WATER USE INSPECTION FORM

Date: July 10,2013	**Licensee Rep.** (Name/Title)**:** Andrew Tam – Environmental Officer
Licensee: Department of National Defence	**Licence No.: 3BC- ALT1015**

WATER SUPPLY

Source(s): Dumbell Lake	**Quantity used to date: 50,603 Cubic meters**
Owner:/Operator: National Defence	185 Cubic meters per day (Licensed use)

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Intake Facilities: A	**Storage Structure:** A	**Treatment System:** A	**Chemical Storage:** A
Flow Meas. Device: U	**Conveyance Lines:** A	**Pumping Stations:** A	**Screen: NI**

Comments: During the Inspection of the Water Treatment Plant and Pumping Station the Inspector noted the following;

- All required records for the Chlorine Testing and Biological sampling were on site and available for review
- Chlorine mixing station was found in good order and a new digital chlorination pump had recently been installed.
- New water treatment equipment including a redundant UV lighting system has been installed on station.
- Meters have been installed and total water usage records including water returned to the source is being recorded.
- It is noted that following the installation of Meters on the intake line from the raw source water at Dumbell lake, it has been determined that the total water used by the facility (1) as defined in the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* is more than anticipated and more than the Licensee is currently licensed for.

WASTE DISPOSAL

Sewage: **Sewage Treatment System** (Prim./Sec/Ter.)**: None- Terrace system**

Natural Water Body: No	**Continuous Discharge** (land or water)**: Yes – Land**	
Seasonal Discharge: NA	**Wetlands Treatment:** unknown	**Trench:** None

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Discharge Quality: U	**Decant Structure:** U	**Erosion:** U
Discharge Meas. Device: U	**Dyke Inspection:** U	**Seepages:** U
Dams, Dykes: U	**Freeboard:** NA	**Spills:** A- 2 closed during Inspection
Construction: NA	**O&M Plan:** NI	**A&R Plan:** A
Periods of Discharge: Cont.	**Effluent Discharge Rate:** Unknown	

Comments: During the inspection of the Waste Water Treatment Facility (Terrace Trap) the Inspector noted the following;

- The constructed facility appears to have failed at a number of locations across the length of the facility on numerous occasions since the last inspection in 2011. Erosion of the constructed diversion dykes (terraces) on the hill side was found to have occurred at each set of terraces. QAn attempts to slow the flow through the installation of large stones was identified during the inspection. The installation of these stones was contained in the 2012 Stantec report on the Facility.
- The lowest dyke was rebuilt in 2012 to prevent the overflow of effluent across the roadway and into the ocean as was seen in 2011. This appeared to be working however because of the late melt this work may have to be undertaken every year to maintain the integrity of the system and prevent the discharge of effluent into the Arctic Ocean.
- Installation of a series of silt screens to protect the terraces was noted. The screens showed evidence of settling and will need to be maintained every year to prevent their loss as outlined in the submitted O&M manual.

As noted above, spring melt has been delayed due to weather and as a result the freshet was very slow on site and in fact remained on-going throughout the inspection. It is unclear if the terraces, as constructed, could withstand the increase in flow and movement of ice in the event of a more rapid melt event.

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1 "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.
However, it does not include navigation or any other use connected with shipping activities that are governed by the *Canada Shipping Act*. **Nunavut Waters and Nunavut Surface Rights Tribunal Act (2002, c. 10)**

Continued maintenance and construction of these terraces will be required annually if this system is to remain in place. This fact is echoed in the O&M manual and recommendations included refer to the Licensee having provisions and stockpiles in place to rebuild and to re-armor areas of overflow. (Page 12 of 20: CFS Alert Sewage Terrace O&M Manual V 1.3, Stantec Architecture Ltd. September 28, 2012)

- Samples were collected at the time of the inspection to determine the effectiveness of treatment provided by this system.

- It is recommended by the Inspector that the Licensee demonstrate that the effluent discharged from the final monitoring station prior to entry into the Ocean is non-acutely toxic under either of the following tests

  - Acute lethality to Rainbow Trout, Oncorhynchus mykiss (as per Environment Canada's Environmental Protection Series Biological Test Method EPS/1/RM/13); or

  - Acute lethality to the crustacean, Daphnia magna (as per Environment Canada's Environmental Protection Series Biological Test Method EPS/1/RM/14).

  Such testing is to be completed once annually and results are to be provided to the Inspector upon completion and a copy included in the Annual Report.

- Materials used on the construction of retention/ diversion dykes/ terraces are constituent of the hill slide. No guard stone (armoring) has been placed to prevent the erosion noted through the system. This has resulted in a great deal of the fine non-organic matter being transported down slope and out into the inlet. Guard stone and armoring are required to prevent this process from continuing.
- 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.
- Erosion channels have formed in the overburden /active layer and were found to have eroded the slope down to the level of the permafrost. (originally identified in 2011)
- High slit loading was noted on the foreshore down gradient from the new discharge location. This was not present prior to the construction of the new terraced facility and has not been properly addressed by the licensee since first observed in 2011.
- It was noted that the system, as installed, is without a holding cell to allow for the precipitation of solids out of the effluent and without a screening system to prevent to discharge of food particles, toilet paper, raw sewage etc. This is an attractant to wildlife and birds as is well known and could result in attracting larger carnivores to the site.

