March 24, 2012

Resources for a changing world

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Phyllis Beaulieu
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0

Dear Ms. Beaulieu,

Re: Water Licence 1AR-NAN0914 – Annual Report

This letter and enclosed documentation are submitted in fulfilment of Part B Item 3 of Water Licence 1AR-NAN0914 which requires the Licensee to file an Annual Report with the Nunavut Water Board. The letter is structured as per Schedule B of the Water Licence.

Inuktitut translations as per Appendices A, C and E are being prepared and will be forwarded to the Water Board within the next few weeks.

Change of Address

Breakwater Resources Ltd. was acquired by Nyrstar in August 2011. Nyrstar is an integrated mining and metals business listed on NYSE Euronext Brussels. Following the acquisition, Breakwater Resources Ltd. became a wholly owned subsidiary of Nyrstar Sales & Marketing AG.

Canzinco Ltd. remains the legal entity for holding Water Licence 1AR-NAN0914. The new mailing address for Canzinco is as follows:

Canzinco Ltd.
c/o Nyrstar Canada (Holdings) Ltd.
2840 – 650 West Georgia Street
PO Box #11552. Vancouver, BC
V6B 4N8, Canada

Summary

Key activities and reclamation progress achieved in 2011 included:

- Discharge of effluent from the West Twin Disposal Area;
- Geotechnical and surface water quality monitoring;
- Decommissioning and removal of petroleum storage tanks and associated infrastructure;
- Delineation of petroleum hydrocarbon (PHC) contaminated soil in the footprint of the former fuel storage tank farm;
- Construction of PHC contaminated soil treatment facilities; and
- Excavation and treatment of PHC contaminated soil.

There were no uses of fresh water or unauthorized discharges in 2011.

As per Part F of the Water Licence, effluent quality limits were met for the effluent discharged into Twin Lakes Creek and wastes generated from the decommissioning of the petroleum storage tanks were shipped off-site for disposal in an approved facility.

As per Part I of the Water Licence, geotechnical and surface water quality monitoring was completed in 2011. The monitoring programs will continue in 2012 and recommendations provided in the monitoring reports will be implemented.

As per Part J of the Water Licence, the reclamation and closure of the mine continued with the decommissioning of the former fuel tank farm and treatment of PHC contaminated soil in the storage tank area. The construction of treatment facilities for contaminated soil was commenced in 2011 and is expected to be finished in 2012. As per Part D of the Water Licence, a construction summary report will be prepared and submitted to the Water Board once the construction of the treatment facilities have been completed in 2012.

An outline schedule of remediation activities planned in 2012 and subsequent years is provided in this letter. Based on current information about contaminated soil volumes and assuming that the biopile treatment technique will perform as anticipated, the remediation work is expected to be completed at the end of 2015.

Part D – Conditions Applying to Construction

No dikes or dams were constructed in 2011.

The construction of treatment facilities for PHC contaminated soil was commenced in 2011 and is expected to be finished in 2012. The facilities constructed in 2011 involve a lower treatment area (LTA) located immediately to the south of the former tank farm and an upper treatment area (UTA) located approximately 200 metres to the southeast of the former tank farm. The treatment facilities are located within the general area specified by the Nunavut Water Board approved conceptual *Abandonment and Reclamation Plan, Fuel Tank Farm, Former Nanisivik Mine Site, Nunavut* (Stantec, 2010). The locations of the treatment facilities were established so as to provide a safe buffer zone to the Twin Lakes Creek and to allow site access. The approximate locations of the LTA and UTA are shown on Figure 1.

The treatment facilities are being constructed as per the design template described in the Abandonment and Reclamation Plan. This involves grading of the areas, placement of a sand and gravel base and construction of gravel berms to contain any precipitation collected within the treatment cells. The base and berms of each cell are covered with 36 millimetre reinforced linear low density polyethylene (LLDPE) geomembrane liners. The cells are sloped so that water will accumulate in an open area at the toe of each cell. A total of eight treatment cells were constructed in 2011 (four in the LTA and four in the UTA) and an additional four cells will be constructed in the UTA in 2012.

