



P.O. Box 119  
Gjoa Haven, NU X0B 1J0  
Tel: (867) 360-6338  
Fax: (867) 360-6369

ᓄᓇᓂᓪ ᐃᓕᓕᓂᓪ ᑲᓂᓕᓂᓪ  
NUNAVUT WATER BOARD  
NUNAVUT IMALIRIYIN KATIMAYINGI  
OFFICE DES EAUX DU NUNAVUT

File: 3BM-CAP0810/F1

November 20, 2009

Mr. Bhabesh Roy, M.A.Sc., P. Eng.  
Municipal Planning Engineer  
Government of Nunavut  
Department - Community and Government Services  
Baffin Region  
P.O. Box 379, Pond Inlet X0A 0S0  
By Email: [RBhabesh@GOV.NU.CA](mailto:RBhabesh@GOV.NU.CA) ,

**Subject: Submission of revised Operation and Maintenance Manual, Sewage Treatment System, Hamlet of Cape Dorset, Part F, Item 1 and Administrative Review of Licence 3BM-CAP0810**

Dear Mr. Roy,

The Nunavut Water Board (NWB) has acknowledged the receipt of a revised Operation and Maintenance (O&M) Manual<sup>1</sup> submitted with your cover letter on September 4, 2009 in response to the NWB letter of June 26, 2009. The following information was included in the submission:

- Appendix A: Revised O&M Manual
- Appendix B: Pages 8 and 9 of AMEC geothermal report, Oct. 13, 2005
- Appendix C: Recorded data from the four thermistors, Dec. 15, 2008 to May 15, 2009
- Appendix D: The Technical specification of Data Loggers
- Appendix E: Location map of the existing three cells lagoons with some photos, and
- Appendix F: Response to the letter of NWB (spread sheets) dated June 26, 2009

Appendix F was provided to address concerns and provided a conformity check with Licence requirements regarding the revised O&M Manual submission, requirements prior to commissioning of the 2007 Sewage Disposal Facility and general licence requirements. The information was distributed for review and comment on October 8, 2009 with a submission deadline of November 8, 2009. Submissions were received from Indian and Northern Affairs Canada (INAC) on November 2, 2009, Environment Canada (EC) on November 6, 2009 and the Government of Nunavut Department of Environment (GN DoE) on November 6, 2009.

The comments received from the parties very much reiterated the letter that was issued by the NWB on June 26, 2009 and confirmed that a considerable amount of work is required by the licensee in order to allow the commissioning of the 2007 Sewage Treatment Facility and ultimately comply with the outstanding conditions of the licence. The following is an attempt to summarize the requirements (previously provided in the excel tables) of the licence with respect to commissioning of the new sewage

<sup>1</sup>Operation and Maintenance Manual, Sewage Treatment System Hamlet of Cape Dorset, September 3, 2009. 05-4319-5000, Dillon Consulting Limited.

facility along with the outstanding conditions of the licence, providing guidance where applicable to adequately address the non-compliance items.

1. Upon carrying out a thorough review of the revised O&M Manual and considering the submissions received, comments provided with respect to the manual and the overall need for additional information prior to the commissioning of the new 2007 Sewage Disposal Facilities, the NWB has determined that prior to approving the O&M Manual under Part F, Item 1, an **addendum** shall be prepared by the licensee that addresses the concerns identified during the review, which include the following:

