



# NUNAVUT WATER BOARD

## REASONS FOR DECISION INCLUDING RECORD OF PROCEEDINGS

In the Matter of:

Applicant: Hamlet of Cape Dorset

Subject: Application Amendment for Type “B” Water Licence

Date: March 7, 2008

Precedence: Where there is any inconsistency or conflict between the *Nunavut Land Claims Agreement* and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act (NWSRTA)*, the Agreement prevails to the extent of the inconsistency or conflict. Where there is any inconsistency or conflict between the *NWSRTA* and any other *Act* of Parliament, except the *Nunavut Land Claims Agreement Act*, the *NWSRTA* prevails to the extent of the inconsistency or conflict.

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## RECORD OF PROCEEDINGS

Applicant: Hamlet of Cape Dorset

Address: PO Box 30 X0A 0C0 Nunavut

Purpose: Application for Type “B” Water Licence

Application Received: July 7, 2005

Date(s) of Hearing: Day 1: January 23, 2008  
Day 2: January 24, 2008

Members Present: Thomas Kabloona, A/Chair (via teleconference)  
Robert Hanson, Member & Hearing Chair  
George Porter, Member Lootie Toomasie, Member  
Guy Kakkiarniun, Member Tommy Tatatuapik, Member

Board Staff: Executive Director D. Filiatrault, P. Eng.  
A/Director Technical Services D. Hohnstein, C.E.T  
Licence Administrator R. Dwyer  
Technical Advisor D. Bhandari, M. Eng.  
Hearing Coordinator D. Carr, B.Sc.  
Board Secretary B. Kogvik

Interpreter(s): Inuktitut  
• M. Hunt,  
• B. Kogvik

NWB Legal Counsel: W.A. Tilleman (via teleconference)

Court Reporter: K. Schumann, CSR(A)

Sound Technician: T. Bourque, Pido Productions

Applicant: Hamlet of Cape Dorset (HCD)  
• Fred Schell, Mayor  
• Art Stewart, Senior Administrative Officer

Government of Nunavut - Community Government and Services (GN-CGS)

- Bhabesh Roy, Municipal Planning Engineer
- Jonathon Palluq, Assistant Regional Director
- Malli Aulakh, Community Government Services
- Patricio Fuentes, Project Officer

- Tom McDonald, Project Officer
- Consultants
- Colin Joyal, Dillon Consulting Limited
  - Paul Cavanagh, AMEC Earth and Environmental

Parties:

Indian and Northern Affairs Canada (INAC)

- J. Rogers, Manager Water Resources
- D. Abernethy, Regional Coordinator
- A. Kiem, Water Resources Officer

Environment Canada (EC)

- C. Spagnuolo, Environmental Assessment/Contaminated Sites Specialist

Government of Nunavut – Department of the Environment (GN-DOE)

- M. Atkinson, Manager Environmental Assessment and Land Use

Independent Reviewer

- H. Hartmaier, BGC Consulting Limited

## **BACKGROUND AND REGULATORY HISTORY**

The Hamlet of Cape Dorset (Inuktitut: Kinngait) is located on Dorset Island, near the southwest tip of Baffin Island at 64° 14' north latitude and 76° 32' west longitude. The Hamlet is situated in the Qikiqtaaluk (Qikiqtani) Region of Nunavut, approximately 402 air kilometers southwest of the city of Iqaluit.

Located in the continuous permafrost zone, Cape Dorset has a climate which consists of short cool summers and long cold winters. Average annual snowfall and rainfall are 118 centimeters (cm) and 15 cm respectively. The typical temperature range for January is between a low of -29°C and a high of -23°C. In July, the typical temperature range is between a low of 3°C to a high of 7°C. Freeze up typically occurs during the month of November but may occur as early as September. Spring thaw typically takes place during the month of July, but the time frame can vary by up to two months. During spring runoff, the community experiences mild flooding.

The community is situated between two valleys of the Kinngait range of hills. Topography consists of areas of moss surrounded by rock outcrops, bedrock and steep cliffs.

The community uses trucked services for both water delivery and sewage collection. Wastewater is treated using a constructed retention cell treatment system that is located approximately 800 meters southwest from the center of the community. As of the 2006 census the population was 1,236, an increase of 7.7% from the 2001 census.

### **Regulatory History**

On July 7, 2005, the Hamlet of Cape Dorset (HCD or Applicant) submitted to the Nunavut Water Board (NWB or Board) an Application for Amendment of Cape Dorset Type B Licence 3BM-CAP0207 (Licence) for construction of a sewage lagoon at P Lake (Application or Project).

The Government of Nunavut Department of Community Government and Services (GN-CGS) provided the HCD with technical support for the Application. GN-CGS contracted the design and construction of the facility to Dillon Consulting Limited (Dillon) who in turn contracted with AMEC Earth and Environmental (AMEC) to provide geotechnical engineering services.

Amendments to the Application were received by the NWB on February 13, 2006. The Application was provided to interested parties for comment until May 1, 2006. The NWB also sought further clarifications from the Applicant and thereafter notified parties that the NWB hired two independent reviewers, BGC Consulting Limited (BGC) and Associated Engineering (AE), to assist the Board with the review of the Application.

A technical meeting was held in Cape Dorset on September 19, 2006. On September 20, 2006, the Board requested the Applicant resubmit the Application. On January 3, 2007,

the Applicant submitted to the NWB a Final Design Report dated December 21, 2006. The NWB requested additional clarification on March 27, 2007. Further information was provided by the Applicant to the NWB on April 26, 2007.

On May 4, 2007, the NWB staff met via teleconference with the regional project engineer. At that time it appeared the application was in order; however, following a detailed assessment of the application it was determined by the NWB that the Application was not sufficiently complete to distribute the final design to parties for their consideration. On May 30, 2007, the NWB distributed the Application with the resubmission and final design information to the parties and requested comments by June 7, 2007. Comments were received from AE, BGC, Environment Canada (EC), Government of Nunavut Department of Environment (GN-DOE) and Indian and Northern Affairs Canada (INAC).

The Board considered the Application on June 16, 2007. On June 19, 2007, the Board advised the parties of a decision to require a Public Hearing on the Application.

As directed by the Board, NWB staff held a pre-hearing conference on July 3, 2007. The Applicant, GN-CGS, EC, INAC, GN-DOE, BGC and AE participated in the pre-hearing conference. A pre-hearing decision was issued on July 11, 2007. The Board confirmed a Public Hearing scheduled on September 18, 2007, with a deadline for submission of the Applicant's clarification and information commitments at least 30 days prior to September 3 to allow interested parties to review the information, and responses by the parties to be submitted by September 3, 2007.

As the Applicant's engineering and technical consultants, Dillon and AMEC did not participate in the pre-hearing conference, the Board requested the Applicant submit written responses to the technical comments provided by the parties. Upon receipt of the Applicant's responses, NWB staff facilitated a follow-up meeting on July 11, 2007, with all technical consultants to further discuss outstanding technical issues.

On July 26, 2007, GN-CGS requested the Board extend the deadline for the Applicant's clarification and information commitments. On July 30, 2007, GN-CGS notified the Board that construction of the P Lake sewage lagoon was on-going and was expected to reach substantial completion in coming weeks. On August 8, 2007, the Board postponed the Public Hearing until GN-CGS submitted all necessary information, INAC reported to the Board regarding inspection and compliance issues, and a further pre-hearing conference was convened to consider the new information.

A second pre-hearing conference was held on October 1, 2007. The Applicant, Dillon, AMEC, GN-CGS, EC, INAC, GN-DOE, BGC, and AE participated in the pre-hearing conference. The Board issued a decision on the second pre-hearing conference on October 10, 2007.

At the Board's request, the Applicant submitted clarifications and as-built drawings to the Board on November 15, 2008. On December 6, 2007, the Board confirmed the Public Hearing date for January 23 and 24, 2008, in Cape Dorset.

The Licence that is the subject of this Application expired on August 31, 2007. The HCD has filed an application for renewal of the Licence for existing facilities on July 17, 2007. The application for renewal of the Licence is currently under consideration by the Board.

## **Summary of Final Hearing Submissions of the Parties**

### **Indian and Northern Affairs Canada**

INAC's participation in the review of the Application is derived from the *Department of Indian and Northern Affairs Act*, the *Nunavut Land Claims Agreement (NLCA)*, the *Territorial Lands Act and Regulations*, and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act (NWNSTRA or Act)*.

INAC submitted that it is not clear how overland flow from upstream of the lagoon was considered in the lagoon design, including whether the channel built to bypass upstream overland flow around the lagoon is adequate. While peak daily precipitation has been estimated, INAC does not yet understand the flow, the design of the flow channel, and the amount of the flow. Annual volumes of effluent in 20 years were included in the application; however, natural runoff, either seeping through or if the spillway or the bypass channel is not adequately designed to prevent runoff running over the berms and into the lagoon, were not included in the design. During the summer of 2007, information from Hamlet residents indicated that local runoff was entering the constructed lagoon, and some water was seeping out of the lagoon.

INAC submitted that throughout the review of the Application and after inspection of the constructed facility, INAC had difficulty in understanding how the design decisions were made and why the project was built without implementing recommendations made by consultants. Examples submitted by INAC included the failure to install thermistors and the use of sand in the cutoff trench rather than clay or impervious material as recommended by the geotechnical engineer. INAC recommended that the Applicant clearly explain why only some of these recommendations of the design team were accepted and that the final as-built drawings be signed by the professional with responsibility for design and implementation, and the copies of the signed drawings provided to the Board within 90 days of issuance of an amended licence.

Further, INAC recommended that thermistors be installed to monitor ground temperatures in the berms and estimate freezing rates and potential seepage. For the first three years, the Applicant should compare these temperatures to the results of the geothermal models, explain the differences, and provide this information to the Board in annual reports.

INAC submitted that contact information in the Operations and Maintenance Manual (O&M Manual) should be updated and that the operation and maintenance plan also be updated to indicate how cell one or the old sewage lagoon will be maintained as a contingency for emergencies, including an assessment of how often the existing lagoon will be used and how it will be decanted should be provided to the Board. The updated plan should also include a concept of managing the sludge build-up in the lagoon and possible removal. Further, a waste water operation plan should be appended to the operation and maintenance plan to outline the timing and discharge rate for decanting and the erosion capability of high rates of flow, and discharge criteria.

INAC further recommended that the HCD submit a conceptual abandonment and reclamation plan for the P Lake lagoon within six months of an amendment being granted, with greater detail for the Board's approval at least six months prior to abandonment.

Overall, INAC submitted that despite non-compliance by the HCD with the requirements of the expired Licence, INAC recommended that the Board approve the Application with relevant conditions. INAC further recommended that any sewage flowing into and out of the lagoon be monitored, with results being reported in an annual licence report to the Board. INAC recognized the difficulty for the Board in amending the expired Licence and recommended to the Board that a short renewal of two years or less be granted and before expiry the HCD be required to re-apply for renewal with the entire water-use system within the Hamlet.

