MEADOWBANK GOLD PROJECT

2014 Annual Report

Prepared for:
Nunavut Water Board
Nunavut Impact Review Board
Fisheries and Oceans Canada
Aboriginal Affairs and Northern Development Canada
Kivalliq Inuit Association

Prepared by:
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1	2015/03/31	All	All	This has been reviewed by Environmental Staff and will be incorporated into training for all mine staff on behalf of the Mine Manager and Senior Management

Prepared By: Meadowbank Environment Department

Approved By: 

Ryan Vanengen
Environmental Superintendent

The information in this document has been presented to mine managers and is endorsed and approved by senior management at AEM*.

* AEM is a recent signatory of the Mining Association of Canada- Toward Sustainable Mining. This document presents information related to assessment tools related to: Biodiversity Conservation Management and Tailings Management. Look for the * marked footnotes for TSM related information.

SECTION 1. INTRODUCTION

The Meadowbank Gold Project operated by Agnico Eagle Mines Limited - Meadowbank Division (AEM) is located approximately 70 km north of the Hamlet of Baker Lake, Nunavut. The project components include marshalling facilities in Baker Lake, the 110 km All Weather Access Road (AWAR) between Baker Lake and Meadowbank, the Vault mine site and the Meadowbank mine site.

These various components and activities associated with the project require a number of different authorizations, leases and permits from regulatory agencies including the Nunavut Water Board (NWB), the Environment Canada (EC) Metal Mining Effluent Regulations (MMER); the Department of Fisheries and Oceans Canada (DFO), Aboriginal Affairs and Northern Development Canada (AANDC) (formerly Indian and Northern Affairs Canada (INAC)); the Kivalliq Inuit Association (KIA) and the Nunavut Impact Review Board (NIRB).

This report is written to address all of the 2014 annual reporting requirements of the project under these authorizations:

NWB Type A Water License 2AM-MEA0815;
NIRB Project Certificate No. 4;
DFO HADD Authorization NU-03-190 AWPAR;
DFO HADD Authorization NU-03-191 Mine Site;
INAC Land Leases 66A/8-71-2 (AWPAR) and 66A/8-72-2 (AWPAR Quarries); and
KIA Right of Way KVRW06F04.

Reporting requirements for the MMER have been submitted directly to Environment Canada; results are presented herein to comply with the NWB Type A water license.

Table 1.1 outlines each requirement by authorization and report section. Table 1.2 presents the status of each of the sampling stations stipulated in Part I, Schedule 1 of Water License 2AM-MEA0815.

SECTION 2. SUMMARY OF ACTIVITIES

2.1 2014 ACTIVITES

2014 continued to bring unpredictable fluctuations in gold market prices which have resulted in continuing efforts by the industry to operate economically and efficiently in a new gold market environment. During 2014 Agnico Eagle continued to initiate a global strategy to minimize risk and bring costs in line with reduced revenues. The strategy included reducing exploration activities, postponing capital expenditures, maintaining companywide production growth from existing operations and optimizing costs of operations. The intent of the strategy was to provide Agnico Eagle with the financial flexibility to withstand gold market changes while also providing for development growth.

The company strategy has achieved great success thanks to the engagement of all employees in working to optimize operations at each of Agnico's operating mines. During 2014 the Company recorded a net income of $83.0 million, or $0.43 per share. In 2013, Agnico Eagle recorded a net loss of $686.7 million, or a net loss of $3.97 per share. Meadowbank Mine made a significant contribution towards the overall success of the Company and delivered record performances during 2014. The Meadowbank team have continued to seek out ways to optimize performance and gain efficiency at the mine. The 2014 highlights for Meadowbank include:

- During 2014, the Meadowbank mill processed an average of 11,313 tonnes per day (tpd), compared to 11,350 tpd in the full year 2013. Mill throughput for the fourth quarter 2014 was lower than the comparable period of 2013 due to variable hardness of the ore. Year-over-year mill throughput levels were relatively stable due to ongoing improvements in equipment availability and maintenance.

- Gold production saw a record of 452,877 ounces during 2014 at total cash costs per ounce of $599 and all-in sustaining cost of $900 per ounce. In 2013, the mine produced 430,613 ounces at total cash costs per ounce of $723. The increased production and decline in total cash costs is primarily due to consistently high crusher throughput levels, better recoveries and strong cost containment programs.

- Safety of our employees remains a top priority for Agnico Eagle and Meadowbank once again achieved record safety performance results during 2014.

Meadowbank's success and operating performance was a key contributor to the overall operating success of the Company in 2014. Meadowbank's continued success, particularly in light of the volatile gold market environment, is a testament that mining in Nunavut can be successful.

In 2014, mining activities continued in both Portage and Bay Goose pit and started in Vault Pit. In June, the dewatering of Vault Lake was completed and thereafter became the Vault Attenuation Pond. On-site water management involved discharging effluent from the Portage attenuation pond (monitored at ST-9) to the receiving environment through the diffuser in Third Portage Lake and Vault dewatering water discharged in Wally Lake through a diffuser. Following regulatory approval, starting in January 2014, AEM also started to discharge East Dike Seepage Water to the receiving environment, Second Portage

Lake via a diffuser. Construction of Central Dike continued in 2014 by the placement of rockfill, coarse and fine filters over the entire foundation; clean-up of the key trench with air, slush grout of the exposed bedrock surface and till placement on top of the slush grouted surface. The main rock embankment was raised from elevation 120m to 132m. Geotextile and LLDPE liners were installed on the upstream slope of the dike between elevation 115m to 132m; and a protective layer of aggregates was placed on top of the upstream liner to elevation 128m.

On June 30, AEM received an amendment approval to the Type A Water License from the NWB to withdraw 1,870,000 m^3 of freshwater in 2013 and 1,150,000 m^3 per year after 2013. The amendment approval documents were forwarded to Minister of Aboriginal Affairs for his final approval and on July 23, 2014 AEM received, from the Minister of Aboriginal Affairs, the final approval to the freshwater amendment (Section 8.1.4).

In July 2014, AEM submitted an application to the NWB for a Type A Water License Renewal. The current license expires on May 31, 2015. The pre-hearing conference and technical meeting was held in Baker Lake on January 14-15, 2015. In the days leading up to the technical meetings and during the meetings, AEM and the regulators came to an agreement on all of the 97 technical comments. The final in person public hearing is scheduled to occur in Baker Lake on April 29 -30, 2015 (Section 11.2).

Quarterly progress reports, prepared for the Kivalliq Inuit Association as required by Production Lease KVPL08D280, are attached in Appendix A1. These reports provide further details of activities throughout the 2014 year.

AEM infrastructure locations can also be found in Figure 1, 2, 3 and 4.

2.2 2015 MINE PLAN

The "*2015 Mine Plan*" for the Meadowbank Gold Project, prepared for the Kivalliq Inuit Association as required by Production Lease KVPL08D280, is attached in Appendix A2. This report was submitted to the KIA on December 16th, 2014, and outlines the activities planned for the project throughout the 2015 year.

The Meadowbank gold mine began the operations phase of the project in February 2010, and thus, is entering its sixth year of operations. In addition to routine activities throughout the 2015 season, a number of secondary construction/modification projects will be undertaken near the main mine site area and Vault area. Construction of the Central Dike Phase 4 as well as Saddle Dam 3, 4 and 5 will be completed in 2015.

AEM has submitted applications to the DFO for an authorization to expand Vault Pit into Phaser Lake. Presently, this application is being screened by the NIRB. Once the project is approved, AEM plans to begin dewatering Phaser Lake in 2016 while completing a fishout, and intends to mine this area at the end of 2016. It will take less than 3 months to dewater Phaser Lake which has a volume of 405,665 m^3 of water. The water will be pumped to the adjacent Vault Lake Attenuation Pond, treated if needed, and discharged through a diffuser into Wally Lake.

As in the past, environmental monitoring (wildlife, aquatic effects, groundwater, noise and air) will continue through 2015 in support of all operational undertakings at the Meadowbank site as required by

the NWB Type A Water License 2AM-MEA0815, NIRB Project Certificate No.004, DFO authorizations, and MMER regulations.

In 2015, AEM's mining plan is to operate Portage and Vault pits at the Meadowbank mine site. Mining activities in Goose pit will be completed in early 2015. A total of 28.5 Mt of rock will be hauled from Portage and Vault pits during the year. The mine plan consists of moving 24.4Mt of waste rock and 4.1 Mt of ore from the open pits and 145 Kt of ore from the stockpiles.

A total of 12.9 Mt of material will be mined out from the active phases of Portage pit. Vault pit will produce a total of 15.5 Mt. According to the plan, no low grade material (<1.05 g/t) will be hauled to the mill in 2015.

The Waste Management Plan for 2015 is to maximize waste storage facility (WSF) utilization and minimize haulage cycle times which will, in turn, minimize the greenhouse gas emissions and impacts on the environment.

SECTION 3. CONSTRUCTION / EARTHWORKS

The following section discusses reporting requirements related to site construction and earthworks activities associated with dikes, dams and quarries.

3.1 DIKES AND DAMS

3.1.1 Performance Evaluation

As required by water license 2AM-MEA0815, Schedule B, Item 1:

a. An overview of methods and frequency used to monitor deformations, seepage and geothermal responses;

The surveillance program consists of several types of inspection and monitoring:

- Daily inspection – carried out daily by a designated qualified engineer or technician;
- Thermistor and piezometer monitoring – carried out generally weekly or bi-weekly by a designated qualified engineer or technician;
- Detailed inspection - carried out, generally, monthly or bi-monthly by a designated qualified engineer or technician; and
- Engineering annual inspection – carried out annually by qualified engineer (consultant), during open water, if possible, to verify that the facilities are functioning as intended.

Table 3.1 describes the routine geotechnical monitoring program.

b. A comparison of measured versus predicted performance;

For the dewatering dikes, i.e. East Dike, Bay Goose Dike, South Camp Dike and Vault Dike; from the analyses of the available geotechnical instrumentation data and as observed by visual inspection, it appears that the structures are performing as expected. No major concerns were identified in 2014. Regular monitoring will continue in 2015 to assess the performance of the structures.

For the Tailing Facilities structures in operation; i.e. Saddle Dam 1, Saddle Dam 2 and Stormwater Dike; from the analyses of the geotechnical instrumentation data available and as observed by visual inspection; the structures are performing as expected. No major concerns were identified in 2014. Regular monitoring will continue in 2015 to assess the performance of the structures. For the Central Dike; from the analyses of the geotechnical instrumentation data available and as observed by visual inspection, the structure is performing as expected structurally. No unexpected settlement, erosion, bulging or sloughing is observed. From the analyses of the geotechnical instrumentation data available and as observed by visual inspection of the Central Dike, seepage was observed at the downstream toe of the dike during the fall period of 2014. The seepage appears to be of low in magnitude and is located within the mining footprint and away from the receiving environment. The seepage water is contained at the downstream toe of the dike and froze as temperatures dropped in November. When thawing will occur, the water will be collected and redirected to the Tailings Storage Facilities – South Cell. For detailed information about the water quality monitoring, refer to Section 8.1.8 of this report. A new groundwater well was installed near the downstream toe of the central dike in 2014 to monitor possible

seepage of the TSF. The monitoring and inspection of the Central Dike will continue in 2015 and throughout the operating life of the dike.

For the dewatering dikes and the Tailing Facilities structures, further comparison of the measured performance to the predicted performance will continue in 2015, as additional data becomes available for analysis.

c. A discussion of any unanticipated observations including changes in risk and mitigation measures implemented to reduce risk;

East Dike

The installation of a seepage collection system downstream of East Dike to capture and pump the seepage water started in September 2011 and was completed in 2012. After the system installation, 3 zones of seepage were identified near the downstream toe. The zones at about Sta. 60+247 and Sta. 60+498 each had a collection sump with pump connected to a year round pumping and piping system.

In 2011, the downstream seepage at Sta. 60+498 was stable at a rate of about 864 m^3/day (10L/s), with no visual signs of turbidity. This was consistent with rates recorded during previous years. In 2011, the seepage downstream at Sta.60+247 appeared stable at around 345.6 m^3/day (4L/s) with no visual signs of turbidity noted, which was consistent with previous rates. Since its installation, all unanticipated seepage has been mitigated through the use of the collection system, all seepage is being captured within the sumps and no sign of additional seepage on the ground surface or downstream in the Portage Pit was observed. The implementation of this system has reduced risks to the mining activities in Portage Pit and to the dike integrity. Flow meters were installed in 2013 at the discharge of each pump. The flow has been generally consistent from 2013 to present and is approximately 1000 m^3/day.

In 2013, AEM applied for a modification to the Type A water license Part F, Item 4 to discharge East dike seepage water as non-contact water effluent. AEM proposed to discharge seepage water from East Dike collection system through a separate sump collection system and diffuser, back to Second Portage Lake prior to contact with mining activity (thus minimizing site contact water and further mitigating the risks to the environment). In April 2013, NWB approved AEM's application to modify the Type A water license. This seepage is considered to be non-contact water seeping from Second Portage Lake. The discharge, from the East Dike sump back to SPL, began in January 2014 and is ongoing. In compliance with Part G, Item 4, a diffusor as-built report was submitted to the NWB in 2014 and is available in Appendix G7 of this report. See Section 8.1.8 for more information on this modification made to the Water License. This discharge is subject to MMER requirements and monitoring results to date indicate the parameters are well within criteria.

Bay Goose Dike

Four small seepage areas were identified with a total of 9 seepage channels along the dike. No turbidity was observed in the seepage. The total flow coming from these seepages is 97.2 m^3/day (1.22 L/s). The overall seepage is less than anticipated and is not presently a concern as no risks have been identified. The area will continue to be monitored to determine increases/decreases of the seepage in these areas.

Refer to the Annual Geotechnical Inspection (Appendix B1) for detailed field observations regarding this dike. Additional geotechnical instrumentation installation and field investigations in certain areas have been implemented to monitor and, if necessary, mitigate the situation. No additional seepage collection has been implemented as the seepage is not affecting the mine operation nor the integrity of the dike. The condition of the dike will continually be monitored, even after the end of mining activity in Goose Pit, and if the condition of the dike is judged to be deteriorating then management actions and remediation will be assessed.

d. As-built drawings of all mitigative works undertaken;

No mitigative works were undertaken in 2014.

e. Any changes in the design and/or as-built condition and respective consequences of any changes to safety, water balance and water quality;

Stage 3 of the Central Dike was completed during the months of April and September 2014. The construction consisted of the placement of rockfill, coarse and fine filters over the entire foundation; clean-up of the key trench with air, slush grout of the exposed bedrock surface and till placement on top of the slush grouted surface. The main rock embankment was raised from elevation 120m to 132m. Geotextile and LLDPE liners were installed on the upstream slope of the dike between elevation 115m to 132m; and a protective layer of aggregates was placed on top of the upstream liner until elevation 128m. None of the changes in the design and/or as-built conditions stated above have consequence on safety, water balance and water quality (refer to the Annual Geotechnical Inspection in Appendix B1). Continuous monitoring will be done to ensure that the conditions remain stable.

f. Data collected from instrumentation used to monitor earthworks and an interpretation of that data;

Section 4.0 of the '*2014 Annual Geotechnical Inspection',* by Golder, provided in Appendix B1, presents the instrumentation data collected in 2014.

The document '*Annual Review of Portage and Goose Pit Slope Performance (2014*)' by Golder Associates, which presents the pit wall geotechnical inspection results, is also provided in Appendix B1, for informational purposes.

g. A summary of maintenance work undertaken as a result of settlement or deformation of dikes and dams; and

No major maintenance work on the dewatering or TSF structures was undertaken in 2014.

h. The monthly and annual quantities of seepage from dikes and dams in cubic metres.

See Section 3.1.1 c and 8.1.8 below for a discussion of seepage from the Vault Dike, East Dike, Bay Goose and Central Dike.

3.1.2 Meadowbank Dike Review Board

As required by water license 2AM-MEA0815 Part I, Item 14: ***The Licensee shall submit to the Board as part of the Annual Report required under Part B Item 5, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel.***

One report (Report 16) was prepared by the Meadowbank Dike Review Board in 2014. This report and the responses from AEM are included in Appendix B2.

3.2 QUARRIES

The annual reporting requirements listed in the following sections apply only to quarries located along the All Weather Access Road (AWAR).

As required by INAC Land Lease 66A/8 72-2, Condition 8: ***The lessee shall file a report, annually, with the Minister in the manner and format stipulated by the Minister. The report shall include:***
i. Quantity of material removed and location of removal, for the immediately preceding calendar year; and
ii. Such other data as are reasonably required by the Minister from time to time.

And

As required by INAC Land Lease 66A/8 72-2, Condition 25: ***The lessee shall file, annually, a report for the preceding year, outlining the ongoing borrow area operations completed in conformity with the approved Borrow Management Plan, as well as any variations from the Plan.***

And

As required by KIA Right of Way Authorization KVRW06F04, Schedule E, Condition 8: ***The lessee shall file annually a report for the preceding year, outlining the ongoing borrow area operations completed in conformity with the approved Borrow Management Plan, as well as any variations from the Plan.***

No material was blasted from the quarries on INAC or KIA leased lands along the AWAR in 2014. The All Weather Access Road (AWAR) and mine site road maintenance utilized crushed NAG material from the mine site.

In 2014, AEM continued the remedial activities in Quarry 22 and Quarry 5. These quarries were historically used as a temporary storage area for contaminated materials generated as a result of petroleum hydrocarbon (PHC) spill clean-up activities. The contaminated material from these quarries was excavated and removed in 2013 and 2014. The contaminated material was transported to the Meadowbank Landfarm. The Quarry 5 report can be found in Appendix B3 – *2014 Quarry 5 Report*. All the results from sampling are well below CCME remediation Criteria for Industrial Use of Coarse Material (meet Recreational Land use criteria) so no further remediation or additional work will need to be performed at Q5 until closure of the Meadowbank Mine Site. The Quarry 22 report can be found in Appendix B4 – *2014 Quarry 22 Report*. The analytical results from the September 2014 soil sampling campaign indicate remnant PHC contamination when compared to the CCME remediation Criteria for Industrial Use of Coarse Material. AEM will resample in Q22 after performing scarification in early 2015 (after the thaw). The scarification activity will assist natural degradation of the PHC's. As stated,

verification sampling will be undertaken later in the fall to determine the effectiveness of the natural degradation. Based on the degradation history of PHCs in the Meadowbank Landfarm, AEM is confident that the natural degradation of PHCs will effectively remediate the remaining contaminated material. Once the results are analyzed a further course of action will be developed which may include additional removal of material.

SECTION 4. WATER MANAGEMENT ACTIVITIES

The following section addresses reporting requirements related to water management activities.

4.1 LAKE LEVEL MONITORING

As required by Water License 2AM-MEA0815 Schedule B, Item 2: ***Results of lake level monitoring conducted under the protocol developed as per Part D Item 11 (Water Quality Monitoring and Management Plan for Dike Construction and Dewatering)*****.**

Dewatering of the Vault Lake impoundment area began on June 27, 2013 and was suspended on October 22, 2013, due to ice buildup in the impoundment area. Vault Lake Dewatering recommenced on June 20, 2014 and was stopped on June 29, 2014, which officially completed the dewatering of Vault Lake. At this point Vault Lake became the Vault Attenuation Pond. Infrastructure was adjusted and water from the Vault Attenuation Pond (contact water) was discharged from July 24, 2014 to August 14, 2014. This water was discharged into Wally Lake through the diffuser as effluent. No treatment of the water was required prior to discharge as the total suspended solids (TSS) were below the required limit. The Vault discharge is also subject to the MMER and all monitoring results met the appropriate criteria.

The elevation measurement, in metres above sea level (masl), of Wally Lake began on June 1, 2014 and was conducted on a weekly basis, during open water season, weather permitting. The location of the lake level survey monitoring is identified as WL-survey on Figure 4. The lake level monitoring results are presented in Table 4.1; the lake level remained within the range of naturally occurring levels.

Water from the Portage Attenuation Pond was discharged into Third Portage Lake from June 10, 2014 to July 5, 2014. The elevation, in metres above sea level (masl), of Third Portage Lake continued to be monitored in 2014 (started on June 6, 2014) on a weekly basis, during open water season, weather permitting. The location of the lake level survey monitoring is identified as TPL-survey on Figure 1. The lake level monitoring results are presented in Table 4.1; the lake level remained within the range of naturally occurring levels.

Water levels of the Portage Attenuation Pond and Vault Attenuation Pond were also monitored. Table 4.1 presents the elevation monitoring results at the water intake; the monitoring locations are identified as SPL-IN and VL-IN on Figure 1 and 4 respectively. This information is provided for informational purposes only.

Water from the East Dike Seepage was discharged into Second Portage Lake starting in January 6, 2014. The elevation, in metres above sea level (masl), of Second Portage Lake was monitored on a weekly basis, during open water season, weather permitting. The location of the lake level survey monitoring is identified as SPL-survey on Figure 1. The lake level monitoring results are presented in Table 4.1; the lake level remained within the range of naturally occurring levels.

4.2 WATER BALANCE WATER QUALITY MODEL REPORTING SUMMARY

As required by Water License 2AM-MEA0815 Schedule B, Item 3: ***Summary of reporting results for the Water Balance Water Quality model and any calibrations as required in Part E Items 6 and 7.***

A water balance and water management plan (and report) update for 2014 was completed in February 2015. The technical report, entitled "*Meadowbank Gold Mine Water Management Report and Plan 2014*", is included in Appendix C1.

As in 2012 and 2013, the 2014 water management plan for the Meadowbank mine site update consists of:

- The validation and update of the site hydrology, including the revision of drainage areas and the update of meteorological conditions.

- The update of the short-term and long-term water management plan, taking into account changes to the following elements:
    - Mining schedule;
    - Mill operation rate;
    - Mine pits layout;
    - Rock storage facility extent; and
    - Tailings management facilities filling.

- The development of a water balance model for the entire site and for the complete duration of the mining activities until final site closure.

- It presents a comparison of the predicted and recently remodeled pit water quality (SNC, 2015) forecast to assist in water treatment planning to assist in closure planning.

In summary, recent updates to the LOM have required revision of AEM's water management plan. The major changes observed in the life-of-mine plan affecting the water management include but are not limited to:

- Goose and Vault Pit modifications;
- Updated truck mining fleet;
- Updated stockpile status; and
- Modification to the Central Portage Pit Waste Rock Storage design and overall volume.

In 2014 the above mentioned modifications added two months to the LOM and tailings storage requirements as well as slightly affecting the pit flooding curves. In addition to the changes in the LOM, other revisions/modifications were made to the water balance in 2014- 2015. These include the following:

- Fresh water consumption revision;
- Total daily mill water requirement;
- Updated tailings deposition plan affecting the North Cell and South Cell deposition calendar;
- Pit water inflow revision based on observed flowmeter data;

- Third Portage Lake elevation change affecting reflooding requirements;
- Dewatering of Phaser Lake – when approved by regulatory agencies;
- Updating the seepages section; and
- Changing in tailings dry density as observed through bathymetric analysis.

Detailing the nature of the revisions and their effects on the overall water management strategy are discussed in detail in the *Water Management Report and Plan 2014*. In summary, the total expected freshwater use planned for 2015 to mine closure varies from 90-150m^3/hr during mill operation, and drops gradually during closure to 4m^3/hr (exclusively for camp use, not including pit reflooding) once the mill has ceased operation at the end of 2017. During the summer months AEM will require 90 m^3/hr of freshwater and during the winter months will require 150 m^3/hr in order to maintain an adequate reclaim water volume in the TSF. The ice cover during the winter months on the reclaim pond will vary between 0-1.8m in thickness which may represent up to 80% of the total reclaim water volume. The water balance has been optimized to reduce freshwater consumption to a minimum and ultimately this minimizes the water treatment requirements through the onsite water treatment plant. The water deficit encountered in the Tailings Storage Facilities during the winter months due to the ice cover is mitigated by an increase in freshwater consumption during these cold months. In 2014, AEM respected the freshwater consumption authorized by the Water License. The yearly total for 2014 was 1,096,829 m^3 which represent 95% of the freshwater use amendment limit of 1,150 000 m^3.

The East Dike seepage has been redirected to Second Portage Lake in order to reduce the water entry into the system, thus reducing the in-pit pumping requirements and subsequently the water treatment that was required in 2014. Once Portage Pit enters its reflooding stage, the East Dike seepage controls will be removed allowing the water to passively flow into Portage Pit with the reflooding operation.

Pit reflooding volumes and sequence (including Portage, Goose and Vault Pits) are presented in the *Water Management Report and Plan 2014* (Appendix C1). Reflooding will commence in 2015 with Goose Pit once mining has been completed, and subsequently in 2018 for both Portage and Vault Pits, and the entire reflooding process will be completed by 2025. Contingent that the water quality meets CCME Guidelines for the Protection of Aquatic Life, dike breaching of the surrounding structures will occur in approximately 2029 and will reconnect the Portage and Goose areas to Second Portage Lake and Vault area to Wally Lake.

Water quality modelling was completed by SNC Lavallin for the life of mine and included as an appendix to the *Water Management Report and Plan 2014* found in Appendix C1. As per Schedule B, Item 3, this document provides "*the Water Balance Water Quality Model"* with all updated parameters to analyze the water quality as the mine proceeds through operating (life of the mine) and the reflooding operation and to determine the need for potential treatment of identified parameters of concern. The impact of transferring the TSF water to the pits during the reflooding process was explored using the latest available water quality results from the North Cell TSF, actual mill tailings and the Portage Attenuation pond obtained in 2013 and 2014. Based on current water quality and the 2014 water balance, the report identifies that copper and selenium may require removal treatment in order for the pit water quality to meet CCME criteria in 2025.

The following recommendations are presented the *Water Management Report and Plan 2014* in order to improve on the current water management strategies and water balance:

- Continue to monitor and include any new flow monitoring locations/devices for any additional or new inflows observed in 2015. Continue to update the deposition plans of the North and South Cell as needed to maximize water use and availability as well as increasing the accuracy of the models including but not limited to bathymetric readings.
- Conduct the water quality modelling analysis on a yearly basis based on updated water quality results and water balance thought the life (this is also a requirement of the Water License).
- Prior to closure, develop a sediment flux model to evaluate erosion of geotechnical structures on site for the closure primarily for TSS control: diversion ditches, rock storage facilities, capping of the tailings storage facilities, dikes and dams.

4.3 BATHYMETRIC SURVEYS

As required by Water License 2AM-MEA0815 Schedule B, Item 4: ***The bathymetric survey(s) conducted prior to each year of shipping at the Baker Lake Marshalling Facility.***

The bathymetric survey in Baker Lake was completed on July 15, 2014 and is included in Appendix C2.

4.4 PREDICTED VS MEASURED WATER QUALITY

As required by Water License 2AM-MEA0815 Part E, Item 8: ***The Licensee shall, on an annual basis during Operations, compare the predicted water quantity and quality within the pits, to the measured water quantity and quality. Should the difference between the predicted and measured values be 20% or greater, then the cause(s) of the difference(s) shall be identified and the implications of the difference shall be assessed and reported to the Board. The comparison of predicted water quality in reflooded pits also addresses Water License 2AM-MEA0815 Part E, Item 6.***

The Table 4-2 provides a comparison between predicted (originally predicted in support of the NWB license) and measured water quantity within Portage, Bay Goose and Vault Pit and water quality within Bay Goose and Vault Pit. It should be noted that in 2014 no water from South Portage Pit sump was sampled because the access to the sump present health and safety issues for the technicians and water was pumped only for 3 months (August to October). By the end of 2014, no more sumps existed in the South Portage Pit as they were filled in with waste rock backfill. AEM will continue to look for the presence of water in this pit.

Percent difference was calculated by the following formulas:

% difference = ((A-B) / B)*100;
where: A = measured value and B = predicted

Water Quantity

As presented in Table 4-2, the % difference between water volume predicted in Golder (2007) and water volume measured in Portage Pit and Bay-Goose Pit was less than 20% of the predicted value. This indicates that the seepage and groundwater sources and volumes predicted that collectively make up the

water in the pits in 2014, are less than what was originally predicted for operations. More specifically, Portage Pit was -167% less than the predicted value and Goose was -122% less than the predicted value. Before 2014, seepage water from East Dike was pumped to the Portage Pit sump. However, as of January 2014, water from the East Dike Seepage has been pumped back to Second Portage Lake which contributes to significantly decrease the water quantity. For Vault Pit, the % difference was 75% and can be explained by the fact that in 2013, AEM had started the pre-stripping of the Vault Pit and water that accumulated in the sump was not discharged. So, in 2014, AEM had to discharge the accumulated water from 2013 plus the volume from 2014. As per the 2014 Water Management Plan and Report, the actual water quantity in Vault Pit in 2015 and in the following years will be closer to the predicted water quantity.

Water Quality

According to the original NWB application documents (Golder, 2007- Water Quality Predictions), a Probable scenario and a Possible Poor End scenario predicted water quality results were developed to anticipate a representative range of water quality to allow for management and mitigative decisions. The probable scenario used input values that simulate predicted observed field conditions, and added realistic scaling factors related to explosives management and pit operations. The Possible Poor End scenario input values simulated probable variance on observed field characteristics and selected input parameters to capture possible, conservative variance. The predicted values in the Probable scenario and the Possible Poor End scenario represented the summer average. The measured values presented are summarized in Table 4.2. The mean and lower 25 centile of all the data available throughout the year at Vault Pit (ST-23) and Goose Pit (ST-20) was compared to the predicted values.

Exceedances of greater than 20% percent difference between predicted vs the mean of measured values in Vault Pit were found for all of the parameters except for pH, ammonia, ammonia nitrogen, dissolved arsenic and nitrate. The mean water quality concentrations measured in the Goose Pit sump exceeded 20% predicted concentrations for half of the parameters except for ammonia nitrogen, chloride, dissolved metal (copper, lead, barium, cadmium, iron, manganese, zinc), hardness and TDS. Although it's difficult to identify the potential cause for the exceedances, for Goose Pit, it is most likely due to the fact that the measured water volumes were significantly less than what was originally assumed (122% less than predicted). This reflects the fact that seepage, ground water, and local runoff volumes are being managed and less than what was originally predicted in these sumps. For Vault, for most of the parameters the accredited laboratory didn't reach a detection limit that allows for a comparison with the predicted values like chloride, fluoride, and most of the dissolved metals such as lead, nickel, iron, zinc, selenium. Therefore the relative % difference is automatically higher than 20%. The exceedances in Goose and Vault will be monitored in the future and the results will be considered in the water quality modelling to assist in informing management of water quality in the pits during closure. All factors including the proportional volume of pit water, and reclaim water in the TSF as well as possible implementation of mitigative measures during operation and closure, will be considered when deciding if water treatment will be required at closure. All of this information including the applicable parameters are integrated into the water quality model and is discussed in the subsequent section.

Furthermore, it is important to note that the water is monitored extensively and not discharged directly into the environment. Vault Pit and Bay Goose Pit water reports respectively to the Vault Attenuation Pond and the Portage Attenuation Pond (now converted to the South Cell Tailings Facility). The water accumulated in the Vault Attenuation Ponds can be treated by the water treatment plant for TSS removal

before discharge into the receiving environment (Wally Lake). It should be noted that since the South Tailings Cell was put into operation (Nov, 2014), no additional water from the former Portage Attenuation Pond will be discharged into the receiving environment during mining operations.

The results can be found in Table 8.44 and Table 8.16 under sampling ST-8 and ST-10 (discharge).

Comparison of Predicted Pit Water Quality

As discussed during follow-up workshops with regulators, after the prehearing conference for the Meadowbank freshwater use increase amendment application (WebEx workshops were hosted by AEM in November 28, 2013 and January 22, 2014) and, as presented as part of the Type A renewal process, AEM contracted SNC to review the water quality predictions for pit reflooding. Table 4.2 of the "*2014 Meadowbank Water Quality Forecasting Update*" found in Appendix C of the *2014 Water Management Report and Plan* (Appendix C1) summarizes the SNC water quality concentrations (based on measured water quality from the TSF) predicted in the pits after reflooding and compares them to originally predicted concentrations for Goose and Portage. SNC evaluated parameters of concern that included Cyanide (total), Total Copper, Total Iron, Nitrate, Chloride, Total Selenium, and Ammonia. All forecasted concentrations meet the CCME guidelines in 2025 except for total copper in Portage Pit. Total selenium was identified as a possible parameter of concern since its forecasted concentration in Portage Pit for 2025 is close to the CCME guidelines. For the Vault pit, no treatment would be required when re-flooding the pit. This is largely due to the fact that there is no interaction of contact water with a tailings disposal facility at the Vault site and all parameters are expected to meet the CCME guidelines.

Based on the results of the water quality mass balance presented in the report, treatment may be required for copper (and possibly selenium) as the pit water quality may exceed CCME limits if the water is not treated. Treatment may not be required if it can be demonstrated in the field that the forecasted equilibrium concentration can be attained. However, if treatment is deemed necessary, through operational and pre-closure field data collection, it could be undertaken at the South Cell Reclaim Pond, or in the Portage Pit. A potential treatment option for the removal of copper prior to discharge in Portage Pit is caustic or lime precipitation.

4.5 ADDITIONAL INFORMATION

As required by Water License 2AM-MEA0815 Schedule B, Item 24: ***Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.***

No additional information was requested in 2014.

SECTION 5. WASTE ROCK MANAGEMENT ACTIVITIES

5.1 GEOCHEMICAL MONITORING

As required by NIRB Project Certificate No.004 Condition 15: ***Within two (2) years of commencing operations re-evaluate the characterization of mine waste materials, including the Vault area, for acid generating potential, metal leaching and non-metal constituents to confirm FEIS predictions, and re-evaluate rock disposal practices by conducting systematic sampling of the waste rock and tailings in order to incorporate preventive and control measures into the Waste Management Plan to enhance tailing management during operations and closure; results of the re-evaluations shall be provided to the NWB and NIRB's Monitoring Officer.***

And

In accordance with Water License 2AM-MEA0815 Schedule B, Item B-5: ***Geochemical monitoring results including:***

a. Operational acid/base accounting and paste pH test work used for waste rock designation (PAG and NPAG rock);

In 2014, AEM sampled 25% of blast holes and analyzed the percentages of sulphur and carbon. The results from these analyses are used to differentiate Non-Potentially Acid Generating (NPAG) from Potentially Acid Generating (PAG) materials. The Total Sulphur (S) analysis is converted into a Maximum Potential Acidity (MPA) value by multiplying the Total S weight % by 31.25 which yields an MPA value in Kg $CaCO_3$ equivalent. The Total Inorganic Carbon analysis is similarly converted into a Carbonate Neutralization Potential (NP) by multiplying the Total weight % Inorganic Carbon (reported as $\%CO_2$) by 22.7 which yields an NP value in Kg $CaCO_3$ equivalent. The Net Potential Ratio (NPR) for the blast hole drill cutting sample is then calculated as follows: NPR = NP/MPA. See Table 5.1 for a summary of Acid Rock Drainage (ARD) Guidelines used to classify Meadowbank Waste.

Table 5.1: Summary of ARD Guidelines used to classify Meadowbank Waste

Initial Screening Criteria	ARD Potential
NPR< 1	Likely Acid Generating (PAG)
1 < NPR < 2	Uncertain
2 < NPR	Acid Consuming Non Potentially Acid Generating (NPAG)

The mine geology staff uses the derived NPR to characterize the rock in the blast pattern. Mine surveyors use this information to delineate the dig limits within the blasted rock to guide the shovel and loader operators in directing where the rock is to be taken. See Section 5.2 and Table 5.2 for a discussion of the use and location of waste rock.

The results of the NPAG-PAG classification confirmation are logged in the Meadowbank GEMCOM database. Due to the large volume of data, the results are not included in this annual report. These results can be provided upon request.

To validate the method used by AEM, approximately 300 samples (including ultramafic volcanic, intermediate volcanic and iron volcanic rock types) from production drill holes in Portage, Goose and Vault Pits were sent to an accredited commercial lab (external lab) for acid base accounting (ABA) analysis using the Modified Sobek Method for determination of NP/AP and metal leaching using the Shake Flask Method. The results confirmed AEM's methodology and results to differentiate PAG/NPAG rock.

As per NIRB Recommendation 1 found in "*NIRB's 2013-2014 Annual Monitoring Report for the Meadowbank Gold Project and Board's Recommendation*" the NIRB "Recognizing that AEM has re-evaluated the characterization of mine waste materials, the Board now requires that it provide a comparison of its results with the FEIS predictions and an explanation of how it re-evaluated rock disposal practices in order to incorporate preventative and control measures into the Waste Management Plan. It is requested that this information be provided to the NIRB within AEM's 2014 Annual Report."

In the FEIS, Vault waste rock was found to be 100% Intermediate Volcanic (IV). AEM's characterization of the Vault waste rock found that it is mostly comprised of IV group rocks, however a small portion is also iron formation. Ultimately, the FEIS was functionally accurate as the IV provides a high buffering capacity, low leachability and is considered NPAG. Data collected for internal control during operations at Vault was compared to the Vault geochemical FEIS (Golder, 2005). The Vault database from AEM included results to date for 11,198 samples analyzed at the on-site laboratory for total sulphur, buffering capacity (NP) , acid potential (AP), the ratio of NP to AP (NRP) and total carbon. Starting at the end of 2014, AEM sent quarterly samples to an accredited laboratory to validate AEM internal determination. The FEIS prediction said that the ARD from Vault rock will be low which was consistent with AEM findings. In the FEIS, it was determine that 14% of the rock will be PAG, 11% uncertain and 75% NPAG. Analysis form our internal determination shows that 4% is PAG, 12% uncertain and 85% is NPAG. Ultimately, there is a higher ratio of NPAG versus what was initially predicted. However as stated previously any PAG or uncertain waste rock material is placed in the middle of the facility while NPAG material is placed on the perimeter to encapsulate the PAG material. Runoff or seepage water monitoring analysis will confirm the effectiveness of this abatement measure.

Operational data from the Vault deposit (results from onsite lab testing) have been compared to static test database collected during the startup of the project (Golder, 2005), in order to recommend a minimum sulphur cut-off concentration to be used to identify NPAG. The NPR values from the operational dataset and static test database were compared to test the fit of both datasets and to determine the sulphur content at which material may be considered PAG per MEND (2009). The datasets appears to correlate and in general, material with total sulphur content below 0.2% and NPR below 2 and thus is designated as NPAG. Additional data analysis will be undertaken and will be provided in the 2015 Annual Report.

b. As-built volumes of waste rock used in construction and sent to the Waste Rock Storage Facilities with estimated balance of acid generation to acid neutralization capacity in a given sample as well as metal toxicity;

Refer to the discussion in Sections 5.1a and 5.2.

c. All monitoring data with respect to geochemical analyses on site and related to roads, quarries, and the All Weather Access Road;

As per the recommendations in AEM (2012), unless there are significant changes during reclamation, it is recommended that quarry surface water sampling not be completed in the future as follow-up water sampling has not provided evidence of geochemical issues in the quarries. As in the past, Quarry 4 and 14 are permanently flooded. The majority of the quarries with geochemical concerns identified in AEM (2009b) have been observed to have little or no water ponding due to snow melt or precipitation during the summer period. As a result, they do not present a risk to the receiving environment and therefore do not require annual monitoring. Slope remediation was in progress in more quarries than last year but none of them were totally reclaimed. AEM is currently evaluating which quarries can be progressively closed. Given the stability of the structures and the monitoring results of 2011 to 2014, previous annual reports recommended that unless turbidity issues were visually observed, surface water chemistry sampling should not be conducted at fish bearing watercourses. When an erosional issue occurs, it was recommended that detailed monitoring should be conducted and at a minimum, a single water chemistry sample upstream and downstream of the source. If deemed necessary, additional follow-up sampling or monitoring should be conducted and if necessary additional mitigation will be undertaken. On May 16, small streams began flowing and by mid-June all of the streams and rivers along the road opened up. Four formal erosion inspections were completed by qualified environment technicians on May 16, 23, 26 and June 6 and weekly visual inspections were made by qualified environment technicians during AWAR inspections. Daily inspections were made in collaboration with site services department (who travel the road daily for ongoing maintenance). No turbidity issues were visually observed so surface water quality sampling was not deemed necessary at non-HADD crossings or quarry contact water pools.

d. Leaching observations and tests on pit slope and dike exposure;

No leaching was observed on the pit slope or dike faces.

e. Any geochemical outcomes or observations that could imply or lead to environmental impact;

In 2013 there was seepage observed at the Portage RSF that had the potential to lead to environmental impacts. Following effective mitigative and management actions in 2013, seepage was monitored throughout 2014. Please refer to Section 8.1.4.2 regarding the seepage event; mitigation and monitoring that occurred in NP2 Lake and other downstream lakes (i.e. NP1, Dogleg, SPL).

f. Geochemical data associated with tailings solids, tailings supernatant, cyanide leach residue, and bleed from the cyanide destruction process including an interpretation of the data;

AEM takes quarterly samples of tailings that are sent to an accredited laboratory to analyse for ABA and Metal Leaching. Table 5.4 presents the results. The results indicate that the tailings are PAG but have low metal leaching. A research program in collaboration with the RIME (Research Institute of Mine and Environment, Quebec) is underway, which includes testing and analysis of the tailings reactivity. AEM will continue to work with RIME to determine long term strategies for managing the TSF under closure and post closure scenarios.

g. Results related to the road quarries and the All Weather Private Access Road.

See Section 5.1c above

5.2 WASTE ROCK VOLUME

In accordance with Water License 2AM-MEA0815 Schedule B, Item B-6: ***Volumes of waste rock used in construction and placed in the Rock Storage Facilities.***

The total volume of waste rock generated in 2014 was 28,669,593 tonnes. The volume of waste rock from the Portage pit in 2014 was 12,825,309 tonnes; 5,655,270 tonnes of non-potential acid generating (NPAG) and 7,170,039 tonnes of potential acid generating (PAG). The volume of waste rock from the Goose in 2014 was 2,310,195 tonnes; 1,012,324 tonnes of non-potential acid generating (NPAG) and 1,297,871 tonnes of potential acid generating (PAG). The volume of waste rock from the Vault Pit in 2014 was 13,534,089 tonnes; 11,858,863 tonnes of NPAG and 1,675,226 tonnes of PAG. The use and location of all of the rock, by volume, is presented in Table 5.2 and is identified by the following categories:

- Tailings Dams – used for the construction of dams or dikes adjacent to the tailings pond;
- Other Construction;
    - Dams and Dikes – used for construction of dams or dikes necessary for water control (not adjacent to the tailings pond);
    - Roads – used for road construction;
    - Crushers – taken to the mobile crusher and used for construction or maintenance purposes;
    - Miscellaneous uses;
- Waste Dump – taken to the waste rock storage facilities;
- Overburden – taken to the till stockpile;
- Backfill – waste return in the pit.