#### **O&M Manual**

- i. Inconsistencies between the manual and the Licence (note that a Licence errata will be prepared by the NWB and issued to clarify the monitoring station requirements. Monitoring Stations identified within Part H, Item 1 are correct and references within Part D will be revised);
- ii. Corrections to the manual with respect to the monitoring program stations, frequency and effluent quality limits, and items identified in the comments provided;
- iii. Monitoring frequency and monitoring stations are requirements of the Licence and although EC has recommended monitoring for two years (as opposed to the O&M Manual's one year) prior to making adjustments to the monitoring program, these changes can only be made upon application to the NWB for amendment of the Licence. The NWB Water Licence requires monitoring on an annual basis for the term of the Licence;
- iv. Section 3.4.5 describes the installation of monitoring wells at the new sewage disposal facility. Only one station is proposed, however the Licence requires under Part H, Item 1, three monitoring locations required at the facility including one up gradient of the lagoon, station CAP-16 and two wells located down gradient of the new lagoon at stations CAP-17 and CAP-18;
- v. Section 3.4.6 describes the procedures for sludge management of the Lagoon. Information on sludge characterization and procedures for the safe removal and disposal of sludge should be included. This was requested however the revised version had not been changed (although the conformity table indicated that the reader refer to the response in the O&M Manual);
- vi. Section 3.4.8 indicates that a Dam Safety Review will be carried out by a qualified geotechnical engineer following three years of operation (after commissioning) and every ten years thereafter, however there is no mention of the required geotechnical inspection required under Part F, Item 5, to be carried out annually in July. These reports are currently outstanding for 2008 and 2009;
- vii. Updated contact phone numbers as identified in the submissions;
- viii. Spill Contingency Plan to expand on the potential for sewage spills from trucks to address the potential of dike failure or overtopping of the dikes and associated response actions. The Plan is to include formal training provided to employees that would be exposed to situations covered in the spill plan;

- ix. Any other concerns raised by the parties that are relevant to the O&M Manual.

Upon submitting the addendum with the revised information, a fully revised version of the O&M Manual should be prepared and submitted at the time of a new revision requirement based on Part F, Item 7.

In addition to the above requirement to submit a revised (addendum) O&M Manual for the Sewage Disposal Facilities prior to commissioning, the NWB letter of June 26, 2009 identified several areas of the Licence (conditions) that would need to be met prior to the approval of the 2007 Sewage Treatment Facility commissioning and general requirements of the Licence. Comments on these issues were also provided in the submissions received during the technical review of the O&M Manual.

### **Commissioning of the 2007 Sewage Treatment Facility**

As was clearly identified in the NWB letter of June 26, 2009, specific requirements of the Licence were to be met prior to commissioning of the 2007 Sewage Treatment Facility. This was further emphasized in the most recent review of the additional information by INAC in their submission<sup>2</sup> as follows:

Throughout INAC Water Resources review of the Thermistor Monitoring Results and the O&M Manual and Appendices, a number of substantial deficiencies have been identified which prevent the conditions of Part H, Item 8 of the Licence from being satisfied at this time. Therefore, until such a time that the GN provides the appropriate information to the NWB, an approval to commission the 2007 sewage disposal facility should be withheld.

Further, the submission by INAC referred to the Inspector's reports of 2008 and 2009 and submitted that:

It is important to note, that the Water Resources Officer (WRO), via July 24, 2009 and previously August 16, 2008 inspection reports indicated that there is obvious seepage through the berm walls of the new lagoon, specifically:

- Ground water entering and pooling within the new lagoon, in 3 places
- A flow exiting the berm from the East side and flowing into the lake adjacent to the new lagoon.
- Water is contained within the access hatch, at a depth that was covering the valve controls to the new lagoon for decant

2. The first item listed in the summary table provided on June 26, 2009 is the requirement under Part E, Item 5, to submit a summary report within sixty (60) days of issuance of the licence to include as-built drawings (record drawings), reflecting any clarifications and omissions during construction as identified in Schedule 1 of the Licence. The response provided does not satisfy this requirement and simply refers to the updated drawings in the revised O&M Manual, as such a summary report is to be provided and cross referenced to Schedule 1 in order to be acceptable for review under Part E, Item 5.

Part H, Item 8 does not allow the commissioning of the 2007 Sewage Disposal Facilities until Part H, Items 6 and 7 have been met and reads:

The Licensee shall not commission the 2007 Sewage Disposal Facility until the requirements of Part H, Item 6 and Item 7 have been completed and approved.