INAC also submitted that throughout this application process INAC has been unclear who the responsible authority for the sewage lagoon is. INAC recommended that the Government of Nunavut explain to the Board, regulators, and other interveners its process of site selection, design, and public consultation to improve understanding and confidence in the Government of Nunavut system.

## **Environment Canada**

EC submitted its intervention under the authority of the *Department of the Environment Act*, and section 36(3) of the *Fisheries Act*.

EC submitted the five discharge criteria submitted by the Applicant, including agreement to use 80 milligrams per litre biological oxygen demand and 100 milligrams per litre total suspended solids, are appropriate limits for the outflow from P Lake. In addition to the five discharge criteria, EC submitted it would be useful to add periodic analysis for a full suite of parameters in order to characterize the waste water, including metals, nutrients, and major ions and suggested that the carbonaceous biological oxygen demand or CBOD should also be added as a monitored parameter to help the HCD assess whether or not they would be able to meet the proposed national performance standards. EC also recommended that the Board include as a condition of the Licence an appropriate acute lethality test to be conducted annually during the second half of the decant with the

effluent sampled either from the outflow of P Lake or just prior to entering Telik Inlet which is the first waters frequented by fish.

EC submitted that a new monitoring program needs to be identified for the P Lake system, and recommended that the new monitoring program include sufficient sampling sites and frequencies in order to characterize the effluent and the quality of the effluent as it travels through the treatment system and at the outflow point into Telik Inlet. EC further recommended that the water balance of the lagoon system be closely tracked so that any losses through exfiltration or seepage are detected, with a contingency plan including appropriate management actions.

EC submitted that the O&M Manual should remain open to resolve a number of other issues requiring further discussion, including optimizing the timing of the decant in order to allow maximum wetland polishing of effluent, issues surrounding whether and how ice will be removed from the lagoon in order to allow discharge of effluent, and drainage management around the site. Further, if the existing three-cell lagoon system is to be designated as providing emergency capacity, it should be included in the operation and maintenance plan, and its maintenance during its standby status should be described in the plan. EC stated that the consequences of allowing the old lagoon to fail would almost certainly result in a violation of the *Fisheries Act*, making appropriate planning and actions essential.

EC recommended that the submission of an abandonment and reclamation plan be a condition in the licence.

### **Government of Nunavut – Department of the Environment**

The GN-DOE reviewed the application under its authority over the discharge of contaminants and their impact on the environment under the *Environmental Protection Act* and its authority under the *Wildlife Act*.

GN-DOE recommended that a licence condition require the Applicant to monitor berm freeze-back and called for further development of a contingency plan should the berm not freeze back as planned.

GN-DOE submitted that the outline of a spill contingency plan contained in the operations and maintenance does not meet the GN-DOE's regulatory requirements. GN-DOE recommended that an updated O&M Manual be prepared by the Applicant; including a comprehensive spill contingency plan is in compliance with the regulations prior to commissioning the lagoon. Further, GN-DOE recommended that the Licence require the spill contingency plan be updated annually and when significant facility or operational changes occur.

GN-DOE recommended that the Board include the sampling program outlined in the November 9, 2007, operations and maintenance manual submitted by the Applicant as condition of the Licence. However, GN-DOE submitted that no guidance is provided in

the operations and maintenance manual regarding the target sludge quality. GN-DOE recommended a licence condition outlining terms and conditions of sludge disposal as contained in the draft guidelines of discharge of domestic waste water in Nunavut and a requirement for the Applicant to submit a plan for compliance with these guidelines.

DOE submitted that the December 2006 design report confirms a grade of 8 to 10 percent over the length of a kilometer for the road to the sewage lagoon leaves the GN-DOE with concerns about the accessibility of the road throughout the winter months. Accordingly, the GN-DOE supports the use of cell one of the existing three cell lagoon for contingency purposes; however, details of any repairs, upgrades, and maintenance should be provided and the annual report submitted by the Applicant should document the number of days the contingency lagoon was used, approximate volume of effluent stored, method of discharge, and the quality of that discharge from the contingency lagoons.

GN-DOE recommended that conditions relating to abandonment and restoration should be contained within the Licence with end objectives to return the site to pre-use conditions and the submission of an abandonment and restoration plan for P Lake lagoon be submitted to the Board for approval at least six months prior to abandoning the facility.

In summary, GN-DOE recommended that the Board issue the Licence for the P Lake sewage lagoon subject to the conditions previously described.

### **Independent Reviewer**

BGC submitted that a number of modifications were required to the as built drawings submitted to the Board, including identification and explanation of field changes from the original construction drawings such as those identified by BGC for Record Drawings 100, 109, 100 and 112. Further, BGC recommended that the as-built drawings be stamped and signed by AMEC as the engineer responsible or the engineer of record for the geotechnical discipline.

With regard to seepage, BGC submitted that a GCL with overlapped sheets is an imperfect liner typically used for secondary containment and freezing of the foundation is required to create an impermeable barrier to seepage under the berm. As a result of construction of the berm during the summer on top of the active zone, modifications made during construction to the cut off trench, and the observed seepage out of the downstream toe of the dam as reported by Hamlet officials in October 2007, BGC recommended that the Board direct the lagoon remain dormant over the first winter season so that the foundation can freeze back prior to commissioning of the lagoon. Furthermore, BGC recommended the installation of a minimum of three 20 to 25 metre deep thermistors be installed in crest of the west the berm and at least one thermistor of that depth in the east berm and the requirement to validate the freeze-back of the foundation prior to commissioning be required as a condition of the Licence. BGC also recommended that section 3.4.6 of the O&M Manual be updated to provide the number, locations, depths, or bead locations of the thermistors to be installed.

Further, BGC submitted that the differences between the modeled and as-built GLC liner configuration may be significant from a stability perspective because a low shear strength element that is oriented at the as-built slope of 45 degrees would have a greater effect in reducing the factor of safety of the upstream slope than the vertical liner. With the model case, the slip circle lies essentially within the granular berm material of the upstream slope. If the failure path was modeled along the inclined low shear strength liner, a lower factor of safety for the upstream slope is expected. BGC recommended that the stability analysis for the 1 and 2 metre a head difference for the rapid drawn-down case include this assessment to demonstrate the stability of the upstream slope based on the as-built detail. BGC further recommended that AMEC validate the stability of the upstream slope with the revised liner configuration for all expected stability cases in agreement with factors of safety recommended by the Canadian Dam Association.

With respect to the O&M Manual, BGC further recommended that the Board include a condition in the Licence requiring prior approval by the Board for any change in the lagoon waste water storage and decanting operations, with the notification triggering a geotechnical and geothermal review to assess the implications of year-round water storage on permafrost conditions under the lagoon. BGC also recommended that section 3.4.7 of the O&M Manual be updated to describe dam safety inspections, including as a minimum, the lagoon should be subject to an annual inspection by a qualified geotechnical engineer and the operators required to conduct a visual inspection of the berms whenever they are visiting the lagoon and record any observations in a logbook that can be reviewed during the annual inspection. Weekly inspections of berms, dikes, and drainage courses as set out in Table 6 of the O&M Manual were also recommended by BGC to be included as a condition in the Licence, with the annual geotechnical inspection added under the yearly frequency in Table 6.

BGC submitted that the overall results of geothermal modeling of the as-built berm configuration found that generally the sewage lagoon is suitable for the proposed operating conditions over the 30 year design life provided lagoon filling does not start until February 2008 and freeze back is confirmed and monitored on an ongoing basis. BGC submitted that this geothermal analysis and the integrity of the system strongly depends on the operation and management of the lagoon contents. Changes in the way and schedule that the lagoon is filled and emptied may affect temperatures in the lagoon and berm foundations and adversely impact the design concept.

## **Community Members**

An estimated forty-five community members attended the Public Hearing over two days. Community concerns focused on a perceived lack of consultation by the Hamlet regarding the choice of a sewage lagoon rather than a sewage treatment plant and the choice of P Lake as the location for the lagoon. The potential risk to the Hamlet's drinking water supply from T Lake as a result of the close proximity of the P Lake sewage lagoon to T Lake and the potential for seepage was raised. Several community members also raised concerns about the safety of the access road to the sewage lagoon.

Concerns about the road included the steep grade and the switch-back in wintertime given the lack of a runoff allowance for the sewage trucks if they start to slide.

## **JURISDICTION OF THE BOARD**

This Board has jurisdiction over the Application pursuant to Division 2 of the NWNSRTA.<sup>1</sup> Relevant sections in that Division allow the Board to issue a licence.<sup>2</sup> In deciding to issue a licence or engage in any other statutory function, the Board must follow the objects of the governing legislation, which are:

... to provide for the conservation and utilization of waters in Nunavut, except in a national park, in a manner that will provide the optimum benefit from those waters for the residents of Nunavut in particular and Canadians in general.<sup>3</sup>

In setting the terms and conditions of this Licence, the Board is guided by these objects. The Board intends to meet its statutory duty to make *all* reasonable efforts to minimize *any* adverse effects on aquatic ecosystems. Reading the several Articles of the NLCA together, which the Board is entitled to do to understand its jurisdiction,<sup>4</sup> the Board relies on the broad definition of “ecosystemic” found in Article 12.1.1 of the NLCA to require not only the Nunavut Impact Review Board (NIRB) but also the NWB to ensure all components of the ecosystem such as fish and fish habitat are protected within the parameters of section 71 of the Act.

For all matters relating to the Application, the burden of proof in this Hearing rests with the Applicant. The NWB Rules of Practice state: “In cases in which the Board accepts evidence, any party offering such evidence shall have the burden of introducing appropriate evidence to support its position. Where there is conflicting evidence, the Board will decide which evidence to accept and will generally act on a balancing of the evidence”.<sup>5</sup> Where a party presents no evidence supporting or rejecting the Applicant’s evidence, the NWB will base its decision on its own assessment of the Applicant’s request.

## **REQUIREMENTS OF THE NWNSRTA**

### **Objects of the Board and its Relationship to other Bodies**

#### **Land Use Plans**

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<sup>1</sup> Sections 42-81 of the NWNSRTA.

<sup>2</sup> See sections 42, 48, 55, 56, and 70 of the NWNSRTA.

<sup>3</sup> Section 35 of the NWNSRTA.

<sup>4</sup> See Article 2 and section 2.9.1 of the NLCA.

<sup>5</sup> Nunavut Water Board *Rules of Practice and Procedure for Public Hearing*, section 8.13.

The Project area currently lies within the West Kitikmeot Land Use Planning Region where there is no approved Land Use Plan; consequently, the Board is not required pursuant to subsection 36(2) of the NWNSRTA, to consider the Project's conformity with a Land Use Plan.

### **Relationship to Environmental Assessment**

For the purpose of the Application, the amendment and type of water licence is exempt from screening by the NIRB pursuant to Schedule 12-1 of the NLCA; consequently, the Board is not required pursuant to subsections 37(1) and 39(1) to consider a NIRB screening or restrict amending the Licence until NIRB has completed a screening in accordance with Article 12 of the NLCA.