The *Mine Waste Rock and Tailings Management Plan* was revised in March 2015 and can be found in Appendix D1*. In 2012, AEM decided to revise Portage rock storage facility (PRSF) footprint which resulted in a temporary expansion from the original area of the waste storage facility from 63 ha to 80.8 ha. The main reason for this was that there was no area to store NPAG rock within the PRSF. The NPAG material is a valuable resource and is required for use as a capping material during closure operations. In order to keep the NPAG material for reclamation and on site construction, a separate storage area of NPAG rock was proposed. This information was submitted as a Plan revision in accordance with the Water License. The expansion is still within the original mine footprint and all runoff is directed to the TSF or the Attenuation pond (currently the South Cell TSF) as originally designed. At the end of mining activity this NPAG storage will be utilized for capping of the TSF's and the PRSF will return to the original dimensions.

The North Diversion ditch ensures that all non-contact water drainage is diverted from the Tailings and waste rock storage areas. Construction of the diversion ditches was completed in 2012. The NAG waste rock extension construction will continue until closure (2017). Any progressive closure activity will allow for material to be taken from the extension in 2015 and/or 2016, i.e., for tailings pond reclamation.

5.3 TAILINGS STORAGE FACILITY

5.3.1 Tailings Storage Facility Capacity*

As required by Water License 2AM-MEA0815 Schedule B-7: ***An update on the remaining capacity of the Tailings Storage Facility.***

At the end of 2014, a total of 4,750,663 m^3 of tailings slurry was deposited in the tailings storage facility (North Cell and South Cell TSF) in 2014. A monthly summary of the tailings volume is provided in Table 5.3. From 2010 to 2014, a total of 20,664,254 m^3 of tailings slurry has been deposited in the TSF's.

As of December 2014 a total of 12,636,984 m^3 of tailings (tailing dry in situ density calculated at 1.28 tons/m^3) has been deposited in the North Cell TSF. A total of 386,029 m^3 of tailings has been deposited in the South Cell TSF. The deposition in the South Cell TSF started at the end of November 2014.

As updates to the mine occurred in 2014, AEM revised the tailings deposition plan in July 2014 (available in *Mine Waste Rock and Tailing Management Plan* presented in Appendix D1). The deposition model completed is valid until the end of the mining operation in 2017. The model is based, on the data collected during previous years operation data. The filling scheme for the two cells of the tailings storage facility is designed for a single point end of pipe discharge, aimed at:

- Avoiding ice accumulation on the dike liner;
- Prevent tailings beach to reach the reclaim barge/system;
- Reclaim water pond maximum elevation of 148m for the North Cell / 135.7m for the South Cell (to maintain a minimum freeboard of 2.0 m);
- Tailings beach to reach elevation 149.5 m for the North Cell / 137.2 m for the South Cell;
- Limit as much as possible deposition at the north end of the North Cell during winter to reduce risk of freezing pipes and ice entrapment;
- Raise beach on RF1 and RF2 to prevent tailings water from seeping out of the North Cell;
- Raise beaches on all external structures such as the roads around the tailings pond to prevent reclaim water from seeping towards the diversion ditches;
- Promote tailings beach along the upstream face of Central Dike; and
- Avoiding ice accumulation on the Central Dike liner.

An ice model has been developed to reproduce the impact of ice formation on the tailings deposition. The main parameters of the model consist of:

- The water balance used in this model assumes reclaim flow changes as a function of the season: summer 90 m^3/h fresh water (FW) & 320m^3/hr reclaim water (RW), and winter 150 m^3/h FW & 260 m^3/h RW;
- The model assumes a tailings dry density and a water balance that incorporates ice entrapment of 1.28t/m^3 for both the North and South Cell;

* TSF- Tailings Storage Facility

- Sub aerial tailings slope set at 0.45% and sub aqueous tailings slope set at 2.36% for the North cell (obtained from summer 2014 bathymetric analysis); and
- Sub aerial tailings slope set at 0.45% and sub aqueous tailings slope set at 4% (taken from the 2012 Golder Deposition plan of the North Cell) for the start of the South Cell.

The main conclusions from the modeling results are:

- The total estimated capacity of the TSF North Cell (structures at El.150m) and South Cell (structures at El.137.7m) is 28.24 M t (21.78 M m^3);
- North cell: 17.74 M t (13.58 M m^3);
- South cell: 10.50 Mt (8.20 M m^3);
- The estimated remaining capacity in the TSF is 8.76 Mm^3 (11.52 Mt);
- The first phase of North cell deposition was completed and the end of November 2014;
- The first phase of South cell deposition started at the end of November 2014 and will proceed until June 2015;
- The reclaim water system was transferred to the South Cell in November 2014;
- The second phase of the North cell deposition will start in June 2015 and the cell will be closed in October 2015;
- The water will be transfer from the North Cell to the South Cell during the second phase, as the reclaim water system will remain in the South Cell;
- The second phase of the South cell deposition will start in November 2015 until the end of mine life; and
- As the deposition in the South cell will resume in November 2015, the South cell reclaim road and the peripheral infrastructures needed for the tailings deposition will be constructed or raised during summer season of 2015 and 2016 to provide the required tailings storage capacity.

5.3.2 Fault Testing and Monitoring

As required by Water License 2AM-MEA0815 Schedule B, Item 15: ***Results of monitoring pursuant to the Fault Testing and Monitoring Plan (August 2007).***

Fault testing and monitoring were completed in 2011. See 2011 annual report for more information.

5.3.3 Tailings Freezeback and Capping Thickness

As required by NIRB Project Certificate No.004, Condition 19: ***Provide for a minimum of two (2) metres cover of tailings at closure, and shall install thermistor cables, temperature loggers, and core sampling technology as required to monitor tailing freezeback efficiency. Report to NIRB's Monitoring Officer for the annual reporting of freezeback effectiveness.***

And

As required by Water License 2AM-MEA0815 Schedule B, Item 17: ***A summary of on-going field trials to determine effective capping thickness for the Tailings Storage Facility and Waste Rock Storage Facilities for the purpose of long term environmental protection.***

<u>Saddle Dam 1</u>

AEM began to determine capping thickness in 2009 by installing thermistor SD1-T2, SD1-T3 and SD1-T4 on Saddle Dam 1 to monitor the thermal condition within the structure and its foundation. The results are illustrated on Figure 5 to 8. The thermistor data from SD1-T2, SD1-T3 and SD1-T4 showed that the dike foundation remained frozen during the past year. Below the rockfill shell, the foundation soil and bedrock remained in a frozen state with temperatures ranging from about -2°C to -7°C. At the upstream toe, below El. 132 m, the compacted till base material below the liner remained frozen. The rockfill shell remained frozen, with the exception of the active layer (upper 2 m) that thawed in the summer. The SD1-T1 thermistor string was installed in the centre of the upstream face of the dike immediately beneath the geomembrane liner to monitor temperatures within the deposited tailings. A thin layer of protective granular material exists above the geomembrane liner at this location. This thermistor records values similar to the ambient air temperature above El. 144 m. Stable values around 0°C were recorded during the year (in the winter and in the summer) below El. 144 m. It is anticipated that data collected from this location will be useful in monitoring the freezing of the tailings in the coming years.

Saddle Dam 2

AEM also installed thermistors SD2-T1, SD2-T2, SD2-T3 and SD2-T4 on Saddle Dam 2. SD2-T1 was installed in 2012 in the center of the upstream face of the dike immediately on top of the geomembrane liner to monitor the thermal regime of the tailings in contact with the structure. This thermistor records values similar to the ambient air temperature above the tailings. The tailings were frozen during the winter of 2013 and 2014. Temperatures above 0 were recorded in the summer of 2013. It is anticipated that data collected from this location will be useful in monitoring the freezing of the tailings in the coming years. SD2-T2 to SD2-T4 was installed to monitor the thermal condition within the structure and its foundation. The results are illustrated in Figure 9 to 12. Thermistor data from within the structure indicate that the dike foundation remained frozen from September 2013 to September 2014 with temperatures ranging from about -5°C to -20°C. At the upstream toe of the dike, the semi-pervious backfill remained frozen during the year. Most of the rockfill stayed in a frozen condition with the exception of the upper 3.5 m (active layer) that thawed in the summer of 2014.

Stormwater Dike

In 2012, AEM installed a thermistor (T147-1) at the downstream toe of Stormwater Dike. Results for this thermistor can be found in Figure 13. This thermistor is being utilized to monitor the freeze back of the talik, and in the future will be used to monitor the thermal regime beneath the tailings in the South Cell. Overall, thermistor T147-1 shows the existence of a frozen crust of material from El. 120 m to El. 113 m that stayed frozen during the summer of 2014. Below El. 113 m, the temperature varied between 0.3°C and 0.1°C. The temperature recorded by this thermistor below El. 113 m shows a slow cooling trend.

Tailings

Thermistor SD1-1 was installed in 2012 in the tailings upstream of SD1. Additional thermistors were installed in the tailings in April 2014. Thermistor SD2-1 was installed upstream of Saddle Dam 2 and SWD-1 was installed upstream of the Stormwater Dike. All the nodes from SD-1 are covered by more than 4.0 m of tailings. The thermal results from this thermistor show that the tailings are frozen. The foundation (till from the tundra) showed temperature close or below 0 Celsius. For thermistors SD2-1 and SWD-1, thermal results show that tailings are completely frozen in the winter and from approximately 1.2

m down to the tailings surface during summer period. For the thermistor SD2-1, the foundation (till from the tundra) showed temperature below 0 Celsius. For the thermistor SWD-1, the foundation (till and bedrock) show temperatures above 0 Celsius, as expected since this thermistor is located in the talik portion of Second Portage Arm. Due to technical difficulties to protect the thermistor cables from excessive tension, thermistors SD2-1 and SWD-1 were operational respectively until July 2014 and October 2014. It is anticipated that data collected from the tailings will be useful in monitoring the freezing of the tailings in the coming years. These data are also being used in the design work of the tailings cover required at closure.

Additionally, two test pads (experimental cells) were constructed in June 2014 in the North Tailings Cell to evaluate the efficiency of different tailings cover designs and thickness. This work was done in collaboration with the RIME (Research Institute of Mine and Environment) as part of a research project. The two experimental cells were built: one with a cover of NPAG material of 2.0m over the tailings, and one with a cover of NPAG material of 4.0m over the tailings. The experiment cells are instrumented with temperature probes, water content probes, suction probes and oxygen consumption probes. The data from the instrumentation is collected by AEM and sent to RIME for analysis. When additional data will be available after a complete year of instrumentation readings, the data will be presented and commented on in the 2015 Annual Report. Additional test pads may be constructed over the tailings in 2015. This information will also use in the design work of the tailings cover required at closure.

RF1, RF2 and Rock Storage Facility

Other thermistors were installed in 2012 in the TSF to monitor the temperature of the tailings as well as the temperature of RF1 and RF2 (which delineates the northeastern side of the TSF's North Cell). Plots of these thermistors data are presented in Figure 14 to 16. Three thermistors are installed on RF1 (T121-1, T73-6, and RF1-3). Thermistor T121-1 shows temperatures which vary from 0.5°C to -5°C. Thermistor T73-6 shows a wide range of temperatures above El. 145 m, but below that elevation the temperature fluctuates between 1°C and -2°C. A similar trend was observed last year but for a lower elevation. This trend indicates the presence of an active zone within the upper elevation of the deposited tailings. RF1-3 shows frozen conditions all year long below El. 146 m with temperatures varying between 0°C and -7°C. Above that elevation, the temperature seems to fluctuate seasonally between 18°C and -32°C. This trend indicates the presence of an active zone within the upper elevation of the deposited tailings. One thermistor is installed on RF2 (T122-1) and shows temperatures which vary from -2°C to -7°C, indicating that the RF2 foundation is in a frozen state. Plots of this thermistor data is presented in Figure 17.

Thermistors are also installed in the Waste Rock Storage Facility. RSF-1 was installed in February 2013 and RSF-3, RSF-4, RSF-5 and RSF-6 were installed on the RSF in November 2013. The results of the thermistor RSF-1 indicates that below approximately 5.6 m from the surface, the temperature remains below 0 Celsius all year long.

As part of the research project with the RIME, additional instrumentation will be installed in 2015 to evaluate the performance of the Waste Rock Storage facility. The 2015 Annual Report will comment on the design and on the installation of the instrumentation program that will be completed in the RSF in 2015.

In the 2012-2013 Annual Monitoring report NIRB (recommendation 14) "*The Board requests that AEM provide a plan of action and a discussion on its permafrost monitoring program that would include Second Portage Lake, Portage Pit and Bay Goose Pit as outlined in the FEIS*".

The action plan and permafrost monitoring program for Second Portage Lake, Portage Pit and Goose Pits were submitted to NIRB previously in response to the above mentioned recommendation. Below is an update with the 2014 data.

Second Portage Lake

To monitor the permafrost aggradation and talik beneath Second Portage Lake, AEM installed a thermistor (SD1-1 T90-2) in the North Cell tailings and a single deep thermistor (T147-1) at the downstream toe of Stormwater Dike in 2012. Thermistor SD2-1 was installed upstream of the Saddle Dam 2 and SWD-1 was installed upstream of the Stormwater Dike in April 2014. Please refer to text above for more information.

New thermistors were installed on Central Dike in the winter of 2013 to monitor the dike's performance, and provide information on the permafrost aggradation of SPL, along and following construction, operation, and into closure (Refer to Section 4.5 and Appendix C2 of the *2014 Annual Geotechnical Inspection* report available in Appendix B1 of this report). The following observation of the thermistors can be made:

- The instruments installed along the central key trench show thawed conditions within the till and the bedrock and within the majority of the rockfill (except for the presence of an active zone in the upper portion of the dike).
- The instruments installed along the downstream toe of the final Central Dike footprint indicate the presence of an active layer at the top of the bedrock which fluctuates between 3°C to -3°C. At deeper elevations, the bedrock is in thawed condition with temperatures varying between 2.5°C and 1°C.

Portage Pit

No thermistors were installed directly in Portage Pit because of the mining activities. However, the permafrost aggradation can be monitored with the thermistors installed in the East Dike and Central Dike.

Five thermistors have been installed on East Dike. Since different observations were made for each thermistors please refer to Section 4.1.2 of the *2014 Annual Geotechnical Inspection* found in Appendix B1.

As part of the instrumentation in the Central Dike, thermistors, as mentioned, were installed during the winter of 2013 to monitor the dike's performance. These were installed along the west side of Portage Pit. The following observation of the thermistors can be made:

- The instruments along the Portage Pit limit show variable results. The bedrock temperature varies between -3°C and -5°C at 465-P3, stays around -1°C at 650-P3, and is about 1°C at 875-P3. This seems to indicate that a permafrost condition is developing along the Portage Pit west wall perimeter.

Goose Pit

The permafrost in Goose pit can be monitored by the thermistor SD-09-A which is located on South Camp Dike approximately 20 m further upstream within Third Portage Lake. As mentioned in Section 4.2 of the *2014 Annual Geotechnical Inspection* found in Appendix B1, this thermistor showed:

- The temperature profile at SD-09 on the upstream side of the dike shows that the soils located beneath the dike foundation and liner appear to have remained frozen (permafrost) below El. 130 m;

Also, thirty-three thermistors (from T1 to T30 and T3' to T5') are installed on Bay-Goose Dike. Please refer to Section 4.3.2 of the *2014 Annual Geotechnical Inspection* for a complete review. New thermistors were installed in 2012 between Bay Goose Dike and Bay Goose Pit to monitored aggradation of permafrost. To date, result show that the freezeback is occurring. Monitoring in the next years will provide more useful data about this aggradation of permafrost.

SECTION 6. WASTE MANAGEMENT ACTIVITIES

6.1 LANDFILL MONITORING

As required by Water license 2AM-MEA0815 Schedule B, Item 8*: Summary of quantities and analysis of seepage and runoff monitoring from the landfills.*

Seepage and runoff monitoring of the Landfill is discussed below in Sections 8.1.4 and 8.1.5.

6.2 SOLID WASTE DISPOSAL ACTIVITY

As required by Water License 2AM-MEA0815 Schedule B, Item 9: ***A summary report of solid waste disposal activities including monthly and annual quantities in cubic metres of waste generated and location of disposal.***

And

NIRB Project Certificate No.004 Commitment 74*: Provide annual report of the quantity and type of waste generated at the mine site distinguishing landfilled, recycled and incinerated streams.*

A monthly summary of the amount of waste transferred to the landfill and sent to the incinerator in 2014 is included as Table 6.1. The waste consists primarily of plastics, fiberglass, wood, cardboard, rubber, clothing and some metal that was not recycled. The April and August amounts of waste transferred to landfill were unfortunately misplaced. Based on the available data, AEM estimated this amount to be 1,076 m^3 of solid waste sent to the landfill for each of these two months. The Environmental Department has advised Site Services Department that the monthly amounts of waste is required and all staff involved must ensure that the volumes are recorded for each month in the future.

In 2013, AEM had determined that there was an overestimation of the quantity of waste sent to the landfill. In the past AEM has calculated the amount of waste based on the number of truck roll off bins (containers) deposited at the landfill. However, by using this method, AEM assumed that the containers sent to the landfill were 100% full. This was not the case for all containers. For this reason, beginning of 2014, AEM checked the waste volume estimates by bin compared to a volume estimate from a field survey. Results of the survey determined that most of the containers sent to the landfill in 2014 were approximately 50% full. Based on this new information, AEM applied this 50% factor to the number of container sent to the landfill and determined that the volume of waste sent to the landfill was 6,458m^3 in 2014. The volume of waste sent to the landfill based on an engineering survey estimated a volume of 6,509m^3 for 2014 (the survey is considered more accurate but the volume based on the 50% factor is very close to the survey volume). Table 6.2 below indicates the volume of waste in m^3, from the engineering survey, disposed of in each sub-landfill and Figure 18 indicates the location of each sub-landfill used to date. Sub-landfill #5B is currently in operation and sub-landfill #1 to #5A were closed and covered with NPAG waste rock. At the end of January 2015, a total of 2,768m^3 of waste had been disposed in landfill #5B.

Table 6.2: Volume of waste disposed in each sub-landfill (from engineering survey)

Landfill	Coordinates (UTM)			Volume (m^3)	Date Covered
	Northing	Easting	Elevation		
#1	7215715.58	638601.45	160	3650	Dec-12-2012
#2	7215795.79	638711.42	186	840	Feb-27-2013
#3	7215743.12	638827.77	195	1656	May-14-2013
#4	7215796.48	638890.93	200	9507	Jan-19-2014
#5A	7206586.10	643115.90	210	3870	Nov-30-2014
#5B	7206586.10	643115.90	210	TBA	TBA

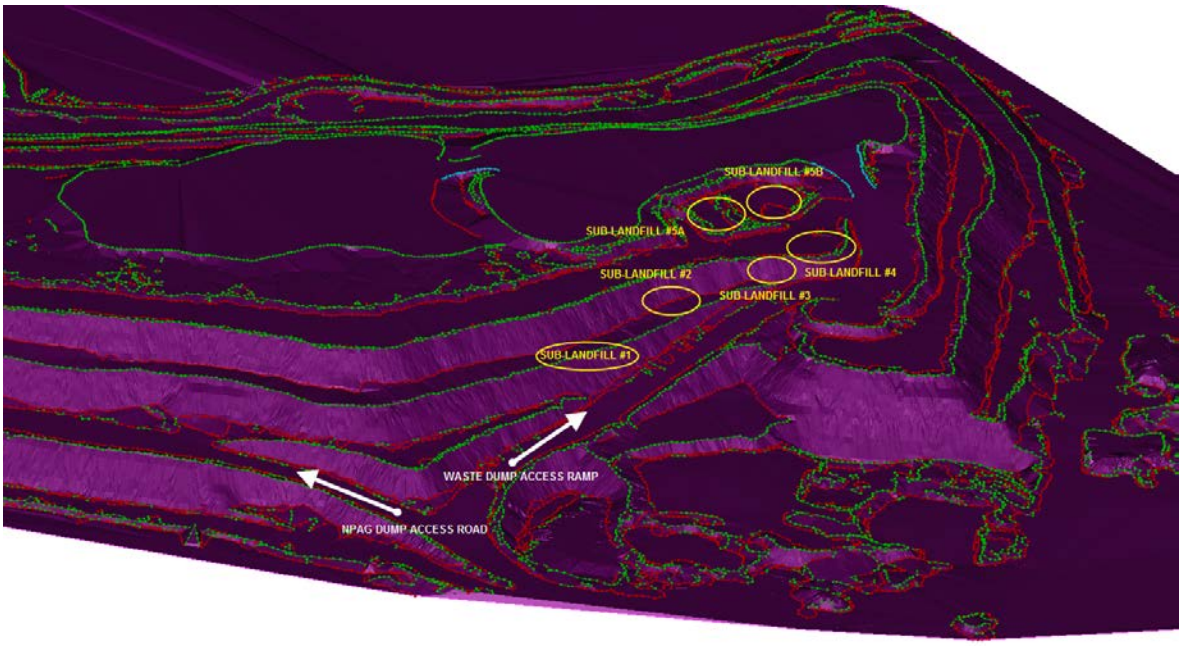


Figure 18: Sub-landfill location

In 2014, a total of 138 sea cans filled with hazardous waste materials (924.2 tonnes) and 144 sea cans filled with steel (1,359 tonnes – recyclable material) were collected from the Meadowbank project area. The sea cans were shipped from the spud barge at AEM's Baker Lake marshalling facilities to Becancour, Quebec by sealift. The materials were subsequently shipped to a licensed hazardous waste and metal recycling companies in the Province of Quebec (recycling or permanent disposal). The waste materials were transported under Waste Manifest #'s 9331181-9, 9331185-0, 9331182-7 and 9331184-3; copies of these manifests are attached in Appendix E1. A description of the types of waste, packaging and volume is provided in Table 6.3.

Several projects for waste reduction/recycling were undertaken or ongoing in 2014 at Meadowbank:

- Recycling of used protective personnel equipment (PPE) ongoing

- The objective of the *Used PPE Project* is to provide a second life to reusable PPEs. With the collaboration of all departments, AEM collected used PPE around the Meadowbank site to create a used PPE inventory. This used PPE is now reused instead of ordering new equipment and disposing of reusable materials in the landfill. All employees have to search the used inventory prior to ordering new. This initiative has been successful in reducing waste sent to landfill and as an overall cost saving measure.

- Waste oil recycling plan
  - AEM has an existing waste oil recycling plan. In 2014 AEM reused approximately 87,750L of waste oil as a fuel source in the on-site incinerator (12,750L) and in three waste oil heaters (75,000L).

- Steel Recycling
  - A total of 1,359 tonnes of steel was packaged and transported south for recycling. This material was removed from our solid waste stream and not landfilled on site. In 2013, AEM initiated a program of puncturing steel aerosol cans to render them as recyclable steel instead of hazmat. This added approximately 11.5 tonnes to our recyclable steel amount in 2014.

- Aluminum Recycling
  - In 2014, no aluminum pop cans were donated as was in previous years. Used pop cans are still stored at the Meadowbank site and will be donated in 2015 to a local charity.

- Wood Recycling
  - In 2014 the Meadowbank Environmental Committee took an initiative to start used pallet recycling program with the community of Baker Lake. Used pallets that were free of contamination, were saved at the Meadowbank site in sea cans. Once a sea can was full this sea can was added to the backhaul list and taken to the community for residents to use as they wish. One major user was the local high school's Carpentry department. The teacher of this department planned projects for students, utilizing the free wood supplied by Meadowbank.

6.3 INCINERATOR

As per Water License 2AM-MEA0815 Schedule B, Item 10: ***Report of Incinerator test results including the materials burned and the efficiency of the Incinerator as they relate to water and the deposit of waste into water.***

And

NIRB Project Certificate No.004 Condition 72: ***On-site incinerators shall comply with Canadian Council of Ministers of Environment and Canada-Wide Standards for dioxins and furan emissions, and Canada-wide Standards for mercury emissions, and AEM shall conduct annual stack testing to demonstrate that the on-site***

incinerators are operating in compliance with these standards. The results of stack testing shall be contained in an annual monitoring report submitted to GN, EC and NIRB's Monitoring Officer.

The incinerator was in operation throughout 2014. The incinerator daily report logbook is included in Appendix E2. The daily report logbook entry is available for all the months. Based on the data, approximately 40% of the material incinerated was food waste; the other 60% was dry waste comprised of food containers, cardboard boxes, paper and absorbent rags. The location of the incinerator is highlighted in Figure 1.

As per discussions with Environment Canada, the frequency of stack testing changed in 2012 to every other year as it was deemed unnecessary each year, due to the fact that the waste stream at Meadowbank remains constant. As a result, the last incinerator stack testing was completed by Exova Consultants on October 2012.

In accordance with AEM's *Incinerator Waste Management Plan*, stack testing was conducted from July 11 to July 13, 2014 by Exova. The "*Stack sampling tests Report"* is provided in Appendix E3. Results from this test indicated that mercury level average (of 3 tests) (64.09 µg / Rm³ @ 11 % v/v O_2) exceed the Environment Canada guideline (20 µg / Rm³ @ 11 % v/v O_2) during the incinerator stack testing. Laboratory re-analysis confirmed these results. As a result an investigation with Meadowbank's site services department was performed to determine the potential sources of this exceedance. Although AEM has an alkaline battery recycling program, the investigation revealed that there could be a significant volume of batteries disposed of along with regular solid waste destined for the onsite incinerator. This would seem to be the most likely source. In addition, it is also possible that the incinerator may have been overloaded on the day of testing which would result in some incomplete combustion but this would not be considered as a major contributing factor. By comparison, it should be noted that the 2012 result for mercury was <0.10 µg / Rm³ @ 11 % v/v O_2. AEM is of the opinion that this was a likely a one-time event. The Dioxin and furans results (53.6 pg TEQ / Rm³ @ 11 % v/v O2) are well below the EC guideline (80 pg TEQ / Rm³ @ 11 % v/v O_2). As a result, AEM has implemented a comprehensive site wide information program to reinforce the requirements of the battery recycling program. This includes regular meetings with individual departments as well as placing information on the AEM intranet site. In addition confirmatory stack testing will take place again in the summer of 2015.

The annual ash sample was collected from the incinerator on July 7, 2014, in accordance with AEM's '*Incinerator Waste Management Plan'* (AEM, July 2014, v5). The purpose of sampling ash is to determine if it is acceptable for disposal in the landfill pursuant to the Government of Nunavut (GN) Environmental Guidelines for Industrial Discharge (2002). The July sample indicates an exceedance of the chromium guideline. As per the management plan, ashes were disposed of in the TSF instead of landfill. As soon as AEM received the elevated chromium, an investigation was undertaken. Sampling frequency was increased from annually to monthly from September to December. After investigation, incinerator ash chromium exceedances for July and September were caused by unnecessary burning of pop cans. As a result, operators were instructed not to incinerate the pop cans. Side wide notification advised site personnel to utilize the pop can recycling containers. October sampling indicated reductions in chromium to levels below the guidelines. Results from this monitoring are provided in Table 6.4. Results from October to December were below guidelines; therefore the incinerator ash was acceptable for disposal in the Meadowbank landfill. Starting in January 2015 ash will be disposed of in the landfill instead of TSF. AEM will continue monitoring the ash quality quarterly which is an increase from the 1x/year sampling frequency stated in the *Incinerator Waste Management Plan*.

In 2014, approximately 592,250 L of waste oil was generated on site. Of this approximately 87,750L was reused as fuel with the remainder being transported south to an approved recycling facility. Table 6.5 provides a breakdown of the volume of incinerated waste oil by month.

In addition to the above testing, waste oil destined for burning in the incinerator was randomly sampled on a monthly basis and compared to the NWT Used Oil and Waste Fuel Management Regulations (NWT, 2003). This data is presented in Table 6.6. All metals and PCB parameters met the NWT guidelines with the exception of one sample containing an elevated level of chlorine. An investigation has not determined the source of the elevated Chlorine levels however AEM will continue to monitor the situation if it occurs again in 2015.

6.4 ADDITIONAL INFORMATION

As required by Water License 2AM-MEA0815 Schedule B, Item 24: ***Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.***

The Board did not request any additional details on waste disposal in 2014.

SECTION 7. SPILL MANAGEMENT

As per Water License 2AM-MEA0815 Schedule B, Item 11 ***A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken.***

A summary of all unauthorized discharges that occurred in 2014 is presented in Table 7.1. This data was also included in monthly monitoring reports submitted to the NWB. GN Spill Reporting Forms for 9 reported spills are included in Appendix F1. Please take note that the spill that occurred on July 11, 2014 was supposed to be reported to the GN but following logistic error it was not. Description of this spill can be found in Table 7.1. AEM did not receive the spill report identification number for these occurrences.

Spill prevention training was emphasised in 2014 for employees to prevent and to report spills, as follows:

- All employees and contractors must participate in an induction session online prior to the arrival at the mine site, which includes a training section on spill management (prevention, reporting and cleaning);

- Every employee and contractor who operates a vehicle on the site must participate in training on vehicle operation. Spill management is a component of this training session;

- 63 toolbox meetings were given by the Environmental Department to different departments at Meadowbank. Topics during the meetings included waste management, hazardous materials, spills, wildlife, environmental policy and department specific subjects. Departments receiving these toolbox sessions included security, powerhouse, warehouse, mine, mill, maintenance, site services, camp, kitchen, FGL maintenance and others (housekeeping, Arctic Fuels, etc.);

- 9 personnel at the Baker Lake Marshalling facility were given an information/training session on how to react to a major spills at the Baker Lake Bulk Fuel Storage & Marshalling Facility during the refueling barge season. Among these personnel were Marshalling Area Supervisors, Warehouse Technicians, Environmental Technicians, and contractors from Intertek. This training was provided by the Environment Department.

Landfarm

The Meadowbank landfarm was constructed in 2012 to treat petroleum hydrocarbon-contaminated soil generated at Meadowbank facilities and the Exploration Camp. The landfarm is located within the perimeter of the South Cell TSF at a sufficient elevation so as to not affect the TSF until after closure.

Approximately 305 m^3 of soil was transported to the landfarm in 2014. The majority of material was generated through the clean-up of spills at the Meadowbank site, with the exception of three spills occurring in Baker Lake locations and one at Quarry 19. All sources of contaminants (petroleum hydrocarbons – diesel, motor oils, etc.) were known so no samples were taken of this contaminated soil.

Approximately 400 m^3 of remediated fine material was removed from the landfarm in August, 2014, and used for the construction of a filter protection structure along the RF1 and RF2 road between the TSF North tailings Cell and the RSF. This included a coarse/fine mix from the top 1 m of several piles which

met GN criteria for agricultural/wildlands or industrial use. In addition, an estimated 235 m^3 of non-contaminated coarse material (unstained rocks) were removed by screening, and stockpiled for eventual re-use.

Sewage sludge continues to be used in the landfarm as a soil amendment. Sewage sludge was spread across all piles as a nutrient amendment in September (41 m^3) and October (27 m^3), 2014.

The total volume of the landfarm is 11,136 m^3. Based on additions and removals to date, the total remaining capacity of the landfarm is approximately 7,159 m^3.

Please see in Appendix F2 the "*2014 Landfarm Report"* which contains more information on landfarm activities in 2014.

Follow-up on Assay Road Seepage

On November 4, 2013, it was observed that water was seeping thru the road in front of the Assay Lab Road. After investigation, it was determined that the seepage was coming from the process plant, specifically leakage from containment structures, (due to the presence of CN, Cu and Fe in sample analysis results). On November 8, 2013 the discharge of seepage was reported to Government Agencies via the GN Spill Reporting Phone line. On November 12, 2013 spill report updates #1 and #2 were forwarded. On November 19, 2013 and December 11, 2013 spill report updates #3 and #4 were sent, respectively. Please refer to the spill report and update #1 to #4 for more information (2013 Annual Report, Appendix F1).

The seepage area froze back and was not visible from November 24, 2013 to mid-May 2014. In December 2013, AEM engaged Tetra Tech (formerly EBA) to perform an assessment, drilling delineation program and provide a report with recommendations in early 2014. AEM received the *Meadowbank Mine, Assay Road Seepage Phase 2: Environmental Site Assessment and Engineering QA/QC, TetraTech EBA* (2014) in August (Appendix F3) and has put into place immediate recommendations. All recommendations made in this report will be completed, prior to closure. AEM also put in place an internal action plan and monitoring program for this seep. This is known as the Freshet Action Plan (2014). The Plan is designed to ensure that noncontact water controls are inspected and managed appropriately during freshet and that site wide inspections are conducted to ensure potential or occurring seepages are managed to prevent adverse environmental impacts. This plan describes the action to be done before, during and after the freshet. This plan will also be implemented during the 2015 (and in future) freshet. Refer to the Freshet Action Plan found in Appendix D of the *2014 Water Management Report and Plan* (Appendix C1) for more details regarding the monitoring and action taken by AEM before, during and after the freshet.

In April 2014, a design for an interception trench was approved by Tetra Tech (formerly EBA). Construction of the interception trench started in April and was completed by the beginning of May. In Section 6 of the *Meadowbank Mine, Assay Road Seepage Phase 2: Environmental Site Assessment and Engineering QA/QC, TetraTech EBA* (Appendix F3), is the as-built construction report as per NWB Water License 2AM-MEA0815 Part D, Item 26.

In mid-May 2014, with the freshet, some water was accumulated as predicted in the original constructed containment sump area and the new interception trench. The water in the interception sump and original

sump was pumped back to the mill from Mid-May to October. Volumes of pumped seepage diminished during the summer which coincided with repairs and sealing of containment structures within the mill (source of spill). Refer to Table 7.2 for a breakdown per month. A recovery well (MW-203) was installed adjacent to the mill before the defined seepage area and interception trench. There is a continuous water source in this area and the pump has been operational since November 2014. This water is analysed on site for CN WAD and monthly volumes. The water is pumped back into the mill for use in the process. It is important to note that the CN WAD concentrations are diminishing significantly. November and December water flow from well MW-203 was a total of 842 m^3 and 871 m^3 respectively. Total yearly volume that has been pumped from the MW-203 well and the containment structures is 14,698 m^3.

Table 7.2: Assay Road Seepage pumped volume

Month	Pumped Volume(m^3)
January	0
February	0
March	0
April	0
May	2,450
June	1,935
July	1,158
August	3,979
September	2,420
October	1,043
November	842
December	871
Total	**14,698**

During the freshet and the open water season, daily inspections of the area were conducted in 2014 and all the water was contained (within the original containment berms or interception trench). At the end of August, the inspection frequency was decreased to weekly and after rain events. Table 7.3 contains all the monitoring results from the seepage and includes stations in the initial containment berm (north and south), interception trench, monitoring wells (shallow) downstream of the trench (see well MW-04 to MW-08 on Figure 19 below), and Third Portage Lake (TPL-Assay). It should be noted that wells MW-04, MW-05 and MW-06 have been mostly (7x/8 sampling events) dry since the 2014 installation. One sample was obtained from these wells in August, 2014. This indicates that the interception trench and initial containment was substantially successful in prevent seepage from migrating to TPL. This was confirmed with near shore sampling in TPL; to date no contaminants (copper, total CN or free CN) have been detected in the lake (TPL-Assay, see Figure 19). In fact the water meets CCME criteria for Protection of Aquatic Life for all parameters of concern.

CN Free results at MW-04 and MW-08 were all <0.01 mg/l (it should be noted that this detection level is greater than the CCME criteria for protection of Aquatic Life of 0.005 mg/l). MW-08 appears free of any contamination which is indicative that the seepage has not migrated in a southerly direction. Cn Total was detected in MW's 04, 06 and 07 at low levels while Copper was evident at MW's 04 and 07. The initial containment berm was basically dry from June 28 thru September which suggests that the seepage diminished through the 2014 monitoring season. Results of monitoring in the interception trench illustrate major decreases in the levels of the contaminants during the monitoring season. This is further evidence

that the contamination has decreased in magnitude which is indicative that the plume was contained and that the majority of the material was pumped back to the mill. No seepage was observed from October to November 2014 as the area was frozen.

By December 31, 2014 all repairs and sealing of the containment areas in the mill was completed which effectively "cut off" the source area.

Further to the monitoring program outlined in the 2014 Freshet Action Plan, which AEM will continue in 2015, additional monitoring will be conducted at the request of the KIA (in TPL). It should also be noted that AEM has made arrangements with our accredited laboratories to ensure that the detection limit for CN Free is <0.005 mg/l.

In summary, monitoring in TPL indicates that there has been no impact to the near shore receiving waters. The seepage appears to be effectively contained and the source area has been repaired. Follow up monitoring will continue in 2015 in accordance with the 2014 Freshet Action Plan and as per a KIA request to conduct additional sampling in TPL.

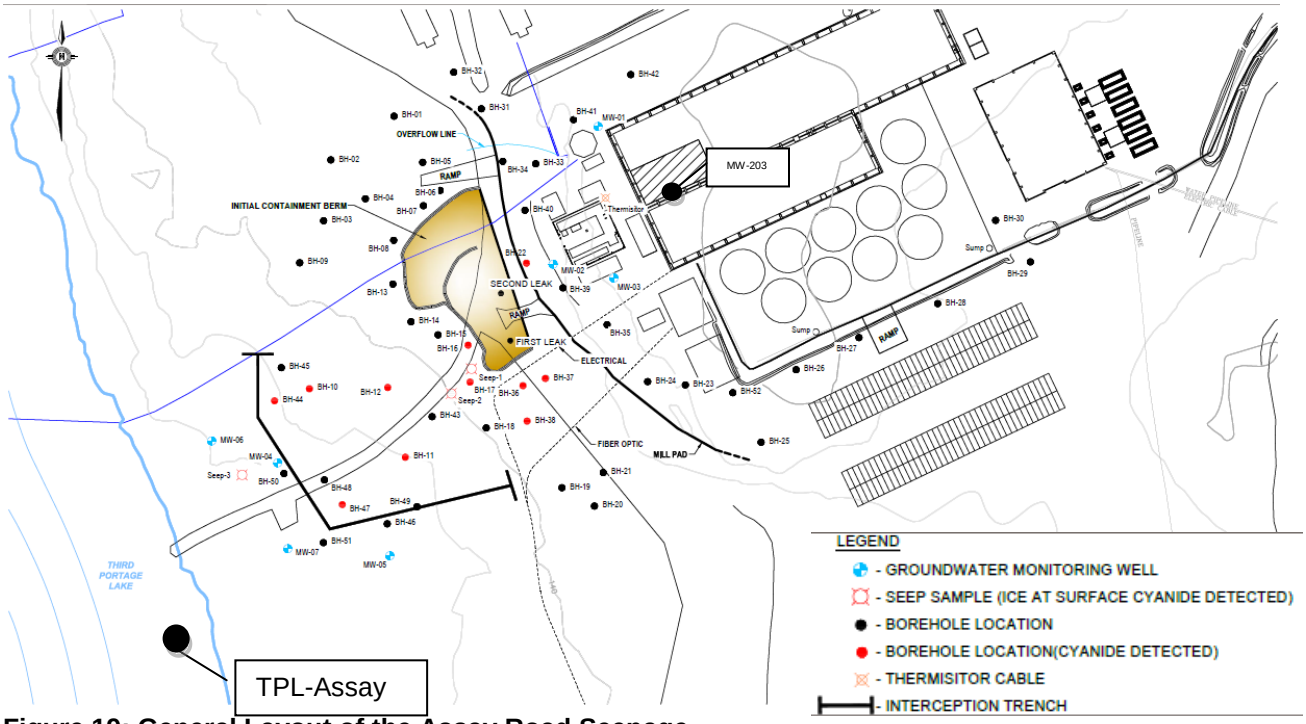


Figure 19: General Layout of the Assay Road Seepage

As required by NIRB Project Certificate No.004 Condition 82: ***Monitor the ingress/egress of ship cargo at Baker Lake and report any accidents or spills immediately to the regulatory agencies as required by law and to NIRB's Monitoring Officer annually.***

In 2014, AEM monitored the ingress/egress of ship cargo at Baker Lake and the results are summarized in the below Figure 20.

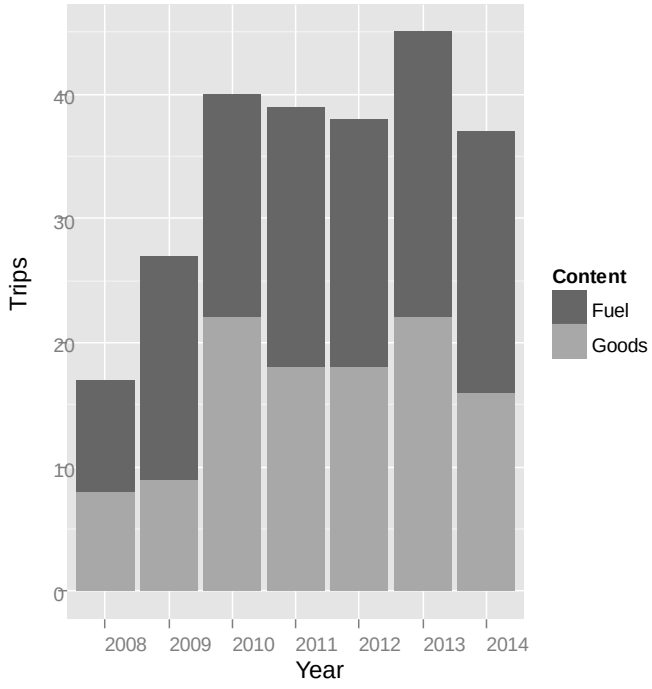


Figure 20- Barge traffic (number of trips/year) arriving in Baker Lake from Chesterfield Inlet since 2008.

In 2014, no spills occurred during the ship cargo ingress/egress.

As required by NIRB Project Certificate No.004 Condition 75: ***provide a complete list of possible accidents and malfunctions for the Project; it must consider the all-weather road, shipping spills, cyanide and other hazardous material spills, and pitwall/dikes /dam failure, and include an assessment of the accident risk and mitigation developed in consultation with Elders and potentially affected communities***

A list of possible accidents and malfunctions are included in the following Meadowbank Gold Project management plans provided in Appendix I1 of the 2013 and 2014 Annual Report:

• *Hazardous Materials Management Plan*, v3, October 2013;
• *Spill Contingency Plan*, v4, November 2013;
• *Emergency Response Plan,* v6, August 2013;
• *Oil Pollution Emergency Plan* v5, November 2014;
• *OMS Manual for the TSF and dewatering dikes*, V4, January 2015.