---

<sup>2</sup>INAC Submission, November 2, 2009 Re: 3BM-CAP0810 – Hamlet of Cape Dorset – Government of Nunavut, Department of Community and Government Services - Submission of Operations and Maintenance Plan and Thermistor Monitoring Results for the 2007 Sewage Lagoon

Part H, Item 6 reads:

The Licensee shall install thermistors for the purpose of validating assumptions made in the geothermal analyses for the 2007 Sewage Disposal Facilities as recommended by the Geotechnical Engineer of record and agreed upon by the Licensee, subject to a minimum of three 20 to 25 metre deep thermistors installed in crest of the west berm and at least one thermistor of that depth in the east berm.

3. Within the information provided on September 4, 2009 a tabular summary and graphs were included, however there is still a need for verification and/or as built drawings and a construction report to be provided, detailing the installation and reasons for any variance from the requirements outlined in Part H, Item 6.

In addition, Part H, Item 7 reads:

The results of thermistor monitoring required under Part H, Item 6, shall be submitted to the Board for approval in writing, prior to commissioning of the 2007 Sewage Disposal Facility. The results shall include an Engineer's Report, validating the assumptions of the geothermal analysis through adequate monitoring of the thermal regime for the East and West Berms and downstream foundations.

4. Results were submitted with the letter of September 4, 2009 however the results, as noted within the comments received, are incomplete and have not been accompanied by the required Engineer's Report under Part H, Item 7. Some discrepancies noted are as follows:
  - a. Temperature data has not been provided for a full year of monitoring. Results were presented from December 15, 2008 through to May 15, 2009. There is missing data within what was provided and include:
  - b. Data Logger #1 - January 15, 2009 through to April 15, 2009;
  - c. Data Logger #2 – December 15, 2009 through to April 15, 2009;
  - d. Data Logger #3 – January 15, 2009 through to March 6, 2009;
  - e. Data Logger #4 – January 15, 2009 through to March 6, 2009;
  - f. The graphs for data loggers 3 and 4 indicate in the titles that they are for the periods March 6, 2009 through to May 6, 2009, however the data is only up to April 6, 2009;
  - g. It is unclear why the legend for the Data logger 4 graphs simply indicates Int/Ext temp?;
  - h. Several strings are missing data for depths, noted are the 4.2m depths for loggers #3 and 4;

An Engineer's Report is therefore required to be submitted under Part H, Item 7 prior to the commissioning of the 2007 Sewage Treatment Facility. This report may also help to clarify some of the assumptions made in the geothermal analysis as well as provide a more recent update on monitoring data acquired. Through a quick review of the data presented, it appears as though actual temperatures have not yet reached those of the 2005 Geothermal Report prepared by AMEC (excerpt excerpt provided with submission) for predicted temperatures within the berm and below, considering the data does not take into account the maximum warming of the ground through to October/November and that there is (no) sewage currently being disposed of in the facility or appreciable water contained in the facility.

5. Part H, Item 9 requires the submission of a Temperature Monitoring Program and Implementation Plan for the approval of the Board, as was identified in the conformity table provided with the letter of June 26, 2009. The response provided within the GN letter of September 4, 2009 does not provide adequate information, nor in a suitable format (stand-alone document) required by the

licence condition for Board approval. A formal, stand-alone document was required to be submitted, past due, within ninety (90) days of issuance of the Licence. In review of the revised O&M Manual provided, the NWB has determined that the requirements of Part H, Item 9 have been sufficiently incorporated into the Manual and as such may be approved with the manual upon completion of the deficiencies listed above. The licensee is requested to submit a request on letterhead for the consideration of the requirements of Part H, Item 9 within the O&M Manual.

Part H, Item 12 requires the installation of monitoring wells around the perimeter of the 2007 Sewage Treatment Facility as well as the solid waste disposal facility and the metals dump area. The table provided under Part H, Item 1 lists the correct number of wells and their locations. Item 12 inadvertently omitted the two locations and is to be clarified with the issuance of an errata to include the two wells down gradient of the sewage facility as indicated in the table (stations CAP-16 through 20).