### **Article 20 of the NLCA**

No issues or requests for compensation were identified to the Board, therefore no action pursuant to Article 20 of the NLCA and section 63 of the NWNSRTA is required by the Board.

### **Recommendations on Marine Areas**

Section 41 of the NWNSRTA permits the Board to advise and make recommendations respecting any marine matters that may arise to any department or agency of the Government of Canada or the Government of Nunavut.<sup>6</sup> The Board has no recommendations on marine areas for this Application.

### **DECISION TO ISSUE**

Following the Public Hearing and for reasons elaborated further below, the Board has decided to issue an amendment to Water Licence 3BM-CAP0810 for the P Lake sewage lagoon subject to the conditions set out therein.<sup>7</sup> The Board notes the term of this Licence has been extended pursuant to a concurrent application for renewal and decision by this Board. The Licence contains terms and conditions the Board feels are necessary to protect the environment, conserve the water resources and provide appropriate safeguards in respect of the licensed use of waters and deposit of wastes.

### **Issuance of a Licence**

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<sup>6</sup> Section 41 of the NWNSRTA states:

The Board may, either jointly with the Nunavut Planning Commission, the Nunavut Impact Review Board and the Nunavut Wildlife Management Board, as established by the Agreement, acting as the Nunavut Marine Council referred to in section 15.4.1 of the Agreement, or on its own, advise and make recommendations respecting any marine area to any department or agency of the Government of Canada or the Government of Nunavut, and those governments shall consider that advice and those recommendations when making any decision that may affect that marine area.

<sup>7</sup> The Licence has been issued under separate cover.

The decision before the Board on this Application was a particularly difficult one. The Board is faced with a decision on whether or not to issue a licence amendment to the Hamlet which is currently not in compliance with the terms of the Licence and with the NWNSRTA.<sup>8</sup>

As the Board stated in correspondence to INAC regarding the construction of municipal facilities prior to the issuance of a water licence,<sup>9</sup> the Board is keenly aware of the words of His Honour Chief Judge Lilles in *R.v Dawson*:

In my opinion, The City of Dawson should not bear full responsibility for the current state of affairs. The conduct of the Water Board in granting a second and then third water-use license to the City of Dawson in circumstances where the City was in substantial breach of the first and then the second, constituted passive encouragement of non-compliance by the City. The Water Board's willingness to extend the third water-use license for five years, until 2005, is consistent with this message. In the *United Keno Hill Mines Limited, supra*, case, the court states:

If the responsible government agency is not pressing for compliance, or it's actually encouraging non-compliance through tacit or explicit agreements to permit non-compliant operations, the corporations cannot be severely faulted.<sup>10</sup>

In not pressing for the Hamlet's compliance with the existing licence and with the NWNSRTA, it is the view of the Board that the regulatory system is failing the people of Cape Dorset and very likely other municipalities in Nunavut. The Board is not prepared to further this failing by passively encourage the Hamlet's non-compliance with the NWNSRTA and the conditions of Licence. However, the Board's jurisdiction does not extend to enforcement thus the Board is left with only a very blunt instrument – to issue or not issue a licence. This is a difficult decision in light of the evidence before the Board and summarized briefly here.

### **The Condition of the Existing Sewage Lagoon System**

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<sup>8</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at pp. 232-233.

<sup>9</sup> See letter to Jim Rogers, Manager, Water Resources, Indian and Northern Affairs Canada, re: Water License Applications: 1BR-TAL, 3BM-REP0409, #BM-WHA0207, from Dionne Filiatrault, Executive Director, Nunavut Water Board, dated May 28, 2007. See also letter, to Michael Nadler, Regional Director General, Indian and Northern Affairs Canada, Nunavut Region, re: Water License Application 3BM-CAP0207, from Dionne Filiatrault, A/Executive Director, Nunavut Water Board, dated August 8, 2007.

<sup>10</sup> 2003 YKTC 16 (CanLII), at para. 46.

The existing sewage lagoon system was the subject of an order from EC six years ago as a result of raw sewage flowing into fish bearing waters.<sup>11</sup> The situation has only worsened over the intervening years with an INAC inspection report in 2007 “echoing” a 2006 inspection report that raw sewage is overflowing the lagoon onto the roadway and into fish bearing water.<sup>12</sup>

At the same time, construction of the P Lake sewage lagoon, which is the subject of the amendment application and the proposed solution to the problems with the failing existing system, was completed prior to the Board’s approval of this application.<sup>13</sup> It appears that the new lagoon has been built without environmental assessment,<sup>14</sup> and certainly without this Board’s regulatory review and approval in direct contravention of sections 11 and 12 of the NWNSRTA.

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<sup>11</sup> Letter to SAO-Art Stewart, Cape Dorset, RE: July 19th , 2007 Municipal Water Licence NWB3CAP0207, from A. Keim, Inspector, Indian and Northern Affairs Canada, dated September 25, 2007, at p. 1:

The Municipality of Cape Dorset, in March 2002 was issued an Inspector’s Direction from Environment Canada requiring the Municipality to prevent the discharge of raw sewage from the Three Tier lagoon from entering water’s frequented by Fish (Telik Inlet). The discharge was the result of a series of failures in the lagoon walls resulting in two of three cells leaking and the resulting overflow entering Telik Inlet.

<sup>12</sup> Letter to SAO-Art Stewart, Cape Dorset, RE: July 19th , 2007 Municipal Water Licence NWB3CAP0207, from A. Keim, Inspector, Indian and Northern Affairs Canada, dated September 25, 2007, at p. 1:

During the period of inspection [July 2007] it was noted at the access road to the third tier (cell) that a channel from the toe or bank of the first and second cells of the lagoon was allowing sewage to flow overland (roadway) down the bank and out into Telik Inlet. This was immediately brought to the attention of the Acting SAO and Mayor who took action to have the cell wall fixed by the next morning. The Municipality was directed to provide photographs of the completed work to the inspector as soon as possible. No photos of this work have been received to date. It is important to note that this observation echo’s those observations made in the previous inspection report of 2006 with reads;

*“There is a leak from Cell 1 which runs along the road down into cell 2 along the northeast side. Additionally there appears to be a overflow from the culvert in cell 1 bypassing cells two and three flowing directly into Telik Inlet. Photographs taken during the inspection will clearly show this run-off or leakage from cell one bypassing the lower cells”*

It should be noted that Algae is still visible in the stream running down from the third cell of the lagoon into Telik inlet and algae is also visible along the shoreline and wall of Kingait mountain when the run off enters Telik Inlet.

<sup>13</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at pp. 232-233.

<sup>14</sup> The P Lake sewage lagoon amendment application is exempt from screening by the Nunavut Environmental Review Board (NIRB) pursuant to Schedule 12-1 of the Nunavut Land Claims Agreement. The Board has been advised that the screening pursuant to the *Canadian Environmental Assessment Act* is pending the completion of the Board’s consideration of this application and the Canadian Environmental Assessment Agency registry at [www.ceaa.gc.ca/](http://www.ceaa.gc.ca/) shows file 07-01-29993 as active as of March 3, 2008.

Without the benefit of environmental assessment or regulatory direction, the evidence supports that the P Lake sewage lagoon, the proposed solution to the failing existing lagoon, has been built in a location with unfavourable geological characteristics;<sup>15</sup> the integrity of the design is seriously questioned by technical reviewers;<sup>16</sup> and the facility has not been constructed in accordance with construction drawings, omitting design elements essential to mitigating the design risks.<sup>17</sup> Furthermore, the new lagoon is accessible only by a road that the Board believes is likely to prove unusable during some of the winter, forcing continued reliance on the existing lagoon.

The Board's decision to hold a public hearing on a Type B licence reflects the depth of concern expressed by the parties reviewing this Application and by the public. This was evidenced by the attendance of an estimated forty-five community members over the course of the two day hearing. The Board heard that the community has serious concerns about the location of the sewage lagoon and its close proximity to the Hamlet's drinking water supply,<sup>18</sup> and about the safety of the access road to the new lagoon.<sup>19</sup>

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<sup>15</sup> See BGC Project Memorandum, Technical Meeting Notes to J. Murdock, NWB from Holger Hartmaier, BGC Engineering Inc., dated October 5, 2006, at pp.3-4.

<sup>16</sup> For example, BGC states:

It is important to note that AMEC's original design recommendation in the October 13<sup>th</sup>, 2005 report was to backfill the cutoff trench with, and I quote, "compacted clay material or grouted." This requirement was never reflected in the previous construction drawings issued by Dillon to date and has been raised as a design issue by BGC in previous reviews.

Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 278.

<sup>17</sup> For example, INAC states:

During the review of the water license and after inspection of the constructed facility, INAC had difficulty in understanding how the decisions were made and who made the decisions for designs to application to construction. For example, reports provided as part of the application included recommendations by the project's consultants and sub consultants; however, the project was built without implementing those recommendations.

.... somebody should tell the Board clearly who makes the decisions. Examples are installations of thermistors. There were recommendations throughout the application. No thermistors are installed at this time, although the lagoon has been built. Would have been a good chance to find out how the freezing went. The use of clay or impervious material in the cutoff trench was a recommendation of the geotechnical engineer; however, they used sand.

Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at pp. 227-228.

<sup>18</sup> For example, Mr. Gillis expressed this concern to the Board:

Our water supply is right beside what you're doing, if you get up there and look. T Lake is right beside it. This is an island. We live on a little island here, and our water supply is our water supply, and you're going to put a sewage lagoon right beside it...

Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at p. 167.

<sup>19</sup> For example, Mike Hayward, an employee with the Municipal Works Department, asked the Board:

...that new access road, I am curious about the safety on the switch-back in wintertime. There's no runoff for the sewage trucks if they start sliding. Is that going to be addressed before the road opens?

Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at p. 176.

## **Compliance and Enforcement**

Pursuant to sections 85 through 87 of the NWNSRTA, INAC is charged with enforcing the NWNSRTA and the conditions of the Licence.<sup>20</sup> As stated by INAC at the Hearing, and evidenced by the 2007 inspection report, the Hamlet is not in compliance with the terms of the Licence. Furthermore, the INAC Inspector carrying out a site inspection at Cape Dorset, knowing there were significant issues around the new sewage lagoon, chose to ignore the fact that the P Lake Sewage Lagoon was being constructed prior to approval of the NWB:

A survey of the Nunavut Water Board website shows that a great deal of questions and correspondence concerning various aspects of the design and subsequent construction of a new sewage lagoon have been posted for review and comment. This inspection report is only relevant to observations and discussion of the existing Three-Tier sewage lagoon, the bulk waste metals area, the municipal dump and the potable water treatment system for the community of Cape Dorset.<sup>21</sup>

When the Board brought the issue of construction commencing on a sewage lagoon that was the subject of the Application currently before the Board, in contravention of sections 11 and 12 of the NWNSRTA, to INAC's attention and requested information on action to be taken,<sup>22</sup> INAC did not respond to the Board's request.

