

November 20, 2009

Mackenzie Valley Land and Water Board
Box 2130, 7th Floor - 4910 50th Avenue
Yellowknife, NT X1A 2P6

Attention: Lynn Carter, Regulatory Officer

Dear Ms. Carter,

RE: Water Licence No. MV2009L3-0007
Technical Session Commitments

Below are the City of Yellowknife's responses to the Technical Session Commitments.

Item 1

In the Dillon Consulting Report, Expansion of Fiddler's Lagoon Treatment System Plan – Final Report, Section 2.2 stated,

“Three control structures were installed at various points along the lagoon to provide additional capacity by increasing the depth and combining ponds F8, F7, and F6. With the addition of these three dams, the level increased to the current depth of 4.5m.”

Section 4.1 of the report outlines how Dillon determined the working capacity of the lagoon to be 2.5 million cubic metres. This is the current existing capacity of the lagoon.

Item 2

Enclosed is a copy of the letter from Transport Canada dated August 28, 2009. regarding the new landfill cell.

Item 3

This item was sent to Dillon Consulting Ltd. for response as the biological model referred to was created as part of their report, Expansion of Fiddler's Lagoon Treatment System Plan – Final Report. Their response follows.

The City of Yellowknife was asked to provide explanation on how the calibration of a biological treatment model considered the seasonal variations in ammonia treatment.

The model accounts for temperature as a factor for ammonia removal. The ammonia removal was analyzed as a function of nitrification within the lagoon system as well as within the wetland (during decanting). The model was calibrated with respect to measured ammonia reduction in the lagoon and wetland system. The calibration determined the kinetic parameters that describe the biological process, including availability of food and oxygen, and seasonal temperatures. Warmer water temperatures (i.e., summer) generally provide greater degree of ammonia removal. The model analysis considered the lagoon and the wetland individually as they are separated by the decanting process. The calibrated system, including temperature effects, provided very good agreement to measured data.

Additionally, the City of Yellowknife was asked if they see a need to predict phosphorous with a biological model and if so what would be the main sources and sinks of phosphorous that would be considered in the model.

Biological phosphorus removal is for activated sludge modeling only. In the lagoon/lake environment one would need a lake/wetland model specially set up/developed for Fiddlers Lake lagoon system. We know that during cold weather phosphorus associated with solids will sink to the bottom of the lagoon. There will be limited algae growth under the ice and only if ice is clean of snow, which in the Yellowknife region is not typical. Under ice algae will take up a small amount of phosphorus. Under ice algae will die and sink to the bottom of the lake. During open water season, as the water in the lake gets warmer, organic matter that settled at the bottom of the lagoon will go through anaerobic decomposition and will release phosphorus from solids phase to soluble phase. During this period (open water season) algae will also grow/bloom and take up some of the soluble phosphorus. Again some of the algae will die and go through the same phosphorus cycle. When the lake contents are discharged soluble phosphorus and phosphorus associated with suspended solids such as algae will be flushed out.

The downstream wetland will filter out some of the solids decanted from the lagoon but they will eventually break down and release phosphorus within the wetlands. Some of the soluble phosphorus will be taken up by plant growth and in fact that is the major sink for phosphorus. However, it would require a very large volume of daily vegetation growth to produce a significant phosphorus release. If the soil has a lot of iron or aluminum or calcium content, it would also chemically bind phosphorus until equilibrium is reached.

The above is a description of the complexity of the phosphorus cycle and removal processes. There is no model available, that Dillon is aware of, that can be used to model the phosphorus cycle in lagoon wetlands system. Such a model would need to be developed as part of a significant field/research project.

Should you require further clarification for any of the City's responses, please contact me directly at (867) 920-5689 or walexander@yellowknife.ca

Sincerely,

A handwritten signature in black ink, appearing to read "Wendy Alexander". The signature is fluid and cursive, written over a light blue horizontal line.

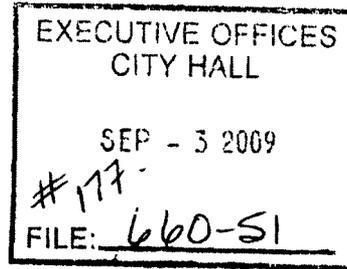
Wendy Alexander, P.Eng.
Municipal Works Engineer
Public Works & Engineering

Encl. Letter from Transport Canada to the City of Yellowknife Dated August 28, 2009



Transports
Canada

Aerodromes and Air Navigation
P.O. Box 8550
Winnipeg, Manitoba
R3C 0P6



Your file Votre référence

August 28, 2009

Our file Notre référence
5151-C154

Max Hall, City Administrator
City of Yellowknife
P.O. Box 580
Yellowknife, NT
X1A 2N4

Dear Mr. Hall,

Thank you for your letter dated July 27, 2009, which outlines the City of Yellowknife's plan for its existing landfill site. Transport Canada applauds your efforts in reducing the exposure of waste that is edible by or attractive to birds. Your summary of present operations, mitigative measures, wildlife management plan and future operations shows a commitment to reducing the risk of bird strikes in the vicinity of the Yellowknife Airport.