In addition to the constructed treatment facilities discussed above, a temporary treatment facility was established within the footprint of the former tank farm in the area of the large tank. This area was already underlain by a liner and provided supplementary treatment capacity during the 2011 season. The use of this ‘in-situ’ treatment area is expected to continue in 2012 and 2013.

Surface water diversion berms were established to direct clean run-off away from the treatment areas and to contain water within the treatment facilities. A ditch backfilled with coarse rock was established as a further contingency measure to facilitate drainage of the UTA.

Winter closure of the treatment facilities were carried out by levelling the soil piles so as to let the snow blow off and not accumulate in gullies. In addition, the cells in the LTA and UTA were covered with high density polyethylene (HDPE) geomembrane. Water that accumulates within the treatment facilities will be utilized to maintain the desired moisture content of the biopiles.

As per Part D Item 9 of the Water Licence, a construction summary report will be prepared and submitted to the Water Board once the construction of the treatment facilities have been completed in 2012.

Part E – Conditions Applying to Water Use and Management

There were no uses of fresh water in 2011.

Part F – Conditions Applying to Waste Disposal and Management

In 2011, effluent quality limits specified by the Water License at monitoring station 159-4 were met. Further information on surface water quality monitoring undertaken in 2011 is provided in Appendix B.

Demolition wastes generated from the removal of the tank farm including piping, scrap metal, plastics and pieces of the tank farm liner were shipped off-site for disposal. The small vertical tanks were cut in half and used as containers to ship the debris off-site. The steel from the three large vertical tanks was taken off site for recycling. Swab tests were made of the steel to confirm that there were no residual hydrocarbons left on the tank materials. Waste liquids, sludge and absorbent material generated from cleaning of the abandoned fuel tanks were placed in drums and shipped off-site for disposal at an approved facility.

Part G – Conditions Applying to Modifications

No modifications to water use and waste disposal related structures and facilities were carried out in 2011.

Modifications to the preliminary project schedule for the tank farm remediation are discussed under ‘ Part J – Conditions Applying to Abandonment, Reclamation and Closure’.

Part H – Conditions Applying to Emergency Response and Spill Contingency Planning

No unauthorised discharges occurred in 2011.

Part I – Conditions Applying to the Monitoring Program

Geotechnical and surface water quality monitoring conforming to the requirements of Part I and Schedule I of the Water License were completed in 2011. The results of the monitoring program are detailed in the monitoring reports appended to this letter (Appendices B, C, D and E).

The geotechnical and surface water quality monitoring programs will continue in 2012. The recommendations provided in the monitoring reports will be implemented in 2012 and a description of the actions taken will be included in the Annual Report for 2012.

Part J – Conditions Applying to Abandonment, Reclamation and Closure

Key closure and reclamation work undertaken on the former tank farm in 2011 included:

- Decommissioning and removal of petroleum storage tanks and associated infrastructure;
- Delineation of PHC contaminated soil;
- Construction of soil treatment facilities; and
- Excavation and treatment of PHC contaminated soil.

Decommissioning of the storage tanks was commenced in May and completed by the end of June 2011, ahead of schedule. Prior to demolition, the tanks were placed in a gas free state. Waste liquids and sludge were collected and placed in drums. Scrap materials and PHC contaminated waste from the tank removal have been disposed of as described under 'Part F – Conditions Applying to Waste Disposal and Management' above. The tank demolition was carried out by Nunavut Construction Limited.