Further, it appears to the Board that INAC is content to leave taking action related to compliance with the Licence in the hands of the Licensee:

As the Board knows and the Hamlet knows, the Hamlet is not in compliance with their existing, expired license, which the Board has raised for renewal. As the enforcer of the terms and conditions of a license issued by the Nunavut Water Board, INAC still has some discomfort with the renewal unless we, and I presume the Board, has confidence that the Licensee will strive to come into compliance with the existing terms and conditions. INAC requests that the Licensee contact the INAC inspector for assistance in reaching this compliance.<sup>23</sup>

## **The Role of GN-CGS**

GN-CGS provided the Hamlet with technical support in this Application and has been responsible for retaining the consultants and contractors to build the P Lake sewage

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<sup>20</sup> See sections 85 through 87 of the NWNSRTA.

<sup>21</sup> Letter to SAO-Art Stewart, Cape Dorset, RE: July 19th, 2007 Municipal Water Licence NWB3CAP0207, from A. Keim, Inspector, Indian and Northern Affairs Canada, dated September 25, 2007, at p. 1.

<sup>22</sup> See letter, to Michael Nadler, Regional Director General, Indian and Northern Affairs Canada, Nunavut Region, re: Water License Application 3BM-CAP0207, from Dionne Filiatrault, A/Executive Director, Nunavut Water Board, dated August 8, 2007.

<sup>23</sup> Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 371.

lagoon. The Hamlet is on the record as not having expertise in the technical matters relating to the Application and is relying on consultations from GN-CGS and the consultants.<sup>24</sup> The Board concurs with INAC that the matter in which this project has proceeded and the concerns expressed by the Hamlet throughout does not instill confidence in the Government of Nunavut system to support the development of municipal water and waste facilities:

INAC also suggests that the Government of Nunavut should explain to the Board, regulators, and other interveners the process of site selection, design and public consultation that it undertakes to improve the Board's understanding and confidence in the Government of Nunavut system. The perceived unwillingness of the Hamlet earlier to operate the lagoon has opened the GN's process to some question.<sup>25</sup>

The Board also does not take lightly GN-CGS's evidence on the current state of municipal sewage facilities in Nunavut:

We know that what the project is about it's called a sewage lagoon, and it's one of the best lagoons on Baffin Island actually, and *most of the sewage lagoons in all the communities, they're all faulty.*

...the sewage lagoons are a big problem. They tend to spread and damage the waters and the land. This is what we're protecting, and us Government employees of Nunavut, we're striving for those projects to be resolved. *We don't want to build another that is badly designed.*<sup>26</sup> [Emphasis added.]

Given the GN-CGS's role in assisting municipalities and evidence before the Board regarding that role in this Application, including the construction of the P Lake sewage lagoon in a manner that defies explanation and in direct contravention of the NWNSRTA, the Board believes that the GN-CGS shares responsibility for the failure of the regulatory regime.

Canada is a country where the Rule of Law governs. Giving consideration to the on-going failure to comply with legal requirements to protect the freshwater in Nunavut, the Board agrees with Judge Lilles' finding that there is no reason municipal corporations should be treated more leniently than commercial corporations when being sentenced for an environmental offence.<sup>27</sup>

## **Recommendation of the Parties**

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<sup>24</sup> See Art Stewart, SAO, Hamlet of Cape Dorset, Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at p. 92.

<sup>25</sup> Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 223.

<sup>26</sup> Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at pp. 19-20.

<sup>27</sup> See 2003 YKTC 16 (CanLII), at para. 41.

In reaching its decision, the Board gave careful consideration to EC and GN-DOE's support for issuing the licence subject to their recommended terms and conditions, and to INAC's offer of assistance to the Hamlet in reaching compliance.<sup>28</sup> The Board also weighed INAC's acknowledgement that it is INAC that is responsible for enforcing the terms and conditions of a licence issued by the Board, and INAC's stated willingness to work with the Hamlet, the Government of Nunavut, the Board and its staff on the water and licensing process and enforcement of any issued or to-be-issued licence.<sup>29</sup>

The Board does not find INAC's closing submission at the Public Hearing particularly helpful in reaching a decision on this difficult matter:

If the Applicant is willing to take the risk and with the low volumes to be inputted into the lagoon if operation begins within the next 60 days -- such as April 1st, so we feel about 25 to 30 cubic metres would enter the lagoon if there was just the input from the sewage -- INAC will not oppose the issuance of the amendment and the beginning use of the lagoon, but it is a risk. Monitoring would assist in limiting that risk and allowing you to develop contingencies.<sup>30</sup>

### **Conclusion on Issuing the amended Licence**

Pursuant to subsection 42(1) of the NWNSRTA, the Board has decided to amend the Licence for the Application, with a renewal issued concurrently in a separate motion by this Board, subject to the terms and conditions set out therein as explained in later sections of this decision. In issuing the Licence, the Board is satisfied that the application contains the required information based on the NWB Guidelines and is in the proper form having regard to the NWNSRTA and associated regulations.<sup>31</sup>

To make this difficult decision the Board gave careful consideration to its objects:

**35.** The objects of the Board are to provide for the conservation and utilization of waters in Nunavut, except in a national park, in a manner that will provide the optimum benefit from those waters for the residents of Nunavut in particular and Canadians in general.

The Board has concluded that the current sewage lagoon system has failed. While the new lagoon system poses serious risks, with appropriate conditions the Board believes these risks can be mitigated and that it is the only likely mechanism for the Hamlet to come into compliance. The Board's conclusion on this is supported by INAC:

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<sup>28</sup> See Jim Rogers, INAC, Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 371.

<sup>29</sup> See Jim Rogers, Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 373.

<sup>30</sup> See Jim Rogers, Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 373.

<sup>31</sup> Northwest Territories Water Regulations, S.O.R./93-303 [hereinafter Regulations] and Application of Regulations made under paragraph 33(1)(m) or (n) of the Northwest Territories Waters Act in Nunavut Order, S.O.R./2002-253.

The question of approving an amendment to a noncompliant license will probably be raised by the Board. INAC believes that the new lagoon will allow improved treatment and allow for the Hamlet to move towards compliance.<sup>32</sup>

Accordingly, the Board has decided that the optimum benefit for the residents of Nunavut is derived from a decision to issue the amendment to the Licence. This decision is based on the conditions that are set out in later sections of these Reasons for Decision, particularly the requirement to install thermistors and validate the freeze-back of the foundation prior to commissioning of the new lagoon and related monitoring. These conditions include the Board specifying responsibilities of the Her Majesty in right of Canada pursuant to subsection 70(2) of the NWNSRTA. The Board believes these conditions are essential to achieving optimum benefit and encourages the Minister to approve this Licence only on the basis that INAC inspectors and Licensee will meet their responsibilities specified in the Licence and pursuant to the NWNSRTA.

Further, the Board puts the Hamlet on notice that pursuant to clause 43(1)(c)(iii) of the NWNSRTA, the Board has the authority to recommend cancellation of a licence when it is in the public interest to do so. Through the conditions set out below, it is the Board's intention to carefully monitor the Hamlet's efforts to come into compliance with the Licence. If at any point the Board determines that further failure to comply with conditions set out in the Licence are such that the balance of the public interest changes, the Board is prepared to exercise its authority to cancel the Licence.

As stated above and pursuant to subsection 42(1) of the NWNSRTA, the Board has decided to amend the 3BM-CAP0810 Licence subject to the terms and conditions set out therein and explanation herein. In issuing the Licence, the Board is satisfied that the application contains the required information based on the NWB Guidelines and is in the proper form having regard to the NWNSRTA and associated regulations.<sup>33</sup>

### **Assumptions**

Where there was doubt in the Board's mind about a certain parameter or standard, the Board has imposed stringent monitoring conditions to ensure the Hamlet will be meeting its promises of performance made in its written application and at the Final Hearing.

### **Applications in Relation to Licenses**

Overall, the Board is satisfied that the requirements of section 48 of the NWNSRTA have been met. The HCD filed an application which complied with the Board's rules,

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<sup>32</sup> Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 233.

<sup>33</sup> Northwest Territories Water Regulations, S.O.R./93-303 [hereinafter Regulations] and Application of Regulations made under paragraph 33(1)(m) or (n) of the Northwest Territories Waters Act in Nunavut Order, S.O.R./2002-253.

including the application fee.<sup>34</sup> The Applicant also provided the necessary information to evaluate the qualitative and quantitative effect of the use of water or the deposit of waste into water.

### **Application to Amend or Application for future Modifications**

In relation to future applications to amend or modify the Project, in accordance with Condition in Part A, Section 3, Item (iv) of the Licence, the Applicant must have in place, a plan to achieve full compliance with the conditions of the Licence, approved by the Board, or the compliance plan must be submitted at the time of any Application in order for the Application to be deemed complete.

### **Term of Licence**

In accordance with section 45 of the NWNSRTA, the term of a licence or any renewal shall not exceed twenty-five years. The Board has concurrently decided on a 2 year term for the Licence.

For the reasons set out in the Decision to Issue above, this short duration is intended to send a clear message to the Hamlet and regulatory authorities that the Board will not passively encourage the Hamlet's failure to comply with the licence conditions and associated legal requirements. The Board fully expects the Hamlet to take immediate steps to come into full compliance with the licence requirements for its existing facilities and to commission and operate the P Lake sewage lagoon in accordance with the Licence. When the Hamlet submits an application to renew the Licence in approximately 18 months, the Board expects the Hamlet to be in full compliance with the licence. This short duration also permits the Board to increase its level of confidence that the new facility is operating as it should.

## **WATER LICENCE TERMS AND CONDITIONS**

This Licence does not take effect until approval of the Minister is given pursuant to section 56 of the NWNSRTA.<sup>35</sup>

## **PART A: SCOPE, DEFINITIONS AND ENFORCEMENT**

### **Enforcement and Compliance**

For the purpose of ensuring compliance with the Licence, an Inspector designated by the Minister may inspect or examine works, waters or waste and exercise other powers

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<sup>34</sup> In accordance with section 48(1) of the Regulations a fee of \$30 was provided with the Initial Application on February 29, 2008, Receipt no. (in process with INAC).

