December 16, 2003

Environment Canada
Prairie and Northern Region
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Attention: Steve Smith

Subject: Eureka Lagoon Annual Discharge Event Report – August 2003

Introduction

The wastewater lagoon at the Eureka Weather Station is a single cell, long retention lagoon. It is discharged once per year near the end of the open water period. Following the treatment period grey water is released to the ocean in Slidre Fjord near Eureka Sound.

The collection of wastewater throughout the Station is by gravity. All piping is within warm portions of the facility. The wastewater is collected in a storage tank located below the floor on the south side of the station. The collected wastewater is intermittently pumped to the lagoon when the liquid in the holding tank reaches a preset level.

Discharge Event

The total volume of the wastewater lagoon is estimated at 2090 m^3. The amount of wastewater within the lagoon was below average in 2003 due to a decrease in activity at the Weather Station and the installation of low flow showerheads and toilets.

In 2003, discharge of the lagoon occurred on August 19-21. The volume of water discharged from the lagoon was estimated at 1,500 m^3. A late summer discharge was selected to provide maximum treatment opportunity for the wastewater within the lagoon. A large pump was used for the discharge in an attempt to minimize the concentration of Total Suspended Solids (TSS) released to the ocean. Discharge from the lagoon on August 19th began at 16:00 and was shut-down at 22:00. Pumping resumed the following morning at 9:00 and was completed by 13:00. Water samples were obtained during the release of grey water to the ocean.

When discharge procedures were near completion, a backhoe was obtained from the DND base near the airport to excavate a sump area for the pump intake. This should improve both the maximum discharge of liquids from the lagoon, as well as minimize the amount of sedimentation (TSS) that are released from the lagoon during pumping activities.

Sample Analyses

The wastewater was sampled three times during the discharge event. Selected results and sampling times can be seen in Table 1.

Table 1: Selected Results from the Lagoon Wastewater Discharge August 19-21, 2003

Sample Number	Location	Time of Sampling	BOD_5 mg/L	Total Suspended Solids, mg/L	Ammonia (N) mg/L	Fecal Coliforms cfu/100 mL
Effluent 1	Outlet ½ period	Aug 19 19:00	74	**174**	0.26	2
Effluent 2	Outlet Initial	Aug 20 09:30	71	**127**	0.26	23
Effluent 3	Outlet Final	Aug 20 12:00	74	**146**	0.23	13
Nunavut Water Board Water Discharge Criteria			100	120	NDC	NDC

NDC – No Discharge Criteria

The wastewater samples analyzed met most requirements set by the Nunavut Water Board. The Total Suspended Solids for all three samples collected slightly exceeded the maximum allowable discharge concentration of 120 mg/L.

Recommendations

Some improvement in discharge quality may be achieved through the addition of a primary settling cell before the large treatment/storage cell. Even higher quality effluent could be released by the use of a mechanical wastewater treatment plant, such as a rotating biological contactor (RBC). If the population at the Weather Station increases to numbers greater than an average of 15 persons per day, additions to the current system should be considered. It is recommended that the sampling program continue in 2004/2005 during the lagoon discharge event.

As noted in the discharge event, a sump was added to the lagoon, which will enable proper drainage of the system for future discharge events as well as lower the TSS in the effluent discharge.

This report is meant to provide a summary of the activities conducted during the 2003 lagoon discharge event. We trust the information presented herein is suitable for your current needs. If you require additional information in relation to this project, please do not hesitate to contact us.

Respectfully Submitted,

PWGSC – Environmental Services

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APPENDIX A

CHEMICAL ANALYTICAL RESULTS