Table 7.1 show all spills related to the all-weather road and other spills related to mine activities.

As per NIRB Recommendation 15 found in "*NIRB's 2013-2014 Annual Monitoring Report for the Meadowbank Gold Project and Board's Recommendation*": Condition 75 requires that the Proponent provide a complete list of possible accidents and malfunctions for various Project components which includes an assessment of the accident risk and mitigation developed in consultation with Elders and

potentially affected communities. Although it is unclear in the submitted management plans whether and how these were developed in consultation with Elders and potentially affected communities. The Board requests that AEM provide within its 2014 annual reporting, further discussion as to how various management plans relating to accident risk and mitigation have been developed in consultation with Elders and potentially affected communities

In its 2013 Annual Report, AEM complied with most of this condition, including the provision of a list of possible accidents and malfunctions as contained in the Spill Contingency and Emergency Response Plans. These Plans were originally reviewed as part of the NIRB and NWB License application process. As such there was extensive public review which included elder participation at the associated hearings.

Furthermore, AEM has consulted at least yearly with Elder representation as part of the Baker Lake Liaison Committee. AEM hosted meetings on August 5 and November 13, 2014. No significant spills occurred in 2014 and therefore possible accidents and malfunctions were not specifically discussed with at the committee meetings in 2014. Although there were no concerns raised regarding this issue, AEM did reassure the committee that the company would respond adequately to any spills occurring on the road and that we would assist Baker Lake ERT personnel with training (see minute excerpt below). AEM also holds a yearly meeting with the community at large (May 27, 2014), which includes elders, regarding road safety on the AWAR and this includes discussion about trucks hauling dangerous goods.

From Baker Liaison Committee (August 5, 2014):

"4) Environment update by Jeffrey Pratt

The caribou monitoring is continuing and as it has been done before and it will be done again is when the herd of caribou are on the road, the road will be shutdown. The workers on the road are also continually reminded when there are caribou on the road to ensure that the caribou have the right of way all the time or any wildlife for that matter. One great achievement is that Transport Canada recognized Meadowbank on the great job on the road, environment and wildlife. The safety program developed has been also approved with very positive results. The Environment department is continually active and ready to respond to any spills or emergency situations on all the roads. The Meadowbank has also been recognized to follow the cyanide code in ways of transporting and handling of the cyanides. We are also well prepared and available to Baker Lake on responding to emergency situations and continually looking at ways to assist Baker with their ERT by educating and training their personnel."

For 2015, as part of the International Cyanide Management Code (ICMC), AEM's intent is to engage and consult with the communities of Baker Lake and Chesterfield Inlet regarding the requirements of transportation and management of cyanide. AEM also plans to discuss management of other hazardous materials that are transported to the mine site and the Emergency Response Plan at these consultations. It is anticipated that there will be significant elder participation at these events. AEM is of the opinion that this NIRB condition has been complied with.

SECTION 8. MONITORING

8.1 AQUATIC MONITORING

This section includes the aquatic monitoring requirements from all aspects of the Meadowbank Project.

As required by Water License 2AM-MEA0815 Schedule B-13: ***The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.***

And

As required by DFO Authorizations NU-03-0191.3 Condition 3.1 (Mine), NU-03-0191.4 (Vault) Condition 3.1; NU-03-0190 Condition 6 (AWPAR);: ***Submit written report summarizing monitoring results and photographic record of works and undertakings.***

A list of the sampling location GPS coordinates for aquatic monitoring programs conducted by AEM is provided in Table 8.1. Summaries of associated aquatic monitoring reports are presented in the following section of this report and supporting documents are located in the listed appendices. Figures 1, 2, 3 and 4 illustrate the location of sampling stations at the Meadowbank mine site, EEM receiving environment monitoring program, Baker Lake marshalling facilities and the Vault Site, respectively. Certificates of Analysis are included in Appendix G1.

8.1.1 Construction Activities

As required by DFO Authorizations NU-03-0191.3 Condition 3.1, NU-03-0191.4 Condition 3.1;

There were no incidences where runoff water from any facility under construction would flow directly or indirectly into a water body.

8.1.2 Dewatering Activities

Mining activity in Vault Pit began in 2014, which required the construction of Vault Dike in order to isolate the mining area and create the Vault Attenuation Pond (see Figure 4). The Vault Dike was finalized in March 2013 and allowed AEM to start the dewatering of Vault Lake during open water season of 2013. As of December 31, 2013, Vault Lake was partially dewatered in order to isolate four separate deeper basins (A, B, C and D) (Figure 21) which formed the Vault Attenuation Pond.

Final dewatering of Vault Lake began on June 20, 2014 and was stopped on June 29, 2014. During these 9 days of dewatering, a total of 139,900 m^3 of water was discharged to Wally Lake. The dewatering of Vault Lake was officially completed on June 29 and the dewatered Vault Lake became the Vault Attenuation Pond (contact water).

The Vault Attenuation Pond will operate until the end of mine life in 2017. The Vault Attenuation Pond receives all pit sump and contact runoff water prior to any discharge to Wally Lake. If required, the water will be treated for TSS removal with an ACTIFLO solids removal system (Vault WTP) during summer months and discharged into Wally Lake. The discharge of contact water will be subject to both the Type

A Water License Part F Item 3 and MMER discharge criteria. Please refer to Section 8.1.4.5 for a complete review of the contact water discharge from Attenuation Pond in 2014.

In 2014 (June 20 – 29), the dewatering water was released into the environment without TSS treatment as Vault Lake water (as it was non-contact lake water) and was compliant with section 4 (1) of the MMER regulation and Part D Item 16 of the NWB Water License (discharge criteria).

Turbidity and Total Suspended Solids (TSS) were monitored daily and once per week in Wally Lake near the receiving outlet. In addition, pH and total aluminum were measured weekly. All of this data was previously reported to the NWB in the monthly monitoring reports. The sampling location named ST-DD-3 and WLE for the receiving outlet, are highlighted on Figure 4 and Table 8.2 provides the results.

Turbidity values were measured in the field by AEM environmental technicians and quality control calibration for the field equipment is discussed in Section 8.1.13. The license criterion for turbidity is 30 NTU for the 24 hour maximum, and 15 NTU for the 30 day mean maximum. For TSS, the 24 hour maximum grab sample criterion is 22.5 mg/L and 15 mg/L for the 30 day mean maximum. No exceedances of the license criteria were observed during the dewatering.

The results of pH and total aluminum monitoring are also presented in Table 8.2. pH values were measured in the field by AEM environmental technicians; quality control calibration for field equipment is discussed in Section 8.1.13. The license criterion for pH is between 6.0 and 9.0. For total aluminum, the 24 hour maximum grab sample criterion is 3.0 mg/L and 1.5 mg/L for the 30 day mean maximum. There were no exceedances of water license criteria.

In addition there were no exceedances of MMER criteria during Vault dewatering activities. Please refer to Section 8.1.12 for more details regarding the MMER monitoring of Vault Lake Discharge.

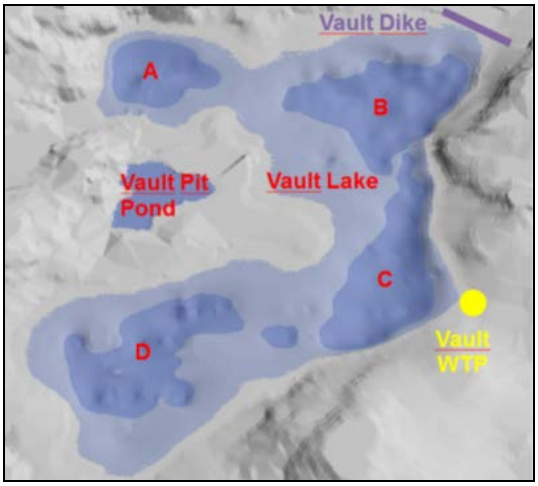


Figure 21 – Vault basin

Channel Crossing Inspections

Inspections of the Eastern and Central Channel Crossings were undertaken during the open water season in 2014 to ensure the banks of the channels were not being eroded as a result of the increase water flow due to the Portage Attenuation Pond discharge in Third Portage Lake. The inspections were undertaken on June 4, July 29 and September 7, 2014 by AEM environmental technicians.

There were no signs of erosion of the channel banks and no visible turbidity plumes in the channels during any of these inspections. The discharge into Third Portage Lake from the Portage Attenuation pond had no adverse erosion effect on the channel crossings.

8.1.3 Water Collection System

A water collection system comprised of the Stormwater management pond, attenuation ponds, ditches and sumps has been developed to control surface and groundwater at the Meadowbank project.

Surface water runoff around the mine site is directed to the attenuation pond, reclaim pond for the water accumulated at the base of Saddle Dam 1 or the Stormwater management pond.

The Stormwater Management Pond collects runoff water as well as the STP treated effluent. A total of 36,584 m^3 of water was transferred to the North Cell TSF from May to September. The water was not released into the environment. This information is presented in Table 8.3.

Surface water was sampled monthly from the Portage Attenuation Pond as per the requirements in the NWB Type A water license (sampling station ST-18), there are no applicable license limits. The data is presented in Table 8.4 for information purposes only. The location of sampling station ST-18 is illustrated on Figure 1. As of November 19, AEM is no longer using the Portage Attenuation Pond (South Cell) as an attenuation pond, as tailings deposition commenced. Water in the South Cell TSF (from November 19) is now used as reclaim water for the mill.

Surface water was sampled monthly from the Vault Attenuation Pond as per the requirements in the NWB Type A water license (sampling station ST-25), there are no applicable license limits. The data is presented in Table 8.5 for information purposes only. The location of sampling station ST-25 is illustrated on Figure 1. The dewatering of Vault Lake was officially completed on June 29 and the dewatered Vault Lake became the Vault Attenuation Pond so sampling of ST-25 started on July 2014.

In 2011 a sump was constructed in the North Portage pit in an area of water accumulation. Water from the North Portage Pit sump was sampled monthly during open water as per the requirements in the NWB water license (sampling station ST-17). However, in 2014 there was no surface water collected to permit sampling. As a result ST-17 was not sampled in 2014; the sampling location is illustrated on Figure 1.

In 2014, no water from the South Portage Pit sump was sampled monthly as per the requirements in the NWB water license (sampling station ST-19 on Figure 1) because the access to the sump present health and safety issues for the technicians. It should be noted that by the end of 2014, no more sumps existed in the South Portage Pit. AEM will continue to look for the presence of water in this pit and will commence sampling in accordance with the Water License, if applicable. In the past, seepage water (ST-S-1) from East Dike was pumped in this sump and ultimately pumped to the Portage Attenuation Pond or the Stormwater Management Pond. However, as of January 2014, water from the East Dike Seepage (ST-8) was pumped back to Second Portage Lake. By discharging the seepage water back to the lake, the volume of water to be pumped from the Portage Pit sumps has significantly decreased.

From January to August, the South Portage Pit water was pumped to Stormwater Management Pond; from September to December, the water was pumped to the Attenuation Pond (South Cell TSF after

November 19). A total volume of 64,803 m^3 was transferred; the volume of water per month is provided in Table 8.3.

In 2014 a sump was constructed in the Vault pit in an area of water accumulation. Water from the Vault Pit sump was sampled monthly during open water as per the requirements in the NWB water license (sampling station ST-23 illustrated on Figure 1). However, in 2014 due to safety issues (no secure access to go to the sump), water samples were taken only in May and August (Table 8.6). The water accumulated in the Vault Pit sump was pumped to Vault Attenuation Pond. A total volume of 101,617 m^3 was transferred; the volume of water per month is provided in Table 8.3.

Water accumulated at the base of Saddle Dam 1 was pumped into the North Cell TSF. This water originated from non-contact surface runoff from the surrounding terrain. Water samples were collected during the open water season to assess water quality. There are no applicable license limits for this location as the water was not been released into the environment; the data is presented in Table 8.7 for information purposes only. The sampling location (ST-S-2) is illustrated on Figure 1.

In 2012 a sump was constructed in the Bay Goose pit in an area of water accumulation. Water from the Bay Goose pit sump was sampled monthly during open water as per the requirements in the NWB water license (sampling station ST-20). The data is presented in Table 8.8; the sampling location is illustrated on Figure 1. The water that was collected in the Bay Goose pit sump was transferred to the Portage Attenuation Pond/South Cell TSF (as stated the Portage Attenuation Pond became the South Cell TSF after November 19 as tailings deposition commenced). A total volume of 297,375m^3 was transferred; the volume of water per month is provided in Table 8.3. There are no applicable license limits for this data as the water was not directly released into the environment; the data is presented for information purposes only.

The North Cell diversion ditch (West Diversion Ditch) which diverts non-contact water from the mine site is located around the North Cell TSF and a portion of the Portage Waste Rock Storage Facility (PRSF) discharges into Third Portage Lake and the East diversion ditch discharges into NP2). The diversion ditches were constructed in 2012 to collect and divert non-contact water. Water from the West diversion ditch (sampling station ST-6) and East diversion ditch (sampling station ST-5) were sampled monthly during open water as per the requirements in the NWB water license. The data is presented in Table 8.9 and Table 8.10 respectively; the sampling location is illustrated on Figure 1.

8.1.4 Tailings Storage Facility, Reclaim Pond, Attenuation Pond and Waste Rock Storage Facilities

The following section reviews the water quality monitoring that is conducted, at the Tailings Storage Facility, Attenuation Ponds and the Waste Rock Storage Facility (RSF), during the operational phase of the mine.

8.1.4.1 Tailings Storage Facility

The Tailings Storage Facility (North Cell) became operational in February 2010. Water from the Tailings Reclaim Pond is sampled, as per the requirements of the NWB water license (sampling station ST-21 – NWB License Table 2). There are no applicable license limits for this station as the water is used as reclaim water at the mill. On November 17, 2014 the reclaim water intake and tailings deposition was stopped from the North Cell TSF and on November 19, 2014 deposition of tailings commenced in the

South Cell TSF. As per the NWB Water License, sampling station ST-21 changed location from North Cell to South Cell. Sample results are presented in Table 8.11. See Figure 1 for the location of ST-21 North Cell and ST-21 South Cell. As per the water license, no more monitoring in the TSF North Cell is required.

8.1.4.2 Portage Waste Rock Storage Facilities – ST-16 Seepage

The Portage Waste Rock Storage Facility (PRSF) has been in operation since 2009. In 2013, ponded water was observed at the south-east base of the PRSF (sampling station ST-16). Seepage in this area was predicted in AEM's initial Mine Waste Management Plans although there was no history prior to 2013. This was first reported in the 2013 Annual Report (as well as to regulators in July 2013) as a small volume of the seepage, with elevated levels of Cyanide, Nickel and Copper (among other constituents) that had migrated, through a rockfill perimeter road, to the near shore area of NP-2 Lake. AEM determined, in 2013, that the seepage contained reclaim water from the North Cell TSF that had flowed under the PRSF to a sump area designated as sampling station ST-16 (refer to *RSF Seepage Golder Report* in Appendix G5 of the 2013 Annual Report).

In 2014 monthly samples were collected to assess water quality at ST-16 and in downstream receiving waters (NP-2, NP-1, etc.). This monitoring was part of the Freshet Action Plan (2014). Additional mitigation measures were implemented in 2014 and this included daily inspections during the freshet period, the installation of a pumping system in ST-16 to direct accumulated water back to the North Cell TSF, installation of four thermistors to analyse freezing in the PRSF and installation of a filter barrier along RF-1 and 2 to prevent water egress from the North Cell (tailings water) through the PRSF to ST-16. Water volumes pumped from this location and deposited in the North Cell TSF are provided in Table 8.3. There are no applicable license limits at this location as there is no discharge to the environment; the data is presented for information purposes only in Table 8.12. The location of this sampling station (ST-16) is illustrated on Figure 1.

As mentioned and in accordance with the 2014 Freshet Action Plan (see Appendix C of the *2014 Water Management Report and Plan* (Appendix C1)), AEM continued to monitor and contain the ST-16 Seepage to assess and prevent any impact to the receiving environment, specifically NP-2 Lake.

On January 29, 2014, the KIA requested that AEM collect additional water quality monitoring data to evaluate the potential "downstream" impacts of the ST-16 seepage in NP-2 (South, East, West), NP-1, Dogleg and Second Portage Lakes (monitoring stations illustrated on Figure 1). In addition KIA also requested additional parameters to be analysed including Free Cyanide residual. As a result AEM implemented this supplemental monitoring. As per the 2014 Freshet Action Plan, AEM submitted a progress report to regulatory agencies regarding this RSF Seepage. This report "*Follow up AEM Report – Seepage Water From Waste Rock Storage Facility – Sample Location ST-16*" can be found in Appendix G2. This report provides an update and a summary of the actions taken and results of the 2014 monitoring program in the downstream lakes. All KIA parameter results can be found in Table 2 and Table 3 of Appendix G2.

In summary and as can be seen below in Table 8.13, the 2014 average analysis results for applicable parameters indicate no impacts to downstream lakes (NP-1, Dogleg, 2PL). The results meet applicable CCME, Water License and MMER criteria. Individual sample event results, including the supplemental results from the KIA request, are referenced in Table 2 and 3 of AEM's follow up report mentioned previously (Appendix G2). Also to be noted in the 2014 results are the significantly decreasing analysis results for contaminants of concern at the three sampling stations in NP-2 Lake. Cn Free, Nickel and

Ammonia (NH3) results are all below CCME Criteria for the Protection of Aquatic Life. Copper is slightly elevated above CCME at NP-2 South and NP-2 East and has decreased at NP-2 West. This clearly indicates and confirms that no further seepage has migrated to NP-2 Lake from the ST-16 sump and that the Till Plug installed in September, 2013 is an effective barrier structure. A comparison of the average results from the ST-16 sump further supports this. Further to this, a Toxicity sample was taken in August, 2014 in NP-2 Lake. Results from this toxicity testing indicated a non-toxic result for rainbow trout and daphnia. To date no fish mortalities have been observed in NP-2. As well, additional mitigation measures were implemented in 2014 and this included the installation of a pumping system in ST-16 to direct accumulated water back to the North Cell TSF, installation of four thermistors to analyse freezing in the PRSF and installation of a filter barrier along RF-1 and 2 to prevent water egress from the North Cell (tailings water) through the PRSF to ST-16.

In 2015, based on the 2014 monitoring results and mitigation measures that have been implemented to date, AEM anticipates continued improvement to water quality in NP-2 Lake and the sump located at ST-16. Flows and volume are also expected to decrease at ST-16 due to installation of the filters at RF-1 and RF-2 and the fact that the reclaim pond (source of contaminants) is no longer in use in the North Cell TSF (moved to South Cell in Nov, 2014). An analysis of Thermistor data will also be undertaken in 2015.

In 2015 AEM is committed to implement the monitoring and mitigation procedures outlined in the 2014 Freshet Action Plan (the Plan will be revised in 2015 to reflect the additional KIA monitoring among other things).

Table 8.13 - 2014 Monitoring Results for ST-16, NP2, NP1, Dogleg and Second Portage Lake

Parameters	Regulatory limit			Date	2014 Average							
	Water License	MMER	CCME	Unit	ST-16	NP-2 South	NP-2 East	NP-2 West	NP-1 West	Dogleg North	SPL-RSF Seep	NP-2 Winter
Ammonia (NH3)	NA	NA	2.33 as N	mg N/L	0.62	0.02	0.03	0.03	*0.01*	*0.01*	*0.01*	
Ammonia nitrogen (NH3-NH4)	32	NA	NA	mg N/L	28.85	2.90	2.93	3.19	0.22	0.01	0.02	7.10
CN total	1.00	1.00	NA	mg/L	1.38	0.02	0.01	0.01	0.003	*0.003*	*0.003*	0.03
CN Free (SGS)	NA	NA	0.005	mg/L	0.18	0.004	0.004	0.004	0.004	0.004	0.004	
CN WAD	NA	NA	NA	mg/L	1.12	0.02	0.004	0.01	0.004	0.003	0.003	0.05
Copper (Cu)	0.2	0.60	0.002	mg/L	0.4871	0.0085	0.0076	0.0107	0.0021	0.0008	0.0006	0.0340
Nickel (Ni)	0.4	1.00	0.025	mg/L	0.4934	0.0134	0.0126	0.0138	0.0043	0.0010	0.0006	0.0360

Italic data is half detection limit

Please note that the as – built drawing required by the Water License for the Waste Rock Plug/Dike is attached in Appendix G3.

8.1.4.3 Vault Waste Rock Storage Facilities

The Vault Waste Rock Storage Facility (VRSF) has been in operation since 2013. In 2014, ponded water was observed at the base of the VRSF (sampling station ST-24). Monthly samples were collected to assess water quality and the results are presented in Table 8.14. No water was pumped from this location as it's just a ponding area without flow. There are no applicable license limits at this location as there is no discharge to the environment; the data is presented for information purposes only. The location of this sampling station (ST-24) is illustrated on Figure 1.

8.1.4.4 Portage Attenuation Pond

The water that was collected in the Portage Attenuation Pond in 2014 was discharged through the diffuser to Third Portage Lake as effluent from June 10 to July 5, 2014, after being treated at the onsite WTP for TSS removal. Samples were taken weekly from the discharge (ST-9) as per the requirements of the Water License and MMER. Results are detailed in Table 8.15 and the location of ST-9 is shown on Figure 1. As of November 19, when tailings deposition began the portage Attenuation pond ceased operation and became the South Cell TSF. In the future there will be no further discharge from ST-9 into TPL.

Four weekly effluent samples were taken from the Actiflo Water Treatment Plant (ST-9) in June 2014. All the results were in compliance with Water License Part F, Item 2 for effluent quality limits except for the aluminium concentration. On June 10, June 24 and June 30, 2014 the aluminum concentration was 1.80 mg/L, 1.55 mg/L, and 1.62 mg/L respectively, exceeding the license limit of 1.5 mg/L as a maximum grab sample. AEM exceed the monthly average concentration limit of 1.5 mg/l with a result of 1.53 mg/L. The source of the elevated level of aluminium appears to be from the coagulant used in the water treatment plant. There was difficulty in optimizing the coagulant dosage. The discharge was compliant with MMER criteria and toxicity testing determined the effluent was non-toxic to Daphnia Magna and Rainbow Trout.

One weekly effluent sample was taken from the Actiflo Water Treatment Plant (ST-9) in July. All the results were below the Water License Part F, Item 2 for effluent quality limits except for aluminium and daphnia toxicity. The effluent was toxic for daphnia on the last day of discharge on July 5 but not for Rainbow trout. Also, on July 5, the aluminum concentration was 1.79 mg/L exceeding the license limit of 1.5 mg/L as a maximum grab sample. AEM exceeded the monthly average concentration limit (1.5 mg/l) as only one sample was taken given the short duration of discharge (3 days). The source of the elevated level of aluminium appears to be from the WTP decommissioning and the coagulant used in the water treatment plant was not adequately removed. WTP operators and engineering staff were made aware of the exceedances; improvements in commissioning and decommissioning will be made in the future should the WTP be used in the future. There will be no further discharge from this location in the future as the former attenuation pond is now the South Cell TSF.

8.1.4.5 Vault Attenuation Pond

The final phase of Vault Lake dewatering started on June 20 2014 and was officially completed on June 29. After June 29, 2014 the dewatered lake became the Vault Attenuation Pond. Refer to Section 8.1.2 for a complete overview of the dewatering activities.

The water collected in the Vault Attenuation Pond was discharged through the diffuser to Wally Lake as effluent from July 24 to August 14, 2014. The water was not treated at the onsite WTP for TSS removal as the water quality was in compliance with Water License Part F, Item 3 and MMER. Samples were taken weekly from the discharge (ST-10) as per the requirements of the Water License and MMER. Results are detailed in Table 8.16 and the location of ST-10 is shown on Figure 1.

All the results were in compliance with the Water License Part F, Item 3 for effluent quality limits except for TSS concentration on August 6 and daphnia toxicity on August 12.

On July 24, 2014, AEM began discharging Vault Attenuation Pond contact water for a short duration which ended on August 14. Prior to discharge, samples were taken on June 30 and confirmed that all regulatory limits would not be exceeded. As required by the Water License Table 2, weekly samples

were taken during the three (3) weeks of discharge on July 31 (TSS - 3 mg/L), August 6 (TSS - 57 mg/L) and August 12 (TSS - 4 mg/L), with an average of 21 mg/L over this period of discharge and an average of 30.5 mg/L for August only. As part of our internal monitoring to ensure the protection of the receiving environment, AEM also took TSS samples from July 24 to July 28 and August 2 at our onsite laboratory, which is not accredited but provides AEM real time data for decision making. Results of these sampling were respectively 8 mg/L, 6.4 mg/L, 6 mg/L, 3.6 mg/L, 7 mg/L and 3.6 mg/L (with a monthly average of 5.7mg/L). It is evident from these data that the 57 mg/L, was not representative of the water quality during discharge and was an anomaly caused either by cross contamination or sampling error.

AEM received the August 6 results on August 27, two (2) weeks after stopping the discharge. Toxicity tests were collected on August 12, 2 days prior to stopping the discharge and were found to be non-toxic for rainbow trout and toxic for daphnia magna. Unfortunately, given the short duration of discharge, it was not possible to conduct another test to validate these exceedances.

Given the water quality chemistry prior to discharge into Wally Lake, the results on July 31 and August 12, the onsite laboratory results for TSS during discharge, the TSS exceedance is considered an outlier and with the short duration of the discharge, AEM is confident the aquatic environment was protected. Core receiving environment monitoring in Wally Lake revealed that Wally Lake has not been impacted by mining activity – See Appendix G4 2014 CREMP Report.

8.1.5 Mine Site

Other locations for water quality monitoring at the mine site include runoff from the landfill and water collected in the secondary containment area of the bulk fuel storage tank. The site layout is presented in Figure 1.

Sewage Treatment Plant

The Meadowbank mine site has one Seprotech L333 sewage treatment plant (STP) and three Little John 100 units in operation; the equipment operates together with one sewage discharge effluent stream directed to the Stormwater Management Pond (SMP). Water is pumped from the SMP twice yearly during the spring and fall to the TSF. There is no discharge to any receiving waters. This acts as a supplement to reclaim water. The SMP also collects spring runoff from the surrounding area.

Samples are taken in accordance with *Operation & Maintenance Manual – Sewage Treatment Plan (Aprils 2013)* for the purpose of determining operating efficiency of the units. Sample results are available in Table 8.17. Results of the sample analysis are submitted to the NWB in the monthly monitoring reports.

The total volume of treated sewage discharged in 2014 was 27,689 m^3. In addition, 214.6 m^3 of sewage sludge was collected and disposed of in the Tailings Storage Facility. A monthly summary of the volume of STP waste is presented in Table 8.18.

Landfill

No water quality monitoring was completed at the landfill in 2014 as no water pooled or was apparent in the area. The total volume of waste transferred to the landfill in 2014 was 6,458 m^3. A monthly summary of the solid waste disposed at the landfill is presented on Table 6.1.

Landfarm

The Meadowbank landfarm was constructed at the end of 2012. In 2014, following the freshet a very small pool of water was identified in the landfarm. This water was utilized in the windrows as a supplemental moisture source to support bioremediation. Thus no sampling was conducted at ST-14. No seepage was identified, and the volume of water present did not warrant pumping.

Meadowbank Bulk Fuel Storage Facility

Water collected in the secondary containment area of the bulk fuel storage tank at the Meadowbank mine site was sampled on May 26, 2014. The data is presented in Table 8.19 and the sampling location (called MB-fuel) is highlighted on Figure 1. No water quality parameters exceeded the water quality limit stipulated in Part F, Item 6 of the water license. As a result, 8,000 liters was discharged on June 10 to the Stormwater Management Pond via a temporary pipe from the secondary containment area of the Meadowbank bulk fuel storage tank. Notifications to the AANDC Inspector, made in accordance with Part F, Item 8 of NWB License 2AM-MEA0815, were sent May 29, 2014. This discharge was in accordance with the Water License.

8.1.6 Baker Lake Marshalling Facilities

The design of the Baker Lake marshalling facility includes a number of facilities that were not constructed. This included: two storage ponds to collect site precipitation runoff (east and west), an explosives storage area and an ammonium nitrate storage area. Consequently, no water quality monitoring of these facilities was conducted at these facilities as they do not exist.

Water collected in the secondary containment areas of the main (Tanks 1 – 4) and additional (Tanks 5 – 6) diesel bulk fuel storage facilities at the Baker Lake Marshalling Facility were sampled on May 26 and July 20. On September 5, the Tank 5-6 containment water was sampled prior to discharge in accordance with Water License conditions. Notifications to the AANDC Inspector, made in accordance with Part F, Item 8 of NWB License 2AM-MEA0815, were sent May 29, July 17 and September 12, 2014. The samples for the main diesel tank farm were analyzed for hydrocarbons, metals, ammonia, conductivity and TSS.

All parameters for the May 26 and July 20 sampling for the Tanks 1 to 4 containment were below the water quality limits stipulated in Part F, Item 23 in the Water License. Therefore approximately 4.3 million liters of water was discharged to land on June 12 (from May 26 sample) and approximately 2.4 million liters was discharged on August 18, 2014 (from July 20 sample) on the East side of the tank farm, on the land.

No parameters exceeded the water quality limit for the Tank 5 and 6 containment area (May 26 results) so approximately 2.2 million liters of water was discharged on the East side of the tank farm, on the land. On July 20, it was noted that the sample from this area exceeded the lead limit (0.0165 mg/l, limit is 0.001 mg/l) so the discharge was not conducted at that time. A last sample was taken on September 5, 2014 and was in compliance with the water quality limits set in the Water License Part F, Item 23. On September 22, approximately 1.1 million liters was discharged on the East side of the tank farm, on the land. The locations of these sampling stations (ST-40.1 and ST-40.2) are illustrated on Figure 3 and results are presented in Table 8.20.

Water collected in the secondary containment areas of the Jet-A storage tanks at Baker Lake was sampled on May 31, June 9 and July 20, 2014. During the sampling on May 31, some parameters requested by the NWB Water License have been forget so water for the missing parameters was collected on June 9, 2014. The samples for the Jet-A tank farm were analyzed for hydrocarbons, metals, ammonia, conductivity and TSS; the results are presented in Table 8.20. The location of these sampling stations (ST-40.3) is illustrated on Figure 3. Two parameters on May 31/June 9, lead (0.0519 mg/L) and TSS (53 mg/L), exceeded the water quality limit stipulated in Part F, Item 23 of the Water License. As the level in the secondary containment was very high, a total of 750,000L of water was transferred from the Jet-A secondary containment to the diesel Tank Farm 5-6 on June 12. The water was not discharged to the environment. Resampling on July 20 revealed that two parameters, lead (0.0225 mg/L) and TSS (46 mg/L), exceeded the water quality limit stipulated in Part F, Item 23 of the Water License. As a result, the water contained in the secondary containment was transferred to the Meadowbank Tailings Storage Facility via water truck. A total of 270,000L was pumped and transferred on August 22, 2014. Notification to AANDC Inspector, made in accordance with Part F, Item 8 of NWB License 2AM-MEA0815, were sent May 29 and July 17, 2014.

As part of the Core Receiving Environment Monitoring Program (CREMP), water quality samples are collected at stations on Baker Lake during the open water season. Four monitoring stations are sampled; one at the Baker Lake community barge dock, one at the Baker Lake marshalling area, and two at upstream reference locations. These marshalling area monitoring stations meet the sampling requirements of ST-37. For more details, please refer to the report entitled ‘’*Core Receiving Environment Monitoring Program 2014”* prepared for AEM by Azimuth Consulting Group, attached as Appendix G4. The results indicate no effects from mine related activities.

8.1.7 All Weather Access Road (AWAR) and Quarries*

A geotechnical structural inspection of the AWAR, including all culverts, bridges and quarries, was conducted by Golder Associates in 2014. This annual inspection is a requirement of the Water License. The findings are presented in the report entitled ‘*2014 Annual Geotechnical Inspection, Meadowbank Gold Mine, Nunavut*’, attached in Appendix B1.

In accordance with Fisheries and Oceans Canada (DFO) Authorizations NU-03-0190, NU-03-0191.3 and NU-03-0191.4, AEM maintains a *Habitat Compensation Monitoring Plan* (HCMP; AEM, 2014) to ensure that fish habitat compensation features are constructed and functioning as intended. Based on the schedule described in the HCMP, monitoring of compensation features currently occurs every other year (this was discussed with DFO, and revised in HCMP (AEM, 2014) which is found in Appendix I1 of the 2013 Annual Report). The previous monitoring was conducted in 2013 therefore in 2015 the monitoring of the spawning pads on the AWAR and mine site monitoring of the East Dike, Bay Goose Dike, Finger Dike and Dogleg Pond will be conducted as per the HCMP, 2014.

No monitoring was conducted in 2014 for the constructed spawning pad, located at stream crossing R02 along the all-weather access road (AWAR). However the constructed spawning pads were visually confirmed to be stable as designed. Rates of shifting of material have not exceeded expectations.

As reported in the 2013 annual report, generally, the condition of adult fish, population size distributions and timing of migration were within the range of values seen in previous years, confirming continued use

* TSM- Biodiversity and Conservation Management

of this area by Arctic grayling. It is suspected that the primary upstream migration occurs below ice cover or immediately at ice-off, since Arctic grayling larval drift has been consistently caught within 1-3 days of study initiation. Larval drift rates of collection continue to exceed those observed prior to construction of the spawning pad, suggesting a positive impact on Arctic grayling reproduction, either through direct use or reduced pressure on upstream spawning areas.

Overall, the constructed spawning pads have not only increased the quantity of high-value habitat, but appear to be effectively increasing production rates in the local population. This information is available in Appendix G7 of the 2013 Annual Report the complete report entitled "*2013 Habitat Compensation Monitoring Report*".

8.1.8 Seepage

As required by Water License 2AM-MEA0815 Part I, Item 16: ***The results and interpretation of the Seepage Monitoring program in accordance with Part I, Item 15***

The Seepage Monitoring program includes the following locations:

Lake water Seepage Through Dewatering Dikes;
Seepage (of any kind) Through Central Dike;
Seepage and Runoff from the Landfill(s);
Subsurface Seepage and Surface Runoff from Waste Rock Piles;
Seepage at Pit Wall and Pit Wall Freeze/Thaw; and
Permafrost Aggradation.

Lake water seepage through dewatering dikes

As mentioned in Section 3.1.1 c, seepage rates and volumes through the East dike have been stable for the past four years.

On July 3 2013, AEM received NWB authorization to discharge East Dike seepage water (from Second Portage Lake) back to Second Portage Lake (see Appendix G8 for the 2013 Annual Report for approval letter from NWB). The discharge, back to SPL, started on January 6, 2014 and all data related can be found in Table 8.44. The discharge is analyzed for NWB Water License Schedule I Group 5 plus Aluminium. The discharge must be compliant with Water License Part F, Item 4 for TSS and compliant with the MMER Regulation. Also, in compliance with Part G, Item 4, an as-built report of the discharge piping and the diffuser was submitted to NWB on October 7, 2014. Due to operational constraints during the winter months (that caused freezing of the summer piping diffuser line), an alternate configuration was designed to allow discharge of water consistent with the summer diffusion criteria during the freeze up period. Please refer to the As-built report for a complete review of the 2 diffusors in Appendix G5.

East Dike Seepage Discharge was stopped from May 2 to July 28 following a visual turbidity increase due to the freshet. To avoid any non-conformity and as per the NWB Modification Letter Approval, the East Dike Seepage non-contact water was discharged to the Portage Attenuation Pond until water quality was acceptable for discharge. As expected, as soon as the freshet was complete, the turbidity level decreased and the discharge to Second Portage Lake resumed. During the period when the seepage from East Dike was directed to the Portage Attenuation Pond, the sampling station was renamed as ST-S-1 (this was the original station prior to the approved discharge to 2PLstated in the Water License). There are no applicable license limits for any seep collection system that is directed to the attenuation pond. Results are presented in Table 8.21 for informational purposes only. The sampling location is highlighted on Figure 1.

In 2014, approximately 143,636 m^3 of water collected from the seepage at the East dike was pumped to Second Portage Lake.

As mentioned in Section 3.1.1 c, seepage rates and volumes through the Bay Goose dike are not significant. No seepage collection system has been implemented because there is no evidence of significant seepage that affects the mining operation or the dike integrity, and that warrants a collection system.

There was no seepage found at the Vault Dike in 2014.

Seepage (of any kind) through Central Dike

As mentioned in Section 3.1.1 of this report, seepage was observed at the downstream toe of Central Dike during the fall period of 2014. The seepage appears to be of low magnitude and of small volume. In 2015 this water will be collected and pumped back into the South Cell Tailings Storage Facility. In December, 2014 it was observed that the seepage was contained at the toe of Central Dike and frozen.

Overall, the integrity of the Central Dike structure is good; however instrumentation data suggests a hydraulic connection between the South Cell and the downstream side of the dike (seepage area). No water inflow was reported to Portage Pit along its west wall or pit bottom. During fall inspections in 2014, water (seepage) was observed ponding at the downstream toe of the dike between Sta.0+645 and the southern access road at Sta. 0+840. Water quality samples from the seepage shows a chemical signature similar to the South Cell TSF reclaim water, however additional monitoring in 2015 will be required to confirm these findings.

From a geochemical perspective, pumping the seepage back into the South Cell will help limit a wet-dry cycle within the dike rockfill embankment and the associated initiation of an acid drainage reaction in the potentially acid generating (PAG) rockfill.

All available information (seepage analysis, instrumentation data, and borehole logs) will be reviewed to better understand the seepage pathway under the dike. In addition, additional geotechnical instrumentation may be added in the area of interest to confirm the readings.

The monitoring of the Central Dike will continue in 2015 and throughout the operating life of the dike, with analysis of the instrumentation results, water quality testing and regular field inspections.

Seepage and runoff from the landfill

See Sections 8.1.5 above.

Subsurface seepage and surface runoff from waste rock piles

See Section 8.1.4 above.

Seepage at pit wall and pit wall freeze/thaw and permafrost aggradation

No significant seepage was observed in 2014 in Portage Pit.

The Goose Pit experienced some seepage along the south, west, and north walls during 2014. Water in-flows were noted along the Bay Fault where it intersects the south wall of the Goose Pit. A sump is located at the south wall in the pit base and collects water in-flow from the Bay Fault (AEM used this station as a groundwater monitoring location in 2014) and from water flowing down the ramp. Seepage and water inflows on the south and west walls of the pit were also noted. The water in-flows appear to be greater than anticipated based on previous hydrogeological modeling. The flow rate of water of the main sump seepage was estimated by AEM to be about 0.4L/s, although it could be greater than this. The Goose pit mining activities will be completed early 2015 prior to any melting or spring shifting. Therefore, the seepage in Goose Pit will not jeopardize any mining activity and will contribute to the reflooding of the pit.

In Appendix B1 you will find the Golder "*Annual Review of Portage and Goose Pit Slope Performance (2014) - Meadowbank Mine*" which includes more details regarding the seepage at the pit wall.

8.1.9 Groundwater

As required by NIRB Project Certificate No.004 Condition 8: Continue to undertake semi-annual groundwater samples and re-evaluate the groundwater quality after each sample collection; report the results of each re-evaluation to NIRB's Monitoring Officer, INAC and EC.

The full results of the 2014 groundwater monitoring program are available in the report entitled '2014 Groundwater Monitoring Report' prepared by AEM, attached as Appendix G6.

The 2014 groundwater monitoring program at Meadowbank was conducted in support of the Groundwater Monitoring Plan (AEM, 2013) which is required by the Water License. Following the 2014 field season, the plan will be updated to reflect changes in pit wall seep sampling (which was discontinued), the installation of a new well (MW-14-01) and the addition of sampling at the Goose Pit sump. The objectives of this program are to monitor the salinity of shallow and deep groundwater in order to update site water quality predictions and to document any effects of mining on groundwater quality, particularly with respect to tailings deposition. Concentrations of total cyanide and dissolved copper in particular are closely evaluated, because these analytes are related to the tailings and reclaim water in the TSF's.

In 2014, a new well was installed (MW-14-01) to replace well MW-11-02 which is blocked with purging material (since 2012). This well and one other (MW-08-02) were sampled. The available third well (MW-08-03) is blocked with an ice bridge. The blockage was successfully removed in 2014, but the well was dry and could not be sampled.

As per recommendations in the 2012 Groundwater Monitoring Report (Golder, 2012), attempts were made to augment the program by sampling production drill holes and pit wall seeps. Groundwater (GW) was not encountered in production wells or pit wall seeps, but the water in the Goose Pit sump appears to be GW from a talik area based on the fact that analysis results are similar to historical GW results at Meadowbank and the area is always wet (not frozen despite being in a permafrost area). This sump has been added to the GW Monitoring network.

Results for total cyanide and dissolved copper in the sample collected from the existing well (MW-08-02) in 2014 were similar to those observed historically, indicating no measureable movement of tailings into groundwater at this location. While concentrations of salinity-related parameters were elevated at the new well (MW-14-01), this was likely related to salt water addition during installation. Concentrations of

dissolved copper in this well were similar to or lower than those observed historically (2011) at nearby well MW-11-02 (non-operational – blocked with purging material). Total cyanide in this location was elevated compared to previous results for MW 11-02, although the results were still more than 5x lower than NWB license limits for discharge to surface water. For the Goose Pit sump sample, total cyanide was not detected (<0.005 mg/L) and dissolved copper was on the lower end of values observed historically site-wide (0.0011 mg/L) indicating no mining effects to GW in this area.

All measured concentrations of other metals were below NWB license limits for discharge to surface water for all locations, and were within the range of historical results, with the exception of dissolved Pb at MW-08-02. However, the value for this analyte was more than 200x higher than the value for total Pb, suggesting a sampling, measurement or reporting error.

These parameters will continue to be monitored in 2015 to determine any trends, with a planned increase in sampling frequency (spring and fall) for the Goose Sump and Well MW-14-01. In addition, AEM will attempt to recover Waterra tubing from well MW-11-02 and continue efforts to unthaw the ice bridge in MW-08-03 using a refined steam process.