<sup>35</sup> Subsection 56(1) of the NWNSRTA states:

56(1) the issuance, amendment, renewal and cancellation of a Type A license and if a public hearing is held a Type B licence are subject to the approval of the Minister. The license is considered approved ninety days followings issuance of the licence or as otherwise approved by the minister under section 56 of the *Act*.

according to the NWNSRTA.<sup>36</sup> The NWNSRTA includes serious penalties for breach of the Licence, including furnishing or maintaining security.<sup>37</sup> Investigations or inspections are carried out by persons designated by the Minister.<sup>38</sup>

The Licence states that “Compliance with the terms and conditions of this Licence does not absolve the Licensee from responsibility for compliance with all applicable legislation, guidelines and directives.”<sup>39</sup>

An Inspector’s Direction from EC regarding the release of effluent from the 3-Tier Sewage Lagoon was issued to the Licensee on May 13, 2004, directing:

...the Territorial Government of Nunavut and the Hamlet of Cape Dorset, Nunavut to take or cause to be taken, immediately, all reasonable measures consistent with the safety and the conservation of fish and fish habitat to prevent the deposit of the aforementioned deleterious substance, that is, raw sewage in water frequented by fish, that is Telik Inlet, and to counteract, mitigate or remedy any adverse effects that result or may be expected to result there from, including; ...<sup>40</sup>

Subsequent correspondence from the INAC Inspector confirmed the requirement of the Licensee to carry out mitigative measures to ensure that every reasonable attempt to prevent a catastrophic failure of the 3-celled Lagoon and reduce the output of raw sewage from the original lagoon.<sup>41</sup> Follow-up inspections by INAC in July 2006 and July 2007 again stated that the sewage treatment in the community continued to be below acceptable standards because of problems with the 3-Tier Lagoon system.<sup>42</sup>

Other non-compliance items were identified in the 2007 inspection, including:

- 1) Requirement to develop a Quality Assurance/Quality Control Plan;
- 2) Poor management of the solid waste disposal facility with large piles of unsegregated materials along the shoreline of Telek Inlet, these issues were brought to the attention of the municipality in 2003, 2006; run off and leachate from the waste metals area obviously entering Telek Inlet; large piles of batteries and other hazardous materials were present;
- 3) Develop an Operations and Maintenance Manual for the Sewage and Solid Waste Disposal Facilities, Cape Dorset; and

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<sup>36</sup> Sections 85-94 of the NWNSRTA

<sup>37</sup> Sections 90 of the NWNSRTA.

<sup>38</sup> Sections 85-88 of the NWNSRTA.

<sup>39</sup> Licence Part A, Item 3.

<sup>40</sup> See Inspectors Direction to Hamlet of Cape Dorset from Mr. Bruinsma, Environment Canada, dated May 13, 2004.

<sup>41</sup> See Inspection Report to SAO Art Stewart, Cape Dorset and Government of Nunavut c/o Tom Rich from Scott Stewart, Water Resources Officer, dated May 27, 2004.

<sup>42</sup> See letter to SAO-Art Stewart, Cape Dorset, RE: July 19th, 2007 Municipal Water Licence NWB3CAP0207, from A. Keim, Inspector, Indian and Northern Affairs Canada, dated September 25, 2007.

4) Posting of appropriate signage.<sup>43</sup>

In addition to the above, annual reports provided by the Licensee have not included all monitoring data required under Part H. Specifically, no monitoring results have been included in annual reports for the releases from either the 3-Tier Lagoon or the single cell lagoon.

Given the current state of non-compliance and the importance of ensuring compliance with the conditions related to commissioning of the P Lake sewage lagoon, as a condition of this Licence, the Board requires the Hamlet to submit for the approval of the Board a plan to achieve compliance with the terms of the Licence within 60 days of the issuance of this Licence. In formulating the plan for achieving compliance, the Board directs the Licensee to consult with the INAC Inspector.

## **PART B: GENERAL CONDITIONS**

### **Reports filed with the NWB**

With the exception of the Annual Report, all other plan(s) or report(s) (Plan, or collectively Plans) submitted to the Board under this Licence shall include a proposed timetable for implementation. Unless listed as approved in the Licence, a Plan cannot be undertaken without subsequent written Board approval. The Board may alter or modify a Plan if necessary to achieve the legislative objectives and will notify the Applicant in writing of acceptance, rejection, or alteration of the Plan. The Plan must then be carried out in manner and timeframe consistent with the Board's direction.

Every Plan to be carried out pursuant to the terms and conditions of this Licence shall become a part of this licence, and any additional terms and condition imposed upon approval of a Plan by the Board become part of this Licence. All terms and conditions of the Licence should be contemplated in the development of a Plan where appropriate.

The Application contains several plans and engineered designs that were reviewed by the Board. The Board has approved these as presented unless otherwise indicated in the terms and conditions of the Licence. Specifically, the QA/QC Plan, Interim Closure and Reclamation Plan, and the Final Closure and Reclamation require formal approval of the Board.

## **CONDITIONS APPLYING TO SECURITY**

The Board does not require security for municipal water and waste disposal facilities.

## **PART C: CONDITIONS APPLYING TO WATER USE**

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<sup>43</sup> See letter to SAO-Art Stewart, Cape Dorset, RE: July 19<sup>th</sup>, 2007 Municipal Water Licence NWB3CAP0207, from A. Keim, Inspector, Indian and Northern Affairs Canada, dated September 25, 2007.

Section 11 of the NWNSTRA states “... no person shall use, or permit the use of, water in Nunavut except in accordance with the conditions of a licence.”

The Board has imposed standard terms and conditions related to water management.

#### **PART D: CONDITIONS APPLYING TO WASTE DISPOSAL**

From an enforcement and compliance perspective, the Board endeavored to write the Licence fairly and properly; the Board strives to outline clearly the discharge parameters and other limits of the Licence in a way that will not over-regulate the Project, leading to potential over enforcement. The Board is also aware of the risks to water quality in Nunavut posed by under-regulation.

For the existing sewage disposal facilities (the 2001 Sewage Disposal Facility or 3-Tier Lagoon and Emergency Sewage Treatment Facility) the Board establishes the effluent quality limits as provided under the existing Licence.

On the issue of effluent quality for the P-Lake sewage lagoon the Board accepts the recommendation of GN-DOE<sup>44</sup> supported by EC<sup>45</sup> and confirmed by the applicant the following limits: 80 mg/L BOD, 100 mg/L. The Board establishes the limits for Fecal Coliform at 10,000 CFU/100ml.

#### **PART E: CONDITIONS APPLYING TO MODIFICATION AND CONSTRUCTION**

Upon completion of construction of infrastructure the Board generally requires a final monitoring report to confirm as built details. As the P Lake sewage lagoon was constructed prior to the issuance of the Licence, the Board is in the somewhat unique and undesirable position of placing conditions in the Licence related to the as built drawings. The Board accepts the recommendations of BGC<sup>46</sup> and INAC<sup>47</sup> that the as-built drawings are to be reviewed and changes between construction design and as-built details be highlighted and explained on the drawings, and submitted to the Board signed and stamped by the engineer responsible or the engineer of record for the geotechnical discipline *prior to commencement of operation* of the lagoon.

The Board is deeply concerned about the changes that took place between design and construction with no understanding of how these decisions were made. It remains a mystery to the Board why thermistors were not installed during construction in

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<sup>44</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 103.

<sup>45</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 116.

<sup>46</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 275.

<sup>47</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 228.

accordance with construction drawings. The Board received evidence from BGC,<sup>48</sup> INAC,<sup>49</sup> and GN-DOE<sup>50</sup> that the design of the lagoon depends on a frozen foundation and that thermistors must be installed to validate freezeback. The Board accepts the recommendation from BGC that a *minimum* of three 20 to 25 metre deep thermistors be installed in crest of the west berm and *at least one* thermistor of that depth in the east berm and that the *freeze-back of the foundation be validated prior to commissioning* of the new sewage lagoon.<sup>51</sup>

The Board notes the Applicant's willingness to install thermistors.<sup>52</sup> The recommendation in the preceding paragraph clearly refers to a minimum requirement. It is the responsibility of the Licensee in consultation with its consultants to determine the full extent of monitoring that is required to validate the frozen foundation. Further, the Board acknowledges that in order to validate a frozen foundation in time for commissioning in the current year requires installation of the thermistors in time for measurements to be taken this winter. The Board has no valid reason before it to waive the design consultant's *requirement to install thermistors before the lagoon is used*, particularly given the recommendations of AMEC as summarized by P. Cavanagh at the Hearing:

Early on in the design process, it was recommended by AMEC that thermistor monitoring sites be installed at several locations along the berm center line to various depths to monitor the progress of freezing within the berm and the foundation soils. This data could be used in conjunction with condition surveys and performance operations during -- sorry, performance.<sup>53</sup>

Further, section 3.4.6 of the O&M Manual is to be updated to provide the number, locations, depths, or bead locations of the thermistors to be installed.

Pursuant to Article 12 and section 12.4.3 of the NLCA, a proposed modification submitted under this Licence may require a screening determination by the NIRB. It is the responsibility of the Licence holder to notify and consult with NIRB to ensure Article 12 requirements are met.

Further, the Board accepts BGC's recommendation that the Licence include a condition requiring prior approval by the Board for any change in the lagoon waste water storage and decanting operations, with the notification triggering a geotechnical and geothermal

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<sup>48</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 278 and 294.

<sup>49</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 372.

<sup>50</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at pp. 100-101.

<sup>51</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 294.

<sup>52</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at p. 110.

<sup>53</sup> See AMEC "Geotechnical Investigations for P-Lake Lagoon, Cape Dorset, NU" dated October 13, 2005 and Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at p. 43.

review to assess the implications of year-round water storage on permafrost conditions under the lagoon.<sup>54</sup>

## **PART F: CONDITIONS APPLYING TO OPERATION AND MAINTENANCE**

The Board accepts the recommendation of GN DOE and requires the Applicant to update and submit for the Board's approval a Spill Contingency Plan that meets the GN-DOE's regulatory requirements prior to the commissioning of the new sewage lagoon.<sup>55</sup> The Board also accepts the recommendations from INAC<sup>56</sup> and EC<sup>57</sup> that the O&M Plan updated to set out how cell one of the old sewage lagoon will be maintained as a contingency for emergencies, including an assessment of how often the existing lagoon will be used and how it will be decanted. This information is to be provided to the Board.

## **PART G: CONDITIONS APPLYING TO ABANDONMENT, RESTORATION AND CLOSURE**

The Board requires within six months of the issuance of the Licence a conceptual Abandonment, Restoration and Closure Plan for the P-Lake sewage lagoon with the objective of returning the site to pre-use condition. A final Abandonment, Restoration and Closure Plan must be submitted to the Board for approval six months prior to the closure.

Further the Board requires the Applicant to submit a Final Abandonment, Restoration and Closure Plan for the 2001 Sewage Disposal Facility and Emergency Sewage Treatment Facility within 90 days of issuance of the licence.

## **PART H: CONDITIONS APPLYING TO MONITORING PROGRAM**

As stated previously, for the purpose of ensuring compliance with the licence or regulations, an Inspector designated by the Minister may inspect or examine works, waters or waste and exercise other powers according to the NWNSRTA.<sup>58</sup> For the purpose of monitoring, the Board may include conditions in its licence regarding monitoring programs to be undertaken.<sup>59</sup>

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<sup>54</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at pp. 279.

<sup>55</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at pp. 101-102.

<sup>56</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at pp. 230-231.

<sup>57</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at pp. 120-121.

<sup>58</sup> See sections 85 to 94 of the NWNSRTA.

<sup>59</sup> See paragraph 70 (1)(c) of the Act

The sewage lagoon decants into P Lake (the last point of control). The outlet of P Lake flows into a small wetland area, which then drains through a small channel over a waterfall before entering Telik Inlet. While not part of the treatment system, there is potential for the wetlands to polish the waste water.

