



Sahtu Land and Water Board

Staff Report

Division: Land Program	Report No. 2
Date Prepared: April 11, 2013	File No. S12X-006
Meeting Date: April 19, 2013	
Subject: Surface and Groundwater Monitoring Plan submitted by Husky Oil Operations Ltd.	

1. Purpose/Report Summary

To inform the Board about a Surface and Groundwater Monitoring Plan (the Plan) submitted by Husky Oil Operations Ltd. (Husky) to satisfy condition Part 26 (1) D.22, of the Type A Land Use Permit S12X-006.

2. Background

2.1 Project Overview

The Plan has been submitted to satisfy Part 26 (1) D.22, of Land Use Permit S12X-006 which states:

“The Permittee shall submit a Groundwater and Surface Water Monitoring Plan by January 11, 2013 for approval from the Sahtu Land and Water Board. Once approved, the Permittee shall;

- (a) revise the Plan as needed and submit to the Sahtu Land and Water Board for approval, and;
- (b) abide by the approved Plan for the duration of this Permit.”

The initial Plan was submitted January 11, 2013. Following a review of the Plan, reviewers requested further information to be provided within the Plan. A revised Plan was submitted March 8, 2013 to address the concerns/recommendations raised by the reviewers.

Groundwater Program

- Drilling of up to 15 holes at five locations (three holes per location) to evaluate bedrock aquifers to a maximum depth of 150 metres each;
 - Two locations have been drilled; one encountered groundwater and one did not (was abandoned).
- Drilling of 20 holes to evaluate surficial groundwater to a maximum depth of 30 metres each or three metres into the bedrock;
 - Two of the 20 wells encountered water while others encountered permafrost or bedrock, so some were either abandoned or completed as thermistor sites to monitor temperature.
- Following construction, wells will be purged and sampled;

- Purged water will be stored onsite until sufficient volumes have accumulated and will then be sent out for analytical testing and if all parameters have not been exceeded the water will be pumped off in a controlled manner; and
- Samples were collected prior to and after completion and stimulation of the two well sites.
- Aquifer testing will be used to evaluate hydraulic characteristics and assess the development potential of the source.

Surface Water Program

- Data loggers will be re-deployed in Bogg Creek, Slater River and Little Bear River to monitor water levels and the barometric pressure;
- Three to five flow/discharge measurements will be conducted throughout the open water season to establish reliable stage-discharge relationships for the three basins;
- 39 Surface water samples were initially sampled in July 2012;
 - Husky is currently assessing the possibility of adding the approved water sources into this program and to expand the program to include the sampling of sediments for sites located within a lake, downstream of operations; and
- Surface water samples will be collected during 2013 on two occasions (early summer and early fall) from the 39 locations.

Recommendations for any changes to the programs based on the findings obtained, any obvious data gaps, or any collaborative review of data from other research or studies in the area will be communicated to the Board in the annual report.

2.2 Process Requirements

Land Use Permit Issued: December 5, 2012

Received the Plan: January 11, 2013

Sent Out the Plan for Review: January 12, 2013

Review Period End Date: February 1, 2013

Number of Review Agencies: 20

Revised Plan: March 8, 2013

Sent Out the Plan for Review: March 28, 2013

Review Period End Date: April 10, 2013

Number of Review Agencies: 19

3. Other Agency Comments

The Plan was first circulated to 20 organizations requesting a reply by February 1, 2013. To date 5 organizations have responded. The following organizations offered comments on the plan:

- **Department of Fisheries and Oceans**
- **AANDC**
- **Environment and Natural Resources**
- **Environment Canada**
- **Sahtu Renewable Resources Board**

Please see the attachments for complete comments.

All review comments were emailed to the proponent for their information and follow-up action as required.

3.1 Discussion

A brief summary of comments are provided below. This section does not summarize all comments. Please review the attachments for complete comments.

Department of fisheries and Oceans Canada

In an email dated January 15, 2013, DFO had no comments or concerns in relation to this plan.

