess if the volume of water can be reduced to optimize for treatment. ECCC should be reminded that the bleed purpose is for the direct protection of DND's water pipeline infrastructure system. The flowing motion of water prevents the risk of freezing damages all year round given the harsh high arctic cold climate.”

In response to Crown Indigenous Relations and Northern Affairs Canada's (CIRNAC) request that a Site Water and Runoff Management Plan be developed, DND states in their April 30, 2019 letter that this plan will be developed between 2023 - 2024 and implemented in 2025.

ECCC's Conclusion

ECCC technical review comment ECCC# 4, requested clarification regarding the use of bleed water and recommended that DND prepare a basic water balance for the site, including estimates of water releases and the concentration of sewage being discharged to the terrace wetland wastewater treatment system, which would vary with the amount of bleed water. ECCC also noted that the Type A WL application and supporting reports contained contradictory information on whether bleed water was consistently being used.

The timeline for the submission of the proposed Site Water Management Plan will not provide information on the site water balance in time to support identification of wastewater treatment systems that would be capable of handling widely varying strengths of influent.

ECCC Recommendation(s):

ECCC recommends that:

- DND prepare a basic site water balance, including seasonal ranges of water used and discharged, to inform wastewater treatment system selection; and
- Water management planning be initiated and completed on a shorter time frame in order to inform and potentially improve water management practices.

3.4 ECCC# 4 – Surface Erosion

References

- DND letter dated February 9, 2017 responding to concerns raised by ECCC in the licence application Completeness Check.
- DND email from Andrew Tam to NWB dated Mar. 7, 2019: DND Submission for ALT Alert Sewage Treatment System – Options and Selection
- CFS Alert Wetland Report 2016; submitted with Annual Report March 2017
- 2015 CFS Alert Constructed Wetland Interim Report; submitted with Annual Report March 2016

Proponent's Conclusion

In the 2016 Annual Report, the CFS Alert Wetland Report reviewed performance of the terrace wetland wastewater treatment system and identified short-circuiting of the treatment flow path as a cause of surface erosion, with flows going into Parr Inlet (outside the regulated compliance point) containing elevated levels of total suspended solids (TSS). The 2015 TSS levels were also highly elevated at the discharge point from the terrace wetland wastewater treatment system.

Concerns with erosion and sedimentation were raised by ECCC, and the letter from DND to ECCC dated February 9, 2017 stated that a study was to be conducted in July and August 2017 with the intent to reduce the total volume of

flow through the system, and identify other methods that could be used to reduce erosion and TSS.

In the review of sewage treatment options (March 2019) DND stated they would consider upgrading the existing terrace wetland wastewater treatment system as a backup to the installation of a packaged treatment plant.

ECCC's Conclusion

Wastewater going to the terrace wetland wastewater treatment system has been flowing along paths outside the terrace berms, causing erosion and short-circuiting treatment time. This results in reduced effluent quality and the transport of suspended solids into Parr Inlet.

Surface erosion and transport of suspended solids into the marine receiving environment was identified in previous studies (CFS Alert Wetland Report 2016; Interim Report 2015). DND indicated that further work would be done, but there has been no indication whether the above-referenced study was conducted.

In the email of March 7, 2019 DND has proposed to upgrade the terrace wetland wastewater treatment system for use as a backup treatment system. Timing for carrying out the remedial and upgrading works has not been provided.

ECCC Recommendation(s):

ECCC recommends that upgrades to the terrace wetland wastewater treatment system area be done in any event to stabilize the terrain and prevent transport of suspended solids into the marine environment, and that the design be reviewed prior to implementation to confirm it will be effective in preventing further erosion and transport of sediments from the terrace.

4.0 Acknowledgements

ECCC acknowledges and appreciates the effort that the Department of Defense has taken to address concerns brought forward by parties throughout the Type A Water Licence process. ECCC would like to thank the Nunavut Water Board for this opportunity to provide input to the Type A Water Licence review and looks forward to continuing its participation in this process.

ECCC's technical review comments and final written submission should not be interpreted as any type of acknowledgement, compliance, permission, approval, authorization, or release of liability related to any requirements to comply with federal or territorial statutes and regulations.