SOLID WASTE: Millionaires Dump, Main Station Landfill and Dump-3

Owner/Operator: Dept of National Defence

Landfill: Y	**Burn & Landfill:** N	**Other:** Incinerator

Comments: During the Inspection of the Solid Waste Management Facility the Inspector noted the following;

- No hazardous materials were currently on site. Shipping and receipt documents from a licensed treatment facility were provided on site.
- Waste metals were found to be crushed and buried in the Millionaires Dump. Recent and continuing efforts to rehabilitate the solid waste management practices at the site were identified and included a procedure for diversion of materials seen as valuable metals and other wastes to be returned south to Trenton to be sold at government auction. The success of this project has seen a reduction in the volume of solid metal wastes being deposited into the dump.
- The incinerator was off line at the time of the inspection. The replacement of the cinder bricks in the unit is required and scheduled to take place this month. Pending that wastes are being stored in a cold building a distance from the main camp. It is important to have this work done as soon as possible to ensure these wastes do not become a wildlife attractant.
- Records of all materials incinerated within the facility were available for review
- New signage was noted on site at all sampling locations inspected.
- No surface flow was found in any location. No samples could be collected

FUEL STORAGE: Owner/Operator: Dept of National Defence

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Berms & Liners: NI	**Water within Berms: U**	**Evidence of Leaks: NI**
Drainage Pipes: NI	**Pump Station & Catchment Berm: NI**	
Pipeline Condition: A	**Condition of Tanks: A**	

Comments: During the Inspection of the Airport Fuel Storage Tanks and Bio-Piles the inspector noted the following;

- Lead levels in water contained in the berm surrounding tank 6A at the lower tank farm and the west end berm at the upper tank farm exceed the license guidelines. The licensee has installed a

filter system to remove the lead.

- The Berm surrounding Tanks 1A and 2A have some water remaining from freshet and new snow accumulation that will require pumping as well.
- In 2011 a possible leak in the containment structure under two of the Lower Tank farm tanks was identified. Further investigation by the Environment division has identified contamination in the low lands between the Lower Tank Farm and the Land treatment facility. This possible loss of containment at the lower tank farm must be addressed by the licensee and action taken to ensure the containment of fuels within the facility. Fuel contained within these tanks should be monitored daily in the event of a leak or loss as the integrity of the Secondary Containment is in question.
- The Land Treatment facilities (Bio Piles) were found in order and well maintained.
- No confirmatory sampling was completed at this location.
- The licensee is also reminded and cautioned that Secondary Containment is to be installed at all fuel transfer stations as based on the recommendations of the Inspector. It is noted that in the recently approved Modifications and Construction of CFS Alert's Fuel System and Waste Disposal Facility submission that the use of the Day-Tank to fill a portable bowser for refueling operations at generators throughout the facility and at the Quarry were not included in the documents submitted and thus this practice was not reviewed as part of the package. Given this, the Inspector has made additional recommendations on site to the Licensee regarding the installation of secondary containment at the site of this refueling activity. It is expected that the Licensee will provide proof of compliance before the end of this construction season. If required an Inspector's Direction to facilitate compliance under section 87 of the Act will be issued in the event this is not followed.
- It was also noted that the practice of not returning the entire length of the fuel dispensing hose back into secondary containment is not safe and should not be allowed to continue on site.

Waste Oil Storage: Not Inspected. A Waste Oil Furnace is installed at the facility. The furnace was found on on-line and well maintained.

SURVEILLANCE NETWORK PROGRAM (SNP)

Samples Collected	**Owner /Operator:** Samples collected by Licensee to be submitted with annual report	
3	**INAC:** Potable water source, Raw Effluent, treated effluent	
Signs Posted	**SNP:** signage found at all locations inspected	**Warning:** Installed
Records & Reporting: Records and reporting requested during the inspection was provided on site		
Geotechnical Inspection: N/A		

Non-Compliance of Act or Licence:

Overall the facility in Alert was again found to have made great efforts to achieve compliance with the issued License and the Act. The Inspector noted a number of changes from the last visit that incorporated comments made by the Inspector in 2011. Evidence of this commitment to compliance was noted throughout the facility and in the Licensee's representatives.

Once on site, the Inspector completed an inspection at each of the above noted locations throughout the facility. Following the inspection the Inspector outlined for the Licensee the following concerns and expects that the Licensee will implement the recommended solutions to ensure continuing compliance with the issued Water License and the Act.

- Water Use records indicate that the facilities use of water appears to be above the Licensee's allowable limits. A recommendation to submit a more accurate estimate of water usage based on the results of proper metering to the Nunavut Water Board was provided to the Licensee. This may result in an amendment application being required by the Board to address this issue. Such will be decided by the NWB in due course and after consideration.
- The Secondary Containment at the bulk Fuel Storage facility at the lower tank farm may be compromised. Further investigation to determine the nature and extent of the contamination below the tank farm and to investigate the possibility of a loss in the integrity of the berm is to be undertaken at the first opportunity. The issue of continued use of these tanks is also to be discussed with Regulators at the first opportunity of the Licensee.
- To ensure continued compliance with the issued license the secondary containment at the fuel transfer area at the Day-Tank is to be installed this construction season.
- A recommendation to conduct further sampling at the Outfall location of the Terrace was made by the Inspector. The obvious non-compliance with the issued license makes this necessary. As outlined during the inspection further and continuing non-compliance will result in further enforcement actions being initiated as necessary to bring the licensee into compliance.
- The licensee will be required to undertake such works as are required to mitigate and prevent the continuance of the discharge of sediment into the ocean.

A.Keim
Inspector's Name

Sent by E-mail (Original signed and on file)
Inspector's Signature

Cc:

Phyllis Beaulieu – Manager Licensing- Nunavut Water Board

Erik Allain - Manager – Field Operations Unit, AANDC

Contact Information:

Andrew Keim
Water Resources Officer
Aboriginal Affairs and Northern Development Canada
Building 918 – Box 100
Iqaluit, Nunavut XOA OHO
867-975-4289 Ph
867-979-6445 Fx
867-222-6488 BB
Andrew.Keim@aandc.gc.ca