Aboriginal Affairs and Northern Development Canada

In an email letter dated February 1, 2013, AANDC had the following comments and recommendations:

- The procedures and frequencies related to surface water and groundwater monitoring, water sampling methods and frequencies, laboratory analysis and reporting should be set to establish adequate baseline data for the region.
- Sample sites should be carefully selected to ensure continuous long-term monitoring can occur and will permit comparison between years over time and would allow for under-ice sampling to occur.
- Plain language communication of sampling results to surrounding communities and organizations.
- Prior to use of groundwater as a water source in the future, deep groundwater wells should be assessed against drinking water quality. Current practice in the shale gas industry is to use surface water as a water source and that groundwater resources may only be used if considered unfit for human consumption.
- Both surface and groundwater quality samples be sent to an accredited laboratory for analysis and water sample collection should follow all standard sampling procedures and include appropriate QA/QC.
- Additional details should be included in the plan to describe how the monitoring data will be used to identify difference in water quality pre and post development.

Environment and Natural Resources

In an email letter dated February 1, 2013, ENR stated that they would like confirmation that the surface and groundwater mapping and monitoring information will be integrated into future drilling projects and into regional baseline information gathering and assessments. They also had the following comments:

- Monitoring should be for at least the duration of the Water Licence and for an extended period if samples are found to be contaminated by project activities.
- Meetings should be held with the local communities and regional authorities to present all plans for surface and groundwater monitoring and mapping.
- If appropriate, gas in water should include isotopic fingerprinting.
- Each monitoring well should be instrumented with a dedicated data-logger or some other means for periodic water level monitoring.

Environment Canada

In an email letter dated February 1, 2013, EC states that they appreciate Husky's approach to establishing a groundwater investigation program and understands that the program will be further developed in time after the initial collection of baseline data, but had the following comments and recommendations:

- Surface water monitoring information should be included in the plan.

- A second sampling event at most (if not all) bedrock monitoring wells be completed in order to provide reliability in baseline data and demonstrate the extent of seasonal variability in groundwater quality and water levels.
- To consult with ConocoPhillips and others conducting surface water and groundwater monitoring in the area and work towards developing consistent water monitoring plans and programs.
- A brief summary of current and proposed involvement with other companies, regulators and agencies with respect to surface water and groundwater monitoring and management.

Sahtu Renewable Resources Board

In an email letter dated February 1, 2013, SRRB had the following comments and recommendations:

- The groundwater monitoring plan should explicitly state whether methane, ethane or propane will be included within the testing parameters.
- Sample frequency should be increased, since twice a year does not provide an adequate data set from which to establish a clear baseline and account for seasonal variability.

The revised Plan was circulated to 19 organizations requesting a reply by April 10, 2013. To date 3 organizations have responded. The following organizations offered comments on the application:

- **Environment Canada**
- **Environment and Natural Resources**
- **Sahtu Renewable Resources Board**

Please see the attachments for complete comments.

All review comments were emailed to the proponent for their information and follow-up action as required.

3.2 Discussion

A brief summary of comments are provided below. This section does not summarize all comments. Please review the attachments for complete comments.

Environment Canada

In an email letter dated April 10, 2013, EC had the following questions, comments and recommendations:

- Does Husky plan on drilling additional wells in the future?
- Map should be updated to reflect drilled well locations with descriptions.
- Elevation surveys of the wells should be included.
- Groundwater sample frequency should be increased to twice a year.

Environment and Natural Resources

In an email letter dated April 10, 2013, ENR stated that they would recommend that the proponent begin discussions with other proponents currently conducting oil and gas activities in order to present a framework on how regional mapping will be implemented.

Sahtu Renewable Resources Board

In an email letter dated April 10, 2013, SRRB had the following comments and recommendations:

- Sample frequency should be increased, which will help to provide an adequate data set from which to establish a clear baseline and account for seasonal variability.
- All approved water sources should be included in the surface water monitoring plan.

4. Conclusion

Board staff concludes that the Surface and Groundwater Monitoring Plan, submitted March 8, 2013, can be approved at this time given that required and agreed upon actions, as a result of review comments, will be adhered to.

5. Recommendation

It is recommended that the SLWB approve the Surface and Groundwater Monitoring Plan as submitted and for Board staff to keep working with the company to ensure consistency with all similar plans in the area.

6. Reference Material Attached

- 6.1 Review Comments from DFO
- 6.2 Review Comments from AANDC
- 6.3 Review Comments from ENR
- 6.4 Review Comments from EC
- 6.5 Review Comments from SRRB
- 6.6 Revised Review Comments from EC
- 6.7 Revised Review Comments from ENR
- 6.8 Revised Review Comments from SRRB

Respectfully submitted,



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Executive Director Comments:

Paul Dixon
Executive Director