

**From:** [Mardy Semmler](#)  
**To:** ["Roger Connelly"](#); ["Emery Paquin"](#); ["Mark Cleveland"](#); [mcleodm@nwtwb.com](mailto:mcleodm@nwtwb.com); ["Louis Covello"](#)  
**Cc:** ["jamie vangulck"](#); ["Freda Wilson"](#); ["Liz Castaneda"](#)  
**Subject:** FW: BAR-C: Type B Water License N7L1-1836 - Notification on Key Trench Changes  
**Date:** October-16-14 3:55:09 PM  
**Attachments:** [Signed letter.pdf](#)

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Good Afternoon

Attached please find IOL correspondence with regard to the Notification on Key Trench Changes for your review and comment.

Thank you

Mardy

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**From:** Bertrand, John A [<mailto:john.a.bertrand@esso.ca>]  
**Sent:** October-16-14 2:54 PM  
**To:** Mardy Semmler ([semmlerm@nwtwb.com](mailto:semmlerm@nwtwb.com))  
**Cc:** 'Brolsma, Masten (Calgary) ([Masten.Brolsma@WorleyParsons.com](mailto:Masten.Brolsma@WorleyParsons.com))'; Rahbani, Ramy  
**Subject:** RE: BAR-C: Type B Water License N7L1-1836 - Notification on Key Trench Changes

Hello Mardy,

Please find attached a letter clarifying the key trench installation. The depth of permafrost was much more favorable than initially reported – we are confident that the design intent will be achieved. As I point out in the attached letter, the performance of the landfill caps will be monitored via the network of monitoring wells and thermistors.

If you have additional questions, please do not hesitate to contact me.

John

John Bertrand  
Team Leader  
Environmental Services, Imperial  
237 Fourth Avenue SW, PO Box 2480, Station M  
Calgary, AB, Canada T2P 3M9 | Room 25061  
[john.a.bertrand@esso.ca](mailto:john.a.bertrand@esso.ca) P 403 237 3429 C 587 226 4368  
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**From:** Brolsma, Masten (Calgary)  
**Sent:** Tuesday, September 23, 2014 7:53 AM  
**To:** 'Mardy Semmler'

**Cc:** 'Bertrand, John A'; 'Freda Wilson'; 'Liz Castaneda'  
**Subject:** RE: BAR-C: Type B Water License N7L1-1836 - Notification on Key Trench Changes

Mardy:

On behalf of Imperial Oil and further to earlier notifications regarding the installation of the key trench into the underlying permafrost at Landfills A and B, please find attached the preliminary as-built information regarding the depth at which the key trench / liner was installed into the permafrost.

Sincerely,

Masten Brolsma, P.Eng.  
Principal Environmental Engineer  
WorleyParsons Infrastructure & Environment  
Prairie Business Unit  
Tel: +1 403 247 0200 | Direct: +1 587 952 1568 | Mob: +1 403 869-2952 | Fax: +1 403 247 4811  
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**From:** Brolsma, Masten (Calgary)  
**Sent:** Monday, September 08, 2014 9:21 AM  
**To:** 'Mardy Semmler'  
**Cc:** 'Bertrand, John A'; 'Freda Wilson'; 'Liz Castaneda'  
**Subject:** RE: BAR-C: Type B Water License N7L1-1836 - Notification on Key Trench Changes

Mardy: as a brief update, the key trench liner has been installed at Landfill B and is almost completed for Landfill A. The majority of the liner at both landfills has been keyed into the permafrost. The as-builts will provide this documentation.

Sincerely,

Masten Brolsma, P.Eng.  
Principal Environmental Engineer  
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**From:** Mardy Semmler [<mailto:semmlerm@nwtwb.com>]  
**Sent:** Wednesday, August 27, 2014 4:21 PM  
**To:** Brolsma, Masten (Calgary)  
**Cc:** 'Bertrand, John A'; 'Freda Wilson'; 'Liz Castaneda'  
**Subject:** RE: BAR-C: Type B Water License N7L1-1836 - Notification on Key Trench Changes

Masten

Thank you for the additional information. The IWB will get back to Imperial Oil upon completion of a technical review of the approved plans and the information submitted.

Thank you again

Mardy

Mardy Semmler  
Executive Director  
Inuvialuit Water Board  
Ph: 867-678-8609  
Fax: 867-678-2943

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**From:** Brolsma, Masten (Calgary) [<mailto:Masten.Brolsma@WorleyParsons.com>]  
**Sent:** August-27-14 3:43 PM  
**To:** Mardy Semmler  
**Cc:** 'Bertrand, John A'; 'Freda Wilson'; 'Liz Castaneda'  
**Subject:** RE: BAR-C: Type B Water License N7L1-1836 - Notification on Key Trench Changes

Mardy, please see below for a response to your two questions.