8.1.10 Core Receiving Environment*

The CREMP (Appendix G4) focuses on identifying changes in limnological parameters, water and sediment chemistry, or changes to primary (phytoplankton) and secondary (benthic invertebrate community) aquatic producers that may be associated with mine development activities (at the mine site and in Baker Lake). This is accomplished through the application of a temporal/spatial trend assessment that includes application of quantitative decision criteria (i.e., early warning "triggers" and action "thresholds"; some of which were updated in 2013 with minor updates in 2014) to facilitate immediate and objective decision-making regarding appropriate management actions.

Meadowbank Study Lakes

CREMP monitoring started in 2006 and in-water mine development started in 2008. Key mine development activities that could result in changes to the aquatic receiving environment include: dike construction, dewatering of both lakes and impoundments, effluent discharge (2012 to present) and general site-related mining activities that mostly generate dust (e.g., rock crushing, blasting, ore and waste hauling). Key findings for 2014 are summarized below:

- Water Chemistry – As in the past, there were some statistically significant mine-related changes relative to baseline/reference conditions identified in 2014 at one or more near-field (NF) areas that exceeded their respective triggers: conductivity (TPN, TPE, TPS, SP, WAL); hardness (TPN, TPE, TPS, SP); calcium, potassium, magnesium, and sodium (TPN, TPE, TPS, SP [except sodium]); and TDS (TPN, TPE, TPS, SP, WAL). In the absence of effects-based thresholds (e.g., CCME water quality criteria) for these parameters, their triggers were set at the 95th percentile of baseline data. While these results most likely represent mine-related changes, the observed concentrations are still relatively low and unlikely to adversely affect aquatic life. These trends need to be reviewed again in 2015.

* TSM- Biodiversity and Conservation Management

- Sediment Chemistry – Quantitative trigger analysis for sediment is based on coring results, which are conducted on a three-year cycle to coincide with MMER EEM field studies. This program was conducted in 2014 and will be conducted next in 2017. Statistically significant increases in sediment metals relative to baseline conditions and triggers were identified in WAL (lead and zinc) and TPE (chromium). The WAL results were deemed as artefacts of the statistical models used and/or as inconsistent with baseline grab sample results; they were not attributed to mining activities. As per the recommendations in last year's CREMP (Azimuth, 2014), the 2014 coring program was expanded in TPE as a targeted study to address uncertainties regarding the nature (i.e., spatial or temporal) of the apparent temporal trend in chromium concentrations since dike construction. The targeted study confirmed that the trend is temporal and mining-related, with the NPAG ultramafic rock used to construct the Bay-Goose Dike the most likely source of chromium-enriched sediments. While TPE sediment chromium concentrations have increased by 50% since dike construction and now exceed the CCME PEL, the local benthic invertebrate community has not been impacted. Notwithstanding, a follow-up study was recommended and will be undertaken in 2015 to test the bioavailability and toxicity of the sediments.

- Phytoplankton Community – The only statistically significant change in phytoplankton community metrics in 2014 was a 24% decrease in taxa richness at mid-field area TPS. However, given the lack of similar changes at any near-field areas, these changes are attributed to natural variability rather than the mine. While not apparently mine related, this trend should be watched again in 2015.

- Benthic Invertebrate Community – The majority of near-field and mid-field areas showed apparent increases in abundance and taxa richness in 2014 relative to baseline/reference conditions. No statistically significant short-term (i.e., past year) or longer-term (i.e., past two to four years) trends were identified. TPN did show a reduction (37%, but not statistically significant) in total abundance relative to baseline/reference conditions in 2014; those results are being analyzed in more detail in the EEM report due in June 2015.

Baker Lake

CREMP monitoring started in 2008. Key mine-related activities include barge/shipping traffic and general land-based activities associated with the tank farm area. No spills of fuels, hydrocarbons or any other materials occurred in the vicinity of the barge dock and jetty in 2014. No changes in the aquatic receiving environment were observed that were attributable to AEM's activities in Baker Lake. No follow-up management actions are required for 2015.

8.1.11 Blasting Activities*

As required by NIRB Project Certificate No.004, Condition 85*: develop a detailed blasting program to minimize the effects of blasting on fish and fish habitat, water quality, and wildlife and terrestrial VECs.*

As required by the NIRB Project Certificate No.004, Condition 85 and as part of the mine site fisheries monitoring in the DFO Authorization, AEM Meadowbank Division conducts monitoring to evaluate blast related peak particle velocity and overpressure to protect nearby fish bearing waters. Guidelines have been developed by DFO to protect fish and fish habitat from works or undertakings that involve explosives in or near fisheries waters.

* TSM- Biodiversity and Conservation Management

The results of the 2014 blast monitoring program are available in the report entitled "*2014 Blast Monitoring Report for the Protection of Nearby Fish Habitat*" prepared by AEM, attached as Appendix G7.

Peak particle velocity (PPV) and overpressure monitoring data (IPC) was recorded throughout 2014 during blasting activities at the North Portage Pit, South Portage Pit, Bay Goose Pit and Vault Pit. The Portage stations are located near the shoreline of Second Portage Lake and the station located on the Bay Goose Dike is near Third Portage Lake East Basin. The Vault Pit station #1 is located between the Vault Attenuation Pond (dewatered Vault Lake) and the Vault Pit, and Vault Pit station #2 is located near Wally Lake. From January to March, blast monitoring was conducted at Vault station #1. Starting in April, 2014 the monitoring was conducted at Vault station #2. The reason for this change (stated in the 2013 Blast monitoring report) in 2014, was to monitor blasting effects closer to Wally Lake, which became the fish habitat with most value after the fishout of Vault Lake was completed in 2013.

In 2014, PPV concentrations at Portage, Goose and Vault stations exceeded the DFO limit of 13 mm/s on 8 occasions over the entire year (n = 243 monitored blasts for the entire year) and all of these were during the period of egg incubation (for lakes near the Meadowbank mine the period is from August 15 (previous year) to June 30 (of the next year)). The IPC measurements were all below the DFO limit of 50 kpa. The blast monitoring results are reviewed after each blast and the blast mitigation plan was implemented immediately if the vibrations or the overpressure exceed the guidelines. This plan includes a retroactive analysis to determine what caused the higher than expected results.

In 2014, the average PPV was 3.93 (CI +/- 0.50) with a maximum of 23.8 mm/s (maximum in 2013 was 32.7 mm/s). The average was lower than last year (5.39 mm/s in 2013). Four of the eight PPV exceedances during the egg incubation period were in Portage Pit South and were due to due to the large blast patterns and quicker delays. Three exceedances were in Vault Pit Station #1 due to blasting occurring in close proximity to the blast monitoring station. It should be noted that this station was a considerable distance from Wally Lake and Vault Pit Station # 2 (no exceedances) and the fishout of Vault had occurred previously in 2013; there likely was little, if any, affect to incubating eggs in Wally Lake from these blasts. The last PPV exceedance during egg incubation was in Goose Pit due to the pre-shear and proximity to the blast monitoring station. The upper 95% confidence limit for all of the annual data was 10.97 mm/s, below the limit of 13 mm/s.

At Meadowbank, it is important to consider the location of the monitoring stations and distances to actual spawning and nursery habitat identified in the baseline habitat mapping. The closest high value habitat area is greater than 250m away from the Goose Pit station, thus incubating eggs would be exposed to significantly less PPV given the distance of the spawning and incubation site from the blast location compared to the distance from the blast to the monitoring station. As in the past, based on the monitoring station locations and comparison to Faulkner et al. (2006), periodic exceedances of 13 mm/s PPV with from the 2014 blasting are unlikely to impact salmonid incubation sites at the Meadowbank Mine site.

8.1.12 MMER and EEM Sampling

8.1.12.1 Portage Attenuation Pond Discharge

The Meadowbank gold mine became subject to the Metal Mines Effluent Regulations (MMER) on January 1, 2010 during the dewatering of Second Portage Lake. In 2014, the final effluent Water Treatment Plan (sampling ST-9, also named ST-MMER-1) was pumped from the Portage Attenuation Pond and was

discharged into Third Portage Lake (TPL) from June 10 to July 5. A total of 207,813 m^3 was discharged. On November 19, 2014 tailings deposition commenced in the South Cell (Portage Attenuation Pond) and this represented the end of use as an attenuation pond with an effluent discharge to TPL. Therefore ST-9 or ST-MMER-1 are no longer applicable.

All water discharged that was discharged in 2014 to TPL was treated for TSS removal by the onsite WTP. Effluent monitoring samples were collected weekly for pH, TSS, Cyanide and Nickel. The sampling frequency for cyanide and nickel changed from quarterly to weekly in 2014. On February 25th, 2014, AEM received an email from Environment Canada Inspector's informing AEM that we must return in normal frequency (once a week) for CN and Ni as soon as the discharge starts because the monthly mean concentration of CN and Ni exceeded 10 % of the value listed in Column 2 of Schedule 4. As per subsection 13(3) of the MMER, the reporting frequency of CN and Ni was increased in 2014. Other Schedule 4 parameters (arsenic, copper, lead, zinc and radium) and acute toxicity samples are analyzed quarterly, as per the approved 'reduced sampling frequency' program. The volume of water discharged to the environment is reported on a weekly basis under the MMER monitoring program and can be found on Table 8.22.

Under the Environmental Effects Monitoring (EEM) program, AEM collected one sub-lethal toxicity sample in 2014. As per subsection 6(1) *"[…] sub-lethal toxicity test under Section 5 shall be conducted two times each calendar year for three years and once each year after the third year […]*". As per the regulations, the sub-lethal toxicity was conducted twice a year from 2010 to 2012, and decreased to one sample event in 2013 and 2014. The water quality samples were taken from the ST-MMER-1 discharge location, the receiving environment exposure area (TPN or ST-MMER-1-EEM-TPN) and the reference area (TPS or ST-MMER-1-EEM-TPS). These sampling locations are highlighted on Figures 1 and 2. Results of the MMER and EEM water quality monitoring programs are presented in Tables 8.23 and 8.24, respectively. Only one EEM effluent characterization monitoring sample was collected on June 30, 2014. Given the short duration of discharge and the fact that it it's unsafe for technicians to sample on the ice in June no samples were collected from the exposure (TPN) and reference (TPS) areas.

On February 13, 2014, AEM submitted the EEM Biological Study Design 2 to Environment Canada. On August 11, the approval letter from Environment Canada (dated July 21, 2014) was received. On August 12, AEM provided EC the updated schedule for the EEM Cycle 2 as outlined in the approval letter. The sampling for the EEM successfully took place at the end of August and was completed during the first week of September. As per MMER requirements, the interpretive report is being completed and will be submitted to Environment Canada by July 1, 2015. The EEM water quality monitoring conducted at the same time as the EEM Cycle 2 was previously reported to Environment Canada via the RISS electronic database reporting system.

There were no exceedences of the MMER water quality criteria in 2014. On several occasions there was no water quality monitoring completed as discharge did not occur; these sampling weeks are identified with 'NDEP' and parameters identified with 'NMR' on the table are not required due to the approved reduced sampling frequency program.

8.1.12.2 Vault Attenuation Pond Discharge

The Vault Discharge became subject to the Metal Mines Effluent Regulations (MMER) on June 27, 2013 during the dewatering of Vault Lake. Vault Discharge (sampling ST-10, also named ST-MMER-2) has discharged into the receiving environment Wally Lake from June 20 to June 29 to finalize the Vault Lake

Dewatering (non-contact water) and from July 24 to August 14 from the Vault Attenuation Pond (contact water) for a total discharged of 329,101 m^3.

In 2014, the TSS water treatment plan was not required as the dewatering of the Vault Lake water (non-contact with any mining activity) and the contact water from the attenuation pond was compliant with section 4 (1) of the regulation. Discharge monitoring samples were collected weekly and acute toxicity was sampled monthly. The volume of water discharged to the environment was reported on a weekly basis under the MMER monitoring program and can be found on Table 8.26.

Under the Environmental Effects Monitoring (EEM) program, AEM was not required in 2014 to collect sub-lethal toxicity sample at this discharge point as per subsection 5(2) of MMER regulation. However, starting in 2015, as per subsection 6(1) *"[…] sub-lethal toxicity test under Section 5 shall be conducted two times each calendar year for three years and once each year after the third year […]*" because the Vault Lake Attenuation Pond Discharge will become the mine's final discharge point that has potentially the most adverse environmental impact on the environment. The water quality samples were conducted from the discharge location, the receiving environment exposure area (WLE or ST-MMER-2-EEM-WLE) and reference area (TPS or ST-MMER-1-EEM-TPS). These sampling locations are highlighted on Figures 4 and 2. Results of the MMER and EEM water quality monitoring programs are presented in Tables 8.25 and 8.24, respectively. The EEM effluent characterization monitoring samples were collected in June and July. Samples were collected from the exposure (WLE) and reference (TPS) areas in July only. Given the short duration of discharge and the fact that it's unsafe for the technicians to sample on the ice in June only one sample was collected from the exposure (WLE) and reference (TPS) areas in July. This data was previously reported to Environment Canada via the RISS electronic database reporting system.

In 2014, all the results respected the Water License Part F, Item 3 for effluent quality limits except for the TSS concentration on August 6. The AEM Environment Canada Inspector was notified of this non-compliance on September 11, 2014 (Appendix G8). This data was previously reported to Environment Canada via the RISS electronic database reporting system. Please refer Section 8.1.4.5 Vault Attenuation Pond as the explanation for this TSS exceedance was already provide there as this was also an exceedance under the NWB Water License Part F Item 3.

8.1.12.3 East Dike Discharge

The East Dike Seepage Discharge became subject to the Metal Mines Effluent Regulations (MMER) on January 6, 2014. In 2014, there were two seepage collection points (North and South) on the west side of the East dike which collect Second Portage Lake seepage. Water was pumped from both South and North seepage and discharged through a common header through a diffuser into Second Portage Lake. The seepage water was released into the environment, prior to contact with mining activity, without treatment as it is compliant with section 4 (1) of the regulation. If monitoring of the seepage detects levels near MMER or Water license criteria the seepage water is directed to the South Cell TSF.

East Dike Seepage (Water License sampling point ST-8, MMER - ST-MMER-3) was discharged into the receiving environment, Second Portage Lake (2PL), from January 6 to May 2 and from July 29 to December 31, 2014. The total volume discharged in 2014 was 143,638 m^3.

From May 2 to July 28 the discharge was stopped following a visual turbidity increase due to the freshet. To avoid any non-conformity and as per the NWB Modification Letter Approval, the East Dike Seepage

non-contact water was discharged to the Portage Attenuation Pond until the water quality improved. Discharge to 2PL was restarted when the TSS returned to Water License and MMER criteria. The volume of water discharged to the environment was reported on a weekly basis pursuant to the MMER monitoring program requirements and can be found in Table 8.27.

Under the Environmental Effects Monitoring (EEM) program, AEM was not required in to collect sub-lethal toxicity samples at this discharge point as per subsection 5(2) of MMER regulation. The water quality samples were taken from the discharge location, ST-MMER-3, the receiving environment exposure area (SPLE or ST-MMER-3-EEM-SPLE) and reference area (TPS or ST-MMER-1-EEM-TPS). These sampling locations are highlighted on Figures 4 and 2. Results of the MMER and EEM water quality monitoring programs are presented in Tables 8.28 and 8.24, respectively. The EEM effluent characterization monitoring samples were collected in January, August, September and November. Samples were also collected from the exposure (SPLE) and reference (TPS) areas in January, August, September and November. This data was previously reported to Environment Canada via the RISS electronic database reporting system.

8.1.13 QAQC Sampling

As required by NIRB Project Certificate No.004, Condition 23: ***ensure that water quality monitoring performed at locations within receiving waters that allow for an assimilative capacity assessment of concern to regulators, be carried out by an independent contractor and submitted to an independent accredited lab for analysis, on a type and frequency basis as determined by the NWB; results of analysis shall be provided to the NWB and NIRB's Monitoring Officer.***

The objective of quality assurance and quality control (QA/QC) is to assure that the chemical data collected are representative of the material being sampled, are of known quality, are properly documented, and are scientifically defensible. Data quality was assured throughout the collection and analysis of samples using specified standardized procedures, by the employment of accredited laboratories, and by staffing the program with experienced technicians.

All chemical analyses were performed by Multi-Lab Direct in Val d'Or, Quebec, an accredited facility. All data from Multi-Lab underwent a vigorous internal QA/QC process, including the use of spiked samples and duplicate samples. All QA/QC data passed the laboratories acceptable limits. The laboratory certificates of quality control are presented in Appendix G1, following the corresponding certificates of analysis.

All toxicity tests were performed by Maxxam Analytique in Quebec City and Exova in Saint-Augustin-de-Desmaures, QC. Testing was conducted as stipulated in the corresponding Environment Canada Biological Test Methods. QA/QC measures implemented by the lab, including the use of reference toxicants, met the acceptable limits. QA/QC data is presented with the toxicity reports in Appendix G1.

Field blanks are laboratory bottles filled with deionized water in the field, and then treated as a normal sample. They are used to identify errors or contamination in sample collection and analysis. Duplicate field water quality samples are collected simultaneously in the field and used to assess sampling variability and sample homogeneity. The following presents the percentage of duplicate and field samples collected from each of the monitoring programs:

- MMER and EEM monitoring programs: 18 duplicate samples and 18 field blanks were collected from a total of 67 samples, representing 26.9%;
- Dewatering monitoring program: 0 duplicates samples were collected from a total of 8 samples, representing 0%;
- STP monitoring program: 6 duplicate samples were collected from a total of 33 samples, representing 18.2%;
- Surface water monitoring programs: 15 duplicate samples and 6 field blanks were collected from a total of 68 samples, representing 22.1%; and
- Bulk fuel storage facilities monitoring program: 2 duplicate samples and 1 field blank were collected from a total of 9 samples, representing 22.2%.

This represents approximately 22.2% of the samples collected, which is higher than the QA/QC program objective of 10%.

Analytical precision is a measurement of the variability associated with duplicate analyses of the same sample in the laboratory. Duplicate results were assessed using the relative percent difference (RPD) between measurements. The equation used to calculate a RPD is:

RPD = (A-B)/ ((A+B)/2)*100; where: A = analytical result; B = duplicate result.

RPD values may be either positive or negative, and ideally should provide a mix of the two, clustered around zero. Consistently positive or negative values may indicate a bias. Large variations in RPD values are often observed between duplicate samples when the concentrations of analytes are very low and approaching the detection limit. Consequently, a RPD of 50% for concentrations that exceed 10x the method detection limit (MDL) is considered unacceptable.

Results for the QA/QC data are presented in Tables 8.29 to 8.32 for the MMER and EEM, STP, Surface Water, and Bulk Fuel Storage Facility monitoring programs, respectively. The following is a brief summary of the QA/QC results, per table:

- MMER and EEM: 3 parameters exceeded the data quality objectives. However, for 9 samples (original or duplicate) values are within the 10x MDL, second sample (original or duplicate) values exceeded the 10x MDL. As a result, this sample was not considered as exceeding the data quality objectives;
- STP: 1 parameter exceeded the data quality objectives. However, for 9 samples (original or duplicate) values are within the 10x MDL, second sample (original or duplicate) values exceeded the 10x MDL. This sample was not considered as exceeding the data quality objectives;
- Surface Water: 3 parameters exceeded the data quality objectives. However, for 14 samples (original or duplicate) the values were within the 10x MDL but the other second sample (original or duplicate) values exceeded the 10x MDL. These samples were not considered as exceeding the data quality objectives; and
- Bulk Fuel Storage Facility: 2 parameters exceeded the data quality objectives. However, for 9 samples (original or duplicate) values are within the 10x MDL, second sample (original or duplicate) values exceeded the 10x MDL. This sample was not considered as exceeding the data quality objectives.

The QA/QC plan was followed and samples were collected by qualified technicians. Given the high number of samples collected in 2014, it is common to have some RPD exceedances as a result of the

discrete differences in the original and field duplicates. Given the variability of these exceedances (occurring with different parameters, on different dates for different sampling programs) and the high number of successful samples, it is evident that field QA/QC standards during water sampling were maintained during sampling in 2014. In the future, AEM technicians will continue to follow standard QA/QC procedures (AEM, 2014) for surface water sampling that requires the use of sample bottles that are provided by an accredited laboratory, proper handling and storage of bottles to prevent cross-contamination between areas and, if appropriate, thoroughly rinsing the sample containers with sample water prior to sample collection

There did not appear to be any trends with the parameters that exceeded the QA/QC data quality objectives, nor were there any indications of sampling errors or variability. All of the results of the field blank samples were acceptable and all other duplicate sample parameters met the QA/QC data quality objectives. Consequently, the QA/QC results indicate that the data quality is sufficient to meet the objectives of the monitoring programs.

For field measurements, the following equipment is used:

- Analite NEP 160 Meter (turbidity);
- Oakton PCS35 Meter (pH and conductivity); and
- Hanna Multi-Parameter Meter (pH, dissolved oxygen and conductivity).

The calibration data regarding these instruments is presented in Tables 8.33 to 8.37 for Analite Meters #2 and #5, the Oakton PCS35 Meter and Hanna Meters 1 and 2, respectively.

QA/QC methods and results for specific field programs are discussed separately in their respective reports; these field programs are presented in the Appendices listed below:

- Appendix G4: *Core Receiving Environment Monitoring Program 2014* – Sections 2.3 and 3.1;
- Appendix G12: *Air Quality and Dustfall Monitoring Report 2014*– Section 4.4;
- Appendix G6: *2014 Groundwater monitoring report* – Sections 6.3.

8.1.14 Water Usage

Meadowbank' s NWB License (2AM-MEA0815) originally permitted Agnico Eagle Mines Ltd. (AEM) to use 700,000 m^3 per year of freshwater for domestic camp use, mining, milling and associated uses. Despite significant improvements and optimization of freshwater use, requirements exceed the permitted volume. On April 23, 2013, Agnico Eagle Mines (AEM) Meadowbank Division submitted a request to the Nunavut Water Board for an amendment to increase the freshwater use rate at the Meadowbank Gold Project. The water license amendment pre-hearing conference and technical meeting was held in Baker Lake on October 16 and 17, 2013. The final written hearing was held on January 17, 2014. On January 24, 2014 AEM received correspondence from NWB advising that hearing record is closed and the Panel would issue, in due time, a decision report to AANDC regarding whether or not to issue the requested amendment, to the Type A Water License. On June 30, AEM received an approval letter from NWB which permitted the withdrawal of 1,870,000 m^3 in 2013 and 1,150,000 m^3 per year after 2013. Those documents were forwarded to Minister of Aboriginal Affairs for his final approval. On July 23, AEM received the final approval from the Minister (Appendix G9).

The total volume of freshwater pumped from the surrounding lakes and used for the Meadowbank Gold Project is listed in Table 8.38. A total volume of 1,096,829 m^3 of freshwater was used for the project in 2014 which was in compliance with the Water License Freshwater usage amount of 1,150 000 m^3.

The volume of reclaim water used in the mill in 2014 was 2,459,907 m^3. The volume of freshwater that is contained in the ore to the mill in 2014 was 39,803 m^3. The monthly volume pumped is detailed in Table 8.38.

8.1.15 Creel Survey Results

As required by DFO Authorization NU-03-0190 (AWPAR) Condition 5.2.4: ***Engage the local Hunter Trapper Organization(s) in the development, implementation and reporting of annual creel surveys within the water bodies affected by the Plan.***

And

NIRB Project Certificate No.004 Condition 51: ***engage the HTOs in the development, implementation and reporting of creel surveys within waterbodies affected by the Project to the GN, DFO and local HTO.***

In March 2007, a harvest study was initiated by Agnico Eagle in association with the Baker Lake Hunters and Trappers Organization (HTO) in order to monitor and document the spatial distribution, seasonal patterns and harvest rates of hunter kills before and after construction of the Meadowbank All-Weather Access Road (AWAR). The harvest study is conducted annually and is open to both Inuit and non-Inuit residents of Baker Lake who are at least 16 years of age. The harvest study focuses primarily on terrestrial wildlife harvests; however, creel results are also recorded by the harvest study administrator in support of on-going creel surveys.

In 2014, creel results were collected from nine (9) participant records over the course of the year. The participation level again dropped from 2013. Although participation levels were lower this year, overall fishing effort per participant increased. The assumption is that the participants recording creel harvests in 2014 were those who are more likely to fish frequently and successfully – their fishing effort is likely at these levels most years of the study. More (successful) fishing trips per participant were reported in 2014 than in previous years and the overall number of fishing trips in 2014 was higher than last year. The number of fish harvested per trip has remained fairly constant over the course of the study (7.4 fish per trip on average).

Total fish harvest was highest in November and December 2014. The high catch numbers for these two months have skewed the total reported fish catch, which is higher than 2013 despite dramatically lower participation rates. Excluding these two months of records, reported total fish catch decreased, as would be expected with a decrease in participation. In previous years, both a summer and winter peak in fish catch have been observed, and have often been comparable. In 2014, the summer fish harvest was much lower than the winter. A smaller peak in total fish caught was observed in May/June, although total catch was lower due to decreased participation.

Total catch for each species is considered in context with changes in participation and reporting rates. Arctic Grayling catch continues to remain low across years. Arctic Char catch in 2014 was lower than previous years. Lake Trout harvest rates increased in 2014, although total catch is still low compared to other years with higher participation. Lake Whitefish catch continues to vary widely. One participant

reported catching 648 Lake Whitefish (mostly during regular fishing trips in November), resulting in the highest reported total annual harvest for this species, despite the lowest year for participation.

The majority of participants continue to fish around the perimeters of Baker Lake and Whitehills Lake. High fishing rates were also reported for Whitehills Lake in 2007 and 2008 prior to AWAR construction. No participants traveled north of Whitehills Lake in 2014. Thus, unless fishing trips are tied to hunting trips, it would appear that study participants are less willing to travel long distances to catch fish, regardless of AWAR access, likely due to the abundance of fish in close proximity to the Hamlet of Baker Lake (as evidenced by total fish caught in this area over the course of the study). Fishing trips in 2014 did continue to be centred along the southern portion of the AWAR. Based on the number of reported trips in the 2014 creel survey, study participation and reporting rates are on the decline.

The results of the creel survey are available in the report entitled *'2014 Hamlet of Baker Lake Harvest Study – Creel Results'* prepared by Nunavut Environmental Consulting Ltd, attached as Appendix G10.

As per NIRB Recommendation 4 found in "*NIRB's 2013-2014 Annual Monitoring Report for the Meadowbank Gold Project and Board's Recommendation*": NIRB is concerned about the declines in participation reported in hunter harvest and creel surveys in 2013. The NIRB appreciates AEM's efforts to engage local harvesters and encourages it to continue this work, however notes that additional measures may be needed to better understand caribou and creel populations within the LSA. The Board recommends that AEM consider increasing its efforts to participate in other regional population level studies carried out by the HTO, GN or other agencies to better understand Project-related effects on caribou and creel populations around the Local and Regional Study Areas. It is requested that additional information regarding its efforts and relevant results of further studies be provided within AEM's 2014 Annual Report.

AEM will continue to work with hunters and increase its communication with the HTO related to the Hunter Harvest Study. In 2013, AEM finalized discussions with the GN and entered into a new Memorandum of Understanding (MOU) to commit to another long term (3 years) contribution in support of the regional GN caribou monitoring program. This agreement will continue to assist the GN- DOE-Wildlife branch in directing the implementation, data analysis and management of caribou populations in the Kivalliq region. AEM's contribution to the regional population level studies carried out by the GN demonstrates a commitment to regional studies. AEM will continue to work closely with the GN and other academic researchers to ensure the data that we collect is relevant, that it continues to contribute to the regional understanding of wildlife, and informs wildlife managers. In 2015, an additional 10 collars are planned to be deployed in mid-April in the Baker Lake area, and monitoring of existing and new collars will continue in 2015 (i.e., 8th year of collar monitoring).

8.1.16 Fish-out program summary*

As required by NIRB Project Certificate No.004 Condition 49: ***develop, implement and report on the fish-out programs for the dewatering of Second Portage Lake, Third Portage Lake and Vault Lake.***

As required by DFO Authorizations NU-03-0191.4 Condition 2.1, 2.2, 2.2.1;

No Fish-out was conducted in 2014.

* TSM- Biodiversity and Conservation Management

8.2 NOISE MONITORING

As required by NIRB Project Certificate No.004 Condition 62: ***Develop and implement a noise abatement plan to protect wildlife from significant mine activity noise, including blasting, drilling, equipment, vehicles and aircraft; sound meters are to be set up immediately upon issuance of the Project Certificate for the purpose of obtaining baseline data, and monitoring during and after operations.***

The 2014 noise monitoring program at Meadowbank was conducted in support of the Noise Abatement and Management Plan (AEM, 2009; 2013). The complete report is provided in Appendix G11. The objective of the 2014 program was to measure noise levels at five previously determined monitoring locations around the Meadowbank site, over at least two 24 h periods. Although no residential receptors are nearby, AEM compares results of this program to target sound levels identified in Environment Canada's "Environmental Code of Practice for Metal Mines" (2009). These values are 55 dBA (daytime) and 45 dBA (nighttime), and are objectives for off-site ambient noise to minimize disturbance of wildlife.

While monitoring was conducted for a total of 15 days, the numbers of usable time points were reduced after removing the data recorded outside optimal weather conditions. Total usable hours of data for each station ranged from 17 – 40 hours.

Since noise levels vary constantly over time, Meadowbank's noise monitoring instruments measure acoustical energy near-continuously and report a single number for each minute, representing the "equivalent sound level" (L_{eq}). Daytime (7am – 11pm), nighttime (11pm – 7am), 10-11pm and 24 h L_{eq} values are shown for each monitoring location in Table 8.39.

No L_{eq} values exceeded the daytime target sound level of 55 dBA. Two values exceeded the nighttime target sound level of 45 dBA, at R1 and R5 (47.9 dBA each). These values were well within the range of those observed in previous years, and were likely a result of increased helicopter activity associated with exploration projects during the monitoring time period, since these two stations are closest to the helicopter route.

No additional mitigation measures or changes to the monitoring program are planned at this time. Trends will be tracked in 2015, particularly with respect to nighttime values at R1 and R5.

Table 8.39. Daytime, nighttime, 10-11pm and 24 h L_{eq} values for monitoring locations R1 – R5 and total hours of valid data available to calculate each L_{eq}. Values exceeding the target sound level (55 dBA - daytime; 45 dBA - nighttime) are shaded grey.

Site	Dates (2014)	$L_{eq, day}$ 7am-11pm (dBA)	Total Hours	$L_{eq, night}$ 11pm-7am (dBA)	Total Hours	$L_{eq, 1\ h}$ 10pm-11pm (dBA)	$L_{eq, 24\ h}$ (dBA)	Total Hours
R1	02/08	-	-	-	-	-	-	-
	03/08	44.0	8	44.2	6	-	43.8	9
	04/08	43.2	8	47.9	8	34.1	43.4	15
	05/08	42.6	7	-	-	-	46.4	14
R2	05/08	48.1	3	-	-	-	48.1	3
	06/08	-	-	42.4	8	-	-	-
	07/08	-	-	38.2	4	-	42.3	9
	08/08	-	-	-	-	-	38.7	3
	09/08	-	-	-	-	-	-	-

Site	Dates (2014)	$L_{eq, day}$ 7am-11pm (dBA)	Total Hours	$L_{eq, night}$ 11pm-7am (dBA)	Total Hours	$L_{eq, 1\ h}$ 10pm-11pm (dBA)	$L_{eq, 24\ h}$ (dBA)	Total Hours
R3	09/08	36.0	10	40.6	8	40.3	36.0	11
	10/08	35.7	13	35.4	4	-	38.4	21
	11/08	32.9	3	-	-	-	33.3	6
R4	11/08	-	-	-	-	-	-	-
	12/08	35.8	6	40.2	8	29.8	35.3	7
	13/08	41.2	6	-	-	-	41.0	13
R5	13/08	-	-	-	-	-	-	-
	14/08	-	-	-	-	-	-	-
	15/08	54.4	7	47.9	8	28.3	53.9	8
	16/08	52.3	16	-	-	52.9	51.4	23
	17/08	-	-	-	-	-	-	-

In their 2014 report entitled "The Nunavut Impact Review Board's 2013 – 2014 Annual Monitoring Report for the Meadowbank Gold Project and Board's Recommendations" (November 19, 2014), NIRB indicated that they encourage AEM and the GN to work together to investigate mine-related disturbance on caribou and wildlife, and report back to the NIRB on the progress of these discussions (Recommendation 20). AEM believes that they are fulfilling noise and wildlife monitoring requirements as described in the Noise Monitoring and Abatement Plan and Terrestrial Ecosystem Management Plan, with few exceedances of established thresholds. Nevertheless, AEM aims to communicate further with the GN in 2015 to better understand any concerns regarding monitoring of mine-related disturbance on caribou and wildlife.

8.3 AIR QUALITY MONITORING

As required by NIRB Project Certificate No.004 Condition 71*: In consultation with EC, install and fund an atmospheric monitoring station to focus on particulates of concern generated at the mine site. The results of air-quality monitoring are to be reported annually to NIRB*

Onsite Monitoring

The 2014 air quality and dustfall monitoring program at Meadowbank was conducted in support of the Air Quality and Dustfall Monitoring Plan - Version 2 (November, 2013).

The objective of the 2014 program was to measure dustfall, total suspended particulates (TSP), PM_{10}, $PM_{2.5}$ and NO_2 at four monitoring locations around the Meadowbank site. Locations were established in 2011 in consultation with Environment Canada. You can found the report "*2014 Air Quality and Dustfall Monitoring Repor*t" in Appendix G12.

Results obtained for the measured parameters were compared to Government of Nunavut (GN) Environmental Standards for Ambient Air Quality (October, 2011) for TSP, $PM_{2.5}$ and NO_2; BC Air Quality Objectives (August, 2013) for PM_{10}; and Alberta Ambient Air Quality Guidelines (August, 2013) for dustfall. The Canadian Ambient Air Quality Standards for $PM_{2.5}$ (May, 2013) are also referenced.

Of 120 TSP samples obtained, one exceeded the relevant GN standard of 120 µg/m^3, with a concentration of 219 µg/m^3. This sample was obtained from DF-2, which is located immediately south

(downwind) of the main mine plant area and adjacent to the TCG contractor area. For PM_{10}, four samples exceeded the BC Air Quality Objective of 50 µg/m^3 for the 24-h average, with values of 53, 63, 66 and 69 µg/m^3. For $PM_{2.5}$, one sample exceeded the GN standard of 30 µg/m^3 and the Canadian Ambient Air Quality Standard of 28 µg/m^3 for the 24-h average, with a concentration of 56 µg/m^3. This sample was also from station DF-2. No suspended particulates exceeded the relevant GN or Canadian standards for annual averages.

The Alberta recreational area guideline for dustfall was exceeded in 5 out of 44 samples, which is lower than 2013 (11 exceedances). The industrial area guideline was not exceeded in any sample.

The GN annual average standard for NO_2 of 32 ppb was not exceeded, with a maximum monthly average of 3.3 ppb.

Estimated greenhouse gas emissions for the Meadowbank site as reported to Environment Canada's Greenhouse Gas Emissions Reporting Program in 2014 were 179,889 tonnes CO_2 equivalent. A year-over-year decline has been observed, with 195,686 tonnes in 2013 and 202,201 tonnes CO_2 equivalent in 2012.

Incinerator stack testing was conducted by Exova, and a summary of results is provided. The result for mercury (average) was 64.09 µg/Rm^3 @11%O_2. This exceeded the Environment Canada guideline of 20 µg/Rm^3. As a result an investigation was undertaken to determine the cause of this exceedance. Although AEM has an alkaline battery recycling program whereby batteries are collected in numerous depots (and shipped south yearly), the investigation revealed that there could still be a significant volume of batteries disposed of with regular solid waste destined for the onsite incinerator. Alkaline batteries contain mercury, thus this would seem to be the most likely source. Incomplete combustion in the primary or secondary chamber may have been a small contributing factor on the dates of testing. By comparison the results for mercury in 2012 were <0.08 µg/Rm^3 @11%O_2. As a result, AEM implemented a comprehensive site wide information program to reinforce the requirements of the recycling program. This includes regular meetings with individual departments as well as placing information on the AEM intranet site. In addition stack testing will take place again in the summer of 2015.

Overall, there are no apparent trends towards increasing air quality concerns at the Meadowbank site.

AWAR Monitoring

In their 2014 report entitled "The Nunavut Impact Review Board's 2013 – 2014 Annual Monitoring Report for the Meadowbank Gold Project and Board's Recommendations" (November 19, 2014), NIRB indicated that AEM should report on additional dustfall sampling along the AWAR in the 2014 year within its 2014 Annual Report (Recommendation 11). The following summarizes the results of AWAR dustfall monitoring from 2012 – 2014. Further details are available in the *2014 All-Weather Access Road Dust Monitoring Report* (Appendix G13).

In addition to onsite air monitoring, AEM has conducted studies of dustfall along the Meadowbank AWAR to Baker Lake since 2012. Attached is a copy of the "*2014 All-Weather Access Road Dust Monitoring Report*" in Appendix G13. This study aimed to characterize dust deposition rates with respect to distance from the AWAR in order to determine the potential for degradation of vegetation (habitat) in excess of impacts predicted in the Final Environmental Impact Statement (FEIS). While predicted dustfall rates were not specified, the FEIS indicated that the majority of dustfall was anticipated to occur within 100 m of the road. The smallest zone of influence (ZOI; area where habitat is assumed lost due to sensory disturbance and other factors) for any wildlife VEC is also 100 m, with the prediction that impacts to VECs outside this zone would not be significant (< 1% change from baseline). Therefore, dustfall studies

focused around the 100 m distance, and particularly on the downwind (most impacted) side of the road. Through these studies, AEM aimed to quantify dustfall with respect to distance from the AWAR, and compare results to background levels and regulatory guidelines.

While all data has been incorporated into this summary, it should be noted that the study in 2012 was preliminary with only 10 sample locations, and in 2013 only seven samples were able to be analyzed due to disruption of sample canisters in the field. Based on these studies, improvements to methods were made and the 2014 study was successful with 41 canisters deployed and analyzed.

Sample locations in 2012 included single transects at AWAR km 76 and 78, with canisters deployed at 50, 100 and 150 m upwind and downwind of the road. In 2013, double transects were planned to be sampled at km 18 and 78 (up to 300 m on the downwind side), with supplementary samples collected at km 1, km 103 and on the Vault haul road (50 m distance only). However, many canisters were disrupted by wind or wildlife, and only seven were analyzed. The 2013 locations were repeated and successfully sampled in 2014, with the addition of two background samples collected at a reference site approximately 10 km upwind of the mine site.

Results of the 2012-2014 AWAR dustfall studies have shown that there is more than a 2x reduction in dustfall from 50 m to 100 m on the downwind (most impacted) side of the AWAR, from an average of 1.24 $mg/cm^2/30d$ (n = 7) at 50 m to 0.53 $mg/cm^2/30d$ (n = 9) at 100 m (km 18, 76 and 78 data; all study years combined). Effect of distance from the road on dustfall rates in transects was also assessed by non-linear regression for upwind and downwind samples collected since 2012. For dustfall downwind of the road, all measured values at 300 m were within the 95% confidence interval of background samples, 5 out of 6 samples were within this range at 150 m, and 3 out of 6 were in the range at 100 m. These comparisons suggest that the majority of dustfall does settle within the predicted 100 m zone, and that dustfall rates reach background levels at around 150 m on the downwind side of the AWAR. However, only two true background reference samples were collected in 2014, so further analysis is proposed for 2015 to confirm these results.

Alberta Environment presents a recreational area guideline for dustfall of 0.53 $mg/cm^2/30d$, and a guideline for industrial areas of 1.58 $mg/cm^2/30d$. The Ontario Ministry of the Environment and Climate Change uses a standard of 0.7 $mg/cm^2/30d$ (above background) for industrial emissions. These values are based on aesthetic or nuisance concerns, and not environmental or human health. Only two samples on the AWAR have ever exceeded the industrial area guideline, and these were at 50 m. At 100 m or more from the AWAR, nine out of 33 samples have exceeded the lowest guideline of 0.53 $mg/cm^2/30d$ (4/8 in 2012; 2/4 in 2013; 3/21 in 2014). At 150 m or more, three samples have exceeded this guideline (1/2 in 2012; 1/2 in 2013 and 1/9 in 2014).

Unfortunately, quantitative relationships between road dust and habitat degradation are not well defined in the North, and no guidelines are available for dustfall based on ecological considerations. Therefore, direct measurements of dustfall have been used in these studies as a conservative screening tool to assess the potential for effects on habitat. Considering results to date, most dustfall does occur within the predicted 100 m zone, and generally reaches the range of background levels within approximately 150 m of the road. It is therefore unlikely that impacts to VECs (vegetation community productivity and wildlife) due to dust are occurring beyond the smallest assumed ZOI (100 m).

These results are supported by wildlife monitoring conducted under the Terrestrial Ecosystem Management Plan, including the Wildlife Screening Level Risk Assessment. In order to assess potential effects of ingestion of chemical contaminants, wildlife screening level risk assessments were conducted in 2005 (baseline), 2011 and 2014. The 2014 assessment included analysis of soil and plant samples collected at 100 m on the downwind side of the AWAR, and indicated no incremental risk to wildlife

associated with consumption of soil and vegetation in this area. Road-related effects on wildlife populations have also been assessed directly through the wildlife monitoring program. Impacts to breeding bird populations (which were determined to have the smallest zone of influence – 100 m from the road) were assessed using thresholds for relative abundance, species richness and species diversity. Breeding bird surveys were conducted along the AWAR for four years (2007 – 2011), and all results indicated that no thresholds were surpassed; therefore road-related effects on bird populations were not considered to be significant.

Despite this evidence that wildlife is not being impacted beyond established thresholds, AEM plans to continue dustfall monitoring along the AWAR and will conduct bird studies along the AWAR in 2015.

Based on these results which support the previous studies conducted in 2012 and 2013, AEM will continue to implement measures to control dust on the AWAR and onsite. The dust suppression program includes:

- Continuous watering of mine site roads, including Vault haul road, in the summer;
- Application of calcium chloride along the highest-use segment of the AWAR (from the Meadowbank Gatehouse to the Exploration Camp); and
- Watering of airstrip 30 min or less prior to arrival of aircraft, and 15 min or less prior to take-off.