Both P Lake and the wetland are not fish-bearing. The first waters frequented by fish is Telik Inlet. This impacts on monitoring requirements:

Any effluent that is discharged into fish-bearing water must be nontoxic in order to comply with the Fisheries Act. In order to achieve this, it may be necessary for the license to differentiate between the last point of control, which is the outfall from the lagoon, and the final point of discharge, which is at some point upstream of the entrance into Telik Inlet.<sup>60</sup>

Accordingly, the Board requires monitoring to take place at both the last point of control and the final point of discharge.

The Board is setting the discharge criteria consistent with the *Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories (1992)*, which formed the basis for discharge criteria in the expired licence, with an adjustment to reflect the change from discharge into a marine environment to discharge into a freshwater environment. The Board notes the Applicant's concurrence with a change to the use of 80 milligrams per litre biological oxygen demand and 100 milligrams per litre total suspended solids when discharging into freshwater.<sup>61</sup>

The monitoring program proposed by the Applicant includes eight locations, the control site, lagoon inflow, lagoon effluent, P Lake effluent, wetlands effluent, and three sites along the wetlands between P Lake discharge and the wetlands outlet. The Board accepts INAC's recommendation that the final monitoring points under the monitoring program sites for the amendment or the P Lake amendment be set up in consultation with the INAC and EC inspectors, and these points, once identified and marked, would be used by the Hamlet, by the inspectors, and reported to the Board.<sup>62</sup> Based on the program proposed by the Applicant the Board accepts the recommendation to sample one week prior to and during the course of lagoon discharge.<sup>63</sup>

The Board also accepts the recommendation by EC to add periodic analysis for a full suite of parameters in order to characterize the waste water, including metals, nutrients, and major ions, and suggested that the carbonaceous [biochemical] oxygen demand

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<sup>60</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at p. 114.

<sup>61</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at p. 51.

<sup>62</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 24, 2008, at pp. 372-373.

<sup>63</sup> See the Operation and Maintenance Manual, Sewage Treatment System, Hamlet of Cape Dorset, dated November 9, 2007 submitted by Dillon Consulting Limited at p. 12.

(CBOD)<sup>64</sup> should also be added as a monitored parameter to help the HCD assess whether or not they would be able to meet the proposed national performance standards.<sup>65</sup>

The Board further accepts EC's recommendation that an acute lethality test from either the effluent sampled from the outflow of P Lake or from the final discharge point just prior to the entrance to Telik Inlet be conducted once annually during the second half of the decant as a condition of the Licence.<sup>66</sup>

In addition, for monitoring programs subsection 70(2) of the Act allows the Board to specify responsibilities of the applicant and Her Majesty in right of Canada, which the Board recommends in this case be INAC.<sup>67</sup> Given the importance of the installation of thermistors and the validation of freezeback of the foundation prior to commissioning of the P Lake sewage lagoon in order to mitigate the risk of licensing this Project, the Board has specified in the Licence certain monitoring responsibilities to Her Majesty in the right of Canada.

The Licence requires Her Majesty in the right of Canada to:

- 1) Monitor the Applicant's installation of thermistors and notify the Board when the installation of thermistors is complete and in compliance with the minimum requirements established by the Board;
- 2) Monitor the Applicant's validation of freezeback of the foundation and notify the Board when satisfied that the freezeback has been validated such that the Project may be commissioned in compliance with the requirements for commissioning established in the Licence; and
- 3) Monitor the Project and notify the Board immediately if the Project is commissioned prior to 1) and 2) above occurring or in contravention of any other condition of the Licence.

## **SCHEDULES**

Schedules provide instructive detail to the conditions appearing in more general terms in the main body of the Licence and are spelled out in this format for greater clarity. Except

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<sup>64</sup> Carbonaceous biochemical Oxygen demand means: the method of analysis is defined by Method 5210 in Standard Methods. CBOD5 is a measure of the biochemical degradation of organic material (carbonaceous demand) over a specified time period. The dissolved oxygen depletion is determined during a 5-day incubation period at a specified temperature (20°C), after a nitrification inhibitor has been added. Modifications are introduced, if necessary, to ensure a suitable level of bacterial activity.

<sup>65</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at p. 117.

<sup>66</sup> See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at p. 115.

<sup>67</sup> Subsection 70(2) of the NWNSRTA states:

70(2) The monitoring programs referred to in paragraph (1)(c) may specify responsibilities of the applicant, the Nunavut Impact Review Board or Her Majesty in right of Canada.

for Schedule A, the schedules provide specific requirements for Plans to be submitted to the Board.

### **ISSUES OUTSIDE THE JURISDICTION OF THE BOARD**

The Board acknowledges the road safety issues raised by community members:

Well, we sent a loader up there once, just our operators from town. One of our loader operators was scared coming down there, so if you send a fully loaded sewage truck going up that hill, it starts sliding backwards, and the only thing at the end of it is a mountain and a 90 degree turn, which he'll never make, I think it's a very serious concern.<sup>68</sup>

This serious occupational and public health safety issue is outside of the jurisdiction of the Board. However, the Board feels very strongly that action should be taken, including consultation with Transport Canada and Workers Compensation Board (where applicable) to ensure the road is designed to standards appropriate for conditions in Nunavut and ultimately, that it is safe. Representatives of the Hamlet and GN-CGS were present when these concerns were raised. The Board strongly encourages the Hamlet to follow up on its commitment to review the road safety with GN-CGS to seek resolution of the significant safety concerns raised:

The issue of the road is separate from the water licence itself. However, this is something even though the Hamlet is a proponent of the new sewage lagoon, we understand that the road can be changed to be more safe, and that is an issue that we would like to address with CGS at another forum.<sup>69</sup>

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<sup>68</sup> For example, Mr Hayward made the quoted statement to the Board. See Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at p. 178.

<sup>69</sup> Nunavut Water Board Hearing Re: Cape Dorset Type B Water License, Hearing Transcript, January 23, 2008, at p. 177.

## **APPENDIX A – LIST OF SUBMISSIONS AND CORRESPONDENCE CAPE DORSET 3BM-CAP**

### Application:

1. Initial Submission of application for Hamlet of Cape Dorset received July 7, 2005.

### Initial Submission & Correspondence:

1. Submitted by Dillon Consulting Limited to the Nunavut Water Board July 7, 2005 Cape Dorset Sewage Treatment System (Preliminary Design Report June 23, 2005)
2. Received July 7, 2005 by the Nunavut Water Board from Dillon Consulting Limited, English Summary titled Cape Dorset Sewage Treatment P-Lake.
3. Received August 3, 2005 by the Nunavut Water Board from Dillon Consulting Limited, Inuktitut Summary, Cape Dorset Sewage Treatment P-Lake.
4. Letter to Gary Strong, Dillon Consulting Limited, dated August 3, 2005 Re: Hamlet of Cape Dorset – Construction of New Sewage Lagoon – Amendment Type “B”. Phyllis Beaulieu, Manager of Licensing, Nunavut Water Board.
5. Memo to Local Organizations Cape Dorset dated August 3, 2005 Re: Public Notice of Amendment Application (Inuktitut & English Notices Attached). Phyllis Beaulieu, Manager Licensing, Nunavut Water Board.
6. Submitted by Janice Lee, Environmental EIT, Dillon Consulting Limited to the Nunavut Water Board August 29, 2005 Construction Tender 75% Review Cape Dorset P-Lake Sewage Lagoon.
7. Submitted February 13, 2006 by Gary Strong, Project Manager, Dillon Consulting Limited titled P Lake Area Sewage Lagoon System *Final Design Report* dated January 30, 2006.
8. Submitted by Community & Government Services to the Nunavut Water Board P-Lake Area – Sewage Lagoon System Tender Drawings (Project No. 3439) dated March 3, 2006.
9. Submitted March 13, 2006 by Government of Nunavut Construction Tender Project No. 05-2020 titled Cape Dorset P-Lake Sewage Lagoon.
10. Public Citizen e-mail comment dated March 13, 2006 Re: Water quality and environmental impact of new Sewage treatment facility in Cape Dorset. Claude Constantineau.

11. Letter to Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset dated March 30, 2006 Re: Submission of P Lake Area Sewage Lagoon System & Complete Construction Tender. Richard Dwyer, Licensing Trainee, Nunavut Water Board.
12. Culture Language Elders & Youth (CLEY) comment dated April 7, 2006 Re: Nunavut Water Board Licence NWB3CAP/TR/E1 P Lake Area Lagoon System & Complete Construction Tender (Hamlet of Cape Dorset). Julie Ross for Douglas Stenton, Director, Culture & Heritage, CLEY.
13. Government of Nunavut Department of Environment comment dated April 20, 2006 Re: Cape Dorset Sewage Lagoon System & Complete Construction Tender. Mike Atkinson, Manager Environmental Assessment and Land Use.
14. Environment Canada comment dated May 1, 2006 Re: NWB3CAP – Hamlet of Cape Dorset – Submission of P Lake Area Sewage Lagoon System & Complete Construction Tender. Colette Spagnuolo, Environmental Assessment/Contaminated Sites Specialist.
15. Fisheries & Oceans Canada e-mail comment dated May 1, 2006 Re: NWB3CAP DFO Comments. Derrick Moggy, Habitat Management Biologist.
16. Indian & Northern Affairs Canada comment dated May 2, 2006 Re: NWB3CAP – Hamlet of Cape Dorset – P Lake Area Sewage Lagoon System Final Design Report and Complete Construction Tender. David W. Abernethy, Water Resources Coordinator.
17. Letter to Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset dated May 8, 2006 Re: Cape Dorset Sewage Lagoon Water Licence Amendment. Joe Murdock, Technical Advisor, Nunavut Water Board.
18. Fax to Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset dated May 8, 2006 Re: Intervenor comments Cape Dorset Sewage Lagoon Water Licence Amendment. Joe Murdock, Technical Advisor, Nunavut Water Board.
19. Letter to Joe Murdock, Technical Advisor, Nunavut Water Board dated May 12, 2006 Re: Response to Intervenor questions (authorization for Dillon Consulting Limited). Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset.
20. Letter to Holger Hartmaier, Senior Geotechnical Engineer, BGC Engineering Inc. dated May 15, 2006 Re: Cape Dorset Sewage Lagoon Water Licence Amendment – Geotechnical Review. Joe Murdock, Technical Advisor, Nunavut Water Board.
21. Letter to John M. Grainger, Project Manager/Senior Municipal Engineer, Associated Engineering (Alberta) Ltd. dated May 15, 2006 Re: Cape Dorset

Sewage Lagoon Water Licence Amendment – Sewage Lagoon Treatment Review. Joe Murdock, Technical Advisor, Nunavut Water Board.

