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1262-1 (W Env O)

12 September 2013

Ms. Phyllis Beaulieu
Manager of Licensing
Nunavut Water Board
PO Box 119
Gjoa Haven, Nunavut X0B 1J0

Dear Ms. Beaulieu,

1. On 7 August 2013, the Department of National Defence, 8 Wing Environmental Management (DND) received the Water Use Inspection Form for Licence Number 3BC-ALT1015 (CFS Alert) dated 10 July 2013. The following provides our response to the Aboriginal Affairs and Northern Development Canada (AANDC) Inspection.

2. Water Supply. The Water Use Inspection Form describes Canadian Forces Station (CFS) Alert's total water usage as exceeding the Water Licence limit. The following explains CFS Alert's water usage calculation:

a. The Intake Volume is the amount of raw water being pumped from the fresh drinking water source (Upper Dumbell Lake) to the Water Treatment Plant via the Water Intake Pipeline;

b. The Return Volume is the amount of raw water that is returned to the intake source (Upper Dumbell Lake) via the Water Return Pipeline. The purpose of the Water Return Pipeline is to prevent freezing and pressure damage to the Water Intake Pipeline;

c. The actual daily usage volume is calculated from the difference between the Intake Volume and Return Volume; and

d. Following the installation of flow meters in 2010, the Nunavut Water Board (NWB) was advised of DND's Water Usage calculation (Usage = Intake Volume – Return Volume), as part of CFS Alert's Water Licence Annual reports. Prior to the installation of flow meters, estimates were provided to the NWB.

3. Waste Disposal. The CFS Alert Waste Water Treatment Facility is an engineered terrace system constructed in August 2011. This location is monitored under the Water Licence Surveillance Network Program (SNP) at ALT-2 (sewage outfall) and ALT-3 (discharge point prior to the entry at Parr Inlet). A performance study of the sewage terrace is being conducted by the Centre for Alternative Wastewater Treatment housed within Fleming College. Since 2011, SNP results for ALT-3 have demonstrated consistently high Total Suspended Sediment (TSS) loads above the water licence maximum concentration limit of 70 mg/L. Previous efforts by DND to improve the

effectiveness of the sewage terrace have included: rebuilding the berm walls, armouring the terraces with large stones to slow and direct flow, and the installation of a series of sediment fences along the water flow path.

4. The Inspection Form makes a number of contradictory and unsupported assertions about the terraces as follows:

a. The box describing Sewage Treatment System indicates, "None – Terrace system". While the Terrace System may not be a traditional southern sewage treatment system, it is not uncommon in the north. The Terrace System is a sewage treatment system that provides primary treatment;

b. The first bullet under the Comments Section mentions "erosion of the constructed diversion dykes (terraces) on the hill side was found to have occurred at each set of terraces." It is unclear from reading the Inspection Form as to what type of erosion has occurred. For the system to function as it was designed and approved by the Nunavut Water Board, there is no question that annual maintenance is required, as outlined in the O&M manual. Minor expected maintenance was completed by hand this spring to repair minor breaches of the terraces;

c. The second paragraph under the Comments Section speculates as to the integrity of the system "in the event of a more rapid melt event". AANDC should review licensing documentation provided by DND in order to fully understand how the system is intended to work;

d. The second bullet on page 2 recommends the completion of an Acute Lethality Test for either *Oncorhynchus mykiss* or *Daphnia magna* once annually. This recommendation is not reasonable, because it is not possible to conduct this test, given the time required for the collection and transportation of samples to the closest lab that could conduct the test. Moreover, it is not within the scope of an AANDC Inspector to make such a request. Environment Canada, as the agency responsible for the enforcement of section 36 of the *Fisheries Act*, has not issued direction to DND to complete toxicity testing;

e. With reference to the fourth bullet of page 2, June 2013 sampling results completed by Fleming College and an external laboratory on behalf of DND note Total Suspended Solids (TSS) concentrations above the licence value of 70 mg/L. These values should be viewed in relationship to Volatile Suspended Solids (VSS) levels. The VSS levels indicate what portion of the TSS is composed of organic matter. The proportion of VSS to TSS entering the Terrace System from the discharge pipe is high. The TSS entering the Terrace System is composed primarily of organic matter from the sewage. However, these ratios are reversed in waters exiting the System (treated water). Thus, as the water leaves the System it has a low organic content. Most of the organic matter is retained within the System itself; the high TSS leaving the System is composed primarily of silt that is being washed off the hillside. This silt likely originates from the construction last fall and natural sediment erosion occurring during the spring melt and as such likely did not originate in the actual wastewater. In summary, the VSS concentration leaving the terrace system is below the 70 mg/L licensed value. Once these results are summarized by Fleming College, a copy of the report will be provided to the NWB; and

f. However, the same bullet contains the following speculation: "It is expected that the sampling results will confirm high values that exceed license criteria for TSS at the sampling site. This will be confirmed in a review of the sampling results

collected during the inspection." DND has requested, but to date has not received, a copy of the analytical results from sampling completed by the Inspector. The fact the Inspector makes this assumption in advance of receiving analytical results indicates bias.