It should be noted that the monitoring wells were to be installed with sufficient time to provide one monitoring season prior to the expiry of the Licence. As the monitoring wells would only be functional for a short period of the year due to freezing, this requirement cannot be feasibly be completed prior to the expiry of the current licence as the next monitoring opportunity would be in late 2010. This item needs to be addressed within the Plan for Compliance, required under Part B, Item 6.

6. Part H, Item 25 requires the verification of several conditions of the Licence and to provide notification to the Board of compliance and satisfaction that the conditions have been met, and reads:

Her Majesty in the right of Canada shall:

- a. Monitor the Licensee's installation of thermistors and notify the Board when the installation of thermistors is complete and in compliance with Part H, Item 6;
  - b. Monitor the Licensee's validation of the assumptions of the geothermal analysis through adequate monitoring of the thermal regime for the East and West Berms and downstream foundations under Part H, Item 7, and notify the Board when satisfied the assumptions of the geothermal analysis have been validated; and
  - c. Monitor the 2007 Waste Disposal Facility and notify the Board immediately if the Project is commissioned prior to the completion of i. and ii., or in contravention of any other condition of the Licence
7. With regard to verification of thermistor installation and monitoring being carried out, the NWB has not received any correspondence from INAC indicating instrumentation and monitoring has taken place and that results have been reviewed in the context of an Engineer's Report under Part H, Item 7. The NWB is in receipt of the latest inspection reports from 2008 and 2009 which clearly indicate that there are several outstanding items with respect to compliance with the Licence and that there are serious concerns with the physical condition of the 2007 Sewage Treatment Facility. The Licensee is therefore encouraged to initiate (or maintain) contact with INAC Field Operations in order to expedite a resolution to the compliance issues that are paramount to commissioning the Facility.

#### **General Conditions for Licence Compliance**

8. In the June 26, 2009 letter with summary tables, the Plan for Compliance required under Part B, Item 6 had not at that time, been submitted. The requirement for this Plan was within ninety (90) days of issuance of the licence or upon the filing of any application in relation to the licence. This Plan is to "clearly demonstrate the ways and means the Licensee will undertake to achieve full compliance with the conditions of the Licence." The response provided in the table summary of outstanding requirements, indicated that :

The CGS Consultant will be dealing with the general O&M issues of the Licence like Plan of compliances, etc.

This response is insufficient, lacking in content and does not provide the required information that will assure the Board that the Licensee is taking the appropriate action to attain compliance in a responsible and reasonable time period. The Plan for Compliance should be a “stand-alone” document that provides details of the measures to be taken, for each condition of the licence that is currently in non-compliance, along with a specified timeframe (preferably within the term of the current licence) that the issues will be resolved and compliance achieved. It also serves as a one-stop repository for non-compliance issues and how they are being managed. The Plan can be revised as required to reflect on-going measures and successes leading to compliance.

9. Part F, Item 2 requires the submission of an O&M Manual for both the Water Supply Facilities and the Solid Waste Disposal Facilities, neither of which have been submitted or received by the NWB. The response in the September 4, 2009 submission, in the table on general conditions, is again insufficient and does not fully explain the status of the manuals, nor when they will be provided. The NWB public register does not contain an O&M for the Water Supply Facilities as is indicated in the response. These items need to be submitted, or included as part of the Plan for Compliance, under Part B, Item 6.
10. Part F, Item 5 requires that an annual inspection in July, of all engineered facilities related to the management of water and waste by a Geotechnical Engineer with the report to be submitted within sixty (60) days of the inspection. The response in the September 4, 2009 submission, in the table on general conditions, indicates that an inspection of all the engineered facilities “will be conducted during this summer and included hamlet 2009 annual report”. This is not in compliance with the licence condition where the report is to be submitted within sixty (60) days of the inspection. Considering the response was included with the September 4, 2009 submission, even if carried out in September, it would not be in compliance with the timing required of the condition. Clarification is required as to the status of the geotechnical inspections and whether one was carried out in 2009, and when the NWB might expect to receive the formal inspection report.
11. Part G, Item 1 required the Licensee submit to the Board a detailed Final Abandonment and Restoration Plan for the 2001 Sewage Disposal Facility and the Emergency Sewage Disposal Facility. The response received on September 4, 2009 indicated that the condition was addressed in the O&M Manual and the A&R for the facilities will be developed only when the new facility is approved for commissioning and functions successfully for one complete year. Although the response provided indicated that the Plan was “attached in the O&M Manual”, a review of the manual concluded that there are no references to an A&R Plan for these or any facilities. This response, again, does not satisfy the licence condition.