22. Letter to Craig Broome, Head of Enforcement, Environment Canada dated May 17, 2006 Re: Environment Canada File # 4408-2004-05-01-2006. Tom Rich, Deputy Minister, Government of Nunavut Community & Government Services.
23. Letter to Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset dated May 31, 2006 Re: Cape Dorset Sewage Lagoon Water Licence Amendment – Engineering Consultants to the NWB. Joe Murdock, Technical Advisor, Nunavut Water Board.
24. Letter to Joe Murdock, Technical Advisor, Nunavut Water Board dated June 2, 2006 Re: Hamlet of Cape Dorset Sewage Lagoon Amendment Review. John M. Grainger, Project Manager, Associated Engineering (Alberta) Ltd.
25. Memo to Joe Murdock, Technical Advisor, Nunavut Water Board dated June 2, 2006 Re: NWB3CAP0207 – Cape Dorset Sewage Lagoon Water Licence Amendment – Geotechnical Review. Holger Hartmaier, Senior Geotechnical Engineer, BGC Engineering Inc.
26. Letter to Joe Murdock, Technical Advisor, Nunavut Water Board dated June 2, 2006 Re: Cape Dorset Sewage Lagoon Water License Amendment (response to intervenors). Gary Strong, Project Manager, Dillon Consulting Limited.
27. Letter to Lootie Toomasie, Acting Chair, Nunavut Water Board dated June 14, 2006 Re: Cape Dorset Sewage Lagoon (contract awarded). Tom Rich, Deputy Minister, Government of Nunavut Department of Community & Government Services.
28. Letter to Stephanie Joyce, Environmental Scientist, Dillon Consulting Limited dated June 21, 2006 Re: Cape Dorset Sewage Lagoon Water Licence Amendment – Meeting Discussion (June 20<sup>th</sup>, 2006) and NWB Technical Concerns. Joe Murdock, Technical Advisor, Nunavut Water Board.
29. Letter to Joe Murdock, Technical Advisor, Nunavut Water Board dated June 22, 2006 Re: In response to Dillon Consulting's Intervener response, dated June 2, 2006. Claude Constantineau, Public Citizen, Hamlet of Cape Dorset.
30. Letter to Joe Murdock, Technical Advisor, Nunavut Water Board dated June 27, 2006 Re: NWB3CAP0207 – Cape Dorset Sewage Lagoon Water License Amendment – Response to Intervener's Comments & NWB Technical Concerns. Colette Spagnuolo, Environmental Assessment/Contaminated Sites Specialist, Environment Canada.

31. Indian & Northern Affairs Canada comment dated June 27, 2006 Re: NWB3CAP – Dillon Consulting Ltd. – Cape Dorset Sewage Lagoon Amendment – Response to June 2, 2006 Information Submission. David W. Abernethy, Water Resources Coordinator.
32. Letter to Joe Murdock, Technical Advisor, Nunavut Water Board dated July 3, 2006 Re: Notification of Decanting of Sewage Lagoon in Cape Dorset. Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset.
33. Letter to Joe Murdock, Technical Advisor, Nunavut Water Board dated July 14, 2006 Re: Cape Dorset Water Licence Application – P Lake Sewage Lagoon Response to NWB Letter Dated June 21, 2006. Gary Strong, Project Manager, Dillon Consulting Limited.
34. Letter to Joe Murdock, Technical Advisor, Nunavut Water Board dated July 18, 2006 Re: Cape Dorset P-Lake Sewage Lagoon Water License Amendment Response to Intervener. Gary Strong, Project Manager, Dillon Consulting Limited.
35. Received July 24, 2006 by the Nunavut Water Board from Dillon Consulting Limited, Sewage Treatment Alternatives for the Hamlet of Cape Dorset, document file number 03-1943.
36. Letter to Gary Strong, Principal, Dillon Consulting Limited dated August 4, 2006 Re: Cape Dorset Sewage Lagoon Water Licence Amendment – Update and First Notice of Technical Meeting. Joe Murdock, Director of Technical Services, Nunavut Water Board.
37. Letter to Joe Murdock, Technical Advisor, Nunavut Water Board dated August 9, 2006 Re: Cape Dorset Sewage Lagoon – Response to Dillon Letter of July 14, 2006. Holger Hartmaier, Senior Geotechnical Engineer, BGC Engineering Inc.
38. Letter to Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset dated August 16, 2006 Re: Cape Dorset Sewage Lagoon Water Licence Amendment – Community Consultation, Treatment Options, Technical Response to the NWB's June 21<sup>st</sup>, 2006 Letter and Second Notice of a Technical Meeting.. Joe Murdock, Director of Technical Services, Nunavut Water Board.
39. Letter to Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset dated September 20, 2006 Re: Cape Dorset Sewage Lagoon Water Licence Amendment – Technical Meeting September 19, 2006. Joe Murdock, Director of Technical Services, Nunavut Water Board.
40. Memo to Joe Murdock, Director Technical Services, Nunavut Water Board dated October 5, 2006 Re: Cape Dorset Sewage Lagoon Licence Amendment Technical

Meeting September 19, 2006 – Notes. Holger Hartmaier, Senior Geotechnical Engineer, BGC Engineering Inc.

41. Letter to Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset dated November 20, 2006 Re: Submission of DIAND Inspection Report. Richard Dwyer, Licensing Trainee, Nunavut Water Board.
42. Letter to Richard Dwyer, Licensing Trainee, Nunavut Water Board dated December 7, 2006 Re: Cape Dorset Water License Application (authorization for Bhabesh Roy to deal with the water license application). Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset.
43. Letter to Richard Dwyer, Licensing Trainee, Nunavut Water Board, dated December 13, 2006 Re: Approval from Cape Dorset Hamlet Council (Bhabesh Roy appointed spokesman for all matters relating to Hamlet of Cape Dorset Water Licence application). Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset.
44. Letter to Joe Murdock, Director Technical Services, Nunavut Water Board dated January 3, 2007 Re: Cape Dorset Sewage Lagoon-Water License Amendment. Bhabesh Roy, Municipal Planning Engineer, Community & Government Services.
45. Received by the Nunavut Water Board January 26, 2007 Stand Alone Final Engineered Design from Community & Government Services.
46. Letter to Richard Dwyer, Licensing Trainee, Nunavut Water Board dated January 26, 2007 Re: 2006 Annual Report for the Hamlet of Cape Dorset. Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset.
47. Letter to Craig Broome, Manger Enforcement, Environment Canada dated March 1, 2007 Re: Cape Dorset Sewage System File No. 4408-2004-03-12-005. Pam Hine, Deputy Minister, Government of Nunavut Community & Government Services.
48. Briefing Note prepared by Zhong Liu, Technical Advisor, Nunavut Water Board dated March 19, 2007 Re: 070126 Stand Alone Final Engineered Design for Water Licence Application of the Hamlet of Cape Dorset.
49. Submission received March 30, 2007, Gary Strong Project Manager, Dillon Consulting Limited to Bhabesh Roy, Municipal Planning Engineer, Community & Government Services titled P Lake Sewage Lagoon Water Licence Application Design Report Cape Dorset NU dated December 21, 2006.
50. Letter to Zhong Liu, Technical Advisor, Nunavut Water Board dated April 2, 2007 Re: Cape Dorset Water Licence Application – “P” Lake Sewage Lagoon

Response to NWB Letter dated June 21, 2006. Bhabesh Roy, Municipal Planning Engineer, Community & Government Services.

51. Letter to Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset dated April 18, 2007 Re: Submission of 2006 Annual Report. Doreen Porter, Administrative Clerk, Nunavut Water Board.
52. Government of Nunavut Department of Environment comment dated May 31, 2007 Re: Cape Dorset Sewage Lagoon System. Mike Atkinson, Manager Environmental Assessment & Land Use.
53. Indian & Northern Affairs Canada comment, dated June 7, 2007 Re: 3BM-CAP/Hamlet of Cape Dorset/Qikiqtani Region/licence. David W. Abernethy, Water Resources Coordinator.
54. Environment Canada comment dated June 7, 2007, Re: Amendment for Cape Dorset Water License 3BM-CAP0207. Cindy Parker, Environmental Assessment Specialist.
55. BGC Engineering Inc. comment dated June 7, 2007 Re: Cape Dorset Sewage Lagoon – March 30, 2007 Re-Submission – Geotechnical Review. Holger Hartmaier, Senior Geotechnical Engineer.
56. Associated Engineering comment dated June 12, 2007 Re: Hamlet of Cape Dorset Sewage Lagoon Amendment Review – Re-Submission. John M. Grainger, Senior Municipal Engineer.
57. Letter to Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset & Bhabesh Roy, Municipal Planning Engineer, Community & Government Services dated June 19, 2007 Re: Cape Dorset Type B Water License Application. Thomas Kabloona, Acting Chair, Nunavut Water Board.
58. Letter to Cape Dorset Distribution List dated June 26, 2007 Re: Cape Dorset Type B Water License Application (Proposed agenda for July 3, 2007 teleconference attached). Dionne Filiatrault, Acting Executive Director, Nunavut Water Board.
59. E-mail to Dionne Filiatrault, Acting Executive Director, Nunavut Water Board dated July 3, 2007 Re: 3BM-CAP0207 Cape Dorset Type b Water License. Jim Rogers, Manager Water Resources, Indian & Northern Affairs Canada.
60. E-mail to Dionne Filiatrault, Acting Executive Director, Nunavut Water Board dated July 3, 2007 Re: Cape Dorset Visit. Brian McQuarrie, Director Finance & Personnel, Hamlet of Cape Dorset.
61. Letter to Cape Dorset Distribution List dated July 11, 2007 Re: Pre-hearing Teleconference for the Hamlet of Cape Dorset Type B Water License

Amendment Application (copy of agenda from July 3, 2007 attached). Dionne Filiatrault, Acting Executive Director, Nunavut Water Board.

62. Letter to Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset & Bhabesh Roy, Municipal Planning Engineer, Community & Government Services dated July 17, 2007 Re: Cape Dorset Technical Consultants meeting, July 11, 2007. David Hohnstein, Acting Director Technical Services, Nunavut Water Board.
63. E-mail to Dionne Filiatrault, Acting Executive Director, Nunavut Water Board dated July 25, 2007 Re: Public hearing in Cape Dorset – P Lake Lagoon (clarafication of intent). Bhabesh Roy, Municipal Planning Engineer, Community & Government Services.
64. Letter to Dionne Filiatrault, Acting Executive Director, Nunavut Water Board dated July 25, 2007 Re: Public Hearing and documents submission: Water License approval “P” Lake Sewage Lagoon, Cape Dorset, NU. Bhabesh Roy, Municipal Planning Engineer, Community & Government Services.
65. Letter to Dionne Filiatrault, Acting Executive Director, Nunavut Water Board dated July 26, 2007 Re: Public Hearing in Cape Dorset P Lake Lagoon. Tom McDonald, Project Officer, Community & Government Services.
66. Letter to Dionne Filiatrault, Acting Executive Direct, Nunavut Water Board dated July 30, 2007 Re: P-Lake Sewage Lagoon Water License Application Design Report Cape Dorset, NU. Bhabesh Roy, Municipal Planning Engineer, Community & Government Services.
67. Submitted by Community & Government Services to the Nunavut Water Board July 30, 2007 Final Report Sewage Treatment Best Available Technology (prepared for INAC by Ferguson Simek Clark dated March 21, 2001 Project No. 98-1585)
68. Letter to Dionne Filiatrault, Acting Executive Director, Nunavut Water Board dated July 30, 2007 Re: P Lake Sewage Lagoon Water License Application Design Report Cape Dorset, NU. Bhabesh Roy, Municipal Planning Engineer, Community & Government Services.
69. Letter to Cape Dorset Distribution List dated August 2, 2007 Re: Deadline for Submission for the Public Hearing for Hamlet of Cape Dorset Type B Water License Amendment Application Dionnne Filiatrault, Acting Executive Director, Nunavut Water Board.
70. Letter to Cape Dorset Distribution dated August 8, 2007 Re: Board Direction on Public Hearing for Hamlet of Cape Dorset Type B Water License Amendment Application. Dionne Filitrault, Acting Executive Director, Nunavut Water Board.