8.4 WILDLIFE MONITORING*

8.4.1 Annual Monitoring

As Required by NIRB Project Certificate No.004, Condition 55: ***Provide the Annual Wildlife Summary Monitoring Report.***

The 2014 Wildlife Monitoring Summary Report represents the ninth of a series of annual Wildlife Monitoring Summary Reports. The report is provided in Appendix G14. Baseline and monitoring programs were first initiated in 1999 and will continue throughout the life of the mine. Details of the wildlife monitoring program for the project are provided in the Terrestrial Ecosystem Management Plan (Cumberland 2006). The 2014 report provides the objectives, methodology, historical and current year results, accuracy of impact predictors, and management recommendations of each monitoring program in standalone sections.

Habitat mapping was completed for the 2014 report, comparing as-built drawings to predicted and approved disturbance using an analysis of Ecological Land Classification (ELC) units. Disturbance has increased since the 2012 analysis, but habitat loss is still within threshold levels. Habitat loss associated with the AWAR was considerably lower than predicted.

Four active Peregrine Falcon (Falco peregrinus) nests were observed and monitored at quarry sites along the AWAR. Quarries appear to have created suitable raptor nesting habitat, as all of these nests have been active for at least four seasons. No nesting activity was observed at Portage Pit in 2014. Raptor nest management plans were not warranted at any of the active nest sites, and no project-related effects on falcon nesting success were confirmed.

* TSM- Biodiversity and Conservation Management

The Government of Nunavut Caribou (Rangifer tarandus) collaring program, ongoing for the past six years in the Baker Lake area, continued in 2014 with monitoring of existing collared animals as part of regional efforts to understand Caribou populations. Seasonal Caribou movements within and adjacent to the Meadowbank Regional Study Area (RSA) were tracked and mapped throughout the year. No additional collars were deployed in 2014. In 2014, collared Caribou were present in the RSA during the spring, fall, fall rut, and early winter, but no movements of collared Caribou were recorded across the Meadowbank AWAR.

Although Hunter Harvest Study (HHS) participation rates remained relatively constant in 2014 (46 respondents), the number of participants recording Caribou harvest decreased dramatically (n=27, compared to n=44 last year), as did overall reported number of Caribou harvested in 2014 (n=269, compared to n=420 last year). Based on these results, it is estimated that only 5% of Baker Lake hunters actively participated in the HHS this year. In 2014, 40% of all reported Caribou harvests were within 5 km of the AWAR, comparable to the average of 39% since the study began.

The AWAR was closed as a preventative measure in October and November, as large herds of Caribou were observed nearby, and traffic on the haul road between the Portage and Vault pits was restricted in September. No Caribou fatalities occurred at the mine site or along the AWAR in 2014. Improved food-handling practices and employee awareness programs at the mine site helped ensure no Arctic Fox (*Vulpes lagopus*) or Wolverine (*Gulo gulo*) fatalities.

Each subsequent Wildlife Monitoring Summary Report builds on data presented in the previous year's report. Analyses of data from monitoring programs to date indicate that the programs are appropriate for comparing baseline conditions and reference areas to current conditions at the mine site. Monitoring programs will continue to meet the conditions of the Nunavut Impact Review Board Project Certificate but will evolve throughout the life of the mine, contingent on data quality objectives and the necessity for adaptive management strategy implementation and subsequent effectiveness monitoring. Ongoing collection of data will allow for increasingly robust statistical analyses each year, where warranted, that will build on an understanding of naturally occurring and potential mine-related effects.

The "*Meadowbank Mine 2014 Wildlife Monitoring Summary Report*" is attached in Appendix G14.

8.4.2 Harvest Study Results

As required by NIRB Project Certificate No.004 Condition 54

a. Updated terrestrial ecosystem baseline data

See "*Meadowbank Mine 2014 Wildlife Monitoring Summary Report*" attached in Appendix G14.

e. Details of a comprehensive hunter harvest survey to determine the effect on ungulate populations resulting from increased human access caused by the all-weather private access road, including establishing preconstruction baseline harvesting data, to be developed in consultation with local HTOs, the GN-DOE and the Nunavut Wildlife Management Board.

At the end of 2014, hunting data had been collected from 46 participants interviewed, which is a continued decrease from a peak in 2012 when 62 were participants interviewed (the highest number of participants in a single study year). The total number of participants recording Caribou harvest during the course of each study year has remained fairly constant (ranging between 35 and 45 hunters each year);

however, in 2014, only 27 participants recorded Caribou harvests with an average of 6.3 participants recording harvest each month. Lower reported harvest numbers may be a reflection of participant fatigue and declining response rate, given the length of time the study has been ongoing. Based on 2014 results, it is estimated that only 5% of Baker Lake hunters are actively participating in the HHS. In previous years, the estimated rate of participation was 10% of Baker Lake hunters participating, based on the 2008 HTO member list.

In 2014, the total number of Caribou harvested within 5 km of the AWAR (108 animals) was the lowest recorded since the first year of the HHS; however, this number still represents 40% of all harvests recorded by participants and is similar to the average of 39% since the study began in 2007, suggesting that overall distribution of harvest has stabilized. In the historical NWMB study, Caribou harvests within 5 km of the road were estimated to be 18% of total harvest year round.

The participation rate near the road has been consistently higher than reported in the first year of the HHS, when only 49% of participating hunters reported harvest within 5 km of the AWAR. The HHS average participation rate within 5 km of the road is 77% of all hunters reporting harvest. Total harvests per participant within 5 km of the AWAR have also increased since 2007, with an average of 6.3 Caribou per participant overall compared to 4.8 Caribou per participant in the first year of the HHS

The total number of Caribou harvested along the AWAR increased during the first few years of the HHS, but has been lower over the past three years of data, likely related to an overall decrease in total harvest. A similar pattern was observed for the growing season, but a slight continual increase in total harvest numbers has been observed along the road in the winter season. The percentage of winter season harvest within 5 km of the AWAR was higher in 2014 than in previous years. The road appeared to be used more often by hunters in the winter season, despite relatively unrestricted access to unroaded areas in the Baker Lake area. On average during the HHS, the percentage of harvest within 5 km of the AWAR was higher during the growing season (43% of the harvest during growing season compared to 34% during winter season). The percentage of harvests within 5 km of the AWAR by season has fluctuated over the course of the HHS with no strong discernible trend, indicating that relative use by hunters has remained fairly constant.

It is not clear how the decline in number of participants in the HHS is affecting these results. For example, a few, very successful hunters along the AWAR who report all harvests could skew the results on an RSA-wide basis, as could the increased success of hunters related to a large Caribou herd. Although the subset of hunters participating in the HHS is thought to be generally representative of Baker Lake hunters, considerable bias could occur; therefore, conclusions on changes in hunting distribution or success must be made with caution.

Reported counts for Muskox and Wolverine remained low, precluding any interpretation of potential mine-related effects. Low densities of these species and their general aversion to humans require hunters to hunt well away from the AWAR; therefore, the presence of the AWAR is thought to have little effect on Muskox and Wolverine hunting patterns. Wolverine harvest reports have decreased from a maximum of 15 animals in 2010. Only three Wolverines were reported harvested in 2014.

f. Details of annual aerial surveys to be conducted to assess waterfowl densities in the regional study area during the construction phase and for at least the first three (3) years of operation, with the data analyzed and compared to baseline data to determine if significant effects are occurring and require mitigation.

Given the low densities of waterbird nests identified at the mine site and along the AWAR from 2005 - 2012 (i.e., too low to determine whether changes in nest abundance or success have occurred), and the absence of data suggesting that mine or road-related effects are occurring, the waterbird nest survey program has been discontinued.

g. Details of an annual breeding bird plot surveys and transects along the all-weather road to be conducted during the construction phase and for at least the first three (3) years of operation.

Details of the breeding bird plot surveys are provided in Section 4 of the "*Meadowbank Mine 2014 Wildlife Monitoring Summary Report*" (Appendix G14).

In summary, the objective of the breeding bird plot monitoring program is to confirm that a mine-related change of 20% function, determined by an increase or decrease in local breeding bird abundance, richness, and diversity, has not occurred. The program uses the widely accepted Canadian Wildlife Service's (CWS) Program for Regional and International Shorebird Monitoring (PRISM) protocols (CWS 2005). A secondary objective of the monitoring program is to determine more effective ways to prevent disturbance to nesting birds based on feedback from mitigation measures and observations.

The breeding bird plot monitoring program is to continue every year during the construction period and for at least the first three full years of mine operation (2010 to 2012) in accordance with the TEMP (Cumberland 2006). The next PRISM plot survey is planned for 2015 following which detailed analyses of project effects will be undertaken. Result of the 2012 plot survey can be found in Section 4 of the "*Meadowbank Mine 2012 Wildlife Monitoring Summary Report*" found in Appendix G5 of the 2012 Annual Report.

To date, PRISM plot data show that most bird community indices are variable with little difference in the overall trends between mine and control plots. The next set of PRISM plot surveys will be conducted in 2015, following which detailed statistical analyses on all PRISM data collected to date will be conducted to investigate potential project effects.

8.4.3 Caribou Migration Corridor Information Summary

As required by NIRB Project Certificate No.004 Condition 56: ***Maps of caribou migration corridors shall be developed in consultation with Elders and local HTOs, including Chesterfield Inlet and placed in site offices and upgraded as new information on corridors becomes available. Information on caribou migration corridors shall be reported to the GN, KIA and NIRB's Monitoring Officer annually.***

See Figure 22 and Figure 23 for spring and fall maps of caribou migration corridors, respectively.

8.4.4 Caribou Collaring Study

As required by NIRB Project Certificate No.004 Condition 57*: participate in a caribou collaring program as directed by the GN-DOE*

The joint satellite-collaring program was developed to provide information on the distribution of Caribou occurring within the Meadowbank RSA and contribute data to other ongoing satellite collaring programs for the Beverly, Qamanirjuaq, and other herds. The satellite-collaring program has become increasingly important as both a monitoring and management tool in recent years. The satellite-collaring program,

along with GN DoE regional data, is also serving to provide a regional perspective on Caribou activity near mine operations and natural changes in Caribou populations in the region.

The satellite-collaring program was initially designed to continue for five consecutive years in accordance with the TEMP (Cumberland 2006), but collar monitoring has continued beyond this period. Caribou in the Baker Lake area were collared in May 2008, November 2009, April 2011, and April 2013. An additional 10 collars are planned to be deployed in mid-April in the Baker Lake area, and monitoring of existing and new collars will continue in 2015 (i.e., 8th year of collar monitoring).

As of December 2014, eight collars originally deployed in the Baker Lake area as part of the GN and industry collaring program were active and transmitting signals (i.e., none from the 2008, 2009, and 2011 deployments). Three final collars from the 2011 program all became inactive on 15 September, presumably when the drop-off feature of the collars was activated (i.e., after 3 ½ years). Collars are removed from the program due to collar malfunction or deactivation, or Caribou mortality. A summary of 2014 locations and movement patterns for animals collared around Baker Lake is provided below and summarized in Figure 9.1 of the *2014 Wildlife Monitoring Summary Report*.. Movements for Qamanirjuaq herd collared animals, a program also supported by Agnico Eagle, are provided for context. Movements of collared Caribou in close proximity to the Meadowbank RSA and LSA are shown in Figure 9.2 of the *2014 Wildlife Monitoring Summary Report*.

A summary of Caribou migration patterns, which synthesizes migration information from satellite collaring data, has been developed by the GN for the spring and fall migrations (Figures 9.11 and 9.12 of the report in Appendix G14). These data and summary are inclusive of telemetry data collected up to 2012.

To generate the maps, satellite-collaring data was first used to generate 'walk lines' for each animal, and then a 'density' analysis was run on the walk lines for Caribou in spring and fall migration pre-breeding and fall migration post-breeding (on a per year and subpopulation basis). This path-derived analysis assesses continuous corridors rather than points, which can artificially elevate density estimates for an area. The approach generates spatial patterns of migration and compares areas by relative intensity of use. Higher use areas represent more intense use by multiple animals within a particular year and/or regions of repeated use occurring over multiple years. One limitation of the data is that areas outside of defined migration corridors do not necessarily indicate it is unimportant to, or uninhabited by, Caribou, but instead could be an area where collared animals have not been located (i.e., and could potentially be an area of high density for non-collared animals)

8.4.5 Raptor Nest Survey

The raptor nest survey monitoring program has been designed to confirm that mine-related activities do not result in inadvertent negative effects on nesting raptors. Raptor surveys along the proposed AWAR alignment in 2005 (i.e., prior to construction) indicated that only low suitability habitat for nesting raptors was available. To construct the AWAR in 2007/2008, excavated and blasted rock materials were used from numerous quarries along the alignment, resulting in the creation of some moderate and high suitability raptor nesting habitat areas characterized by steep walls and overhangs. Established nests within some of these quarries are monitored on an annual basis to evaluate occupancy.

The primary objectives of the raptor nest survey monitoring program are to:

1. Confirm that raptor nest failures will not be caused by mine-related activities. The threshold level is one nest failure per year; and

2. Confirm that no project-related mortality of raptors will occur. The threshold level of mortality is one individual per year.

Raptor nest monitoring is to continue annually throughout the operational and decommissioning phases of the mine in accordance with the TEMP (Cumberland 2006).

Cumulative information on Peregrine Falcon nests from 2009 to 2014 is summarized in Table 8.40. Only the presence or absence of active nests was recorded in 2014; no details were collected on nesting success. No nesting behavior was observed at Portage Pit in 2014, possibly attributable to the increased elevation of the pits making raptor observations more difficult. Environmental personnel did perform surveys of the pit area to determine if falcons were nesting. All surveys reported a negative presence.

No new active nest sites were identified in 2014, and raptor nest management plans were not warranted at any of the active nest sites.

Table 8.40: 2014 Raptor and Raven Nests Identified and Monitored at the Mine Site and along the AWAR between Baker Lake and the Meadowbank Mine Site from 2009 to 2014

Quarry	Nest in:						Comments
	2009	2010	2011	2012	2013	2014	
1	No	No	No	No	No	No	Shallow quarry.
2	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	Good cliff faces for nesting.
3	No	**Yes**	**Yes**	**Yes**	**Yes**	No	Nest Management Plan in 2010.
4-6	No	No	No	No	No	No	Shallow quarry and/or flooded.
7	No	No	No	No	No	No	Old Common Raven (*Corvus corax* – CORA) nests. Lots of fractured rock forming cliff faces but limited ledges. No nest observed in 2013.
8	No	No	No	No	No	No	No cliff faces.
9	No	Yes[1]	Yes[1]	No	No	No	CORA stick nest with 3 chicks in 2011. Old CORA nest. Lots of fractured rock forming cliff faces but limited ledges.
10-15	No	No	No	No	No	No	Shallow quarry and/or flooded.
16	No	No	No	No	No	No	Moderate depth with good cliff faces, no ledges. Old fallen stick nest, likely CORA. Old PEFA(?) nest observed in 2011, lots of whitewash in quarry.
17	No	No	No	No	No	No	Very shallow quarry. PEFA present but no nest.
18	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	Good, high cliff face but no ledges. Nest at top lip.
19	**Yes**	No	**Yes**	**Yes**	**Yes**	**Yes**	Good, vertical cliff face, some suitable ledges. Falcon eggs observed in 2013.
20	No	No	No	No	No	No	Very shallow quarry. Partially filled with snow. Lots of whitewash on north end of quarry, adult observed (2011).
21	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	Good, high cliff face, no ledges. Nest at top lip in 2010, but close to road in 2011.
22	No	No	No	No	No	No	Good, high cliff face. Currently used as tire/metal dump, may deter nesting.
Portage Pit	No	No	No	**Yes**	**Yes**	**No**	Nesting efforts not deterred following implementation of raptor management and protection plan in 2012

Quarry mining activities along the AWAR corridor have created moderate to high suitability raptor nesting habitat. Raptors are expected to continue to use select quarries for the foreseeable future, which may necessitate the implementation of a raptor nest management plan for raptor nests if deemed necessary. Raptor nest surveys must be conducted annually at each of the quarries along the AWAR early in the nesting season (mid- to late June) to confirm the status of previously confirmed raptor nests, assess for the presence of new raptor nests, and determine the need, if any, for development and implementation of raptor nest management plans. Raptor nests should continue to be monitored weekly during the breeding season to confirm nest success or failure.

8.5 COUNTRY FOOD

As required by NIRB Project Certificate No.004 Condition 67: ***Develop and implement a program to monitor contaminant levels in country foods in consultation with HC; a copy of the plan shall be submitted to NIRB's Monitoring Officer***

In keeping with AEM's Terrestrial Ecosystem Monitoring Plan and Nunavut Impact Review Board Project Certificate, Condition 67, a Wildlife Screening Level Risk Assessment (WSLRA) and Human Health Risk Assessment for the Consumption of Country Foods (HHRA) were completed in 2014 to evaluate risks to wildlife and human health from contaminant exposure during operation of the Meadowbank mine. The full WSLRA and HHRA reports for 2014 are provided in Appendix G15 and G16 respectively, and summarized here.

WSLRA and HHRA assessments were based on soil, water and plant tissue samples collected from onsite, near-site, AWAR, and reference sites in 2014. Methodology of the risk assessments follows the format of the pre-construction screening level risk assessments (2005), and initial assessments under operational conditions (2011). The WSLRA evaluated risk to wildlife (ungulates, small mammals, waterfowl and songbirds) from dietary ingestion of chemical contaminants. The HHRA evaluated risk to humans from consumption of country food items (caribou meat and organs; Canada goose meat). Both assessments used a hazard quotient approach. As per Condition 67, the 2014 HHRA report incorporates recommendations from Health Canada's review of the 2011 assessment, as well as updates from the most recently published federal guidance document (Health Canada, 2012). Updated toxicity reference values and bio transfer ratios were used as available.

WSLRA

Exposure was calculated from $95^{\%}$ UCLM concentrations in environmental media for each location, and toxicity reference values (TRVs) were developed from lowest-observed adverse effect levels (LOAELs) from the literature (TRVs were the same as previous assessments). HQ values were calculated as:

$$HQ = EDI / TRV$$

Where:

EDI = estimated daily intake (ug/kg body weight/day)
TRV = toxicity reference value (ug/kg body weight/day)

Risk was characterized as negligible when HQ ≤ 1.

Key findings were as follows:

- Risk to ungulates (caribou), small mammals (northern red-backed vole), and waterfowl (Canada geese) was found to be negligible (HQ < 1) for all COPCs in all locations.

- Potentially unacceptable risks to songbirds from chromium and beryllium (HQ>1) were identified for all locations including the external reference site, which is consistent with baseline and 2011 assessments.

    - For chromium, the external reference HQ exceeded onsite, near-site and AWAR HQ values, indicating that risk from this COPC is not elevated as a result of mining activities. Chromium is naturally elevated in ultramafic rock, which is common in the region.

    - For beryllium, the HQ threshold of 1 was marginally exceeded for all study areas using a NOAEL-based TRV, so risk for populations in all locations is assumed to be negligible (as in the baseline assessment).

- All 90th centile concentrations of COPCs in soil samples collected onsite were lower than values measured during the baseline (pre-construction) assessment.

Overall the operation of the Meadowbank mine does not appear to be contributing excess risk to wildlife via dietary uptake of chemical contaminants.

HHRA

As recommended by Health Canada, a hazard quotient (HQ) approach was used to classify the risk associated with the low, moderate and heavy consumption of country food items from onsite, near-site, AWAR, and external reference locations. Exposure was calculated from maximum measured concentrations in environmental media for each location. Risk was classified as negligible for each contaminant of potential concern (COPC) if the calculated HQ value was ≤ 0.2 (Health Canada, 2012). For each COPC with an HQ value > 0.2, the incremental risk associated with the mine site was assessed by identifying whether onsite, near-site or AWAR HQ values exceeded the corresponding external reference HQ value.

Key findings were as follows.

Caribou Meat

- Negligible risk (HQ ≤ 0.2) is associated with the consumption of caribou muscle (meat) for most COPCs. For chromium, nickel, lead, thallium, and zinc, HQ values exceeded 0.2 for all study areas, including the external reference site.

    - Onsite and AWAR HQs for chromium, nickel and lead were the same as or lower than the corresponding value for the external reference site, indicating no incremental risk as a result of the project.

    - Onsite HQ values for thallium and zinc marginally exceeded external reference values in some consumption scenarios. HQs are based on the maximum measured concentration among the samples collected. For comparison, measured mean concentrations in onsite environmental media did not exceed external reference values in statistical tests, indicating that average exposure for animals spending time in the onsite caribou study area is not higher than background. As a result, incremental risk associated with these COPCs is not expected to be significant.

Caribou Kidney

- Negligible risk (HQ ≤ 0.2) is associated with the consumption of caribou kidney from all study locations for most COPCs. The HQ value for thallium exceeded 0.2 for all study areas, including the external reference site (to a maximum of 0.6; for moderate or heavy consumption scenarios).

    - Thallium HQ values for onsite or AWAR locations were the same as or lower than external reference values, indicating no incremental risk as a result of the project.

Caribou Liver

- Negligible risk (HQ ≤ 0.2) is associated with the consumption of caribou liver from onsite, AWAR, and external reference study areas, for all COPCs except lead, which had HQs > 0.2 for all study areas, including the external reference site (maximum HQ of 1.0).

    - Only the onsite lead HQ for low consumption by toddlers exceeded the corresponding external reference value, but the difference in HQs is marginal (0.004) and is not expected to be significant. The toxicity reference value used for lead in this assessment is equivalent to the median dietary lead exposure for the Canadian population (0.1 ug/kg bw/d), as determined in Health Canada's Final Human Health State of the Science Report on Lead (2012) and identified in Health Canada's review of the 2011 Meadowbank HHRA.

Canada Goose Meat

- Negligible risk (HQ ≤ 0.2) is associated with the consumption of Canada goose meat from onsite, near-site, AWAR and external reference study areas, for most COPCs. For chromium and lead, HQ values exceeded 0.2 for all study areas, including the external reference site (maximum of 0.8).

    - Lead and chromium HQ values for onsite, near-site or AWAR locations were the same as or lower than external reference values, indicating no incremental risk as a result of the project.

Combined Consumption

- The combined consumption analysis produced one additional scenario under which adverse health effects may potentially occur (low combined consumption by adults due to exposure to lead).

    - HQ values marginally exceeded 0.2 for this scenario, but were the same (0.3) for onsite and external reference areas, indicating no incremental risk as a result of the project.

Overall, this analysis indicated that mining activities do not appear to be contributing significant incremental risk from COPCs to consumers of country food items sourced in and around the Meadowbank area. This is consistent with the baseline assessment (2005) which concluded that based on projected concentrations of COPCs in environmental media (soil and water), risk to persons consuming country foods would not increase appreciably following mine development. Since HQ values between the assessments are not directly comparable due to changes in various reference parameters, a comparison of projected and current concentrations of COPCs in soil was performed to assess

quantitative impact predictions. Measured concentrations of COPCs in soil in 2014 did not exceed concentrations projected to occur in the Project's Final Environmental Impact Statement (Cumberland, 2006), confirming that impact predictions are not being exceeded.

8.6 ARCHEOLOGY

As required by NIRB Project Certificate No.004 Condition 69: carry out the Project to minimize the impacts on archeological sites, including conducting proper archeological surveys of the Project area (including the all-weather road and all quarry sites); [Cumberland] shall provide to the GN an updated baseline report for archeological sites in the Project area.

In 2014 there were no new development, expansion, construction, road building, etc. activities conducted or planned taken in areas of the mine site that have not already been assessed by archaeological impact studies and therefore no additional archaeological studies were required or conducted during 2014 for the operational activities. In other words the Meadowbank Mine did not conduct any activities in 2014 that were outside of the boundaries of the boundaries previously assessed for archaeological or paleontological resources sites. Should future expansion occur in areas not previously assessed Agnico is committed to ensuring that Archaeological Impact Assessment studies are completed in accordance with the regulations and the requirements of our Production Lease with the KIA regarding any new archaeological or heritage sites.

8.7 AEMP*

As required by Water License 2AM-MEA0815 Schedule B, Item 14: ***The results of monitoring under the Aquatics Effect Management Plan (AEMP).***

8.7.1 Introduction

The Aquatic Effects Management Program (AEMP) for Agnico Eagle Mines' (AEM) Meadowbank Gold Mine site was developed in 2005 as part of the project's Final Environmental Impact Statement (FEIS) (AEMP 2005), and has been formally implemented since 2006. In 2008, the Nunavut Water Board (NWB) issued Meadowbank's Type A water license (2AM-MEA0815), and requested a revised AEMP, and specified some of the requirements for that revision. Most importantly, while the 2005 AEMP focused on core receiving environment studies at the level of basins and lakes, the NWB advised that the revised AEMP needed to be broader in scope to comply with the following Type A water licence requirements (as stipulated in Part I-1):

- A detailed monitoring protocol to verify that the Canadian Council of Ministers of Environment Fresh Water Aquatic Life Guidelines are met thirty (30) metres from the outfall diffusers;
- Annual reporting for more immediate adaptive management;
- Mechanisms to measure changes to productivity in the lake as a result of the mine adding nutrients;
- Sampling and Analysis Plans; and
- Monitoring under Fisheries Authorizations, NWB Licence Compliance Monitoring, Environmental Effects Monitoring, and Groundwater Monitoring.

* TSM- Biodiversity and Conservation Management

The last requirement diverged from traditional AEMPs, that are traditionally guided by INAC (2009), and required AEM to propose a new approach, which was presented in draft to the NWB (March 2-3, 2010 in a workshop). This draft was accepted without additional comments and submitted as a final revised plan in December 2012, and necessitated the restructuring of the AEMP. Through this process, the AEMP was restructured to serve as an overarching "umbrella" program that conceptually provides an opportunity to integrate results of individual, but related, monitoring programs in accordance with the Type A water license requirements (Azimuth, 2012). The scope of the 2005 AEMP, which was essentially the core receiving environment monitoring, is now one of the monitoring programs that is integrated under the restructured AEMP, and has been renamed the Core Receiving Environment Monitoring Program (CREMP).

The 2013 AEMP synthesis report aims to:

- Identify potential sources of impact and develop a conceptual site model;
- Summarize the results of each of the underlying monitoring programs, including the CREMP (the cornerstone broad-level monitoring program);
- Review the inter-linkages among the monitoring programs;
- Integrate the results for each component program;
- Identify potential risks to the aquatic ecosystem; and
- Provide conclusions and recommend additional management actions, undertaken in 2013, or that should be considered in future monitoring.

8.7.2 Potential Sources of Impacts and the Conceptual Site Model (CSM)

The framework for the AEMP is founded on a conceptual site model, which is used in ecological risk assessment to help understand potential relationships between site activities and the environment (e.g., water quality or certain ecological receptors). The foundation of the 2012 conceptual site model (CSM) is presented in Table 8.41 and consists of the following elements (Azimuth, 2012):

- Stressor sources –the sources of chemical (e.g., metals) or physical (e.g., total suspended solids) stressors that can potentially impact the environment.
- Stressors –the actual agents that have the potential to cause adverse effects to the receiving environment.
- Transport pathways –the ways in which a stressor is released from the source to the receiving environment.
- Exposure media –the media where a stressor occurs in the receiving environment. A single stressor might actually end up in multiple exposure media, with different ones being most important at different times. For example, if an effluent contained mercury, it would initially be found in the water column, and then most likely would settle to sediments where it would then enter the food chain (i.e., biota tissue).
- Receptors of concern –ecological entities selected for a variety of reasons, usually including sensitivity to relevant stressors and perceived ecological importance (i.e. could be determined to be valued ecosystem components).

In 2014, all of the potential pathways, exposure media and receptors of concern listed in Table 8.41 were relevant to the AEMP analysis and were evaluated with the exception of and periphyton (which is collected as habitat compensation monitoring, which will be conducted in 2015). In 2014, the Cycle 2 EEM biological monitoring field study was completed, however the data has not been fully analyzed nor interpreted. Therefore fish tissue results are not discussed in the AEMP in 2015 and benthic or water quality results or other analysis specific to the Cycle 2 EEM are also not integrated into this assessment.

Table 8.41- Primary transport pathways, exposure media, and receptors of concern for the AEMP

	Transport Pathways		Exposure Media		Receptors of Concern
				a, g	Phytoplankton
g,h	Effluent				
				g	Zooplankton
f	Groundwater	a,f,g,h,j,l	Water		
				g	Fish
h,j	Surface water	a	Sediments		
				a	Benthic community
l	Air	g, i	Tissue		
				d	Periphyton
NA	Direct				
				a,d,k	Fish habitat

Notes:	
a	Core Receiving Environment Monitoring Program
~~b~~	~~Effects Assessment Studies~~
~~c~~	~~Dike Construction Monitoring~~
d	~~Habitat Compensation Monitoring Program - No Net Loss Fisheries Planning~~
e	Dewatering Monitoring (Vault Lake in June)
f	Groundwater Monitoring
g	MMER Monitoring
h	Water Quality and Flow Monitoring
i	~~Fish-Out Studies~~
j	AWPAR and Quarry Water Quality Montoring
k	Blast Monitoring
l	Air quality monitoring
NA	Direct, so measured in exposure medium.

Note: ~~strikethrough~~ text is an "AEMP" monitoring program that was not required to be completed in 2014

8.7.3 Summary of Results of AEMP-Related Monitoring Programs

In 2014, in accordance with the Type A license the AEMP-related monitoring programs included:

- the Core Receiving Environment Monitoring Program (CREMP);
- Metal Mining Effluent Regulation (MMER) Monitoring;
- Mine site Water Quality and Flow Monitoring (and evaluation of NP-2);
- Visual AWAR water quality monitoring;
- Blast Monitoring; and
- Groundwater Monitoring.

The results of the monitoring programs are integrated in the AEMP, and assist in the evaluation of potential effects of mining activities on the aquatic environment.

Air quality was also considered as part of the conceptual site model and are included in the AEMP discussion to inform the process, but this program is not a requirement of the Type A License; Part I-1.

Table 8.42 summarizes the results of the AEMP programs in 2014. Details of the programs are described previously in this Monitoring Section (discussed throughout Section 8 of the annual report). For detailed results on individual monitoring programs, refer to the appended reports.

Table 8.42- Summary of results for aquatic effect monitoring programs in 2014

		Core Receiving Environment Monitoring Program	Effects Assessment Studies	Dike Construction Monitoring	Habitat Compensation Monitoring Program - NNL related monitoring	Dewatering Monitoring	MMER Monitoring	Environmental Effects Monitoring (as part of MMER)*	Water Quality and Flow Monitoring	Fish-Out Studies	AWPAR and Quarry Water Quality Montoring	Blasting Monitoring	Groundwater Monitoring
Completed in 2014?		**Yes**	**No**	**NA**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**
Stressor Variables													
	suspended solids	O				O	O		O		O	NA	O
	sediment deposition	NA				NA	NA		NA		NA	NA	NA
	water-borne toxicants	O				O	O		●		O	NA	O
	sediment toxicants	●				NA	NA		NA		NA	NA	NA
	nutrients	O				O	O		O		O	NA	O
	other physical stressors	O				O	O		O		O	●	O
Effects Variables													
	Phytoplankton	O				NA	O		NA		NA	NA	NA
	Zooplankton	NA				NA	O		NA		NA	NA	NA
	Fish	NA				NA	O		NA		NA	NA	NA
	Benthic invertebrate community	O				NA	NA		NA		NA	NA	NA
	Periphyton	NA				NA	NA		NA		NA	NA	NA
	Fish habitat	O				NA	NA		NA		NA	NA	NA

Notes:

O No observed effects

● Trigger or guideline exceedance - early warning explained in report

● Observed effects explained in report

* Interpretive report is due July 1, 2015; data analysis is underway and not reported herein

The following section discusses the stressor and effects based results of the monitoring programs presented in Table 8.42. On February 13, 2014, AEM submitted the EEM Biological Study Design 2 to Environment Canada and between August and September, the sampling for the EEM was completed. As per MMER requirements, the interpretive report is being completed and will be submitted to Environment Canada by July 1, 2015; results specific to the Cycle 2 program are not discussed in the AEMP. Mine effluent was discharged at three locations in 2014: water from Portage Attenuation was treated through the WTP and discharged into Third Portage North from June 10 to July 5, East Dike Seepage water was discharged into Second Portage Lake, Vault lake dewatering into Wally lake was completed on June 29; and effluent from the Vault Attenuation Pond was discharged into Wally lake from July 24 to August 14, 2014. Given the short duration of discharge into TPN and Wally, only one sample was collected from the

exposure and reference area and reported to Environment Canada. The EEM water quality monitoring conducted in 2014 and collected at the same time as the EEM Cycle 2 was reported to Environment Canada via the RISS electronic database reporting system. According to DFO authorizations and recent monitoring plans, habitat compensation monitoring along the AWAR and mine site monitoring was not completed in 2014 and will be conducted in 2015.

Overall, none of the site specific stressors, effects based triggers or guideline exceedances monitored onsite had the potential to cause significant risks to the aquatic environment. NWB license limits for Aluminum during weekly sampling collected on June 10, 24 and 30 were 1.80 mg/L, 1.55 mg/L, and 1.62 mg/L respectively, exceeding the license limit of 1.5 mg/L as a maximum grab sample. AEM exceed the monthly average concentration limit with 1.53 mg/L. The source of the elevated level of aluminium appears to be from the coagulant used in the water treatment plant, and the difficulty to optimize coagulant dosage. NWB license limits for TSS and daphnia toxicity on August 12 were exceeded on one occasion during effluent discharge from Vault Attenuation Pond into Wally Lake. Second Portage Lake did not exceed license limits and all discharges were in compliance with the MMER regulation and were not considered toxic.

The CREMP determined that there were some apparent mine-related changes in conventional parameters relative to baseline/ reference conditions at one or more near-field (NF) areas. Specifically, conductivity, calcium, potassium, magnesium and sodium (in Second Portage Lake – SP, Third Portage North- TPN, Third Portage East –TPE, Third Portage South – TPS, and Wally - Wal). In the absence of effects-based thresholds (e.g., CCME water quality criteria) for these parameters, their triggers were set at the 95th percentile of baseline data. While these results represent mine-related changes, the observed concentrations are still relatively low and unlikely to adversely affect aquatic life. These trends need to be reviewed again in 2015. Sediment coring was conducted in 2014 which helped to inform periodic exceedances in PELs and changes in chromium in TPE from baseline conditions. The targeted study confirmed that the trend is temporal and mining-related, with ultramafic rock used to construct the Bay-Goose Dike the most likely source of chromium-enriched sediments. While TPE sediment chromium concentrations have increased by 50% since dike construction and now exceed the CCME PEL, the local benthic invertebrate community has not been impacted. Notwithstanding, a follow-up study is recommended and will be conducted in 2015 to test the bioavailability and toxicity of the sediments. Lastly phytoplankton and benthic metrics demonstrated variability that could not be explained as mine related. The results of the CREMP are summarized in Table 8.41 and these results are subsequently evaluated in the AEMP.

As discussed in the previous monitoring sections of the annual report and summarized in Table 8.43, discharge and groundwater monitoring programs detected changes in water quality in a well located at the toe of the central dike. This water is isolated and is unlikely to cause any observed effects to the receiving environment but will be considered in this analysis.

In 2014 AEM continued the monitoring in NP-2 during freshet and completed additional monitoring at stations requested by the KIA (which included monitoring at NP-1, Dogleg and Second Portage Lake). Water quality monitoring results at these locations during freshet and throughout the open water season in 2014, indicated improved water quality in NP-2.

In response to the mill seepage through the assay road (discussed in Section 7.0- Spill management), AEM installed GW wells down-gradient of the interception trench and KIA requested additional monitoring in Third Portage Lake, in the nearshore area of a small basin adjacent to the mill. Based on groundwater quality in the monitoring wells and water quality sampling, there is no impact to Third Portage Lake.

Consistent with past results, blast monitoring results showed periodic exceedances of DFO guidelines for peak particle velocity (PPV) predominately due to pre-sheer surface blasting immediately adjacent to the monitoring station. It should be noted that blast monitoring stations are set up on land to permit accurate and consistent readings, and are therefore overly protective of spawning habitat which is at least 250 m away. Furthermore, in comparison to other studies conducted at Ekati, the numbers of observed PPV exceedances at Meadowbank are well below a “no-observed-effect-level”.

Table 8.43- Summary of results of the CREMP

Variable Type & Variable	Magnitude[1]	Spatial Scale[2]	Causation[3]	Permanence[4]	Uncertainty[5]	Comments	Management Action[6]	
Exposure - Limnology								
Oxygen	**0**	n/a	n/a	n/a	?		**0**	
Temperature	**0**	n/a	n/a	n/a	?		**0**	
Conductivity	**0**	n/a	n/a	n/a	?		**0**	
Exposure - Water Chemistry								
Conventionals	**1**	Large	High	Low	?	Conductivity (TPN, TPE, TPS, SP, WAL); Hardness (TPN, TPE, TPS, SP); Ca/K/Mg/Na (TPN, TPE, TPS, SP [not Na]); TDS (TPN, TPE, TPS, SP, WAL) were all elevated relative to reference/baseline conditions. However, concentrations suggest low potential for adverse effects.	**1**	
Nutrients	**0**	n/a	n/a	n/a	?		**0**	
Total Metals	**0**	n/a	n/a	n/a	?		**0**	
Dissolved Metals	**0**	n/a	n/a	n/a	?		**0**	
Total Suspended Solids	**0**	n/a	n/a	n/a	?		**0**	
Exposure - Sediment Chemistry								
Physical	**0**	n/a	n/a	n/a	?		**0**	
Total Metals	**1**	Large	High	Moderate	??	Lead and zinc exceeded the trigger at (WAL), but were clearly within baseline range. Chromium (TPE) temporal trend confirmed in coring study. Target study recommended.	**2**	**
Organics	**0**	n/a	n/a	n/a	?		**0**	
Effects - Phytoplankton								
Chlorophyll-*a* *	**0**	*	*	*	?		**0**	
Total Biomass	**0**	n/a	n/a	n/a	?		**0**	
Taxa Richness	**1**	Moderate	Low	Low	?	>20% lower at TPS than reference/baseline conditions. However, attributed to natural variability similar changes were not seen at near-field areas and there was no prior evidence of trend	**1**	
Effects - Benthic Invertebrates								
Total Abundance	**0**	n/a	n/a	n/a	?		**0**	
Total Richness	**0**	n/a	n/a	n/a	?		**0**	

NOTES:

[1] Magnitude Ratings (narrative in brackets used in the absence of specific triggers/thresholds):

0 – no exceedances of triggers or thresholds (or no apparent changes from baseline of concern)
1 – early warning trigger exceeded (or change from baseline warranting concern)
2 – threshold exceeded (or change from baseline exceeding magnitude of concern)

[2] Spatial Scale Ratings:

n/a – no magnitude of effect, therefore not evaluated
Small – localized scale
Moderate – sub-basin to basin scale
Large – basin to whole lake scale

*Continued data quality issue (chlorophyll-*a*)
** Targeted study recommended; see text for detail.

[3] Causation Ratings:

n/a – no magnitude of effect, therefore not evaluated
Low – no evidence for a mine-related source
Moderate – some likelihood of a mine-related source
High – the source of the problem is very likely to be mine-related

[4] Permanence Ratings:

n/a – no magnitude of effect, therefore not evaluated
Low – rapidly reversible (e.g., months to years)
Moderate – slowly reversible (e.g., years to decades)
High – largely irreversible (e.g., decades +)

[5] Uncertainty Ratings:

? – low uncertainty
?? – moderate uncertainty
??? – high uncertainty

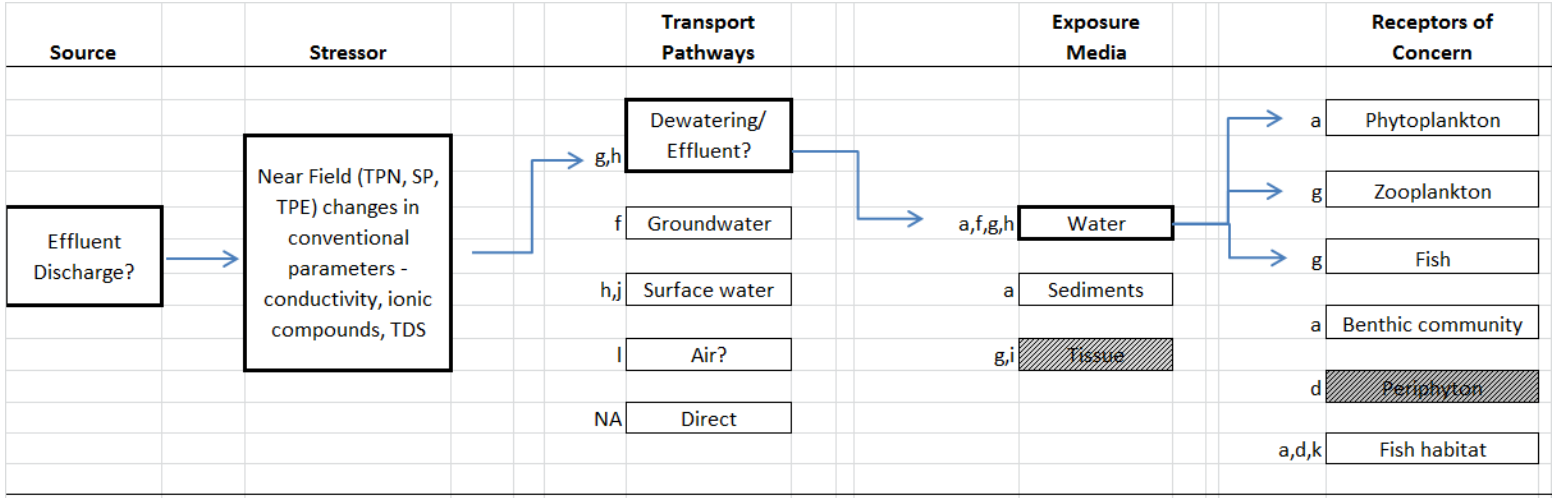
[6] Management Actions:

0 – no action
1 – continued trend monitoring in 2015
2 – active follow-up with more detailed quantitative assessment in 2015

8.7.4 Integration of Monitoring Results

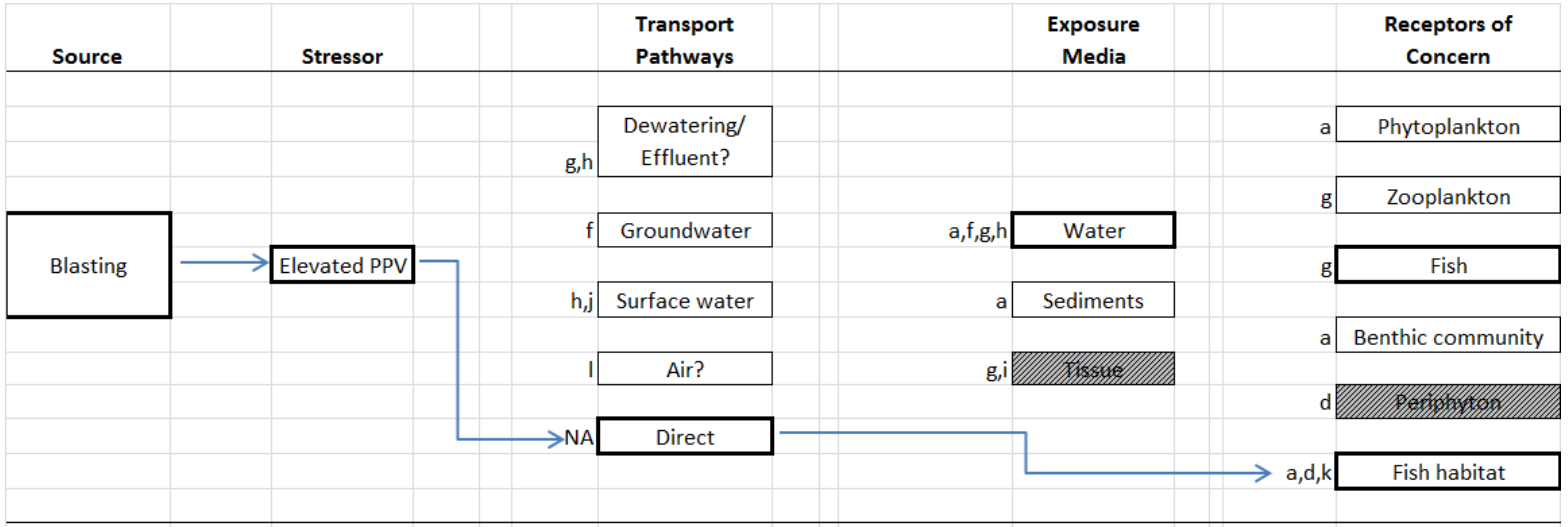
The 2014 AEMP monitoring programs were integrated into the conceptual site model which assisted in the evaluation of the transport pathways, provides information on specific media (identifies stressors) and evaluates receptors of concern (effects variables). As previously discussed, fish tissue and periphyton data were not reported or collected in 2014 in the mine site area and therefore are not included in the conceptual model (shaded grey in the table).

