Environment Canada Environnement Canada

EUREKA SLUDGE DISPOSAL PLAN

- Eureka High Arctic Weather Station –

In support of the
Nunavut Water Board License
No. 3BC-EUR0611

Prepared by Environment Canada
Assets, Contracting and Environmental Management Directorate (ACEMD)

November 2010

Canada

CONTROL PAGE

On receipt of revisions and/or amendments, the Assets, Contracting and Environmental Management Directorate (ACEMD) shall complete this control page to ensure that the Eureka Sludge Disposal Plan is always current and consistently reflects the operations and activities taking place on site.

Revision Number	Date Inserted	Description	Signature
1	**Nov. 2010**	**Updates to Contact information and Content, as of November 2010.**	

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ACRONYMS AND SYMBOLS

ACEMB	Assets, Contracting and Environmental Management Directorate
MSC	Meteorological Service of Canada, Environment Canada
CCME	Canadian Council of Ministers of the Environment
EC	Environment Canada
DIAND	Department of Indian Affairs and Northern Development
DND	Department of National Defence
m	Metres
NRC	National Research Council Canada

1. PREAMBLE

This report applies to the Eureka Sewage Lagoon (latitude 79^0 59' 23" N, longitude 85^0 50' 11" W) located in Eureka, NU (latitude 79^0 59' 41" N, longitude 85^0 48' 48" W) and is a requirement of subsection D.10 of the Nunavut Water Board Licence No. **3BC-EUR0611.**

The following formal distribution will be made of this report:
Nunavut Water Board
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2. INTRODUCTION

The Sewage Lagoon is located on the east end of the MSC Weather Station and southeast of the Hydrogen Balloon Release building, on the shores of Slidre Fjord. The lagoon is approximately 75 m x 14 m and is separated from the fjord by a 3 m wide berm. Grey and black water from the AES Operations building is pumped into the lagoon via an aboveground pipe. The lagoon is drained twice per year, once when it reaches capacity, usually in July, and a second time prior to freezing in August in order to provide maximum possible capacity available for the winter season. The land slopes toward the south and the fjord.

3. CONTEXT

1. Part D, item #10 of Environment Canada's Water Licence states:
   Should the Licensee require the removal and disposal of sludge from the Sewage Disposal Facilities, a Sludge Disposal Plan shall be submitted to the Board for approval, at least ninety (90) days prior to commencing the work.
2. The sludge in the existing lagoon was sampled and analyzed in the summer of 2006 by the National Research Council's Biotechnology Research Institute (NRC). Concentrations of selected elements were determined to be above existing Canadian Sediment Guidelines for the Protection of Aquatic Life (CCME). DND and EC are currently confirming the data and are investigating the reasons for the elevated levels.
3. EC has initiated an "options" analysis for sewage treatment and disposal at Eureka, NU, by Golder Associates, the results of which have previously been forwarded to the Nunavut Water Board in 2010 for their review and analysis. This Options analysis by Golder Associates recommended the construction of a new 2 cell facultative sewage lagoon as the most viable among the 3 different options. Subsequent to this report, a geotechnical study was initiated by Worley Parsons in order to further investigate the geotechnical feasibility of constructing a new 2 cell sewage lagoon as an option. This report is in the draft stage and will be forwarded to the Nunavut Water Board when completed. The complete report is expected by the end of 2010 or early 2011.

4. SLUDGE DISPOSAL PLAN

Decisions by EC subsequent to the previously mentioned sewage treatment and disposal options analysis may have implications for the current sewage lagoon and its sludge. If it is decided to:

- close the existing lagoon; or
- remove the existing sludge,

the services of a qualified engineer will be obtained to determine whether the lagoon is/is not highly contaminated and to recommend a remediation option(s) which may include the following:

  - the lagoon may be de-watered (eg. evaporation allowed to take place), backfilled and shaped to blend in with existing contours provided that measures are applied for leachate control;
  - the sludge may be de-watered and the dried residue removed and disposed of on-site in an engineered land fill; or
  - the de-watered sludge may be containerized and land filled to preclude contact with the Arctic ecosystem.

The Golder Associates report indicated that the recommended treatment for sludge disposal, based on initial sampling and analysis of the sludge and the review of the precipitation and evaporation data for Eureka, could be performed with the use a simple 2-cell drying bed. The 2 cells used on an alternating basis would allow sufficient time for dewatering and sludge stabilization. The dried sludge could be left in place or removed to the site's landfill.
Upon completion of the Worley Parsons Geotechnical study and consultations with the Nunavut Water Board, a strategy for further proceedings will be developed.

5. REFERENCE

National Research Council Canada, Biotechnology Research Institute, Characterization of Contaminated Sites at CFS-Alert and CFS-Eureka, Nunavut NRC, 2007

Golder Associates, Environment Canada's High Arctic Weather Station Eureka, Nunavut, Golder Associates Eureka Investigation of Wastewater Treatment Options