Aboriginal Affairs and Northern Development Canada | Affaires autochtones et Développement du Nord Canada

Field Operations Unit
Aboriginal Affairs and Northern Development Canada
Nunavut Regional Office
P.O. Box 100
Iqaluit, Nunavut X0A 0H0

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Dany P. Breton
Lieutenant- Colonel
Wing Logistics and Engineering Officer
8 Wing / CFB Trenton
P.O. Box 1000 Station Forces
Astra, Ontario K0K 3W0

RE: DND Response to Water Use Inspection conducted at CFS Alert July 11, 2013.

Mr. Breton,

Thank you for taking the time to write the response delivered to our offices and that of the Nunavut Water Board on September 12, 2013. The role of Aboriginal Affairs and Northern Development Canada (AANDC) in issues related to the use of water or deposit of waste in Nunavut is one of compliance monitoring and enforcement. Our preferred option is to work with clients by identifying instances of non-compliance, risks to the environment and/or people, bringing them to the licensee's attention and ensuring the operator addresses these issues to achieve and maintain compliance with the authorizations and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, SC 2002, c 10.

In reviewing your response to the Inspection Report Form (License #3BC-ALT1015) submitted to your offices and staff on August 7th 2013, I have responded to your letter after having reviewed previous inspection reports, correspondances, and other reports we have on file.

1. Please see my responses to your letter I will respond to each section as identified in your correspondence using the associated numbers you have used in your letter.

2. Water Supply.

   In your letter, you state that the Department of National Defense (DND) calculates water use based on the formulae *Usage = Intake Volume – Return Volume*. Unfortunately, this interpretation of water use is inconsistent with the applicable legislation (*Nunavut Waters and Nunavut Surface Rights Tribunal Act*, SC 2002, c 10) whereas section 4 of this Act defines 'use' as follows:

"Use", in relation to waters, means a direct or indirect use of any kind, including, but not limited to,

- *a) any use of water power and geothermal resources;*
- *b) any diversion or obstruction of waters*
- *c) any alteration of the flow of waters; and*
- *d) any alteration of the bed or banks of a river, stream, lake or other body of water, whether or not the body of water is seasonal*

With respect to CFS Alert's use of water, the quantity of water that is used for the purposes of preventing freezing and pressure damages to the Water Intake Pipeline, even though it is returned to the intake source, is still considered part of the total water used by the facility. Therefore, under the Nunavut Water Board license number 3BC-ALT1015, the CFS Alert's total water used by the facility is more than was anticipated in the application for a license and remains more than the National Defense is currently licensed for.

This being the case, and as stated in the inspection report completed by Inspector Keim, it is requested that an amendment application to the Nunavut Water Board for your additional water use be submitted immediately.

3. Waste Disposal. In your letter you have detailed that a significant amount of work has been completed on the sewage terrace system. Similar observations were also included in the submitted Inspection Report. It is to be noted that this on-going work was also detailed in the Stantec's *Final Report 2012 for CFS Alert Wastewater Terraces* as being a requirement for the on-going and sustainable use of this facility.

   I commend your efforts around rebuilding the berm walls, armoring the terraces with large stones to slow and direct flow, and the installation of the series of sediment fences along the water flow path, all of which were recommended in the 2011 Inspection of these same facilities. This work was recorded in the Inspection Report was clearly for the purpose to improve the viability and stability of the Terrace system. However, Total Suspended Sediment (TSS) loads have continued to be above the maximum concentration limit of 70 mg/L, as described within your annual report. It was for these reasons that the Inspection Report includes further recommendations to ensure the continued integrity of the system, so that water quality may eventually become compliant with the license.

4.

a. Overland systems such as constructed and engineered wetland treatment systems can act as effective sewage treatment systems and are often used in many northern, as well as southern environments to successfully treat waste water. The terraced system in place in CFS Alert in its current state is not providing the intended treatment it was meant to, as evidenced through the constant breaches, erosion, and high TSS. Working in the High Arctic is an extremely harsh environment, yet we must work towards a Sewage Treatment System that effectively works in this environment. With respect to your comment about the Terrace System not being uncommon in the North, where else is a terraced system such as this located in Nunavut?

b. As detailed in the submitted inspection report, the "erosion of the constructed diversion dykes (terraces) on the hill side was found to have occurred at each set of terraces." As stated in the above section 3, AANDC commends the work done to re-develop the integrity of system, but even after the minor expected maintenance, which was completed by hand last spring (2013), at the time of the summer inspection in July 2013, it was noted that significant erosion was still evident and discussed with staff on site.

c. With respect to the observations contained within the Inspection Report detailing how a rapid melt event may affect the integrity of the system, Keim's comments were based on his knowledge of the history of the system, gained through previous inspections on this and many other sites within the Territory. Additionally it is noted that similar observations were outlined in a Stantec Report, *Alert Wastewater Treatment System – Site Recommendations* completed for your offices at National Defense. In this report, Ron Kent and Arlen Foster describe how the system became compromised after a spring melt. The report goes on to say,