As per Azimuth (2012), the results of the monitoring programs were integrated in a mechanistic fashion that required a thorough review of the results to identify any patterns among the relevant receiving water monitoring programs. Although the receiving environment water quality changes at TPN, TPE, SP and WAL in 2014 are considered unlikely to cause any adverse environmental effects, a conceptual site model was developed to address the issue of changes in conductivity and increases observed in ionic compounds parameters. This will ultimately assist in linking possible incremental changes in the receiving environment, that are evaluated in separate monitoring reports, into the bigger picture to ensure all mine activities and sources, are accounted for and are not resulting in receiving environment impacts (see Figure 25a – evaluation of TDS, conductivity and ionic parameters; Figure 25b – evaluation of PPV exceedances; Figure 25c – evaluation of elevated chromium in TPE sediment). As per Azimuth (2012), source, stressor, transport pathways, exposure media, and effects measures were evaluated in 2014. Although independent programs did not identify risks to the environment, each stressor/transport-pathway, stressor/medium and medium/effect measure combination related to the issue was assessed for programs that had exceedances of relevant guidelines (blast monitoring, water quality and flow monitoring) or triggers (changes in sediment chemistry in TPE reported in the CREMP).



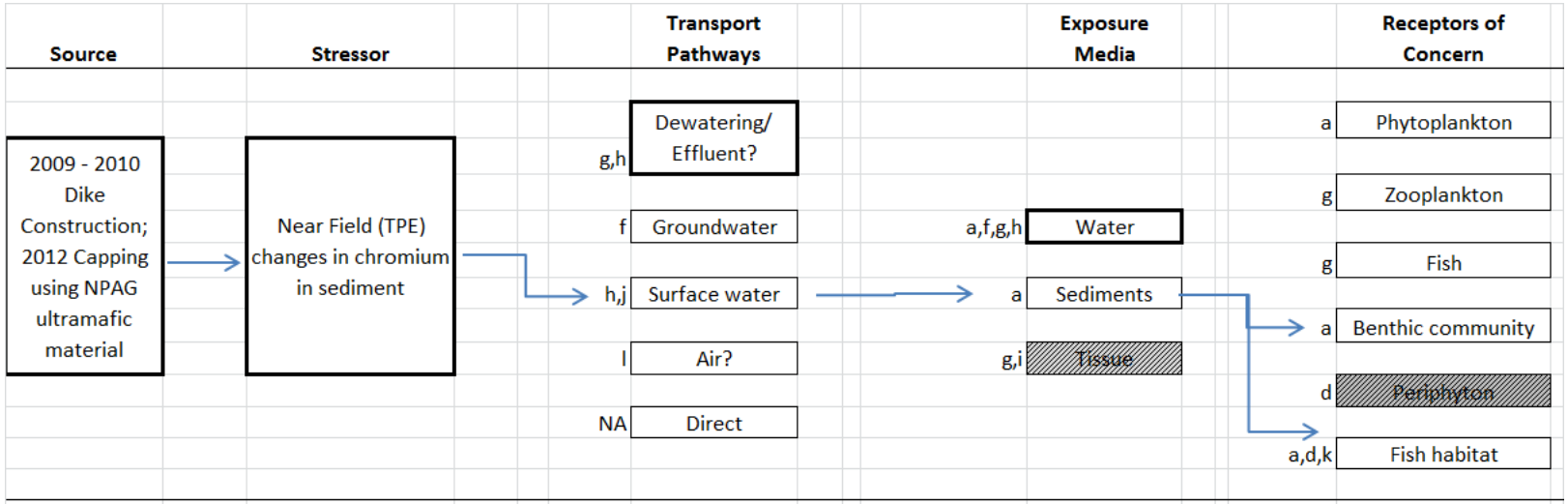
Notes:	
a	Core Receiving Environment Monitoring Program
~~b~~	~~Effects Assessment Studies~~
~~c~~	~~Dike Construction Monitoring~~
d	~~Habitat Compensation Monitoring Program~~
e	Dewatering Monitoring
f	Groundwater Monitoring
g	MMER Monitoring
h	Water Quality and Flow Monitoring
i	~~Fish Out Studies~~
j	AWPAR and Quarry Water Quality Montoring
k	Blasting
l	Air quality monitoring
NA	Direct, so measured in exposure medium.

Figure 25a: Integrated conceptual site model for 2014 AEMP – Near Field changes in conductivity parameters



Notes:	
a	Core Receiving Environment Monitoring Program
~~b~~	~~Effects Assessment Studies~~
~~c~~	~~Dike Construction Monitoring~~
d	~~Habitat Compensation Monitoring Program~~
e	Dewatering Monitoring
f	Groundwater Monitoring
g	MMER Monitoring
h	Water Quality and Flow Monitoring
i	~~Fish Out Studies~~
j	AWPAR and Quarry Water Quality Montoring
k	Blasting
l	Air quality monitoring
NA	Direct, so measured in exposure medium.

Figure 25b: Integrated conceptual site model for 2014 AEMP – Elevated Peak Particle Velocity (PPV)



Notes:

a	Core Receiving Environment Monitoring Program
~~b~~	~~Effects Assessment Studies~~
~~c~~	~~Dike Construction Monitoring~~
d	~~Habitat Compensation Monitoring Program~~
e	Dewatering Monitoring
f	Groundwater Monitoring
g	MMER Monitoring
h	Water Quality and Flow Monitoring
i	~~Fish Out Studies~~
j	AWPAR and Quarry Water Quality Montoring
k	Blasting
l	Air quality monitoring
NA	Direct, so measured in exposure medium.

Figure 25c: Integrated conceptual site model for 2014 AEMP – Elevated Chromium in TPE sediment

8.7.5 Identification of Potential Risks and Discussion

Assessment of changes in Water Quality due to Effluent Discharge

The mine-related activities undertaken in 2014 with point-source discharges were effluent discharges to Third Portage North (TPN), Second Portage (SP) and Wally (WAL). In addition, the Waste Rosk seepage event in July 2013 from the Waste Rock Storage Facility which migrated through the perimeter rockfill road at sample station ST-16 into NP-2 Lake was considered a potential source of impacts to NP-2 and ultimately Second Portage Lake. In 2013, elevated Copper, Nickel and Total Cyanide were noted; monitoring results in 2014 confirmed that this seepage was short in duration and isolated to the nearshore area of NP-2. Based on the monitoring data, it was evident that appropriate actions undertaken in 2013 were effective in stopping any further seepage to the NP-2 lake; monitoring during 2014 in downstream locations of NP-2 and ponds that drain from NP-2 to Second Portage confirmed these findings(see Section 8.1.4.2 for discussion and analysis). Furthermore, mitigative and management control measures that were put in place to protect TPL from mill seepage through the assay road were effective (including sealing up cracks in the mill floor, collecting and pumping water from the temporary berms and constructing an interception trench). Downgradient groundwater analytical results and TPL water quality results substantiate these conclusions. See Section 7 for discussion and analysis.

As reported in the CREMP, receiving environment water quality changed relative to baseline/ reference conditions for conventional parameters (TDS and conductivity) and ionic parameters at SP, TPE, TPN, TPS and WAL in 2014. However, these results do not suggest any risk to aquatic life. Notwithstanding, consideration was taken in the AEMP for all of the potential mine-related sources (effluent release, fugitive dust, and seepage) that may contribute to changes in general parameters in near-field stations (TPN, TPE, SP and WAL) and the farfield (TPS) and were considered in the AEMP. The conceptual site model presented in Figure 25a assisted in understanding the possible linkages (i.e., effect to stressor from the source). Based on the monitoring results for 2015, it was determined that the most likely source of changes to conventional parameters is effluent discharge. Another possible contributer, albeit not likely based on air monitoring results to date, could be fugitive dust migration. Based on receiving water quality monitoring in nearshore TPL and NP-2, historical seepage events were not considered as a source of changes to the surface water quality observed in the CREMP.

Air quality monitoring results indicated that dustfall, total suspended particulates (TSP), PM10, and PM2.5 (potential sources of changes to conventional parameters) generally did not exceed available standards or guidelines at stations nearest to the mine. Although dust is considered an unlikely, but possible contributor source that might cause changes to conventional parameters evaluated in the CREMP, the dust levels generated in 2014 were not high enough to cause the observed changes. This was further substantiated by the Screening Level Risk Assessment (summary presented in Section 8.5). Within the SLRA, a comparison of projected and current concentrations of contaminants of potential concern (COPCs) in soil was performed to assess quantitative impact predictions. Measured concentrations of COPCs in soil in 2014 did not exceed concentrations projected to occur in the Project's Final Environmental Impact Statement (Cumberland, 2006). As a result, effluent discharge is the primary cause of minor changes in conventional parameters in TPN, WAL and SP; the changes in TPE and TPS could be related to fugitive dust as a contributor, however the source of these changes is uncertain.

Water Chemistry changes observed may be a result of effluent (at stations TPN, SP and WAL) from baseline conditions and dust may be altering the water quality (as compared to baseline) at stations

(TPE and TPS). That said, no other significant effects to aquatic biota were identified in effluent discharge: water quality did not exceed MMER; TSS exceedance at WAL, aluminium exceedance and a failed daphnia toxicity test in TPN were insignificant as results in the CREMP results did not detect significant changes in plankton in these basins. The phytoplankton surveys flagged changes in taxa richness decreases in TPS, demonstrating the inherently uncertain in plankton monitoring. Furthermore, the pattern in changes of phytoplankton are not consistent with water quality results thus further trend monitoring in 2015 will be required to determine the source of these changes. In addition to this assessment, effects of TPN effluent will be discussed in the EEM Cycle 2 interpretive report, which is due on July 1, 2015.

Assessment of the Blast Monitoring Exceedances

The conceptual model for blast exceedances and potential effects to fish habitat are presented in Figure 25b. In 2014, the average PPV was 3.93 (CI +/- 0.50) with a maximum of 23.8 mm/s. The average was lower than last year (5.39 mm/s in 2013). Faulkner et al. (2006) found no effects on lake trout eggs due to blasts at Diavik Mine, NWT, with a maximum PPV of 28.5 mm/s and reported 80 exceedances of DFO guidance of 13 mm/s PPV at these stations. This study found there were no differences in mortality of lake trout eggs in incubators between exposure sites and reference sites that resulted from blasting at Diavik in 2003-2004. The results that were found in 2014 are consistent with results collected previously during habitat compensation monitoring at Meadowbank along the dike faces and during fishouts that occurred near operations, which found healthy populations of juvenile and adult fish occupying the dike faces. Overall, it is unlikely that blasting has caused any impacts to fish incubation, therefore there are no expected risks to fish habitat due to periodic PPV exceedances at the monitoring stations.

Assessment of the Changes in Chromium in TPE Sediment

The trigger exceedance for chromim in sediment at TPE was identified in 2013 and coring samples in 2014 determined that there was a temporal trend in chromium concentration increases within a localized area of TPE and mine related. Although elevated chromium levels have also been found in reference areas of PDL and TPS (PEL exceedances have been previously observed in reference areas) the chromium exceedance is likely related to mine activities, more specifically due to Bay-Goose dike capping and construction activity. This may be explained by the fact that ultramafic rock, which is commonly found in the region and was used to construct the Bay-Goose dike, is generally known to contain elevated concentrations of chromium (e.g., on the order of 2000 mg/kg) relative to other rock types (Motzer and Engineers, 2004).

Figure 25c provides the conceptual site model of impacts due to capping and construction of the Bay-Goose dike. Upon review of the sediment data and historical water quality data, effluent and dust were ruled out the most likely source of change, as the discharge point is nearest to TPN, where water quality changes in chromium have note been found. Furthermore, review of the construction monitoring data in the CREMP indicated elevated chromium in water quality data and sediment traps. However, there is no evidence that the changes in chromium in TPE sediment has impacted fish habitat nor the benthic community in TPE (no statistically significant difference or decline in total abundance, taxa richness). Rather, due to a decrease at INUG and PDL, there is an apparent increase in benthic invertebrate population metrics at TPE. Notwithstanding, in 2015, AEM will complete followup sediment bioavailabiltiy and toxicity testing to ensure there are no impacts to TPE due to dike construction.

8.7.6 Recommended Management Actions

Overall, based on the integration of results from the monitoring programs, the AEMP evaluation did not find an apparent excess risk to the aquatic environment due to mine-related activities. Although some trigger levels were exceeded: chromium in TPE sediment, conductivity, TDS and ionic parameters in water quality at nearfield stations, and an emphasis in monitoring to ensure seepage occurrences of assay road and at NP-2 in 2013 did not impact the receiving environment; AEM has adequately addressed these concerns.

Based on the 2015 AEMP evaluation it is recommended that:

- Water quality monitoring as per the license are MMER requirements continue in 2015;
- (As recommended by KIA and integrated into the Meadowbank License renewal) water quality samples will be collected in NP-2, NP-1 and Dogleg pond and total cyanide continue to be added to the list of parameters in the CREMP;
- Sediment bioavailability and toxicity testing of sediments be conducted to evaluate elevated chromium in TPE sediments;
- Continue closely examining monitoring results to ensure the protection of the receiving environment;
- Conduct spring and fall groundwater monitoring at well MW-14-01;
- Complete a review of the freshet action plan and update it as needed to ensure contact and non-contact water quality and flow are monitored and immediately managed to avoid any impacts to nearby receiving water environments (i.e. in TPN, SP, NP2, etc.).

SECTION 9. CLOSURE

9.1 PROGRESSIVE RECLAMATION

9.1.1 Mine Site

As required by Water License 2AM-MEA0815 Schedule B, Item 16: ***A summary of any progressive closure and reclamation work undertaken including photographic records of site conditions before and after completion of operations, and an outline of any work anticipated for the next year, including any changes to implementation and scheduling.***

In January 2014, AEM updated the 2008 site closure plan using revised life of mine calculations. You will find in Appendix H1 of the 2013 Annual report the updated "*Interim Closure and Reclamation Plan*".

The current mine plan includes progressive closure associated with the following mine components: Portage and Goose open pits, Portage Waste Rock Storage Facility, Tailings Storage Facilities, water management infrastructure, and site infrastructure (limited structures).

Progressive reclamation of Goose and Portage will start once the mining activities in each pit has ceased, 2015 and 2018 respectively. Overall, the works will consist of decommissioning and removing the pumping system and an actively reflooding the pits.

Water management infrastructure to be decommissioned consists of all the pumping systems that had served for the dewatering of Second Portage Arm and the Bay Goose impoundment, as well as the reclaim water system. Following conversion of the Portage Attenuation Pond into the Reclaim Pond (South Tailings Cell), all of the dewatering equipment (i.e. dewatering pipelines, effluent diffuser pipelines, and pumps) will be dismantled and either shipped from the mine site or disposed of in the on-site landfill. Following the cessation of operations, all reclaim pipelines and pumps will be dismantled. The tailings pumping system including pipelines will also be decommissioned at the end of mining operations.

Certain site infrastructure could be closed progressively during the life of the mine, such as camps, temporary workspace, marshalling yards, quarries and storage areas. Inventory of material will also be decreased on site during operations. Buildings that are no longer required will be dismantled and the areas contoured to restore natural drainage or new acceptable drainage. The disturbed areas will also be scarified to promote natural re-colonization of vegetation from surrounding areas.

Under the current design plans, waste rock from Portage and Goose Pits are currently being stored in the Portage Rock Storage Facility, in the Goose Rock Storage Facility (NPAG for reuse at closure) or in the Central Portage Pit following the completion of mining in this area. The Portage waste rock storage facility (PRSF) was constructed to minimize the disturbed area and restrict runoff to the Tailings Storage Facility. The PRSF is composed of an internal sector comprising potentially acid generating (PAG) waste rock and a cover or external sector comprising of non-acid generating (NPAG) waste rock. The PAG rock portion of the PRSF will subsequently be capped with a 4m layer of NPAG rock to constrain the active layer within relatively inert materials. The control strategy to minimize the onset of oxidation and the subsequent generation of acid rock drainage includes freeze control of the waste rock through permafrost

encapsulation and capping with an insulating convective layer of NPAG rock. The waste rock below the capping layer is expected to freeze, resulting in low rates of acid rock drainage (ARD) generation in the long term. Results to date from the thermistors indicate that freeze back is occurring in the WRSF structures. In 2012, AEM completed a major portion of the reclamation of the PRSF and this was continued in 2013. Placement of a 4m NPAG rock cover over the exterior slopes, around the perimeter, as the PRSF is filled in lifts, including development of internal cells to encapsulate PAG materials by NPAG rock; as of January 2015, 54% of the area of the Portage PRSF had been covered with NPAG rock.

A similar principle will be used for the Tailings Storage Facility. Thermal modelling indicates that the tailings will freeze in the long term, and that the talik that currently exists below 2PL Arm will freeze before seepage from the TSF will reach the groundwater below the permafrost. The tailings are potentially acid generating (PAG); therefore a 2 to 4 m thick cover of NPAG material will be placed over the tailings to physically isolate the tailings and to confine the active layer within relatively inert materials. Cover trials commenced (2014) in the TSF North Cell to confirm the required cover thickness to physically isolate the tailings and to confine the active layer within relatively inert materials. Information gathered during these trials will be used in the final design of the TSF capping. The control strategy to minimize water infiltration into the TSF and the migration of constituents out of the facility includes freeze control of the tailings through permafrost encapsulation. Progressive closure by capping the tailings in the North Cell may be undertaken in winter of 2015 or 2016 following the completion of the tailings deposition in this cell. Final design work of the tailings cover has been initiated in 2014. The final design of the tailings cover will be presented in the final closure and reclamation plan presented one year prior to the end of mine operations.

For more information regarding these activities you can refer to Section 3.4 of the Interim Closure and Reclamation Plan found in Appendix H1 of the 2013 Annual Report.

9.1.2 AWAR

As required by INAC Land Lease 66A/8-71-2, Condition 33: ***The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with the approved Abandonment and Restoration Plan, as well as any variations from the said Plan.***

And

As required by KIA Right of Way KVRW06F04, Condition 26: ***File annually a progress report for the preceding year, outlining any ongoing restoration completed, in conformity with the Abandonment and Restoration plan***.

No restoration work was completed in 2014.

9.1.3 Quarries

As required by INAC Land Lease 66A/8-72-2, Condition 33: ***The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with C&R Plan, as well as any variations from the said Plan.***

No restoration work was completed in 2014. Before the construction of the landfarm facility at the mine site in 2012, contaminated soils from spills occurring on the AWAR were stored in quarries 5 and 22 along the AWAR. In 2014, AEM completed assessments in Quarry 5 and 22 to verify if the substrate where contaminated materials (with petroleum hydrocarbons (PHC"S) were stored met CCME Remediation Criteria for Industrial use of Coarse Material. Please refer to Section 3.2 for more details. Quarry 5 was determined to meet all criteria (recreational land use criteria) and no further remedial action is required at this site. There were some areas in Quarry 22 where residual contamination was noted and additional remediation will be required in 2015. There has been no impact to any receiving waters determined to date. The final reclamation of the quarries along AWAR will be done during the closure phase of the Meadowbank mine site as explained in the AEM Interim Closure Plan.

9.2 RECLAMATION COSTS

9.2.1 Project Estimate

As required by Water License 2AM-MEA0815 Schedule B, Item 18: ***An updated estimate of the current restoration liability based on project development monitoring, results of restoration research and any changes or modifications to the Appurtenant Undertaking.***

And

As required by NIRB Project Certificate No.004, Condition 80: ***File annually with NIRB's Monitoring Officer an updated report on progressive reclamation and the amount of security posted, as required by KivIA, INAC, and/or the NWB.***

See Section 9.1 for the progressive reclamation completed in 2014. Progressive closure measures undertaken to date, which are reflected in the financial security cost estimate, include the PRSF reclamation works. The financial security cost estimate has been conservatively developed assuming no further progressive rehabilitation activities are completed through the remaining life of the mine, and all remaining reclamation costs are incurred at the onset of permanent closure. For this reason the financial security cost estimate should be revisited as progressive reclamation measures are completed.

A financial security cost estimate of the closure and reclamation activities for the Project, based on the current end of mine life configuration, was previously prepared using the RECLAIM template (Version 6.1, March 2009); details of this estimate are provided in Section 4.0, Appendix I1 and I2 of the closure plan found in Appendix H1 of the 2013 Annual Report. The cost estimate developed assuming third party contractor rates, on the basis that AEM is unable to fulfill its closure and reclamation obligations, and regulating authorities are required to take over reclamation of the Meadowbank Gold Project.

An update of the financial security cost presented in the Interim Closure and Reclamation Plan was prepared in December 2014 and is available in Appendix H1 The updated financial security cost estimate has been prepared using a more recent version of RECLAIM template (Version 7.0, March 2014).

RECLAIM Version 7.0 provides updated typical unit costs, as well as a relocation of post-closure monitoring and maintenance costs under indirect costs and the inclusion of an interim care and

maintenance provision under direct costs. In general, unit costs have been increased from RECLAIM version 6.1 to version 7.0; however, some unit costs relating to labour have been reduced.

As mentioned, RECLAIM version 7.0 now includes an interim care and maintenance provision. The manual distributed with RECLAIM (Brodie, 2014) describes the interim care and maintenance provision as providing for care and maintenance of a mine for a number of years prior to commencing the planned closure activities. This cost would include personnel and equipment to maintain facilities, any necessary ongoing water treatment activities, and continued geotechnical and environmental monitoring as required under license/permit agreements.

Specific assumptions and quantities used for the financial security cost estimate have been previously reported in Appendix I of the Meadowbank Gold Project Interim Closure and Reclamation Plan (available in Appendix H1 of the 2013 Annual report). No changes have been made to assumptions or quantities previously reported. The only changes are related to adjustments in RECLAIM unit costs between the previously used version 6.1 and the current version 7.0, and a relocation of the water treatment cost from surface and groundwater management to post-closure monitoring and maintenance as directed by Reclaim version 7.0. In a few limited cases, unit rates previously used from RECLAIM version 6.1 are no longer provided in version 7.0. In these cases equivalent applicable unit rates have been selected from RECLAIM version 7.0.

Closure activities are planned to commence immediately following the end of mining operations so no period of interim care and maintenance has been accounted for in this cost estimate. The updated closure and reclamation cost estimate for the Meadowbank Gold Project using RECLAIM version 7.0 is $84,869,488. A detailed breakdown of closure costs by mine component for the Meadowbank Gold Project is summarized in Table 1 of the updated cost estimate available in Appendix H1.

Updating the closure and remediation financial security cost estimate to RECLAIM version 7.0 results in an estimated financial security grand total of $84,869,488, which is an increase of $11,202,841 over the RECLAIM version 6.1 previous total of $73,666,647. Table 2 of the updated cost estimate available in Appendix H1 lists key differences between this cost estimate and the previous cost estimate developed with RECLAIM version 6.1. Most significant to this financial security cost estimate are the changes to unit rates for bulk soil excavation and placement and site accommodations (accounting for combined increase of $10.3 million in direct costs), as follows:

- Bulk soil excavation and placement (cost code SB3L) which has been increased from $4.16 to $5.10 per m_3, for an increase of over $6.4 million in direct costs relating to tailings and waste rock cover, and an increase of over $1.6 million in indirect costs (project management, engineering, and contingency).
- Site accommodations (cost code ACCML) which has been increased from $1,483.19 per man-month ($48.76 per man-day) to $100 per man-day, for an increase of over $2.3 million in indirect costs.

As part of the closure and reclamation planning, AEM has undertaken a research program in collaboration with the RIME (Research Institute in Mine and Environment). The focus of this research program is the reclamation of the tailings storage and waste rock storage facilities. In June 2014, two test

pads (experimental cells) were constructed and instrumented in the North Tailings Cell to evaluate the efficiency of different tailings cover designs and thickness. Additional test pads may be constructed over the tailings in 2015. Instrumentation will also be installed in 2015 in the Portage waste rock storage facility to verify the efficiency of the NPAG cover over the PAG material. Data from the experimental cells and will be used in the design work of the tailings cover required at closure. The analysis of instrumentation data on the RSF will verify that the NPAG cover on the RSF is performing as expected. Data will be presented and commented in the 2015 Annual Report.

9.2.2 AWAR and Quarries

As required by INAC Land Lease 66A/8-71-2, Condition 19: ***The lessee shall submit to the Minister every two years after the commencement date of this lease (January 2007), a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.***

And

As required by INAC Land Lease 66A/8-72-2, Condition 37: ***The lessee shall submit to the Minister every 2 years after the commencement date of this lease (January 2007), a report describing cumulative variations from the C&R Plan with updated cost estimates.***

And

As required by KIA Right of Way KVRW06F04, Condition 14: ***Submit to KIA every two years on each anniversary of the commencement date (February 2007), a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.***

No progressive reclamation has been completed on the AWAR or associated quarries in 2014. No major modifications were made in the updated interim closure plan from 2014 compared to with the '*AEM Closure and Reclamation Plan, September 2008*'. The cost estimate for the reclamation of the AWAR and quarries in the December 2014 cost estimation is 991,072$ with Reclaim 7.0 instead of $1,061,664 estimated previously with Reclaim 6.1. The difference in cost is explained by 8.6 % increase in scarifying unit rate and by the drill/blast unit rate removed and replaced with drill/blast/load/short haul which represented a 28% decrease.

SECTION 10. PLANS / REPORTS / STUDIES

10.1 SUMMARY OF STUDIES

As required by Water License 2AM-MEA0815 Schedule B, Item 19: ***A summary of any studies requested by the Board that relate to Waste disposal, Water use or Reclamation, and a brief description of any future studies planned.***

No studies were requested by the NWB in 2014.

10.2 SUMMARY OF REVISIONS

As required by Water License 2AM-MEA0815 Schedule B, Item 20: ***Where applicable, revisions will be completed as Addendums, with an indication of where changes have been made, for Plans, Reports, and Manuals.***

The following monitoring and management plans were revised in 2014:

- Quality Assurance / Quality Control (QA/QC) Plan, Version 2;
- Baker Lake Bulk Fuel Storage Facility; Environmental Performance Monitoring Plan, Version 3;
- Meadowbank Bulk Fuel Storage Facility; Environmental Performance Monitoring Plan, Version 2;
- Incinerator Waste Management Plan, Version 5;
- Groundwater Monitoring Plan, Version 4;
- Oil Pollution Emergency Plan; Meadowbank Mine Fuel Farm in Baker Lake, Version 5;
- Interim Closure and Reclamation Plan, Version 2 + Cost Reclaim 7.0;
- Mine Waste Rock and Tailings Management Plan, Version 4 (Appendix D1);
- Tailings Storage Facility – Operation, Maintenance and Surveillance Manual, Version 4;
- Dewatering Dike – Operation, Maintenance and Surveillance Manual, Version 4;
- 2014 Water Management Report and Plan (Appendix C1).

The above listed plans are included in Appendix I1. A brief description of revisions made to each of plans is provided in Appendix I2.

10.3 EXECUTIVE SUMMARY TRANSLATIONS

As required by Water License 2AM-MEA0815 Schedule B, Item 21: ***An executive summary in English, Inuktitut and French of all plans, reports, or studies conducted under this Licence.***

Appendix I2 includes an executive summary in English, French and Inuktitut for the following documents:

- All monitoring and management plans listed in Section 10.2 above.

- Reports or studies submitted in 2014:
    - Production Lease KVPL08D280 2014 Mine Plan;
    - 2013 Annual Geotechnical Inspection;

- Annual Review of Portage and Goose Pit Slope Performance (2013);
- 2013 Independent Geotechnical Expert Review Panel Report;
- Meadowbank Gold Project Water Management Plan 2013;
- 2013 Landfarm Report;
- Interim Closure and Reclamation Plan
- 2013 Habitat compensation monitoring report;
- Core Receiving Environment Monitoring Program 2013;
- 2013 Hamlet of Baker Lake Harvest Study – Creel Results;
- 2013 Groundwater Monitoring and Water Quality Results, Meadowbank Mine, Nunavut;
- 2013 Wildlife Monitoring Summary Report;
- Rock Storage Facility Seepage Golder Report;
- 2013 Blast Monitoring Report for the Protection of Nearby Fish Habitat;
- 2013 Vault Fishout Summary Report;
- 2013 Air Quality and Dustfall Monitoring Report; and
- 2013 Noise Monitoring report.

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SECTION 11. MODIFICATIONS / GENERAL / OTHER

11.1 MODIFICATIONS

As required by Water License 2AM-MEA0815 Schedule B, Item 12: ***A summary of modifications and/or major maintenance work carried out on all water and waste related structures and facilities.***

In 2013, AEM applied to the NWB to amend Water License (2AM-MEA0815). The amendment was for an increase in freshwater use. The Meadowbank NWB Water License (2AM-MEA0815) permitted AEM to obtain 700,000 m^3 per year of fresh water for domestic camp use, mining, milling and associated uses. Despite significant success at engineering solutions to optimize fresh water use, requirements are projected to continue to exceed the permitted rate. On July 23, 2014 AEM received final approval from the Minister of Aboriginal Affairs and Northern Development (AANDC) for a water use increase to 1,870,000 m^3 in 2013 and 1,150,000 m^3 in subsequent years. See Section 8.1.14 for more information.

11.2 NWB TYPE A WATER LICENSE RENEWAL

On July 23, AEM submitted an application to the NWB to renew the Type A Water License for the Meadowbank Project. The current license expires on May 31, 2015. On September 30, AEM received the NWB review for completeness that included recommendations from AANDC, EC, KIA and DFO. AEM responded to these comments on October 14. On September 30, NIRB also sent a letter stating that the License Renewal does not required a screening. On November 28, AEM held a WebEx meeting with AANDC to discuss the renewal application – discussion was primarily on closure. On November 28, the NPC conformity review was received advising that no further review would be needed As requested by AANDC, on December 4, a revised closure cost estimated using Reclaim V7.0 was sent to AANDC and NWB. The technical review comments from NWB and the interveners AANDC, EC, KIA and DFO were received on December 24. AEM submitted responses to these comments to the NWB on January 7, 2015. The pre-hearing conference and technical meeting was held in Baker Lake on January 14-15, 2015. In the days leading up to the technical meetings and during the meetings between AEM and the regulators agreement was reached in regard to 97 technical comments. The final hearing is scheduled to occur in Baker Lake on April 29 -30, 2015. All of the documents related to the renewal can be found on the NWB FTP site.

At the PHC, it became apparent that the timelines required to process the full renewal application would be insufficient to ensure that a renewed water license is approved prior to the May 31, 2015 expiry date. Therefore, Agnico Eagle requested a 180 day short term renewal on January 23, 2015. On March 21, 2015, AEM received notice from the NWB that the short term renewal was approved by the Board and that the documents had been sent to the Minister for his final approval.

11.2.1 Technical Comment KIA-30

During the pre-hearing conference and technical meeting for the NWB Water License Renewal held on January 14-15, 2015, the KIA requested that AEM report in the annual report on and monitor the amount of PAG versus NPAG material in the Vault RSF in order to ensure that, if required, the RSF is capped with an appropriate amount of material to ensure that freezeback of the RSF occurs upon closure.

AEM has indicated that the Vault RSF is not expected to require capping, as the bulk of the material from this deposit is expected to be NPAG (Golder, 2005a). However, the quantity of PAG vs NPAG material is monitored and updated on a routine basis and geochemical testing on rock is conducted quarterly to ensure the ratio is still valid. From the forecasted (predicted) mining life in the *Updated Mine Waste Rock and Tailings Management Pla*n – *2014* (Appendix D1), from 2015 to 2017 AEM will produce 43.1 Mt of waste rock from which approximately 95% will be NPAG and 5% will be PAG. As per Portage and Goose Pits, segregation of waste rock as PAG or NPAG, waste rock in the Vault RSF is separated based on the same operational testing principles differentiating PAG/NPAG rock. The management of the waste rock still requires segregation of PAG material in the Vault RSF; PAG and uncertain PAG/NPAG are placed in the middle of the Vault Waste Rock Storage Facility and NPAG material is placed on the sides to ensure any PAG material is encapsulated adequately. Please also refer to Section 5.1 for more information.

The water seepage from the Vault RSF area is expected to be of suitable quality to allow discharge to the environment without treatment (Golder, 2007c), and capping of this facility is therefore not proposed. An adaptive management plan will include monitoring of water quality during operations to confirm modelling predictions, and to allow adjustments to the closure plan as required. Details for the Vault RSF closure will be included in the final closure and reclamation plan to be provided one year prior to the end of operations.

11.2.2 Technical Comment AANDC B1 and B2

As per AANDC Technical Comments during NWB Water License Renewal process, they requested that AEM provide Nunavut Professional Engineer stamped drawing for the Waste Rock Plug/Dike constructed from August 26 to September 1, 2013 in the 2014 Annual report. These drawings have already been submitted via the Golder Construction Summary Report Rock Storage Facility-Interim Till Plug. The report was stamped but not the drawing. You will find in Appendix G3 the Waste Rock Plug/Dike as-built stamped as per NWB Part P Item 1.

11.2.3 Technical Comment AANDC BGC Eng. 5.1

During the technical meeting and pre-hearing conference held in Baker Lake on January 14 -15, 2015 regarding the NWB Water License renewal, one of the technical comments from AANDC was that the climate for a given year is not presented within the annual monitoring reports. AANDC said that "*climate data provide important input for interpreting site-specific geothermal aspects, such as the rate of mine waste freezeback and active layer thicknesses, for permafrost encapsulation of the mine wastes. In addition, the previous year's climate is useful for interpreting the hydrology and water balance for the site.*" They recommend that the annual monitoring report summarize monthly climatic conditions at the Meadowbank site over a 12-month period. AEM has to summarized monthly climate condition information collected since 2008 at Meadowbank site and has included it in the 2014 annual report to assist in the interpretation of site specific geothermal aspects, such as the rate of mine waste freezeback and active layer thicknesses for permafrost encapsulation of mine wastes. The information reported in (Table 11.12) includes average, minimum and maximum air temperature, average and maximum wind speed as well as the daily average precipitation total and maximum volume of precipitation (rainfall / snowfall). It should be noted that AEM does not have a snow gauge but rather a rain gauge. For this reason, snow precipitations are reported as mm of rain. Monitoring of the precipitation started in June 2013.

Overall, the climate data over the 12-month period compared from 2009 to 2014 is relatively similar with an consistent average temperature. Based on an analysis of the data it appears that the temperature trend is similar on a year over year basis.

Table 11.12: 2008 to 2014 Meadowbank Data Climates

Date	Temperature Average °C	Temperature Max °C	Temperature Min °C	Wind Speed Average m/s	Wind Speed Max m/s	Total Precipitation mm	Daily average Precipitation mm	Max Precipitation mm
Feb-09	-30.88	-19.38	-42.62	3.38	14.19			
Mar-09	-31.06	-14.13	-42.08	4.81	17.72			
Apr-09	-16.11	-2.64	-28.85	4.52	17.52			
May-09	-10.39	-0.15	-19.21	5.14	15.44			
Jun-09	3.84	18.38	-6.20	4.22	14.46			
Jul-09	11.67	21.70	1.23	3.96	14.25			
Aug-09	9.83	21.14	1.40	4.27	15.60			
Sep-09	4.62	16.07	-4.99	5.71	25.28			
Oct-09	-7.85	2.48	-22.50	5.28	19.48			
Nov-09	-17.75	-5.20	-26.93	4.26	16.31			
Dec-09	-24.54	-7.02	-33.39	4.73	22.05			
Jan-10	-26.80	-9.38	-36.63	4.84	20.50			
Feb-10	-26.31	-12.52	-42.83	3.35	15.52			
Mar-10	-21.02	-7.91	-34.07	4.23	17.27			
Apr-10	-8.70	2.88	-21.58	4.80	19.95			
May-10	-8.09	0.41	-17.88	5.04	19.82			
Jun-10	3.95	18.79	-6.57	4.14	14.07			
Jul-10	12.94	24.02	3.73	3.65	16.42			
Aug-10	10.26	22.01	1.23	4.86	18.54			
Sep-10	4.68	15.42	-4.24	4.16	17.78			
Oct-10	-2.83	5.29	-16.24	4.87	19.60			
Nov-10	-13.84	0.24	-30.86	5.48	22.29			
Dec-10	-25.28	-12.40	-35.27	4.49	14.99			
Jan-11	-20.76	-4.22	-37.39	4.42	17.05			
Feb-11	-29.78	-19.47	-42.99	5.86	20.01			
Mar-11	-29.55	-25.09	-33.85	3.83	8.65			
Apr-11	-19.84	-5.09	-30.76	4.93	18.25			
May-11	-8.21	2.54	-23.39	-3.84	-11.64			
Jun-11	3.54	17.13	-4.94	4.67	20.64			
Jul-11	13.44	25.46	2.49	4.07	17.21			
Aug-11	10.99	20.95	1.72	4.44	17.37			
Sep-11	4.27	13.27	-3.85	5.33	18.33			
Oct-11	-5.56	3.75	-16.89	5.36	20.91			
Nov-11	-13.59	0.21	-29.33	5.56	24.42			
Dec-11	-24.43	-11.86	-31.82	4.50	21.27			
Jan-12	-30.44	-18.91	-38.18	5.37	14.50			
Feb-12	-25.80	-4.79	-38.61	5.19	21.13			
Mar-12	-27.96	-8.44	-39.96	4.70	21.96			
Apr-12	-16.47	0.84	-28.67	4.41	15.52			

May-12	-4.41	4.85	-19.18	4.73	17.69			
Jun-12	4.41	13.92	-4.63	5.40	16.22			
Jul-12	12.36	21.81	3.18	4.99	20.37			
Aug-12	10.87	22.46	2.31	4.57	15.20			
Sep-12	4.79	15.66	-2.67	5.06	19.47			
Oct-12	-6.21	4.52	-17.37	5.01	18.13			
Nov-12	-18.26	-2.34	-31.05	5.11	23.94			
Dec-12	-25.17	-11.96	-39.25	4.98	20.18			
Jan-13	-33.86	-22.49	-44.33	5.07	19.92			
Feb-13	-32.01	-15.38	-40.59	5.53	17.11			
Mar-13	-24.81	-8.78	-38.03	5.29	18.77			
Apr-13	-17.57	-4.22	-30.41	6.80	27.45			
May-13	-7.44	3.85	-25.35	5.66	24.83			
Jun-13	7.60	21.36	-4.11	5.39	18.32	18.00	0.60	6.00
Jul-13	11.57	28.00	1.26	5.65	22.15	24.50	0.79	8.00
Aug-13	11.03	25.83	1.21	5.38	18.78	26.50	0.85	10.00
Sep-13	2.31	16.50	-4.56	5.64	21.52	66.25	2.21	23.00
Oct-13	-5.09	4.41	-18.15	5.68	17.86	13.00	0.42	4.00
Nov-13	-20.97	-4.27	-34.32	4.14	14.35	9.50	0.32	4.00
Dec-13	-29.84	-15.90	-40.15	4.80	18.50	NA	NA	NA
Jan-14	-32.40	-19.46	-41.93	5.81	20.38	7.50	0.24	3.00
Feb-14	-30.70	-15.96	-41.39	6.05	20.09	3.05	0.11	1.95
Mar-14	-28.67	-17.56	-38.31	5.61	20.78	3.40	0.11	1.05
Apr-14	-19.15	0.63	-33.90	5.86	20.34	5.95	0.20	3.35
May-14	-1.82	15.88	-12.74	5.07	18.01	21.90	0.71	11.50
Jun-14	7.52	26.79	-5.29	5.18	18.17	5.40	0.18	2.00
Jul-14	13.57	25.96	5.29	4.64	19.48	43.60	1.41	13.40
Aug-14	9.68	25.70	1.96	5.57	22.25	29.02	0.94	9.70
Sep-14	1.34	14.42	-9.75	5.78	24.03	19.42	0.65	6.00
Oct-14	-6.36	2.16	-22.12	5.07	16.35	4.30	0.14	1.11
Nov-14	-21.48	-2.04	-33.70	5.73	18.84	2.38	0.08	0.82
Dec-14	-25.63	-11.75	-37.59	5.05	19.01	3.95	0.13	0.81

11.3 INTERNATIONAL CYANIDE MANAGEMENT CODE

As required by NIRB Project Certificate No.004, Condition 28: ***Cumberland shall become a signatory to the International Cyanide Management Code, communicate this to shippers, and do so prior to Cumberland storing or handling cyanide for the Project.***

In August 2011, Agnico Eagle Mines became a signatory of the International Cyanide Management Code (ICMC). AEM then had three years to prepare for an audit by external auditors. This assessment/audit examines how the Meadowbank project standards of practice for cyanide compare to the Code requirements.