71. Letter to Michael Nadler, Regional Director General, Indian & Northern Affairs Canada dated August 8, 2007 Re: Water License Application: 3BM-CAP0207. Dionne Filiatrault, Acting Executive Director, Nunavut Water Board
72. Letter to Gary Strong, Project Manager, Dillon Consulting Limited dated August 20, 2007 Re: Cut-off Trench Excavation Sewage Lagoon Berms Construction Monitoring, Cape Dorset NU. Dmitry Dumsky, Geotechnical Engineer, AMEC Earth & Environmental Limited.
73. Letter to Gary Strong, Project Manager, Dillon Consulting Limited dated August 21, 2007 Re: Additional Geotechnical Analyses for P-Lake Sewage Lagoon, Cape Dorset NU. En Tzu (Peter) Hsieh, Geotechnical Engineer, AMEC Earth & Environmental Limited.
74. Letter to Bhabesh Roy, Municipal Planning Engineer, Community & Government Services dated August 27, 2007 Re: P-Lake Sewage Lagoon, Cape Dorset NU. Gary Strong, Project Manager, Dillon Consulting Limited.
75. Letter to Dionne Filiatrault, Acting Executive Director, Nunavut Water Board dated August 29, 2007 Re: Final Documents Submission of P-Lake Sewage Lagoon for the Water License of the Hamlet of Cape Dorset. Bhabesh Roy, Municipal Planning Engineer, Community & Government Services.
76. Submitted by, Bhabesh Roy, Municipal Planning Engineer, Community & Government Services to the Nunavut Water Board September 6, 2007 Final Documents Submission of P-Lake Sewage Lagoon for the Water License of the Hamlet of Cape Dorset (CD copy included).
77. Fax Memo to Phyllis Beaulieu, Manager Licensing, Nunavut Water Board dated September 11, 2007 Re: Cape Dorset P-Lake Lagoon (Record of documents submitted to NWB August 29, 2007).
78. Letter to Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset dated September 12, 2007 Re: Supplemental Information received. Dionne Filiatrault, Acting Executive Director, Nunavut Water Board.
79. Letter to Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset dated September 18, 2007 Re: Confirmation in writing of technical support team. Phyllis Beaulieu, Manager of Licensing, Nunavut Water Board.
80. Fax memo to Phyllis Beaulieu, Manager of Licensing, Nunavut Water Board dated September, 18, 2007 Re: Cape Dorset P-Lake Sewage Lagoon – Water License application Design Report. Bhabesh Roy, Municipal Planning Engineer, Community & Government Services (confirmation of technical support team attendance).

81. Letter to Art Stewart, Senior Administrative Officer, Hamlet of Cape Dorset dated September 25, 2007 Re: July 19<sup>th</sup> 2007 Municipal Water Licence NWB3CAP0207. Andrew Keim, Inspector, Indian & Northern Affairs Canada.
82. Letter to Cape Dorset Distribution List dated September 25, 2007 Re: Public Notice of Pre-Hearing/Technical Meeting for the Hamlet of Cape Dorset. Phyllis Beaulieu, Manager Licensing, Nunavut Water Board.
83. Submitted October 1, 2007 by John Dawe, Director of Community Infrastructure, Community & Government Services titled Cape Dorset Sewage Lagoon – Opening Remarks on behalf of Applicant.
84. Letter to Cape Dorset Distribution List dated October 10, 2007 Re: Pre-hearing Meeting/Teleconference for the Hamlet of Cape Dorset Type B Water License Amendment Application
85. Letter to Phyllis Beaulieu, Manager Licensing, NWB dated November 13, 2007 Re: Pre-hearing Meeting/Teleconference for the Hamlet of Cape Dorset Type B Water License Amendment Application. Bhabesh Roy, Municipal Planning Engineer, Community & Government Services.
86. Submitted November 14, 2007 by Bhabesh Roy, Municipal Planning Engineer, Community & Government Services titled Operation and Maintenance Manual, Sewage Treatment System (Hamlet of Cape Dorset November 9, 2007)
87. Submitted November 14, 2007 by Bhabesh Roy, Municipal Planning Engineer, Community & Government Services Titled P Lake Area-Sewage Lagoon System Record Drawings (Project No. 3439)
88. Letter to Gary Strong, Project Manager, Dillon Consulting Limited dated November 15, 2007 Re: Additional Stability and Seepage Analyses for P-Lake Sewage Lagoon, Cape Dorset, NU. En Tzu, Geotechnical Engineer, Alexandre Tchekhovski, Associate Geotechnical Engineer, Paul Cavanagh, Associate Geotechnical Engineer, AMEC.
89. Letter to Cape Dorset Distribution List dated November 15, 2007 Re: Final Submissions for the Hamlet of Cape Dorset Type B Water License Amendment Application. Phyllis Beaulieu, Manager of Licensing, Nunavut Water Board.
90. Distributed to Cape Dorset Distribution List dated December 06, 2007 Re: Notice of Public Hearing. Richard Dwyer, Licence Administrator, Nunavut Water Board.
91. Submitted December 13, 2007 by Helen Yeh, Environmental Assessment Coordinator, GN-DOE Titled Intervention to The Nunavut Water Board

Regarding the Matter of The Municipality of Cape Dorset (Type B) Water License Amendment Application Final Public Hearing – January 2008.

92. Submitted January 8, 2008 by Holger Hartmaier, Senior Geotechnical Engineer, BGC Engineering Inc. Titled Review of Final Submissions for Hamlet of Cape Dorset Sewage Lagoon Type B Water Licence Application.
93. Submitted January 8, 2008 by Jim Rogers, Manager Water Resources, INAC Titled 3BM-CAP0207 Final Submissions for the Hamlet of Cape Dorset Type B Water License Amendment Application.
94. Submitted January 8, 2008 by Cheryl Baraneicki, Manager Environmental Assessments, Environmental Protection Operations, EC Titled Environment Canada's Submission to the Nunavut Water Board for the Cape Dorset Sewage Lagoon Public Hearing.
95. Submitted January 16, 2008 by Jim Rogers, Manager Water Resources, INAC Inuktitut Translation of Intervention.
96. E-mail to Dionne Filiatrault, Executive Director, Nunavut Water Board dated January 18, 2008 Re: Executive summary and geothermal analysis results. Holger Hartmaier, Senior Geotechnical Engineer, BGC Engineering Inc.
97. Submitted January 18, 2008 by Holger Hartmaier, Senior Geotechnical Engineer, BGC Engineering Inc. Re: Executive Summary –Cape Dorset Sewage Lagoon, Review of Final Submission.
98. Submitted January 18, 2008 by Lukas Areson, Geotechnical Engineer, BGC Engineering Inc. Project Name, Review of Final Submissions for Hamlet of Cape Dorset Sewage Lagoon Type B Water License Application.

**APPENDIX B – LIST OF EXHIBITS FILED AT THE PUBLIC HEARING JANUARY 23-24, 2008**

| <b>NO.</b> | <b>Name of Exhibit</b>                                                                         | <b>Type of Exhibit</b> | <b>Submitted by:</b>           |
|------------|------------------------------------------------------------------------------------------------|------------------------|--------------------------------|
| 1          | Cape Dorset Sewage P lagoon Public Hearing Presentation                                        | Hard Copy              | Colin Joyal, Dillon Consulting |
| 2          | Cape Dorset Sewage P Lagoon Public Hearing Presentation                                        | Electronic Copy        | Colin Joyal, Dillon Consulting |
| 3          | AMEC Geotechnical Design and Construction Cape Dorset Sewage Lagoon (January 23&24 2008)       | Hard Copy              | Paul Cavanagh, AMEC            |
| 4          | AMEC Geotechnical Design and Construction Cape Dorset Sewage Lagoon (January 23&24 2008)       | Electronic Copy        | Paul Cavanagh AMEC             |
| 5          | GN Department of Environment Presentation for the Cape Dorset (Type B) Water License Amendment | Hard Copy              | Mike Atkinson                  |
| 6          | GN Department of Environment Presentation for the Cape Dorset (Type B) Water License Amendment | Electronic Copy        | Mike Atkinson                  |
| 7          | EC Cape Dorset Sewage Lagoon Final Public Hearing, January 23-24 2008                          | Hard Copy              | Collette Spagnuolo             |
| 8          | EC Cape Dorset Sewage Lagoon Final Public Hearing, January 23-24 2008                          | Electronic Copy        | Collette Spagnuolo             |
| 9          | INAC Presentation Hamlet of Cape Dorset P-Lake Sewage Lagoon January 23-24 2008                | Hard Copy              | Jim Rogers                     |
| 10         | INAC Presentation Hamlet of Cape Dorset P-Lake Sewage Lagoon January 23-24 2008                | Electronic Copy        | Jim Rogers                     |
| 11         | INAC Pond Inlet Municipal Water License Inspection December 6, 2007with Photos                 | Electronic Copy        | Jim Rogers                     |
| 12         | INAC Hall Beach Municipal Water License Inspection 3BM-HAL0308 December 17, 2007 with photos   | Electronic Copy        | Jim Rogers                     |
| 13         | BGC Cape Dorset Sewage Lagoon Review of Final Submission January 8, 2008                       |                        | Holger Hartmaier               |
| 14         | BGC Cape Dorset Sewage Lagoon Executive Summary January 17, 2008                               |                        | Holger Hartmaier               |
| 15         | BGC Independent Geothermal Evaluation of Proposed Design January 17, 2008                      |                        | Holger Hartmaier               |

|    |                                                                                                      |  |                  |
|----|------------------------------------------------------------------------------------------------------|--|------------------|
| 16 | Caduceon Certificate of Analysis<br>Report to Hamlet of Pond Inlet, B07-<br>32335, October 30, 2007  |  | Patricio Fuentes |
| 17 | Caduceon Certificate of Analysis<br>Report to Hamlet of Pond Inlet, B07-<br>34682, November 20, 2007 |  | Patricio Fuentes |
| 18 | Caduceon Certificate of Analysis<br>Report to Hamlet of Pond Inlet, B07-<br>31475, October 23, 2007  |  | Patricio Fuentes |
| 19 | Caduceon Certificate of Analysis<br>Report to Hamlet of Pond Inlet, B07-<br>34075, November 12, 2007 |  | Patricio Fuentes |
| 20 | Caduceon Certificate of Analysis<br>Report to Hamlet of Pond Inlet, B07-<br>33259, October 31, 2007  |  | Patricio Fuentes |