1. Monitor the groundwater in the vicinity to see if there is contamination in the future, if so, corrective action then required; or

RESPONSE: A post-construction Monitoring Plan based on the AMSRP which includes groundwater monitoring has been prepared for Landfills A and B. Contingency measures were included in the Monitoring Plan.

2. Risk assessment of the situation to be completed by the Proponent and predict the expected impact on the environment/groundwater and devise a solution to the issue.

RESPONSE: WorleyParsons has evaluated how surface and groundwater may affect the design principle of freezeback and liner integrity. The following mitigations have been considered:

- a) Placement of the surface water diversion berm.
- b) Making the berm larger and/or possibly relocating a section of it to best divert any surface drainage away from the key trench. A larger berm would further enhance the depth that permafrost would penetrate under the berm thus also helping to protect the key trench from possible thermal effects from groundwater or surface water.
- c) Thermistors are planned for installation within the key trench to monitor for freezeback.
- d) A nested groundwater well pair could be installed between the diversion berm and the key

trench to help further gauge that freeze back is occurring in addition to groundwater quality.

Sincerely,

Masten Brotsma, P.Eng.  
Principal Environmental Engineer  
WorleyParsons Infrastructure & Environment  
Prairie Business Unit  
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**From:** Mardy Semmler [<mailto:semmlerm@nwtwb.com>]  
**Sent:** Wednesday, August 27, 2014 1:52 PM  
**To:** Brotsma, Masten (Calgary)  
**Cc:** 'Bertrand, John A'; 'Freda Wilson'; 'Liz Castaneda'  
**Subject:** RE: BAR-C: Type B Water License N7L1-1836 - Notification on Key Trench Changes

Good Afternoon Masten

It would be in everyone's best interest for the IWB complete a technical review of this as the plan was approved as submitted. A revised plan may have to be submitted for approval by the Board

Preliminary Technical review comments and concerns are as follows:

I believe the design was to rely on permafrost to encapsulate the waste and therefore limit movement of contaminants in groundwater away from the waste. If permafrost is not encountered until >4 m depth, what to do?

Possible actions to be completed:

1. Monitor the groundwater in the vicinity to see if there is contamination in the future, if so, corrective action then required; or
2. Risk assessment of the situation to be completed by the Proponent and predict the expected impact on the environment/groundwater and devise a solution to the issue.

I will get back to you as soon as possible after a more detailed technical review is completed and comments are provided.

If you have any questions, please contact me at 867-678-8609.

Thank you

Mardy

Mardy Semmler  
Executive Director  
Inuvialuit Water Board  
Ph: 867-678-8609  
Fax: 867-678-2943

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**From:** Freda Wilson [<mailto:wilsonf@nwtwb.com>]  
**Sent:** August-27-14 10:00 AM  
**To:** 'Brolsma, Masten (Calgary)'  
**Cc:** 'Mardy Semmler'; 'Bertrand, John A'  
**Subject:** RE: BAR-C: Type B Water License N7L1-1836 - Notification on Key Trench Changes

Thanks, Masten.....we will get back to you on this matter.

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**From:** Brolsma, Masten (Calgary) [<mailto:Masten.Brolsma@WorleyParsons.com>]  
**Sent:** August-27-14 9:35 AM  
**To:** Freda Wilson (IWB)  
**Cc:** John Bertrand  
**Subject:** BAR-C: Type B Water License N7L1-1836 - Notification on Key Trench Changes

Freda: The design for the key trenches at Landfills A and B specify that the key trench is to be installed 1 m into the permafrost. During initial stages of the excavation of the key trench for Landfill B, it has been noted that permafrost is not being encountered in some locations until a depth of approximately 4 m. These types of conditions will exceed the maximum reach of the excavator to allow installation to the design of 1 m into permafrost. Based on testpitting results at Landfill A, similar conditions are expected, mainly where the active zone has been influenced by surface water. The contractor, AECOM has been instructed to excavate as deeply as safely possible.

The as-built drawings will document the final location and depths of the key trench locations. Please let me know should you need any further information in this regard.

Sincerely,

Masten Brolsma, P.Eng.  
Principal Environmental Engineer  
WorleyParsons Infrastructure & Environment  
Prairie Business Unit  
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