Appendix I

Compliance Plan - Follow Up on 2015 Inspection Report
Year: 2015
Reference A. INAC, Water Licence Inspection Report dated January 4th, 2016.

A. Inspection

The Indigenous and Northern Affairs Canada (INAC) Inspectors conducted a water licence inspection of CFS Alert from June 28th to July 1st, 2015.

B. Purpose

This Compliance Plan is an action required under Section 3 of Reference A to provide details on how the DND will come into compliance to the observed wastewater deficiency, the Total Suspended Solid (TSS) water quality, at the CFS Alert Sewage Terrace System.

This Compliance Plan details the DND's actions to justify a request for a higher site-specific TSS limit criteria, to reach compliance, based on a scientific approach of collecting additional performance data from the system and a comparison of physical properties (TSS) observed at two additional reference (natural) streams within the local area. Engineering solutions may be sought based on the results of 2016 CFS Alert Sewage Terrace System performance study report.

C. Background

The CFS Alert Sewage Terrace System is represented by the 8AC-ALT---- Surveillance Network Program Sites: ALT-2 (Outfall) and ALT-3 (Final Discharge Point). The CFS Alert Sewage Terrace System was constructed in the summer of 2010. The performance of the CFS Alert Sewage Terrace System is currently entering its 7th year of study (2010 to present) by the Centre for Alternative Wastewater Treatment of The Sir Sandford Fleming College of Applied Arts and Technology (Fleming College), Peterborough, Ontario.

D. Existing Site Challenges

As indicated in Section 2 of Reference A, there are challenges on the performance of the CFS Alert Sewage Terrace System due to the geographical setting, construction materials, physical properties of the ground material, required physical maintenance that compromises soil and plant development, harsh polar environment, and the natural process of erosion from water movement.

As indicated to the Inspectors during the 2015 inspection, directly opposite of the CFS Alert Sewage Terrace System and located on and in Parr Inlet, there exist a large delta formation from a natural melt stream. This observation suggests an aggradation process from the melt stream into Parr Inlet, and further provides support that the natural ground materials (tundra/fractured shale rock) are poorly consolidated and easily entrained in water for transport (elevated natural TSS).

E. Situation - ALT-3 Results for TSS
Total Suspended Solids (TSS)

The CFS Alert Sewage Terrace System consistently yields elevated TSS values above the Water Licence limit criteria of 70 mg/L. In the previous Annual Reports, maximum TSS results observed by Fleming College at ALT-3 were reported to be: 346 mg/L (2010), 231 mg/L (2011), 124 mg/L (2012), 590 mg/L (2013), 805 mg/L (2014), and 880 mg/L (2015). As per Reference A, the TSS from the grab sample results collected from the 2015 Inspection was 270 mg/L.

In 2012, Fleming College further investigated the components of the TSS, there is a greater ratio for Inorganic Suspended Solids than the Volatile Suspended Solids (organic), suggesting a greater influence of sediment erosion and entrainment in water rather than biological components of wastewater.

Considering the elevated height and slope of the CFS Alert Sewage Terrace System, the tundra ground material of the system, the construction materials, and the constant supply of wastewater, a natural geomorphological process response to the system may be occurring with sediment entrainment and transport towards Parr Inlet (ALT-3) and may be affecting the TSS.

Since 2013, the DND, INAC, and the NWB have been in communication regarding the TSS limit criteria of 70 mg/L and the consistently elevated TSS observed at ALT-3 with discussions to increase the limit to a higher site-specific criteria.

F. Actions Required
Actions taken to date of this 2015 Annual Report submission:

1. As of 2016, the DND (8 Wing Trenton and 1 Canadian Air Division in Winnipeg) have renewed a service contract with Fleming College to continue the performance study at the CFS Alert Sewage Terrace System from spring melt (May-June) to freeze up (August-September). The site cannot be accessed during the winter season due to safety concerns.

2. As a response to Reference A, DND has augmented the 2016 Performance Study to include two local reference streams to observe and collect background physical properties. The data collected from the reference streams will provide information on natural geomorphology and background TSS under a natural process for comparison to the CFS Alert Sewage Terrace System. In the past performance studies (2010-2015), one reference stream was used primarily for quality control and assurance purposes.

3. DND is supporting the 2016 CFS Alert Sewage Terrace System performance study by Fleming College (May-September).

Actions to be taken:

4. The Final Report containing the results of the 2016 CFS Alert Sewage Terrace System and expert recommendations from Fleming College will be delivered to the DND in March 2017.

5. The DND will provide a copy of the Final Report to the INAC Inspector and the NWB for consideration of initiating the process of justifying a site-specific TSS limit criteria that is reasonable and reflective of the situation.

6. The DND will provide a copy of the Final Report internally to the Program/Project Manager and Engineers for review of the expert recommendations.