> *"Breaches in the soft soil and erosion caused necessary repair work to occur in 2011. It appears now that, rather than icing, the new scree slopes freely transport water from terrace to terrace. This is aided by the high temperature (10C+) of the wastewater preventing freezing. Thus, ice does not accumulate in the upper reaches of the site to the same extent as intended. Further, ice accumulation appears to be shifted to the north instead of being spread across the site. Instead, it forms in the lower reaches between the tail of Terrace 3 and Terrace 4. This blocks the flow path so that the flow must seek an alternate exit."*

d. An acute lethality to Rainbow Trout, *Oncorhynchus mykiss* (EPS/1/RM/13) and an acute lethality to the crustacean, *Daphnia mahna* (EPS/1/RM/14) were two tests that were recommended by the Inspector following observations that the wastewater system may not be operating effectively. While the location of CFS Alert may contribute to the difficulty in coordinating the logistics of conducting these tests it should not prevent them from occurring. One of the two tests is still requested to be submitted along with the Annual Report.

Additionally, you suggest that recommendations regarding the undertaking of this testing is not within the scope of an AANDC Inspector's powers. This is not the case. An Inspector may require a licensee or any person to undertake actions (such as sampling) to prevent adverse effects to people, property and the environment. The authority to do so is based in the legislation as set out in the *Act* under section 87.

Section 87: Nunavut Water and Nunavut Surface Rights Tribunal Act.

87. (1) An inspector may direct any person to take such reasonable measures as the inspector may specify, including the cessation of an activity, to prevent the use of waters or the deposit of waste or the failure of a work related to the use of waters or the deposit of waste, or to counteract, mitigate or remedy the resulting adverse effects, where the inspector believes, on reasonable grounds,

(a) that

(i) waters have been or may be used in contravention of subsection 11(1) or of a condition of a license,

(ii) waste has been or may be deposited in contravention of subsection 12(1) or of a condition of a license, or

(iii) there has been, or may be, a failure of a work related to the use of waters or the deposit of waste, whether or not there has been compliance with any standards prescribed by the regulations or imposed by a license; and

(b) that the adverse effects of that use, deposit or failure are causing, or may cause, a danger to persons, property or the environment.

e) The fact that the Volatile Suspended Solids (VSS) to TSS ratio is high when the sewage enters the system, but low when it exits the system, assures me that the system has the potential to retain and process organic matter; however, the system also needs the ability to remove non-organic suspended solids, regardless of if construction is occurring or not. Considering that maintenance and possibly construction may be an ongoing issue with the waste water treatment facility, it is plausible that you will continue to be above 70 mg/L of TSS. In the inspection report, a number of recommendations to help achieve levels below this were supplied for the benefit of National Defense.

f) With respect to the Statement made by the Inspector, "It is expected that the sampling results will confirm high values that exceed license criteria for TSS at the sampling site". My understanding is that the inspector based his statement on the previous TSS results collected by the Researcher on site and as detailed in the Annual Report 2012 (Appendix B). These results were higher than the limits allowed by the license and the samples to be conducted by the Inspector were to come from the same site.

5. Solid Waste: Excellent news that the Thermal Incinerator Facility was successfully repaired and is back to operational status.

6. Fuel Storage: With respect to your concerns over the installation of secondary containment at all fuel dispensing points, it has been and continues to be the recommendation of AANDC Inspectors that suitable secondary containment is installed at all fuel transfer areas. Although not a requirement under the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*, it is definitely considered a best practice in the guiding document for the regulations (Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products, s. 3.10.1 www.ccme.ca/assets/pdf/pn_1326_eng.pdf). The inspector has recommended this option because, in the event of a spill, and depending on the size of it, your solution of a small portable secondary containment berm may not be enough to contain it. On the other hand, please let me know when you receive your three potable secondary containment berms.

7. Surveillance Network Program (SNP): Comments found in the inspection report, "Secondary Containment at the bulk Fuel Storage Facility at the lower tank farm [SNP ALT-8] may be compromised" and should be further investigated to, "determine the nature and extend of the contamination below the tank farm" are based on the observation that there was no water contained within the berm at this facility, yet there was water in the other fuel storage areas. I also believe this is a reasonable suspicion. If a leak is in fact occurring due to a compromised secondary containment system, this should be remedied as soon as possible to prevent further contamination of the soil and adjacent waters. I will follow up with Andrew Tam to ensure this is being investigated.

In closing, it is clear that DND has made some significant efforts to achieve compliance with the issued License and the Act, especially given the challenges of working in the far north. Many of the requests and recommendations made in the Inspection Report and further in this letter are based on the obligation,

under the *Act*, to respect water resources in Nunavut. Ultimately, they have been made with your interests, those of Canadians and the interests of the environment at heart.

Sincerely,

Justin Hack
Water Resource Officer
Aboriginal Affairs and Northern Development
Iqaluit, NU X0A 0H0
Nunavut Regional Office
Tel: 867-975-4289
Justin.Hack@aandc.gc.ca

CC:
Erik Allain – Field Operations, AANDC
Phyllis Beaulieu – Manager Licensing, Nunavut Water Board
Andrew Tam – Assistant Wing Environmental Officer, DND
Drew Craig – Environmental Officer, DND