Preparation and internal planning was undertaken in 2013 and 2014 and several areas were examined including Transportation, Handling and Storage, Operations, Health and Safety, Environment, Training,

Community Relations, Emergency Response, and Decommissioning. These areas were all analyzed and comparisons made to the criteria set out by the International Cyanide Management Institute (ICMI).

In 2013, an internal gap analysis was preformed to determine what was required Meadowbank to meet full compliance with the ICMC. Items were identified and the applicable departments were tasked to fill the gaps that existed.

One gap that was identified was that the shippers of the cyanide from the Port of Bécancour to the Meadowbank project were not signatories of the ICMC which is a requirement for the project to be certified ICMI. Rather than having each transporter go through a separate audit and potentially delaying the compliance certification of the Meadowbank project, AEM decided to certify the transportation route as a whole. In 2014, the Meadowbank project became a transportation route signatory for the ICMC which is now known as the Meadowbank Supply Chain.

On July 30, 2014 AEM personnel from the Meadowbank project along with one ICMC auditor visited the Port of Bécancour to commence the auditing of the supply chain.

From August 26 – September 3 the Meadowbank site had its first external audit by two ICMC auditors. The auditors reviewed:

- Policies
- Procedures
- Training program records
- Safety program
- Environment program
- Mill process and structural integrity
- Dykes and Tailings impoundments
- Emergency response capabilities
- Storage and Handling procedures

At the end of the audit the auditors presented their findings. Overall, the auditors were pleased with the Meadowbank site and commented that it was one of the best sites audited in their career (one auditor has been performing audits for 30 years). However, there were items that required attention to reach full compliance status with the ICMC. Meadowbank achieved a status of *Substantial Compliance.* This is considered the norm after an initial audit.

Items that need to be addressed are as follows:

- Be sure all containment areas for cyanide related fluids have adequate secondary containment (110% of the largest tank).
- Be sure all storage pads for cyanide are constructed to protect against cyanide exposure and releases
- Implement a Management of Change process
- Proof of enhanced inspection procedures for Mill maintenance
- A report signed by an engineer concluding that the facility's continued operation within established parameters will protect against cyanide exposure and releases.

- Improve dialogue with community by developing written descriptions of how Cyanide is used and managed
- Improve Emergency Response Plan for the AWAR while transporting cyanide
- Perform a mock training drill for cyanide spills.

AEM has one year from the submission date of the DAFR to come into compliance with all outstanding items. October 31, 2015 is the target to have all of these items completed

11.4 INSPECTIONS, COMPLIANCE REPORTS AND NON-COMPLIANCES ISSUES

As required by Water License 2AM-MEA0815 Schedule B, Item 22: ***A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector.***

And

As required by NIRB Project Certificate Condition 4: ***Take prompt and appropriate action to remedy any noncompliance with environmental laws and regulations and/or regulatory instruments, and shall report any noncompliance as required by law immediately and report the same to NIRB annually.***

The KIA conducted an inspection at the Meadowbank site on May 21, 2014. No immediate concerns were raised and the Inspector requested information regarding the RSF and mill seepage. The 2014 Freshet Action Plan (Appendix C of the *2014 Water Management Report and Plan* in Appendix C1) was provided to the Inspector on May 22. No formal inspection report was received from the KIA for this inspection.

An informal site visit was conducted on May 28 with GN representative to review and provide feedback on the Transport Canada Oil Pollution Emergency Plan (OPEP).

On June 11, AEM made a presentation to KIA and conducted site tour of the Tailings Storage Facilities (North and South Cell TSF's) and the reported seepage areas (RSF – ST-16 and Assay Road seep (mill).

On July 13, AANDC and KIA conducted the annual surface water sampling (non-regulatory). AEM did not receive any follow up report or the sample results in 2014 for this event.

On August 2-3, 2014 an inspection and meeting with Transport Canada Inspectors was held in Baker Lake regarding implementation of the OPEP at Baker Lake Marshalling Facility and Oil Handling Facility (Fuel tank loading area). Following this visit, AEM received a non-compliance letter related to the Meadowbank OPEP on September 4 (Appendix J1). A response letter was sent to Transport Canada on September 9 advising that a revised OPEP would be submitted. The revised OPEP Version 5 (see Appendix I1) was forwarded to Transport Canada and DFO – Canadian Coast Guard on November 2.

Environment Canada staff (non inspectors) visited the site from August 25 to 27 primarily to review the EEM workplan and procedures. A general site tour was also undertaken. AEM did not receive any report or correspondence related to this visit.

Transport Canada at Baker Lake for Artic Fuel Contractor Inspection and also included an onsite visit on August 25. AEM received on December 1, the TDG inspection report (Appendix J2) following this site inspection. AEM had a call with the Transport Canada Inspector on December 8 to discuss the non-compliance and sent an email on December 16 to advise TC of our action plan regarding these non-compliances. As per the action plan discussed with the TC representative, a revised TDG form was sent for review along with additional outstanding items listed in the report on December 23. On February 12, AEM had a call with TC inspector to received input about the documents sent in December 2014. To date most of the items are resolved and AEM is on track to be compliant for the next fuel barge season.

HTO visited the site on August 27. The visit included an introduction to the Amaruq Exploration Project.

The NIRB Monitoring Officer was on site for an inspection on September 4 and 5. AEM received November 19 the 2014 NIRB Inspection report as part of the 2013-2014 Monitoring Report and Board Recommendations. A response to the recommendations was forwarded to NIRB on December 18, 2014. All of these documents can be found in Appendix J3.

AANDC and DFO didn't conduct any site inspections in 2014.

On July 23, AEM received a letter from the NWB requesting AEM to submit the supplemental funds for the full payment of the water use fees in accordance with Section 9(6) (b) of the Regulations and the terms of the recent Water License 2AM-MEA0815 Amendment #2 for the freshwater consumption (see section 8.1.14). This supplement is related to the approved increase in freshwater use of 1,870,000 cubic meters in 2013 and 1,150,000 cubic meters per annum for 2014 and the following years. On August 26 the supplemental funds were submitted.

Non-compliance related to water quality exceedences which have been discussed previously in this document included:

- Portage Attenuation Pond (ST-9) discharge aluminium concentration on June 10 (1.80 mg/L), June 24 (1.55 mg/L) and June 30 (1.62 mg/L) exceeded the Water License Part F, Item 2 for effluent quality (1.5 mg/L as a maximum grab sample). AEM exceed the monthly average concentration limit for aluminum (1.53 mg/L).

- Portage Attenuation Pond Discharge (ST-9) aluminium concentration on July 5 (1.79 mg/L) exceeded the Water License Part F, Item 2 for effluent quality (1.5 mg/L as a maximum grab sample). AEM exceed the monthly average concentration limit for aluminum.

- On July 5, final effluent from Portage Attenuation Pond (ST-9) was toxic for Daphnia.

- Vault Attenuation Pond (ST-10) discharge for TSS concentration on August 6 was non-compliant for both MMER and the NWB Water License which permits for a maximum authorized concentration of 30 mg/l in a grab sample and 15 mg/L for the maximum authorized monthly mean concentration. The August 6 result was 57 mg/L with a monthly mean of 30.5 mg/L.

- On August 12, the final effluent from Vault Attenuation Pond was toxic for Daphnia.

Non Conformance was observed during Incinerator Stack testing conducted in July, 2014. The mercury level exceeded the CCME Guideline for the Discharge of Dioxins and Furans. See Section 6.3 for more information.

11.5 AWAR USAGE REPORTS

11.5.1 Authorized and Unauthorized Non-Mine Use

As required by NIRB Project Certificate Condition 32g: ***Record all authorized non-mine use of the road, and require all mine personnel using the road to monitor and report unauthorized non-mine use of the road, and collect and report this data to NIRB one (1) year after the road is opened and annually thereafter.***

And

As required by NIRB Project Certificate Condition 33: ***Cumberland shall update the Access and Air Traffic Management Plan to: 1. Include an All-weather Private Access Road Management Plan, including a right-of-way policy developed in consultation with the KivIA, GN, INAC and the Hamlet of Baker Lake, for the safe operation of the all-weather private access road; and 2. To facilitate monitoring of the environmental and socio-economic impacts of the private road and undertake adaptive management practices as required, including responding to any concerns regarding the locked gates.***

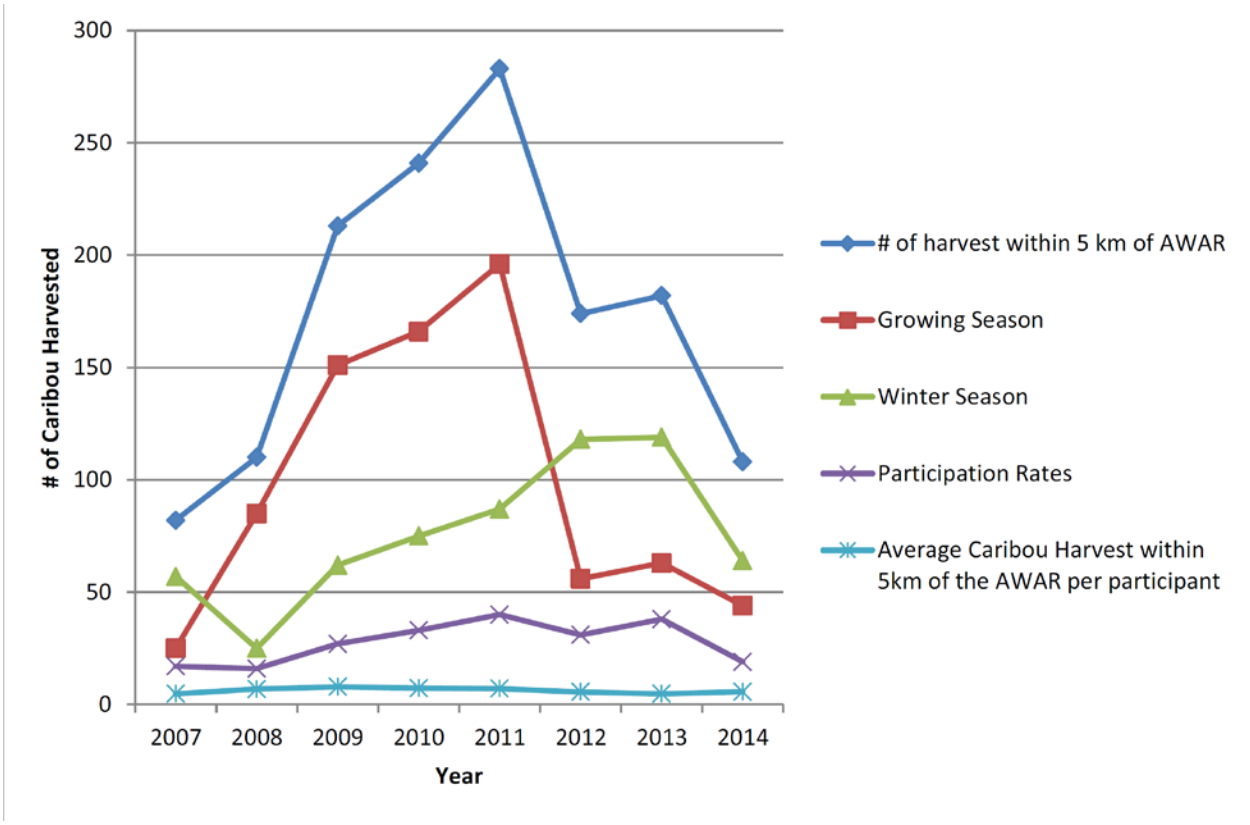
The security department at the Meadowbank Gold Project maintains fully staffed security gates a 24/7 schedule; one at the entrance to the AWAR in Baker Lake and one at the entrance to the Meadowbank mine site. Security staff monitors the safety and security of all personnel using the road. AEM procedures for non-mine uses of the road require that any local users report to the Baker Lake Gatehouse and sign a form that describes the safety protocol while on the road. The road is used primarily by local hunters using ATV's and snowmobiles. Daily records are kept. A summary of the non-mine authorized road use for 2014 is provided in Table 11.1. AEM is confident that our current procedures and protocols provide for the safety of the local public while using the road either for hunting access or for general recreational opportunities. There have been no accidents to date involving mine related truck traffic and locals using ATV's.

Table 11.1 2014 AWAR ATV Usage Records

Month	# of ATV's
January	0
February	0
March	0
April	7
May	182
June	317
July	170
August	127
September	284

October	227
November	5
December	0

According to "*Meadowbank Mine 2014 Wildlife Monitoring Summary Report*", in 2014, the total number of Caribou harvested within 5 km of the AWAR (108 animals) was the lowest recorded since the first year of the HHS; however, this number still represents 40% of all harvests recorded by participants and is similar to the average of 39% since the study began in 2007, suggesting that overall distribution of harvest has stabilized. In the historical NWMB study, Caribou harvests within 5 km of the road were estimated to be 18% of total harvest year round. The participation rate near the road has been consistently higher than reported in the first year of the HHS, when only 49% of participating hunters reported harvest within 5 km of the AWAR. The HHS average participation rate within 5 km of the road is 77% of all hunters reporting harvest. Total harvests per participant within 5 km of the AWAR have also increased since 2007, with an average of 6.3 Caribou per participant overall compared to 4.8 Caribou per participant in the first year of the HHS (see Figure 25 below).



Note that sharp decreases in 2012 data points reflect lower overall harvest totals

Figure 25: Caribou Harvests (Total Harvest and Average by Participant) Along the AWAR (2007 to 2014).

Reported counts for Muskox and Wolverine remained low, precluding any interpretation of potential mine-related effects. Low densities of these species and their general aversion to humans require hunters to hunt well away from the AWAR; therefore, the presence of the AWAR is thought to have little effect on Muskox and Wolverine hunting patterns. Wolverine harvest reports have decreased from a maximum of 15 animals in 2010. Only three Wolverines were reported harvested in 2014.

11.5.2 Safety Incidents

As required by NIRB Project Certificate Condition 32e: ***Prior to opening of the road, and annually thereafter, advertise and hold at least one community meeting in the Hamlet of Baker Lake to explain to the community that the road is a private road with non-mine use of the road limited to approved, safe and controlled use by all-terrain-vehicles for the purpose of carrying out traditional Inuit activities.***

And

As required by NIRB Project Certificate Condition 32f: ***Place notices at least quarterly on the radio and television to explain to the community that the road is a private road with non-mine use of road limited to authorized, safe and controlled use by all-terrain-vehicles for the purpose of carrying out traditional Inuit activities.***

And

As required by NIRB Project Certificate Condition 32h: ***Report all accidents or other safety incidents on the road, to the GN, KivIA [KIA], and the Hamlet immediately, and to NIRB annually.***

On May 27, 2014, AEM held a meeting in the Hamlet of Baker Lake to explain to the community the Policies and Procedures of the All Weather Access Road from Baker Lake to the Meadowbank Mine site. The presentation is attached in Appendix J4. AEM also placed a notice on the local radio station describing the Policies and Procedures for use of the All Weather Access Road from Baker Lake to the Meadowbank Mine site. AEM also conducts quarterly meetings with the Baker Lake Community Liaison Committee and issues related to the use of the AWAR are discussed regularly.

There have been no accidents to date involving mine related truck traffic and locals using ATV's.

A total of 2 environmental spills occurred along the AWAR in 2014. Table 7.1 provides details on each of these spills.

In 2014, no road mortalities were reported. This is a downward trend from previous years. To avoid further incidents, messages are continually provided to employees and contractors to reinforce the procedures for wildlife protection during road use.

11.6 ON-BOARD VESSEL ENCOUNTER REPORTS

As required by NIRB Project Certificate Condition 36: ***Inuit observation and encounter reports for on-board vessels transporting goods and fuel through Chesterfield Inlet.***

AEM engaged one local representative from Chesterfield Inlet to act as a marine mammal monitor for the 2014 shipping season.

In fulfillment of NIRB Condition 36, the following table summarizes the observations made by the local marine mammal monitor onboard contractor vessels transporting fuel or materials for the Meadowbank Mine through Chesterfield Inlet. The observation report from the monitor is located in Appendix J5. There were no adverse incidents reported. Muskox were observed on the land.

In 2014, there were many logistical issues with this program and at times prevented the monitors from to board the fuel barges. In addition, a cancelled flight from Chesterfield Inlet to Baker Lake prevented one monitor to board a transport vessel. There was inadequate communication with potential monitors related to organizing the monitoring trips. Finally, one monitor from Baker Lake became ill prior to boarding a vessel, which prohibited a monitor from being on board for another run.

A plan for 2015 barge season will be put in place with both the Environment and Community Relations groups to better organize the monitors and ship traffic which should alleviate this problem in the future.

Table 11.2: 2014 Summary of local area marine mammal monitor's observations

Name	Direction/Location	Start Date	Finish Date	Observations	Comments
Nathaniel Tatanik	Baker Lake to Helicopter Island	Oct. 6	Oct. 10	Muskox	Close to Baker Lake

11.7 TRADITIONAL KNOWLEDGE, CONSULTATION WITH ELDERS AND PUBLIC CONSULTATION

As required by NIRB Project Certificate No.004, Condition 39: ***annually advertise and hold a community information meeting in Chesterfield Inlet to report on the Project and to hear from Chesterfield Inlet residents and respond to concerns; a consultation report shall be submitted to NIRB's Monitoring Officer within one month of the meeting.***

And

As required by NIRB Project Certificate No.004, Condition 40: ***Gather Traditional Knowledge from the local HTOs and conduct a minimum of a one-day workshop with residents of Chesterfield Inlet to more fully gather Traditional Knowledge about the marine mammals, cabins, hunting, and other local activities in the Inlet. Report to the KIA and NIRB's Monitoring Officer annually on the Traditional Knowledge gathered including any operational changes that resulted from concerns shared at the workshop.***

And

As required by NIRB Project Certificate No.004, Condition 58: "*in consultation with Elders and the HTOs and subject to safety requirements, design the lighting and use of lights at the mine site to minimize the disturbance of lights on sensitive wildlife and birds***"**

And

As required by NIRB Project Certificate No.004, Condition 59: ***in consultation with Elders and the HTOs, design and implement means of deterring caribou from the tailing ponds, such as temporary ribbon placement or Inukshuks, with such designs not to include the use of fencing"***

And

As required by Water License 2AM-MEA0815 Schedule B, Item 23: ***A summary of public consultation and participation with local organizations and the residents of the nearby communities, including a schedule of upcoming community events and information sessions.***

As per NIRB Recommendation 3 found in "*NIRB's 2013-2014 Annual Monitoring Report for the Meadowbank Gold Project and Board's Recommendation*": "The Board strongly encourages AEM to undertake additional workshops in Chesterfield Inlet and Baker Lake to annually gather Traditional Knowledge at both the community level and from the Chesterfield Inlet and Baker Lake HTOs. It is requested that a response be provided to the NIRB within 30 days of receiving this correspondence, and that applicable follow-up be included within AEM's 2014 Annual Report to the Board." Please see below the AEM response to this recommendation.

AEM held an Inuit Qaujimajatunqagit (IQ) workshop in Chesterfield Inlet for two days on January 26 and 27, 2010. This workshop was focused on gathering information on traditional use and traditional environmental knowledge of Chesterfiled Inlet residents, as well as project-specific effects and mitigation recommendations including search and rescue operations and safety. The second part of the condition 40 is to report to KivIA and NIRB's Monitoring Officer annually on the Traditional Knowledge gathered including any operational changes that resulted from concerns shared at the workshop. Following meetings with Chesterfield residents in 2014, no change in the TK gathered was reported to AEM and no operational changes were necessary. AEM believes this complies with the condition 40. As per the AEM response sent on December 18, 2014 regarding the NIRB recommendation 3, AEM will request a discussion with NIRB, at their convenience, to clarify the interpretation of Condition 40.

A log of 2014 public consultation activities is included in Appendix J6.

During the week on April 28th, the Meadowbank Environment Department sent one technician for Trade Week at JASS in Baker Lake. The purpose of the event was to give students, who had volunteered, a firsthand look of environmental field work. Topics included were:

- Sampling techniques for on-ice work, including auger work;
- Use of analysis meters and probes for on-ice work, including depth profiling;
- Proper wildlife deterring techniques
- Introduction to spill response and deployment of equipment; and
- Hazardous materials storage and good practices.

In addition, the students were brought to the Meadowbank site for a site tour to show, first-hand, how the environment department functions on a mine site. This site tour was led by the environmental coordinator.

Both students and the teacher provided positive feedback from the presentation and tour, and the AEM technician appreciated efforts and participation from the class. All benefited from the exchange of time and knowledge. This program will continue in 2015.

On June 25, 2014, AEM held a community session to discuss, shipping, marine mammal, wildlife and general information. A summary of the meeting is included in Appendix J7.

11.7.1 AEM Kivalliq Donations Policy

AEM is committed to be an active participant in Kivalliq communities. An important aspect of participation is to provide donations that enrich the cultural and social well-being of Kivalliq communities. AEM is also committed to sponsor major events that promote interest and activity related to the mining industry in Nunavut.

Unfortunately due to difficult economic conditions AEM had to review its donation policy in 2014 and limit its ability to contribute to community requests. AEM maintained its contribution to major events but had to decline other, smaller, donations requests. This decision allowed the company to maintain sustainable operations in Nunavut and elsewhere where the company operates. The Company is reviewing the donation programs for 2015.

11.7.2 Community Engagement Initiatives

The following is a summary of community initiatives that AEM participated in during 2014.

11.7.2.1 Community Coordinators Program

During 2014 Agnico sponsored part time AEM Coordinators within the Hamlets of Chesterfield Inlet and Arviat. AEM's offices in the communities of Rankin Inlet and Baker Lake already had community relation resources.

The objectives of the community based AEM coordinators is to provide a point of contact in each community to facilitate communications, provide services and coordinate activities in the following areas.

- Provide support to the HR Department:
    - Assist HR and other AEM departments to contact employees as required
    - Contact employees in advance of their shift departure times
    - Pick up employees from their residence and take them to the airport on shift departure days
- Provide advice and assistance to AEM to organize and hold community information sessions on AEM projects and initiatives
- Provide advice and assistance on the design, development and implementation of community based projects (training, AEM employee well-being and community development initiatives)
- Provide updates to the Hamlet Council on AEM activities
- Distribute AEM information and promotional materials

AEM is generally satisfied with this program. There is a clear link and opportunity between the agreements with Hamlets and the practical socio-economic mitigation activities that may be considered by the SEMC. A roving AEM coordinator makes regular visits to other Kivalliq communities.

11.7.2.2 Baker Lake Student Clean up

During the summer of 2014 AEM funded 9 students to conduct various clean - up and other community projects in Baker Lake. The students generally conducted clean – up of litter and other debris. Additional projects related to this program included painting at the arena and the installation of soccer nets at the sports park.

11.7.2.3 Summer Student Employment program

AEM's companywide policy offers summer employment programs to the children of all AEM employees (both Nunavut and non-Nunavut based) that are participating in postsecondary education. Summer job opportunities were also offered to Inuit students who are participating in post-secondary activity, even though they had no family relative working at the mine. There were, unfortunately, no Inuit students working at the mine site in 2014. However, as mentioned above, many were hired in Baker Lake for different maintenance tasks. The program will continue to be offered in 2015.

11.7.2.4 Site Tours for Baker Lake Residents

AEM continued to offer tours of the Meadowbank Project site to all residents of Baker Lake throughout the summer of 2014. This program started in 2008 with tours being offered to all elders. It was subsequently extended to youth groups and then to all residents of Baker Lake. People sign up at the AEM Baker Lake office for tours of the site typically offered on a Saturday or Sunday. The tour groups are bussed from Baker Lake to the mine, have a tour of the Mine, enjoy a meal in the camp where they can talk with other resident employees and observe the onsite working and living conditions before returning to Baker Lake. It has now become a tradition that will be once again offered to Baker Lake residents in 2015. Over 150 residents participated in the site tours during 2014.

11.7.2.5 Sports Day in Canada – Baker Lake

Under the Sports Day event this year AEM contributed to the annual baseball tournament in Baker Lake. For this occasion players from other communities in the Kivalliq traveled to Baker Lake to participate in the tournament. Equipment and food was provided to the local canteen to generate profit for the provision of prizes.

11.8 MINE EXPANSION

As required by NIRB Project Certificate Condition 29: ***report to NIRB if and when [Cumberland] develops plans for an expansion of the Meadowbank Gold Mine, and in particular if those plans affect the selection of Second Portage Lake as the preferred alternative for tailings management.***

11.8.1 Vault Pit Expansion into Phaser Lake

AEM has submitted a proposal to expand the Vault Pit operations into Phaser Lake (referred to as Phaser Pit) which is a small open pit that extends to the southwest from the perimeter of the Vault Pit and into Phaser Lake. To do so a mini project description and the NIRB Project Certificate terms and conditions were submitted to the NIRB and NWB on July 15, 2014.

Previously the Phaser expansion was not considered in the life of mine (LOM). All Certificates, Licenses and Permits for the Meadowbank Project were based and approved in accordance with the original (2005) environmental management plans and the associated life of mine (LOM) plans. Consideration for expansion of the mine is a continuous process and is based on continuing exploration, economic conditions and operations. Initial feasibility studies did not consider Phaser Pit; however this was dependent on scale, timing, the potential environment impacts and the economics at the time. As the economics of the project have changed, and, with optimization of mining practises expanding Vault Pit into Phaser Lake has become feasible.

AEM has applied for an authorization from the DFO and has an approved NNL Plan (AEM, 2012) that has an offsetting plan to account for fisheries losses to Phaser Lake (the project will ultimately improve its connectivity to Vault and Wally Lake). Furthermore, based on current mine plans, the Phaser Lake expansion would no longer require water diversion into Turn Lake, which was originally predicted to be a potential impact. The dewatering activity proposed in the application follows current dewatering plans approved by the NIRB and NWB. Details of the proposed Phaser Lake dewatering are presented the *2014 Water Management Report and Plan* Section 3 presented in Appendix C1.

It is AEM's opinion that Vault Pit Expansion into Phaser Lake is not a significant change to the project, is within the scope of the original project permitted by NIRB Project Certificate No.4, and is within the conditions stated in the KIA Production Lease (KVPL08D280). In total this expansion amounts to approximately an additional 20 – 30 days of mining activity. An amendment or modification to the NWB Water license would also be required to proceed.

On September 2, 2014 AEM received confirmation from the NPC that the Vault Expansion project would not require a NPC conformity review. On November 18 NIRB correspondence was received requesting interested parties to provide comments regarding the AEM proposal by December 2, 2014. Interested parties comments were received on December 4, 2014.

In January, 2015 NIRB determined that the Vault pit Expansion into Phaser Lake application requires more information and requested that AEM prepare a comprehensive addendum to the original FEIS (2005) submitted in support of the Meadowbank Gold Project. A WebEx was held with NIRB on February 6, 2015 to discuss the decision by NIRB and a revised concordance table (that NIRB required). On February 13, 2014, AEM forwarded correspondence to NIRB requesting further guideline information for the addendum to the original FEIS. On February 23, AEM received NIRB clarification on the requirement for the Vault Pit expansion amendment proposal. AEM is currently analysing the situation.

11.9 INSURANCE

As required by NIRB Project Certificate Condition 45: *"[Cumberland] shall carry, and require contracted shippers to carry adequate insurance to fully compensate losses arising from a spill or accident, including but not*

limited to the loss of resources arising from the spill or accident; any claims are to be reported to proper officials with a copy to NIRB's Monitoring Officer"

No claim was reported by our marine shipper in 2014.

As required by NIRB Project Certificate No.004 Condition 45: ***[Cumberland] shall carry, and require contracted shippers to carry adequate insurance to fully compensate losses arising from a spill or accident, including but not limited to the loss of resources arising from the spill or accident; any claims are to be reported to proper officials with a copy to NIRB's Monitoring Officer***

Contractors have insurance to fully compensate losses arising from a spill or accident, including but not limited to the loss of resources arising from the spill or accident.

11.10 SEMC

As required by NIRB Project Certificate Condition 63: ***the GN and INAC shall form a Meadowbank Gold Mine Socio-Economic Monitoring Committee ("Meadowbank SEMC") to monitor the socio-economic impacts of the Project and the effectiveness of the Project's mitigation strategies; the monitoring shall supplement, not duplicate, the monitoring required pursuant to the IIBA negotiated for the Project, and on the request of Government or NPC, could assist in the coordination of data collection and tracking data trends in a comparable form to facilitate the analysis of cumulative effects; the terms of reference shall focus on the Project, include a plan for ongoing consultation with KivIA and affected local governments and a funding formula jointly submitted by GN, INAC and [Cumberland]; the terms of reference shall be submitted to NIRB for review and subsequent direction within six (6) months of the issuance of a Project Certificate; [Cumberland] is entitled to be included in the Meadowbank SEMC***

And

As required by NIRB Project Certificate No.004, Condition 64: ***[Cumberland] shall work with the GN and INAC to develop the terms of reference for a socio-economic monitoring program for the Meadowbank Project, including the carrying out of monitoring and research activities in a manner which will provide project specific data which will be useful in cumulative effects monitoring (upon request of Government or NPC) and consulting and cooperating with agencies undertaking such programs; [Cumberland] shall submit draft terms of reference for the socio-economic monitoring program to the Meadowbank SEMC for review and comment within six (6) months of the issuance of a Project Certificate, with a copy to NIRB's Monitoring Officer.***

In July of 2007 AEM submitted Draft Terms of Reference (TOR) for the Meadowbank Gold Project Socio-Economic Monitoring Committee (SEMC) to the Nunavut Impact Review Board. Indian and Northern Affairs Canada, Government of Nunavut and AEM jointly developed these TOR. NIRB acknowledged receipt of these TOR on July 16, 2007 and accepts SEMC reports as part of the annual review.

The Kivalliq Regional SEMC met in Baker Lake and Meadowbank Mine on October 7 to 9 2014. AEM participated at the meetings and provided presentations. Copies of these presentation materials were previously provided to the GN and are included in the Kivalliq Regional SEMC report and are available on the GN SEMC website (http://www.nunavutsemc.com/Kivalliq).

At the 2014 SEMC meeting a draft monitoring program containing measures to gauge predicted socio-economic impacts was approved for further development. The monitoring program will collect data from the beginning of Meadowbank operations and be updated on an annual basis to indicate trends. Officials from AEM, Canada and the GN are tasked with having a draft report ready for review and approval by May, 2015. Once AEM has approval from the SEMC, we intended to communicate with NIRB to advise them of the program, along with a copy of a completed report.

AEM will continue to actively participate in the Kivalliq Regional SEMC and will meet its socio-economic reporting requirements to NIRB through the SEMC annual report. To the best of our knowledge AEM has complied with all of the requests for data made by the SEMC and is current with all commitments made to the SEMC by AEM.

11.11 SOCIO ECONOMIC

As required by NIRB Project Certificate No.004, Condition 65: ***Cumberland shall include in its socio-economic monitoring program for the Meadowbank Project the collection and reporting of data of community of origin of hired Nunavummiut.***

11.11.1 Meadowbank Workforce

The total number of people working at the Meadowbank Mine site as of December 31, 2014 was 1,012 persons (Contractors, AEM Permanent + Temporary), broken down as follows:

- # Working for contractors: 224
- # Working for AEM: 788

The total AEM workforce at the end of 2014 was 788 broken down as follows:

• Permanent AEM employees	693	87.9%
• Temporary AEM employees	95	12.1%
• AEM employees who are Inuit / Nunavummiut	269	34.13%
• Proportion of AEM employees who are female	120	15.2%

Table 11.3 -Total Workforce at the Meadowbank Mine as of Dec 31, 2014

Total # of AEM employees on AEM Payroll on December 31, 2014; 788		
# of above employees who are permanent AEM employees	**693**	**88.0%**
of these employees who are Inuit /Nunavummiut	179	25.6%
of these employees who are female	89	13.0%
# of above employees who are temporary employees	**95**	**12.0%**
of these employees who are Inuit	90	94.7%
of these employees who are female	31	33.0%

AEM defines a permanent employee as an employee whose current job is not specifically tied to a short-term project and the position is expected to be required throughout the LOM. A temporary employee is considered as an employee whose current job will not continue beyond a specified period of time. A

temporary on-call employee, 100% filled by Inuit/Nunavummiut, is an employee who has an indefinite contract and is called upon when the need arises.

All AEM employees are required to provide a medical health certificate before they are offered a permanent position. Most Inuit employees, in particular those from Baker Lake, have been unable to provide a medical certificate as examination services are not available to our employees from GN Nursing Stations. In 2014 AEM continued providing new medical exam services at Meadowbank using qualified medical staff brought in from outside Nunavut. These services are provided at no cost to employees. In future, unless Inuit employees are hired specifically for a short period due to a special project or situations (i.e. replacement leave); employees will undergo a medical examination after three months of temporary status. The company will continue to offer more Inuit with permanent offers of employment to ensure that employees can enjoy a full range of benefits and feel more confident and secure about their employment status.

As per the NIRB Recommendation 7 "*The Board requests that future reporting on socio-economic data include a breakdown of the types of positions held by Inuit beneficiaries and non-Inuit Nunavummiut at the Meadowbank site. It is requested that information be provided in AEM's 2014 Annual Report*". To fulfill this recommendation please find below Table 11.4 and Table 11.5 which lists the types of jobs held by Inuit and non-Inuit employed at Meadowbank as of December 2014. At the end of December 2014, 269 Inuit and 519 non-Inuit were employed at Meadowbank.

Table 11.4 - Types of job positions held by Inuit/Nunavummiut at Meadowbank as of Dec 31, 2014

Job position	Total
Apprentice	6
Auxiliary Equip. Operator	21
Cook Helper	5
Dishwasher	23
Driller and Blaster	3
Environmental Technician	1
Fixed Equipment Operator	1
Haul Truck Trainee	3
Guests Services Leader	1
Haul Truck Operator	67
Heavy Equipment Operator	3
Helper	36
Human Resources Agent	2
IIBA Coordinator	1
Janitor	68
Labourer	14
Millwright	1
Production Loading Equip. Operator	2
Receptionist	1
Security Guard	8
Sharpener	1
Utility Person	1
TOTAL	**269**

Table 11.5 - Types of job positions held by non-Inuit at Meadowbank as of Dec 31, 2014

Job position	Total	Job Position	Total
Carpenter	4	Airport Controller	1
Leader Operation	2	Protocol Agent	2
Leader Trades	10	Assayer	10
Electrician	6	Chief Assayer	1
Utility Person	6	Clerk	6
Building Mechanic	6	Counselor	12
Machinist	2	Chief	2
Welder	9	Dispatcher	4
Mechanic	33	Engineer	14
Millwright	11	Geologist	7
Crusher Operator	4	Hygienist	1
Grinding Operator	4	Leader	3
Relief Operator	6	Metallurgist	4
Leach/CP Operator	4	Nurse	2
Haul Truck Operator	12	Officer	3
Guest Services Leader	5	Planner	9
Instrumentation Technician	7	Refiner	1
Diesel Mechanic	2	Specialist	4
Plumber	3	Security Guard	2
Driller and Blaster	39	Assistant Superintendent	5
Crane Operator	2	Superintendent	12
Fixed Equipment Operator	1	Supervisor	38
Heavy Equipment Operator	6	Assistant General Supervisor	2
Auxiliary Equipment Operator	26	General Supervisor	15
Prod. Loading Equip. Operator	28	Surveyor	3
Sharpener	2	Technician	32
Cook	19	Trainer	7
Paster Baker	2	Warehouse Person	14
Pump Man	9	Reagent Operator	6
Power Plan Operator	4	Analyst	6
Process Controller	4	Administrative Assistant	1
Coordinator	11		
TOTAL			**519**

As of the end of 2014 AEM estimates that close to 81% of the Nunavummiut workings at Meadowbank are working in what we classify as either skilled or semi-skilled occupations.

Table 11.6 - Skill level of position held by Inuit/Nunavummiut at Meadowbank as of Dec 31, 2014

Total # of AEM Inuit employees as of December 31, 2014		
# of these employees that have a *skilled* level job	35	13%
# of these employees that have a *semi-skilled* level job	183	68%
# of these employees that have a *unskilled* level job	51	19%
Total	**269**	**100.0%**

11.11.2 Hours Worked by AEM Employees at Meadowbank

The total person hours worked by all AEM Meadowbank employees (Permanent + Temporary) for the 12-month period ending December 31, 2014 was 1,720,992. Table 11.7 provides a breakdown by Nunavut and non-Nunavut based employees.

Table 11.7 - Person-hours worked - Nunavut based vs. Non-Nunavut based Employees

Jan. 1, 2014 to Dec. 31, 2014	**Person-Hours**	**%**
All AEM Employees		
Nunavut Based AEM Employees	585,312	34%
Non Nunavut Based Employees	1,135,680	66%
Total	**1,720,992**	100.00%

As the number of Inuit Employees at Meadowbank increased comparable to 2013, we can observe the Inuit hours of employment increased too, by 52,416 hours in 2014 and the percentage of Inuit employed increased from 31.9% in 2013 to 34.1% in 2014. By having the Kivalliq region candidates do the work readiness training and an interview prior to their employment, AEM is having more success at finding the right position for each employee.

Furthermore, establishing the on-call contracts has given us the chance to quickly replace the unplanned or planned absences of employees, which is reflected in the increase of the hours worked. As those on the on-call contracts are from the Kivalliq communities they have the possibility to work more hours given their more immediate availability.

11.11.3 Employment Demographics for Nunavut Based Employees

Table 11.8 shows the breakdown of the home communities of the Nunavut based employees as of December 31, 2014 compared to December 2013 and December 2012.

Table 11.8 - Home Communities of Nunavut Based Employees

	As of December 31, 2014		**As of December 31, 2013**		**As of December 31, 2012**	
Arviat	38	14.1%	28	11.5%	44	17.8%
Baker Lake	155	57.6%	162	66.4%	154	62.3%
Chesterfield Inlet	3	1.1%	3	1.2%	5	2.0%
Coral Harbor	5	1.9%	3	1.2%	1	0.4%
Rankin Inlet	44	16.4%	31	12.7%	29	11.7%
Repulse Bay	10	3.72%	4	1.6%	2	0.8%

Whale Cove	2	0.75%	3	1.2%	2	0.8%
Others	12	4.5%	10	4.1%	10	4.0%
Total	**269**	**100.0%**	**244**	**100.0%**	**247**	**100.0%**

AEM funds the transportation of all Nunavut based employees from their point of hire to the Mine for each work rotation. AEM has a service contract with First Air to transport AEM employees by charter plane from Kivalliq Communities directly to and from the Meadowbank Mine. Currently all Nunavut resident employees from the southern Kivalliq communities (Arviat, Chesterfield Inlet, Whale Cove) are transported by commercial carrier to Rankin Inlet to connect with the First Air charter to the mine site. For those who live in Coral Harbour and Repulse Bay commercial flights provide transport from their community to Baker Lake. These employees are transported to Meadowbank on the "daily ride" from Baker Lake.

11.11.4 Employee retention

In 2014, AEM continued to experience some turnover of Inuit employees. For the employees who occupied temporary positions, there was small increase in the rate from 65% in 2013 to 70% in 2014. However, 38% of temporary employees left due to contract expiration.

Furthermore, the on-call contracts allowed new employees to better adapt to their new work environment because they start replacing for a couple of days, therefore experiencing the camp life. This helps decreasing the gap between their understanding of Meadowbank and the reality of the work environment; consequently it contributes to reduce the voluntary resignations. Also, some Inuit/Nunavummiut wants to work on-call only for individual reasons.

As per NIRB Recommendation 8 "*The Board requests that future reporting on socio-economic data in AEM's post-environmental assessment monitoring program include percentages of the most common reasons reported for employee voluntary termination. It is requested that information be provided in AEM's 2014 Annual Report.*" AEM has included this data in the PEAMP section. Table 11-9 below indicates the reason and percentage related to the turnover rate for Inuit and non-Inuit employed at Meadowbank in 2014.

Table 11.9 – Turnover reason for Inuit and non-Inuit employed at Meadowbank in 2014

Reason	#	%
Dismissal	29	13.94%
Perm. Disability	2	0.96%
Death	4	1.92%
C.O.	1	0.48%
End of Contract	33	15.87%
End of Probation	1	0.48%
Student Leave	48	23.08%
Resignation	75	36.06%
Lay Off	1	0.48%
Retirement	4	1.92%
Terminated with cause	2	0.96%

Voluntary Leave	8	3.85%
TOTAL	**208**	100%

Based on AEM's experience it has become apparent that many Inuit have never had a full time work experience in their home communities where full time employment opportunities are often very limited; and although employment opportunities are actively sought working away from home for two weeks at a time in a structured industrial environment is a change that many cannot adapt to.

Exit interviews and focus group meetings support this assumption and the following provides the most common reasons given for voluntary terminations for Inuit employees;

- Spousal relationships issues
- Did not like the work or too tired to continue working
- Too much gossip amongst co-workers
- No babysitter or daycare
- Found a new job in town Home sick – need to go home
- Family wanted them to come home
- Work was too hard or did not like the work
- Increase in rent for social service housing (example $30 to $880 per month)

The turnover rate of Inuit employee's occupying permanent positions has increased to a 26% from 23% in 2013. However, the global Inuit turnover rate has lightly decreased from 38% to 36%, when considering both permanent and temporary employees.

In 2013, AEM contracted a nurse who attends the site to conduct pre-employment exams once every 4 weeks. This measure is reducing the delays to complete the employee's file optimizing the Inuit hiring process. This program operated in 2014 and will continue.