As per the Abandonment and Reclamation Plan, test pitting was undertaken in order to delineate the PHC contaminated soil and to refine the estimates of contaminated soil quantities requiring treatment. Soil samples collected from the test pits were screened in the field using a photo-ionization detector (PID) meter and select samples were sent to an accredited laboratory for chemical analysis of benzene, toluene, ethylbenzene, xylenes, polycyclic aromatic hydrocarbons and PHC fractions 1-4. The results of the supplementary soil sampling demonstrated that the PHC contamination extended deeper and over a larger area than what was foreseen in the Abandonment and Reclamation Plan. In areas of high PHC concentrations, the impacts were found to extend beneath the normal depth of the active permafrost layer. Based on currently available data, the quantities of soil requiring treatment (applying the soil quality remediation objectives recommended in the Abandonment and Reclamation Plan) are estimated at approximately 17,000 m^3. For comparison, the Abandonment and Reclamation Plan assumed that the total volume of impacted soil would be in the order of 8,000 m^3.

The construction of the treatment facilities are discussed under 'Part D – Conditions Applying to Construction' above. As mentioned, the construction of the treatment facilities will be completed in 2012 through the addition of four treatment cells in the upper treatment area (UTA).

In 2011, a total of 7,504 m^3 of PHC contaminated soil was excavated and placed within the designated treatment facilities. The analytical laboratory results from the test pits were augmented with PID vapour readings and field observations to separate the excavated contaminated soil from the uncontaminated soil. Soil known to have high concentrations of PHC was placed in the LTA and UTA. Soil that exhibited low concentrations of PHC contamination was moved to the temporary 'in-situ' treatment facility. The contaminated soil in the treatment facilities were aerated mechanically every four days using an excavator or bulldozer until winter closure.

Stockpiles of PHC contaminated soil were made within the northeast corner of the former tank farm footprint. Based on the delineation estimate described above, an estimated 6,600 m^3 of contaminated soil remains to be excavated. A summary of PHC contaminated soil volumes exceeding the soil quality remediation objectives (SQRO) is provided in *Table 1*.

Table 1 Summary of Contaminated Soil Volumes exceeding SQROs.

Location	Maximum Depth	Soil to be Excavated	Working Volume*
Below Ground within Secondary Containment	1.9 m bgl	1,400 m^3	1,800 m^3
Below Ground within area of Former Tanks	2.5 m bgl	5,200 m^3	6,750 m^3
Stockpiled within Tank Farm Footprint	N/A	N/A	1,050 m^3
Temporary Treatment Area within Tank Farm	N/A	N/A	3,900 m^3
Upper Treatment Area	N/A	N/A	1,350 m^3
Lower Treatment Area	N/A	N/A	2,250 m^3
Total Volume of Soil requiring Treatment			**17,100 m^3**

* Working volume is based on a bulking factor of 1.3
m bgl – metres below ground level

Photos from the 2011 remediation work are included in Appendix F.

No soil materials are yet to be removed from the treatment facilities. Confirmatory sampling and analysis of soil from the treatment facilities will be undertaken in 2012 to assess remedial performance. As per the Abandonment and Reclamation Plan, soil meeting the SQROs will be recycled on site as fill material.

Confirmatory soil samples will be taken from the bases and walls of the excavated areas to confirm the remaining soil meet the established SQROs as described in the Closure Monitoring Plan (as per Part J Item 1.g. of the Water Licence). A GPS will be used to confirm sample locations established by tape/chain survey.

The remediation work will continue in 2012 applying the remediation methodology described in the Abandonment and Reclamation Plan and implemented in 2011. Testing completed in 2011 has determined that nutrient amendment to the managed soils will increase the rate of remediation. The nutrients to be applied will be in the form of diammonium phosphate (DAP) and urea. The soil will continue to be aerated once every three to four days once the ground begins to thaw and nutrients will be applied under the direction of an engineer.