5. Solid Waste. As Mr. A. Tam advised by e-mail on 7 August 2013, I am pleased to report that the Thermal Incinerator Facility at CFS Alert was successfully repaired and is back to operational status.

6. Fuel Storage. In the fifth bullet on page 3, the Inspector notes that the fuel dispenser, associated with the new Day Tank was not submitted for regulatory review prior to installation.

7. On 16 April 2013, DND submitted a proposal complete with Territorial Engineer-stamped drawings to the NWB. Four of the drawings clearly illustrate a "Fuel Dispensing Point". The proposal and drawings were forwarded by the NWB to AANDC and Environment Canada for review.

8. On 20 June 2013, Mr. Ian Parson of AANDC responded to the NWB. In the Comments/Recommendations Section of his letter he indicates "AANDC also recommends adhering to all Environment Canada Acts and Regulations concerning above ground storage tanks and its associated piping". The letter makes no reference to the need for secondary containment.

9. On 21 June 2013, Jane Fitzgerald of Environment Canada responded to the NWB, referencing the requirement to conform to the *Canadian Environmental Protection Act* (CEPA) *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*. This Regulation governs the management of storage tank systems on federal property.

10. After consultations with AANDC and Environment Canada were complete, the Modification and Construction of CFS Alert's new Day Tank Facility received approval from the NWB on 10 July 2013.

11. Still, the fifth bullet on page 3 recommends the installation of additional secondary containment at the newly constructed Day Tank Facility Fuel Dispenser location (note: the expression used in the Inspection Form is "Fuel System and Waste Disposal Facility") adding that "It is expected that the Licensee will provide proof of compliance before the end of this construction season". We should immediately point out that:

a. the installation is mentioned in an Inspection Form submitted to DND on 7 August 2013;

b. the construction season in Alert is only from June to early August;

c. there are no membranes and limited gravel on site, to construct such a facility. Procurement of these items, preparation and tendering of the requisite contract and actual planning by the selected contractor to perform the work at this distant location would require months; and

d. the installation would likely require approval from the NWB.

12. So even if the said installation was needed, it is impossible to install such secondary containment within the described timeframe. Accordingly, this "expectation" is clearly unreasonable.

13. The recommendation to install permanent secondary containment at all fuel dispensing points was discussed with the Inspector. It is our contention that this is neither practical nor reasonable from a technical/scientific point of view since if a permanent secondary containment system were to be installed, it would be impossible to remediate the site in the event of a spill (particularly during the winter) because of the physical, geological and meteorological conditions prevailing at this site. DND currently uses small metal drip pans at all dispensing sites. As a reasonable and feasible measure, DND will procure and deliver three small portable secondary containment berms to CFS Alert which will be used during fuelling operations. However the installation of a permanent secondary containment system is neither reasonable/practical in Alert nor required under the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*.

14. Surveillance Network Program (SNP). The second bullet under this Section states that "The 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 extent of the contamination below the tank farm". As explained during the site inspection, the area directly down gradient of ALT-8 is a historical Federal Contaminated Site and DND intends to continue following the 10-Step Federal Contaminated Sites Action Plan process to investigate this location.

15. Additional Comments. 8 Wing and CFS Alert have established and maintained a number of cooperative relationships/partnerships with Inspectors and advisors from other Federal/Territorial Departments/organizations and the scientific community in general. Given the difficulty and danger of working in the far north, it is extremely important that all activities are planned as far in advance as possible. For these reasons, DND has consistently sought to submit water licensing documents well in advance of our requirements. Many of the recommendations provided are not realistic nor do they have a basis in law. Nonetheless, DND continues to actively improve environmental performance in Alert as evidenced by the reductions in wastes sent to the local landfill and recent improvements to fuel infrastructure.

16. In closing, I kindly ask that the NWB review the recommendations and direction provided and described in the Water Use Inspection Form in context with DND's response. Should you have any further questions or comments, please contact Mr. Andrew Tam, Assistant Wing Environmental Officer, at (613) 392-2811, Extension 4821.

Yours truly,

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