If there are significant factors and logistical or budgetary reasons why the Plan cannot be prepared at this time for compliance with the licence, the Licensee should provide this information and include it in the Plan for Compliance under Part B, Item 6, otherwise it remains a current, non-compliance issue.

12. Part G, Item 2 required the Licensee to submit to the Board for approval, within six (6) months of issuance of the Licence, a preliminary Abandonment and Restoration Plan for Water and Waste Disposal Facilities not covered under Part G, Item 1. The response submitted and provided below may have resulted from a misinterpretation of the requirement and possibly confused with other licences that require a submission prior to “planned” abandonment. The response was as follows:

Yes, the preliminary or conceptual abandonment and restoration plan will be submitted respectfully six (6) months prior to implementation as directed by the Water Board.

This, again does not satisfy the condition of the Licence and, as in item 12 above, if the Plan cannot be prepared at this time it should be included within the Plan for Compliance under Part B, Item 6 providing the details on when and how compliance is to be achieved.

- 13.** Part H, Item 20 required the submission of a revised Quality Assurance/Quality Control Plan. The submission of September 4, 2009 included, once again (this was submitted as a revision with the June 17, 2009 submission by GN CGS), the version of the “Guidelines for Wastewater Sampling, dated October 24, 2007” which was identified in the table provided in the June 26, 2009 letter as being a previous version to the October 27, 2007 version on file with the NWB. This aside, condition 20 of this part requires a revision of this guideline to replace it with a Quality Assurance/Quality Control Plan, submitted to the NWB for approval by an Analyst in writing. This Plan is to be based on the INAC guideline for preparation of QA/QC plans, referenced in the condition. In addition to requirements of condition 20, an important aspect of the plan is the description of the site and water sampling location (monitoring locations), where a map of locations is an important item.

In review of and in response to this letter, the Licensee is requested to review the previous letter of June 26, 2009, the table of omissions and the full submissions from the parties on the additional information of September 4, 2009, in order to provide a response to any other further concerns that have not been identified above.

The NWB fully expects the Licensee to provide the information requested above, in a detailed, organized format and to ensure that the submission is complete and meets all requirements of this and the previous letter of June 26, 2009. Processing of incomplete information has placed an unnecessary burden on the licensing and technical staff of the NWB along with the other interested parties that have been part of the review and approval process to date and will not be accepted.

I would like to take this opportunity to remind the Licensee that the current licence, Licence No. 3BM-CAP0810 is to expire on March 1, 2010 and a renewal application should be provided to the Licensing Department by December 1, 2009 to allow for proper processing the first quarter of 2010.

If you require clarification or wish to discuss any of the above information further, please do not hesitate to contact me at my email or phone (780) 443-4406, or the Licensing Department at [licensingadmin@nuavutwaterboard.org](mailto:licensingadmin@nuavutwaterboard.org).

Yours truly,

*Original signed by:*

David Hohnstein, C.E.T.  
Director Technical Services

Cc: Qikiqtani Distribution list  
Cape Dorset SAO  
Roy Green, GN CGS

Encl. Comments received from INAC, EC and GN-DoE