The Yellowknife Airport Zoning Regulations Disposal of Waste clause states "No owner or occupier of any land to which these Regulations apply shall permit that land or any part of it to be used for the disposal or accumulation of any waste, material or substance edible by or attractive to birds."

The present landfill pre-existed the regulations, however, any expansion of the site used for disposal or accumulation of any waste, material or substance edible by or attractive to birds would be prohibited.

Transport Canada does not consider the start of a new cell for the disposal of household waste to be an expansion because the existing cell will be closed first and the new cell will contain less exposed household waste than the present cell.

The Yellowknife Airport Zoning Regulations do not prohibit the use of land for the disposal of waste such as construction material, tires, appliances, etc. providing this type of waste does not attract birds.

Transport Canada will continue to monitor operations at the Yellowknife Airport to verify that land is used only in accordance with agreed methods. We encourage the City of Yellowknife and the Yellowknife Airport to continue working collaboratively towards aviation safety.

Yours truly,

Wayne Woloshyn
Regional Manager Aerodromes and Air Navigation
Transport Canada Prairie and Northern Region

Canada



**Mackenzie Valley Land
and Water Board**

*Providing optimum benefit through
conservation, development and
utilization of land and water resources*

**Mackenzie Valley Resource Management Act &
Northwest Territories Waters Act**

**NOTICE OF
PUBLIC HEARING**

The City of Yellowknife has made an application for renewal to the Mackenzie Valley Land and Water Board (Board or MVLWB) for their Type "A" Water Licence, MV2009L3-0007, for the use of water and disposal of waste for municipal purposes at the City of Yellowknife, Northwest Territories.

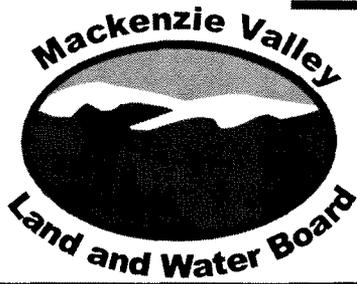
A Public Hearing will be held, under subsection 21(2) of the *Northwest Territories Waters Act*, by the Board on **January 19, 2010 at the Explorer Hotel** from 1:00 pm to 5:00 pm. An evening session will also be held from 7:00 pm to 9:00 pm on January 19. Participants in the evening session must register at the door before 7:30 pm. Should no one register to speak by 7:30 pm, the evening session will be adjourned. If necessary, the hearing will resume on **January 20, 2010** at 9:00 am and continue until complete.

Written interventions for this Public Hearing must be submitted to the Office of the Mackenzie Valley Land and Water Board at the address below by **5:00 pm, November 27, 2009**.

Mackenzie Valley Land and Water Board
Box 2130
7th Floor, 4922-48th Street
Yellowknife, NT X1A 2P6
Phone: (867) 669-0506
Fax: (867) 873-6610
Email: permits@mvlwb.com

If no notice is received of persons indicating their intention to appear and make presentations concerning this application and the applicant consents in writing to the disposition of the matter without a Public Hearing, the Board may cancel the hearing in accordance with subsection 21(3) of the *Northwest Territories Waters Act*.

Information submitted by the applicant relevant to the application can be reviewed at www.mvlwb.ca/mv, or at the office of the MVLWB located on the 7th Floor, 4922-48th Street (YK Centre), Yellowknife, Northwest Territories.



Mackenzie Valley Land and Water Board
 7th Floor - 4910 50th Avenue
 P.O. Box 2130
 YELLOWKNIFE NT X1A 2P6
 Phone (867) 669-0506
 FAX (867) 873-6610

FILE NUMBER: MV2009L3-0007

Date: November 23, 2009
 To: Rae Edzo Metis; NWTMN; Lutsel Ke Wildlife, Lands and Environment
 Organization: (see above)
 Fax Number: 867-371-5406; 867-872-2772; (867)-370-3143
 Copied To: n/a
 From: Lynn Carter, RO

Number of pages including cover 6

Remarks:

Hello –

Please find attached documents related to the City of Yellowknife Water Licence Renewal. These documents were originally sent in email format, but were returned.

There is a Notice of Hearing for the City of Yellowknife.

As well, I have included the answers from the City of Yellowknife regarding commitments made at the November 12 technical meeting.

Again, just a reminder that interventions are due this Friday November 27th, 2009. Please don't forget to check our website (<http://www.mvlwb.ca/mv/reg.aspx?app=MV2009L3-0007>) for further information.

Any questions on these documents or anything else, please feel free to contact me at 669-0506.

Faxed by (initial only) _____

- Enclosures
- As requested
- For your information
- For your comment
- For your approval

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Signature of Lynn Carter

Faxed by (Initial only)

- Enclosures
As requested
For your information
For your comment
For your approval

Table with columns: Delivered by, Date. Rows include Mail, Courier, Hand Delivered, Fax.

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