In order to improve the efficiency of the remediation, the PHC contaminated soil will be processed using a vibrating screen to separate stones and boulders with a particle size larger than 10 cm from the contaminated soil fines. Given the larger surface area of the silt, sand and gravel fractions (< 10 cm), only a very small portion of the PHC contaminants will be attached to the screened large size materials. Additionally, because of the low clay and moisture content of the soil, the finer PHC contaminated soil particles are expected to readily separate from the stones and boulders during the screening. The screening and removal of coarse fractions is standard practise in the treatment of contaminated soil and has been applied at numerous remediation projects in Canada and elsewhere. It brings key advantages in terms of reducing the volumes of materials requiring treatment, improving the performance of the biopile treatment methodology and promoting the volatilization of fuel components.

The screened large size materials (> 10 cm) will be visually inspected for evidence of hydrocarbon sheen and PID vapour readings will be collected to detect the presence of volatile PHCs. In addition, swab tests will be undertaken at the start of the remediation campaign to analyse for the presence of PHCs and to validate that the screened fractions do not contain PHCs in concentrations exceeding the SQROs. The swab tests will be carried out by swabbing a 10 cm by 10 cm area of rock using a hexane wetted swab and analysing for total extractable hydrocarbons and the total weight of the rock sampled. The concentration of hydrocarbons can then be calculated by dividing the total μg extractable hydrocarbons by the weight of the rock.

Separated stones and boulders (> 10 cm) that do not show signs of PHC impact will be considered “clean” and will not be subject to further treatment. Impacted materials will be placed in the biopiles within the treatment areas.

An outline schedule of remediation activities planned in 2012 and subsequent years is presented in *Table 2*. Based on current information about contaminated soil volumes and assuming that the biopile treatment technique will perform as anticipated, the remediation work is expected to be completed at the end of 2015. It is recognised that this represents a delay relative to the preliminary time schedule presented in the Abandonment and Reclamation Plan which targeted a completion date in Q3 2013. The primary driver for the extended time period relates to the quantities of PHC contaminated soil requiring treatment; the preliminary time schedule presented in the Abandonment and Reclamation Plan was based on an assumption of 8,000 m^3 of contaminated soil while the delineation investigation undertaken in 2011 proved soil volumes requiring treatment to be approximately 17,100 m^3. It should also be noted that the only remediation work completed in 2010 was the mobilization of the tank farm decommissioning contractor at the end of the season and a site reconnaissance visit intended to allow for the optimization of the work planned for 2011 and onwards. The contaminated soil could not be dealt with until the fuel tanks and concrete block foundations above them were removed.

Table 2 *Outline Project Schedule*

Activity	2010				2011				2012				2013				2014				2015			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
NWB Approval																								
Site Reconnaissance																								
Mobilization of Demolition Contractor																								
Tank Farm Decommissioning																								
Demobilization of Demolition Contractor																								
Treatment Facility Construction																								
Excavation of Contaminated Soil																								
Soil Treatment																								
Remediation Confirmation Sampling																								
Backfilling and regrading																								
Tank Farm Reclamation Confirmation Reporting																								
Soil Remediation Performance Monitoring																								
Treatment Facility Closure																								

Current reclamation liabilities associated with the remediation of the former tank farm are estimated at approximately $2 million. Reclamation expenditures in 2011 were in the order of $1.9 million.

I trust that this letter and appended documentation meet your expectations. Please do not hesitate to contact me by phone or email should you have any questions or comments.

Sincerely,

Johan Skoglund
Group Environment Manager, Americas

Figures:
Figure 1 - Approximate Locations of Upper and Lower Treatment Areas

Appendices:
Appendix A – Inuktitut translation: Summary of this letter
Appendix B – 2011 Annual Water Quality Monitoring Report – Nanisivik Mine, Nunavut. Stantec. March 9, 2012
Appendix C – Inuktitut translation: Executive Summary of 2011 Water Quality Monitoring Report
Appendix D – 2011 Annual Geotechnical Inspection, Final. BGC Engineering. March 1, 2012
Appendix E – Inuktitut translation: Executive Summary of 2011 Geotechnical Inspection
Appendix F – Photolog of Remediation Activities