Table 11.10 – 2014 Turnover rate

2014 TURNOVER RATE					
Department	**South Permanent**	**Inuit Permanent**	**Inuit Temporary[1]**	**Inuit Turnover**	**All**
TOTAL	**7%**	**26%**	**70%**	**36%**	**16.9%**
Mine operation	4%	14%	13%	14%	9.2%
Mill operation	3%	4%	5%	4%	3.4%
Maintenance	3%	1%	4%	2%	2.6%
Services	4%	20%	51%	29%	12.1%

In 2014 a total of 119 Nunavummiut employees terminated their employment (voluntary and involuntary terminations). Of these, 75 were temporary employees and 44 were permanent employees. The

positions with the highest turnover are, respectively: helper, janitor, haul truck driver and labour (sites services). The average length of employment for the terminated employees was 356 days, with a range from 3 to 2,619 days.

11.11.5 Education & Training

As per NIRB Recommendation 9 "*The Board requests that AEM report on its pre-apprenticeship program, including: enrollment numbers; successful completion rates; and how many successful participants found employment with AEM or, if known, other opportunities. Each of these details should include a breakdown of Inuit beneficiaries and non-Inuit Nunavummiut. It is requested that information be provided in AEM's 2014 Annual Report.*"

In 2014, we had 4 employees enrolled in pre-apprenticeships. Three of these employees completed the pre- apprenticeship. All four were employed by AEM and this program is only offered to Inuit employees to develop skilled trades.

During 2014, a total of 32,742 hours of training was provided to 944 AEM Meadowbank employees. Among them, 224 Inuit employees were provided training. AEM identifies three main categories of training; Health and Safety, General and Specific training. Part of the Health and Safety training is mandatory and are in an e-learning format. General and Specific training consists of job related training that is provided both on the job and in class. This information as well as a comparison for the previous 12 month period is shown in Table 11.11.

Table 11.11 - Training Hours for Meadowbank Employees Period Ending December 31, 2014

Total training hours					
Training Hours for AEM Employees	**Training Hours (Jan. 1 - Dec. 31 2013)**	**Training Hours (Jan. 1 - Dec. 31 2014)**			
		Health and Safety	General	Specific	**Total**
Inuit Employees	13,530	1,522	647	12,175	14,344
Non Inuit Employees	15,054	612	1,367	9,275	18,398
Total	**28,584**	**1,224**	**2,014**	**21,450**	**32,742**

In comparison to 2013, there was an increase in the total number of hours for training provided to all employees (by 4,158 hours). Training provided to Inuit increased by 814 hours over 2013. These increases are related to the launch of the Vault pit as 12 new positions were created.

43% of all the training provided at Meadowbank is dedicated to Inuit employees. 85% of the training provided to Inuit is specific training which means training related to the specific job performed. The training is designed to increase skills and competencies, therefore, employability. Furthermore, 57% of all specific training offered on site, is provided to Inuit employees. This is evidence of the importance that AEM places on the continuous development of specific skills for Inuit employees.

11.11.5.1 Haul Truck Driver Training

AEM believes that it is important for every employee to have an opportunity to improve their skills and enhance their future career opportunities within the company. The majority of the Company's haul truck drivers started in an entry level position such as dishwasher, janitor, chambermaid, housekeeper, etc. The haul truck driver program is popular with Inuit employees, who appreciate an opportunity to gain a career in the mining industry.

The current Haul Truck driver crew for the Mine and Surface department is mostly comprised of Inuit workers. Throughout 2014, 34 Inuit workers enrolled in the Haul Truck Driver Training program. In order to get certified on the equipment, the operators have to complete a total of 336 hours of training on a simulator, on the job and in the classroom.

Due to the start of mining at Vault in 2014 twelve (12) new positions were created at the entry level. This provided additional opportunities for Inuit employees to develop a career path.

In 2014, 33 Haul Truck Trainees successfully completed the program and are now fully certified Haul Truck Operators working with the mine department.

Due to the success of this program the training department has expanded and a permanent Inuk Haul Truck Trainer has been retained. With this new addition to the training team, AEM plans to train up to 20 new haul truck operators in 2015.

AEM is satisfied with the success of this program.

11.11.5.2 Career Path

In 2012, to support upward mobility opportunities for Inuit employees, a Career Path program was designed by the Meadowbank training team. This program is designed to provide an opportunity to all Inuit employees who have limited formal skills or education. This program identifies the incremental steps that an employee is required to accomplish to advance in their chosen career of interest. The path defines a combination of work experiences, hours of completion, training and skills development for an employee to achieve each step. The Career Path system is currently available for five (5) areas of mine operations; Mine, Drill & Blast, Process Plant, Field Services and Road Maintenance. The objective is to provide internal promotions for Inuit and no external candidates (southerners) will be hired to fill a position that is part of the program. AEM continued the Career Path program in 2014 and for 2015, a new career path for the Maintenance Department will be developed. With the implementation of the Drill & Blast career path, the training demands increased and a new Driller Trainer was hired to fulfill the training needs.

11.11.5.3 Training Curriculum

Implemented during 2014, the Training Curriculum is an ongoing project. The training formula manual, which is composed of three sections; training theory, training standards and training delivery, gives the proper tools, tips, guidelines and standards to all the Agnico Eagle - Meadowbank trainers. By having a new Training Development Specialist position in the training team on site, we will perfect the skills of the members of the training team. Preliminary meetings between the development specialists and the trainers

were performed throughout the year 2014 to set goals. The trainer's manual was developed internally by Agnico Eagle and is specifically designed for the Company's operating environment in order to provide consistent training standards.

11.11.5.4 E-Learning Training at Meadowbank

After successful implementation in 2013, the e-learning program continued during 2014. Before coming to Meadowbank for the first time, newly hired employees must complete their Mandatory Induction Training on-line. The General Induction consists of segments that provide general information about Agnico Eagle and working life at Meadowbank Mine. Once completed, employees are invited to access additional online training that includes health and safety training. To implement the e-learning approach, training material has been translated into English, French and Inuktitut. Lesson plans have been created and updated in order to improve the quality and the consistency of the training.

In 2014, AEM employees spent a total of 2,797 hours on the e-learning modules. Inuit employees spent 507 hours on these training modules.

In May 2014, at the annual OCTAS event in Quebec, AEM Meadowbank's online training program was awarded a First Place Award for Excellence in Information Technology - Human Capital: over 1,000 employees. Not only is this program a milestone among the mining industry, it also had a great impact within the Company. By eliminating the challenge of training hundreds of new employees on site, we are now able to deliver effective training to employees before they arrive on site and our trainers now have more time to deliver specific training.

In November 2014, Agnico Eagle Mines Meadowbank won a Canadian Award for Training Excellence for its e-learning project for mandatory training in Health and Safety and General Induction. This award recognizes "best practices" in terms of innovation in learning programs in Canada. The project "Learning through IT: Technological Change in the heart of the Arctic" has many benefits. It ensures that all workers are trained on health and safety matters such as WHMIS, fire extinguisher, etc. prior to coming on site. The program also improves the consistency of the delivered message as well as its understanding as the content is trilingual. This mandatory e-learning places health and safety at the heart of the training strategy.

The training team at Meadowbank continues to find ways to improve the training curriculum and develop new programs. Process Plant Induction as well as Chemical Awareness training is currently under development. In September, a Skill Assessment module was provided in order to analyze the training needs within the Maintenance Department at the mine site. Plans are underway to add more skill assessment content and electronic evaluations (e-evaluations) as part of different Career Path's evaluation system during 2015.

11.11.5.5 TMS & LMS

The Training Management System (TMS) as well as the Learning Management System (LMS) were initially implemented in 2013 in order to ensure better management of training activities and to monitor the proper management of the e-learning training. Both of these tools are now in full operation and optimization phases were ongoing in 2014 with the addition of a function designed to track electronic

training files for employees. Even though the platform works well, the optimization of the TMS & LMS will continue in 2015 and will allow an increase in the efficiency of our reporting tools as Phase 2 of the project.

11.11.5.6 Apprenticeship Training at Meadowbank

AEM is committed to employ Kivalliq based Inuit employees to fill as many available positions as possible. An Apprenticeship Program for the training of Inuit employees in skilled trades is being reviewed and improved.

Many fields of study are now available and we are aiming at acquiring more diversity in terms of trades at Meadowbank. The apprentice positions will lead the employees to work in various departments such as Mobile Maintenance, Site Services, Process Plant (Maintenance), Kitchen and Electrical Department.

There are many Inuit who are interested in becoming apprentices but Agnico Eagle is finding that most failed the trades' entrance exam due to low comprehension, literacy and numeracy skills. This is recognized as a problem within the mining industry and private sector in Nunavut. To tackle this problem, in collaboration with the KMTS and Nunavut Arctic College, AEM supported a pre-trade program in 2013 and 2014.

In 2014, four (4) Inuit employees enrolled in pre-trades assessment program. Three completed the program successfully. One (1) Inuk woman is now enrolled as an apprentice Chef, one (1) Inuit male is now enrolled in as a Carpenter's apprentice and one (1) Inuit male is enrolled as a Millwright apprentice.

In 2015, six (6) new Apprentice positions will be available for a total of at least 12 apprentice positions. Meadowbank has also organized information sessions for Inuit employees to inform them on apprenticeship opportunities and processes.

Agnico Eagle is aiming at extending the program in order to allow AEM Inuit employees opportunities in as many fields as possible. Therefore, Agnico Eagle is targeting more trades, such as plumbers, welders and carpenters. The company is also aiming at developing skills assessment to evaluate the level of Inuit employees' competencies related to a trade to ensure a better fit between skills, interests and job position.

The company is confident that this approach will be beneficial for Inuit employees' ambitions, needs and accomplishments and the company's objectives of maximizing the percentage of local Inuit Beneficiaries working at Meadowbank.

11.11.5.7 Collaboration committee training

All members of AEM's collaboration committee were part of a training session related to topics they were interested to be trained on (labour relations). As part of their role as an employee representative, situations are occasionally encountered that can be challenging or outside of their comfort zone. In order to provide tools to manage their responsibility, training included communication, teamwork, conflict management, motivation, and personality and emotions management. An external trainer visits the site to provide coaching to the members of the Collaboration Committee. The trainer was at Meadowbank

from July 31 to August 5, 2014 and is scheduled to visit again during the summer of 2015. Six (6) Kivalliq Inuit employees participated in this training in 2014.

11.11.5.8 JOH&S committee training

Members of the Meadowbank Joint Occupational Health and Safety (JOH&S) committee received training in order to improve their skills related to the management of Health & Safety. The training covered various topics including: Roles & Responsibilities of the JOH&S committee, interpretation of the Mines Act & Regulations, conducting inspections, conducting accident/incident investigations due diligence, part of the Criminal code and Supervision Formula training as well as a coaching phase. During 2014, a total of six (6) Inuit employees received training related to and participated in the JOH&S committee.

11.11.5.9 Emergency Response Team (ERT) training

At Agnico Eagle Mines, one of the most important priorities is to keep employees safe. Meadowbank has a well-trained. Emergency Response Team (ERT) on site at all times. Employees wishing to become part of the ERT team must show an interest towards safety, have good attendance and behavior at work and also be in good physical condition. An ERT practice takes place weekly and each member must attend at least six (6) practices throughout the year. In 2014, there were a total of 53 ERT members. Among them, five (5) were Inuit (3 Men, 2 Women). Training in 2014 included first aid, firefighting, extraction, search & rescue, rope rappelling, etc. This training includes practical aspects as well written exams.

11.11.5.10 Work Readiness Training Program

In collaboration with the Kivalliq Mine Training Society (KMTS), Agnico Eagle developed a Work Readiness Training program as a pre-employment initiative. The program, implemented in April 2013, is delivered over a 4 day period at the community level as per a schedule throughout the year. During 2014, the program was delivered in each Kivalliq community and a total of 128 people from the various communities attended, of which 111 successfully completed the program. In 2014, 57 graduates of the program were hired by AEM (included 24 women).

Many employees that benefited from the program were able to obtain positions and continue to improve their skills at work. The Work Readiness program provides coaching in the following areas:

(1) Insight into personal beliefs that drive behaviors in their social lives;
(2) Awareness of employers' unspoken expectations;
(3) Self-control skills for managing strong emotions;
(4) Communication skills for dealing with difficult social interactions, and;
(5) Problem solving skills for logically resolving interpersonal workplace issues.

The intent is to assist Inuit workers to be better prepared for the work environment in an industrial setting. Graduates of the program are eligible to join the AEM Labor Pool.

11.11.5.11 Labor Pool Initiative

The Labor Pool initiative is based on an agreement between Agnico Eagle, the KMTS and the KIA to offer pre-employment opportunities to Inuit from all Kivalliq communities. The program was implemented in 2014.

The goal of the program is to pre-qualify candidates from Kivalliq communities. In 2014 Agnico Eagle visited all communities to provide information sessions and conduct interviews with potential candidates. Individuals were selected based on their motivation and previous work experience. Candidates were also required to complete mandatory training by e-learning as well as participate in the 4 day Work Readiness training program. The objective is to create a ready pre-qualified pool for Agnico Eagle to draw future employees from.

Labor pool participants will be retained for short term on call assignments to ensure a good fit and they are eligible to gain a full time position. At its peak the labor pool contained 111 graduates of which 57 were provided a work opportunity at Meadowbank. This initiative will continue in 2015.

11.11.5.12 Cross Cultural training program

Implemented in 2010, the Cross Cultural Training Program is offered to all AEM employees. It is a five (5) hour in-class training course. This course allows employees from different cultures and backgrounds to understand each other's culture in order to improve understanding and communications in the workplace. The program was revisited with the assistance of the Nunavut Literacy Council in 2013 and a revised program was initiated in 2014. Throughout 2014, 304 employees received the training. Among them, 103 were Inuit employees, including 43 women and 60 men.

11.11.5.13 Memorandum of Understanding (MOU) with Department of Education

The Department of Education, Government of Nunavut (EDU) and AEM share the belief that developing the capacity of Inuit to pursue skilled trades and professional careers will lead to confident, responsible and capable individuals who are prepared to join the labor force or pursue relevant trades or professional careers. Both parties have agreed to develop a partnership agreement that recognizes the mutual benefit to be gained through collaborative efforts.

A Memorandum of Understanding was signed in April 2012 to establish a strengthened partnership between the Department of Education and AEM, with a focus on increasing the number of students in the Kivalliq region who are able to successfully transition from high school to trades and mining-related career opportunities. The MOU with the Department of Education is currently under review and a renewed agreement should be in place during 2015.

During 2014, AEM continued to sponsor the Mining Matters program as part of the MOU with the Department of Education. Mining Matters is a branch of the Prospectors and Developers Association of Canada (PDAC) that is dedicated to bringing knowledge and awareness about Canada's geology and mineral resources to students and educators. The organization provides current information about rocks, minerals, metals, mining and the diverse career opportunities available in the minerals industry. Mining Matters offers exceptional educational resources that meet provincial curriculum expectations. Core to the program are the Mining Matters educational resources, created by educators and Earth science

experts. The program was delivered at schools in Repulse Bay, Whale Cove and Baker Lake during 2014.

In 2013 AEM and the Mining Matters group participated with the GN Department of Education, Curriculum Review Services to assist in a review of Earth Sciences Curriculum of Nunavut Schools. The review concluded that with some adjustments to meet the unique culture, language and learning needs in Nunavut, the Mining Matters curriculum could be adapted into an Earth Sciences Curriculum for Nunavut schools.

11.11.5.14 Kivalliq Science Educations Community

In 2014 AEM invested $35,000.00 towards the regional Math Camp, Science Camp and Kivalliq Science Fair operated by the Kivalliq Science Educators Community. AEM's educational partners from Mining Matters assisted with the Science camp. The Science camp was organized just outside of Whale Cove and the weeklong program included a mix of traditional, cultural and educational studies related to sciences. The program provides science credits to participants.

11.11.5.15 Arviat Community Training Programs

There is a long-term demand for diamond core drilling to support Agnico's exploration activities in the Kivalliq region, and there are other mining companies with active exploration projects in the area. This has created a demand for locally available diamond driller's helpers.

In 2011 the Hamlet of Arviat proposed a partnership to invest in a community based drilling school that would provide Inuit with the skills needed to work in diamond drilling. With advice and support of AEM the Hamlet brought together a range of partners to acquire the drilling equipment, develop the curriculum and operate the training program. Government training agencies, the KIA and drilling companies provided partnership investments.

The curriculum of Arviat's driller's school has been modeled based on a well-developed and successful program offered by Northern College, Ontario. The program uses experienced trainers and includes both in class theory and practical hands-on training. Graduates receive a certificate that is recognized by the diamond drilling industry across Canada. The program is steered by an Advisory Group that includes participation by Colleges, Drilling contractors, AEM, KMTS, Hamlet and GN ED&T.

In 2013 the program was expanded to include a Welder's Helper program. Renovations to the Hamlet's training facility included the addition of two welding bays. The 8 week program is delivered using curriculum and instructors from Northern College, Ontario. The program was launched in 2013 and saw 7 graduates.

The Arviat Training Advisory Group met in January 2014, and decided that during 2014 that there would be one driller's helper class, two sessions of the Work Readiness Program and one class of the Arviat Welding Trade Readiness Program.

The 2014 drillers program took place between April and June 12 students registered. There were 11 graduates. Over the past 4 years the program has graduated 54 trained driller's helpers, whom all have

found employment. The welders program took place in December and saw six graduates. All of the welder's helpers graduates found employment.

Agnico invested $190,000 towards the Arviat training programs in 2014. The Advisory Group will meet in April, 2015 to consider programs for 2015-16.

11.11.5.16 Kivalliq Mine Training Society

In May 2012 AEM was invited by Human Resources & Skills Development Canada(HRSDC) to participate in discussions with KMTS members on a new mine training initiative. HRSDC proposed a two-year "northern pilot project" program that would see five of Canada's program areas bundled in a seamless application and delivery program. The parties agreed to proceed and a proposal has since been approved by HRSDC. The KMTS has also enjoyed financial support from the GN, Department of Economic Development and Transportation. The KMTS program costs were estimated to be $9.5 million over a two year period, from April 2013 to the end of March 2015. AEM has provided $6.8 million in cash and in kind support towards the overall initiative. A one year extension of the program for 2015-16 is currently under review by Canada.

A major focus of the KMTS program has been to support AEM's Mine Training Initiatives, such as the Career Path, Apprenticeship and Haul Truck Driver operators' programs. Between April 2013 and December 2014 a total of 197 Inuit Employees participated in Career Path initiatives, of which 178 successfully completed their training and 110 received a promotion.

The KMTS program had provided support for the development and delivery of community based Work Readiness and Labor pool initiatives to help prepare Inuit for employment opportunities. The KMTS has also supported the Arviat Drillers program as well as some interesting community based initiatives, such as the Fly-In Fly-Out program and Community Net-work program, which have provided support to communities to help employees and their families cope with the challenges that come with employment. Between April 2013 and December 2014 at total of 437 Inuit participated in KMTS community based programs of which 386 successfully completed their training and 255 found employment work.

By June 2015 the KMTS will provide all sponsors, including the GN, an audited report of activities between April 2013 and March 2015.

SECTION 12. POST-ENVIRONMENTAL ASSESSMENT MONITORING PROGRAM (PEAMP) – EVALUATION OF IMPACT PREDICTIONS

As Per Meadowbank's NIRB Project Certificate, Appendix D (Post-Environmental Assessment Monitoring Program (PEAMP)), the following provides a review of monitoring conducted in 2014 in relation to impacts described in the Final Environmental Impact Statement (FEIS; Cumberland, 2005). As stated in the NIRB Project Certificate, the PEAMP is a conceptual program designed "*to work as an instrument of the proponent's overall monitoring efforts and should provide feedback to the NIRB and other agencies regarding ongoing project monitoring*." The overall goal of this program is to provide the NIRB and other regulatory agencies with information on how current environmental and socioeconomic effects of the Meadowbank mine site compare to impacts predicted in the FEIS.

More specifically, the objectives of the PEAMP as specified in the Project Certificate Appendix D are to:

a) Measure the relevant effects of the project on the ecosystemic and socioeconomic environment(s). These effects may be measured through biophysical and socioeconomic monitoring programs undertaken by the Proponent or by other means as described in the Project Certificate;
b) Assess the accuracy of the predictions made within the FEIS;
c) Evaluate the effectiveness of project monitoring procedures and plans;
d) Identify impacts requiring additional mitigation or adaptive management; and
e) Provide relevant data and information to support regional monitoring initiatives where feasible.

The methods, objectives, results and recommendations of the specific monitoring reports are discussed in greater detail in the preceding annual report or appendices.

It should be noted that the monitoring programs as described in the FEIS were developed at a conceptual level to assist in evaluating the overall potential impacts of the project. These were supporting documents in the FEIS and assisted in informing predictions, establishing regulatory limits, and forecasting management and mitigation actions to assist in the impact prediction process. Monitoring plans and sampling locations have since undergone changes to reflect actual mine operations. These differences are taken into account when making comparisons to FEIS predictions.

This section has been organized into 6 main categories: Aquatic Environment, Wildlife and Terrestrial Environment, Noise Quality, Air Quality, Permafrost, and Socio-Economics. For each of these categories, Table 12.1 summarizes the valued ecosystem components (VECs) identified in the FEIS, the original impact predictions and the management plans/mitigative measures submitted as part of the FEIS. This review focuses on the potential impacts for which monitoring were recommended, for the phase of mine activity currently underway (i.e. operations).

AEM is currently working with various researchers in multiple disciplines (i.e. tailings storage and optimization, wildlife and aquatic researchers, socio-economic researchers, etc.) and would be interested in discussing other opportunities with the NIRB to advance regional monitoring initiatives as requested.

Table 12.1 - Summary of FEIS VECs, assessment endpoints and references for the predictions, management and mitigative measures.

VEC	Summary of Potential Impacts	Reference for Impact Predictions	Reference for Management and Mitigative Measures
Aquatic Environment			
Surface water quantity	Reduced water level and flow in receiving lakes	FEIS, Section 4.21.2.3 FEIS App B, Table B4	FEIS, Section 4.24.2.5
Surface water quality	Contamination of receiving lakes	FEIS, Section 4.21.2.3 FEIS App B, Table B5 FEIS App E FEIS - WQ	FEIS, Section 4.24.2.5
Fish populations	Direct impacts through blasting. Indirect impacts through habitat changes.	FEIS, Section 4.21.2.7 FEIS App B, Table B13	
Fish habitat	Direct impacts through habitat destruction or alteration. Indirect impacts through introduction of contaminants.	FEIS, Section 4.21.2.7 FEIS App B, Table B14	FEIS, Section 4.24.2.3 NNL
Terrestrial Environment			
Vegetation (wildlife habitat)	Removal of plant cover, abrasion/grading, salt, dust, grey water release	FEIS, Section 4.21.2.4 FEIS App B, Table B6	FEIS, Section 4.24.2.1 TEMP
Ungulates	Habitat loss, mortality	FEIS, Section 4.21.2.5 FEIS App B, Table B7	FEIS, Section 4.24.2.2 TEMP
Predatory mammals	Habitat loss, mortality	FEIS, Section 4.21.2.5 FEIS App B, Table B8	FEIS, Section 4.24.2.2 TEMP
Small mammals	Habitat loss, mortality	FEIS, Table 4.24 FEIS App B, Table B9	FEIS, Section 4.24.2.2 TEMP

VEC	Summary of Potential Impacts	Reference for Impact Predictions	Reference for Management and Mitigative Measures
Raptors	Habitat loss, noise	FEIS, Section 4.21.2.6 FEIS App B, Table B10	FEIS, Section 4.24.2.2 TEMP FEIS App B, Table B10
Waterfowl	Habitat loss, ingestion of contaminants	FEIS, Section 4.21.2.6 FEIS App B, Table B11	FEIS, Section 4.24.2.2 TEMP
Breeding birds	Habitat loss, mortality	FEIS, Section 4.21.2.6 FEIS App B, Table B12	FEIS, Section 4.24.2.2 TEMP
Air Quality	Contamination of aquatic environment by dust. Contamination of terrestrial environment by dust. Poor air quality. Odours may attract scavengers. Production of greenhouse gases, other gaseous contaminants and particulate matter.	FEIS, Section 4.21.2.2 FEIS App B, Table B2	FEIS, Section 4.24.2.3
Noise	General disturbance of wildlife as a result of regular noises (behavioural changes, displacement). Reduced habitat effectiveness.	FEIS, Section 4.21.2.2 FEIS App B, Table B3	FEIS, Section 4.24.2.3
Permafrost	Thaw instability. Changes in permafrost depth in various areas (increase/decrease). Ice entrapment in tailings/reclaim.	FEIS, Section 4.21.2.1 FEIS App B, Table B1	FEIS, Section 4.24.2.4
Socio-economic		FEIS, Section 4.21.4 FEIS App B, Table B15	FEIS, Section 4.24.3
Traditional Ways of Life (personal and community)	Reduced access to land. Reduction in traditional activities including harvesting. Undervaluing traditional ways and loss of knowledge.		

VEC	Summary of Potential Impacts	Reference for Impact Predictions	Reference for Management and Mitigative Measures
Wellness (personal and community)	Poor financial decision making. Increased income disparity. Increased public health and safety risks. Stress from rotational employment. Increased traffic accidents and emergencies. Disturbance by project activities.		
Infrastructure and social services	Shortage of housing and other infrastructure. Increased demand for social services.		
Sites of heritage significance	Potential degradation of historically significant sites.		

12.1 AQUATIC ENVIRONMENT

In agreement with the PEAMP objectives, the results of the 2014 aquatic ecosystem and physical environment monitoring programs were evaluated and a comparison was made to the impacts predicted in the FEIS. The aquatic environment VECs identified in the FEIS were: surface water quantity, surface water quality, and fish/fish habitat. The following sections summarize the predicted impacts to the aquatic environment, assess the accuracy of the predictions, discuss the effectiveness of the monitoring program at targeting predicted impacts and provide recommendations for any additional required mitigation or adaptive management. Any use of the monitoring data in regional monitoring initiatives is described.

12.1.1 Accuracy of Predictions

In general, Meadowbank's water quality and quantity monitoring programs intend to meet the requirements of the NWB (Type A license) and Environment Canada (MMER). As anticipated, the mine lay-out and infrastructure have changed since the FEIS was produced, and sampling locations have been adjusted accordingly. Overall, observed impacts to water quantity, water quality, fish and fish habitat measured in 2014 appear to have been within FEIS predictions, as described in the following text, and summarized in Tables 12-2, 12-3 and 12-4.

12.1.1.1 Water Quantity

A summary of predictions for impacts to water quantity and the accuracy of these predictions (observed impacts) is provided in Table 12.2.

Water usage predictions were made during the FEIS to predict potential impacts to water levels in Third Portage Lake, Second Portage Lake, and Wally Lake. Modeling predicted the natural range of water levels in Third Portage Lake to be 133.82 – 134.19 masl, and the impact assessment indicated that this range would not be exceeded (Physical Environment Impact Assessment Report, 2005). Although these values accounted for 1-in-100 yr precipitation or drought events, prior to operation, water levels were already below this range when monitoring began (prior to any significant freshwater consumption) in 2009 and continue to be today. Although rates of dewatering (i.e. pumping rates) were underestimated during the FEIS, water levels have not significantly changed at monitoring stations since monitoring began.

Table 12.2. Water Quantity. *when monitoring began in 2009 (prior to significant freshwater use), water level was already outside this range at 133.5 masl, which is similar to the 2014 average.

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted (2014)	Predicted Impact	Measured Impact (2014)
Altered water levels in Third Portage Lake	Potentially high seepage rates (from lakes into pits)	Monitor pit seepage rates	Lake levels monitored	No change in lake level (modeled range = 133.82 – 134.19 masl*; 2009 measured = 133.5 masl)	133.47-133.59 masl
	Freshwater consumption	Monitor freshwater use	Freshwater use	0.53 M m^3/yr (Year 5 – 8; FEIS)	1,094,722 m^3 in 2014

			monitored	NWB approved an amendment to 1.150 Mm^3/yr in 2013	
	Discharge from Attenuation Pond	Monitor discharge volumes and timing	Discharge volumes monitored	458,400 m^3/yr (max)	207,813 m^3 discharged in 2014
	Non-contact water diverted from Second Portage Lake drainage	Monitor discharge volumes of non-contact water	Lake levels monitored	No change in lake level (modeled range = 133.82 – 134.19 masl*; 2009 measured = 133.5 masl)	133.47-133.59 masl
Altered water levels in Second Portage Lake	Potentially high seepage rates (from lakes into pits)	Monitor pit seepage rates	Lake levels monitored	Dike seepage rates predicted at 10^{-2} – 10^{-4} L/s/m of dike; Minor effect on lake level (baseline = 133.1 masl)	132.86-133.55 masl
	Non-contact water diverted from Second Portage Lake drainage	Monitor discharge volumes of non-contact water	Lake levels monitored	Minor effect on lake level (baseline = 133.1 masl)	132.86-133.55 masl
Increased water levels in Wally Lake	Discharge from Attenuation Pond	Monitor discharge rates	Monitored discharge rates	Total average annual discharge is approximately 456,450 m^3 during open water months	329,101 m^3 discharged

12.1.1.2 Water Quality

Many monitoring programs evaluate water quality at Meadowbank, because this is the first tier in informing mitigation and adaptive management. As outlined in the FEIS, the Core Receiving Environment Monitoring Program (referred to as the AEMP in the FEIS) is intended to monitor large-scale (e.g. basin-wide) changes in physical and biological variables to evaluate potential impacts from all mine related sources in the receiving environment. It therefore serves as the most important monitoring program for evaluating short term and long term potential impacts to populations. Each year, information from the CREMP and other targeted programs is evaluated in an integrated manner to determine any required changes to mitigation practices.

In 2012 AEM submitted an updated CREMP design to the NWB and NIRB. It provided a thorough review of the historical data, updating the analysis that was completed as part of the FEIS by incorporating all of the baseline data (1992-2008) and data collected from 2008-2012. An updated CREMP was submitted to address the requirements in the Type A water license, DFO authorization for the protection of fish habitat and FEIS. The scope of the 2005 AEMP, which was essentially the core receiving environment monitoring, is now one of the monitoring programs that is integrated under the restructured AEMP and has been renamed the CREMP to minimize confusion.

The 2014 AEMP synthesis report summarized the results of each of the underlying monitoring programs, including the CREMP, reviewed the inter-linkages among the monitoring programs; integrated the results, and recommended management actions. Neither the CREMP nor AEMP detected any significant changes in the water quality that had the potential to cause risks to the aquatic environment. This is consistent with FEIS predictions.

Other programs aimed at monitoring water quality in 2014 included: the AWAR erosion inspections, non-contact water collection, mine site contact water collection, dewatering, seepage collection, groundwater monitoring, and MMER and EEM sampling.

Aspects of the mine which were identified in the FEIS as potentially leading to significant impacts during operations are summarized Table 12.3, along with results of the monitoring programs aimed at assessing these impacts. Note that this assessment focuses on comparing current measured effects with predictions made in the Physical Environment Impact Assessment Report (2005); it does not attempt to compare effects of all aquatic environment monitoring programs with respective threshold or trigger values developed for AEMP programs. For results of those assessments, see individual monitoring reports, or the summary provided under Section 8.7 of this report.

Table 12.3. Water quality.

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted (2014)	Predicted Impact	Measured Impact
Impaired Wally Lake water quality	Vault attenuation pond effluent discharge; dike leaching	Effluent and receiving environment monitoring	CREMP; MMER	<MMER (effluent); <CWQG except arsenic and cadmium (whole lake)	<MMER except 1 TSS sample and 1 Daphnia test; <CWQG (whole lake)
Impaired Second Portage Lake water quality	Portage Attenuation pond effluent discharge; dike leaching	Effluent and receiving environment monitoring	CREMP; MMER	<CWQG except cadmium	<CWQG (whole lake)
Impaired Third Portage Lake water quality	Portage Attenuation pond effluent; dike leaching	Effluent and receiving environment monitoring	CREMP; MMER	<MMER (effluent); <CWQG except cadmium and manganese	<MMER; <CWQG (whole lake)

12.1.1.3 Fish and Fish Habitat

In addition to water quality and quantity, site specific monitoring programs were developed to address the impacts of mining activities to fish and fish habitat. These are primarily guided by the No Net Loss Plan (NNLP) and associated fisheries monitoring (e.g. CREMP, Habitat Compensation Monitoring Plan, blast monitoring) as set out in the DFO Authorization for the mine-site. Results of these programs are summarized in Table 12-4, below. All measured impacts to fish and fish habitat were within FEIS predictions.

Table 12.4 Fish and Fish Habitat

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted	Predicted Impact in FEIS	Observed Impacts
Reduced fish egg survival and larval development	Metals leaching and low pH from effluent, leachate or runoff	Water quality monitoring under MMER (effluent). Monitor fish biomass changes (Portage); plume delineation study (Wally). Monitor water quality along dike faces.	MMER and EEM monitoring, dewatering monitoring.	Net reduction in fish biomass in SPL and TPL. Incorporate optimal habitat for fish spawning and egg survival on dike exteriors to partly offset loss of habitat along shorelines. Dissolved metals may reduce fish egg survival and larval development during overwinter incubation. Use of low metal leaching rock will reduce magnitude and frequency of habitat impairment	No exceedances of MMER except for TSS with no consequence at Vault; No observed impacts.
Mortality of fish and fish eggs	Blasting	Targeted study in AEMP	Blast monitoring	Residual effects related to blasting during mine construction and operation will be low in magnitude, local in extent, of medium-long duration, and will occur frequently. Residual effects are not significant.	Few exceedances; no expected risks to fish habitat
	Particulates in run-off and road dust	Water quality monitoring through AEMP	Water quality monitoring as part of AEMP programs	Negligible ecological effects on fish. Mitigation will eliminate pathways of contamination, reducing magnitude, extent, and duration of impacts.	No observed impacts
	Increased suspended	TSS monitoring through AEMP	Water quality monitoring as part	Given the small annual volume relative to receiving	Only one TSS exceedance of MMER

Table 12.4 Fish and Fish Habitat

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted	Predicted Impact in FEIS	Observed Impacts
	sediment (effluent discharge)		of AEMP programs (CREMP, dewatering and MMER)	environment volume and the relatively uncontaminated nature of the effluent, impacts to fish habitat and fish populations are expected to be low in magnitude, local in spatial extent, medium-term in duration, and occur frequently. Residual impacts are not significant.	limits at Vault in 2014 but did not have any adverse impact on fish and fish habitat. MMER Trout toxicity all non-toxic. EEM study done in 2014 - result still under review. (report to be submitted by July 1st, 2015)
	Spilled substances (e.g. fuel)	Event-based monitoring	Monitoring spills during site inspections and as part of managing the TSF		No observed impacts
Loss of fish biomass	Habitat disruption (pit area)	NNL monitoring	-	Pit effect is low in magnitude, local in extent, of short duration, and infrequent. Value created along dike exterior (operation) and interior (post-closure)	Same as predicted impact.
	Habitat loss (tailings area, dike footprint)	-	-	The cumulative direct loss of habitat as a result of the dike footprint is 0.6% in TPL, 1.9% in SPL and 0.1% in WL. Exterior of each dike will be constructed to provide high value habitat for fish to	Same as predicted effect.

Table 12.4 Fish and Fish Habitat

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted	Predicted Impact in FEIS	Observed Impacts
				compensate for the loss of habitat during operation. The residual impact to fish habitat from dike construction in each of the lakes is low in magnitude, local in extent, of short duration, and has infrequent occurrence.	
Fish stress, behavioural changes, avoidance	Increased particulates (runoff, road dust)	Water quality monitoring through AEMP	Water quality monitoring as part of AEMP programs	Negligible ecological effects on fish. Mitigation will eliminate pathways of contamination, reducing magnitude, extent, and duration of impacts.	No observed impacts
	Increased concentrations of dissolved metals (effluent discharge, leachate/runoff)	EEM program (effluent), AEMP Targeted Monitoring (leachate/runoff)	Water quality monitoring as part of AEMP programs (CREMP, dewatering and MMER)	Possible degradation of fish habitats, smothering of fish eggs, and negative effects to fish. Mitigation will reduce the magnitude and extent and minimize adverse ecological effects.	No observed impacts
	Increased suspended sediment (effluent discharge)	'MMER and TSS monitoring through AEMP	Water quality monitoring as part of AEMP programs (CREMP, dewatering and MMER)	Possible degradation of fish habitats, smothering of fish eggs, and negative effects to fish. Mitigation will reduce the magnitude and extent and minimize adverse ecological effects.	No observed impacts
	Increased pH (leachate/runoff)	AEMP Targeted Monitoring	Water quality monitoring as part	Use of collection ditches and attenuation ponds will	No observed impacts

Table 12.4 Fish and Fish Habitat

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted	Predicted Impact in FEIS	Observed Impacts
			of AEMP programs (CREMP, dewatering and MMER)	eliminate pathway to receiving environment, reducing magnitude, duration, and frequency of impacts. No significance of residual effect.	
	Barge activity, noise and TSS	Monitoring through AEMP	Water quality monitoring as part of AEMP programs (CREMP)	Negligible residual impact. Mitigation will reduce magnitude and spatial extent of ecological effects.	No observed impacts
Impaired benthic habitat (incl. loss of periphyton and benthos)	Sedimentation	Water quality monitoring through AEMP	Water quality monitoring as part of AEMP programs (CREMP)		No observed impacts
	Leaching of metals from dikes	NNL monitoring	Habitat Compensation Monitoring	Possible toxicity to phytoplankton and benthos. Effect will be reduced over time. Use of low metal leaching rock will reduce magnitude and frequency of habitat impairment.	Not required in 2014 – next monitoring and analysis in 2015.
Increased fish biomass	Release of nutrients in treated sewage	Water quality and primary productivity monitoring through AEMP	Water quality monitoring as part of AEMP programs (CREMP and MMER)	Increase in nutrient concentrations may cause an increase in primary productivity (i.e., phytoplankton) that may be reflected as an increase in secondary productivity and ultimately, fish.	No observed impacts

Table 12.4 Fish and Fish Habitat

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted	Predicted Impact in FEIS	Observed Impacts
Impaired fish passage	AWAR crossings	NNL monitoring	AWAR habitat compensation monitoring	Possible reduced movement by fish. Adequate culvert sizing will ensure that fish passage is not compromised.	No observed impacts. Habitat compensation shows a good utilisation and passage of fish – next monitoring in 2015.

12.1.2 Effectiveness of Monitoring Programs

The aquatic monitoring programs at Meadowbank were originally designed as part of the FEIS and adapted to meet the requirements of the NWB Type A License, Environment Canada regulations and DFO authorizations for the protection of the aquatic system. Beyond meeting the regulatory requirements, the numerous 2014 aquatic monitoring programs addressed all relevant potential impacts to water quantity, water quality and fish/fish habitat identified in the FEIS. Table 12.5 provides a summary of the evaluation of the monitoring programs.

Table 12.5 Summary of the aquatic environment monitoring programs at the Meadowbank site

	Aquatic Environment Monitoring Programs											
	Mine Site Water Quality Sampling*	Core Receiving Environment Monitoring Program*	Water Quality and Flow Monitoring*	Effects Assessment Studies	Dike Construction Monitoring*	Habitat Compensation Monitoring Program - No Net Loss	Dewatering Monitoring*	MMER Monitoring	Environmental Effects Monitoring (EEM) (part of MMER)	Fish-Out Studies	AWPAR and Quarry Water Quality Monitoring	Blast Monitoring
Completed in 2014?	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	No	Yes	Yes
Water Quality	o	o	o	o	o	o	o	o	o	o	o	NA
Water Quantity	NA	NA	o	o	o	NA	o	o	o	NA	NA	NA
Fish Populations	NA	NA	NA	o	NA	o	NA	NA	o	o	NA	NA
Fish Habitat	NA	o	NA	o	NA	o	NA	NA	o	o	NA	o

* Type A Water License requirements

Notes:

o Effectively evaluates impact predictions

- Does not effectively evaluate impact predictions

NA Not Applicable

12.1.3 Recommendations for Additional Mitigation or Adaptive Management

Overall, the measured impacts to water quantity, water quality, fish and fish habitat appeared to be within the FEIS predictions. In most cases operation activities were accurately predicted (summarized in Table 12.2) and monitored in 2014. Potential impacts onsite in 2014 were within impact predictions or had no observed effects, indicating that the original predictions were conservative. In the case where water levels in Third Portage Lake are currently below predicted levels, it is not clear that this impact is mine-related, since significant changes in water levels have not occurred since prior to dewatering and freshwater use began (2009). Based on FEIS predictions, there are no other specific recommendations for further mitigation of impacts to water quality, water quantity or fish/fish habitat. However, several amendments to monitoring programs are recommended in AEMP-related studies.

12.1.4 Contributions to Regional Monitoring

AEM continues to work closely with the University of Guelph to improve aquatic monitoring methods and is working in collaboration to inform future aquatic ecology research in the north. Specifically, AEM is working with the university of Alberta raptor researcher to extend terrestrial modelling to include linkages to aquatic food webs, which will also assist to inform productivity models. Furthermore, AEM has discussed refining current methods of evaluating fish habitat and productivity of a fishery under the new DFO Fisheries Act and fisheries protection policy with consultants, academic researchers and have provided all of the raw fishout data and habitat mapping to DFO scientists. At a regional level, the information, monitoring tools, monitoring data and modelling that is used at Meadowbank are currently being applied by AEM and other consultants at other proposed projects in Nunavut including, but not limited to the Meliadine Gold Project.

Furthermore, AEM is contributing to the Baker Lake Watershed Monitoring Organization to assist in developing and engaging in the development of the Baker Lake Aquatic Cumulative Effects Monitoring Program. The Baker Lake Basin includes watershed that encompass a large portion of the southern Kivalliq region of Nunavut and feeds into estuaries of Chesterfield. In 2012, KivIA and AANDC partnered with the Nunavut General Monitoring Program (NGMP) to develop a high-level aquatic cumulative effect monitoring framework and preliminary program for the Baker Lake Basin. In 2014, an AEM representative participated in the design workshops and participated in the development of the program as a member of the Technical Advisory Group.

12.2 TERRESTRIAL AND WILDLIFE ENVIRONMENT

In accordance with the PEAMP objectives, the results of the 2014 wildlife monitoring programs were evaluated and a comparison was made to the thresholds for adaptive management established for each VEC (vegetation (wildlife habitat), ungulates, predatory mammals, small mammals, raptors, waterfowl and breeding birds). Thresholds, as developed in the Terrestrial Ecosystem Management Plan (a component of the FEIS), were used in this comparison because most impact predictions in the Terrestrial Ecosystem Impact Assessment were qualitative (other than loss of habitat area).

The following sections summarize the thresholds for terrestrial and wildlife VECs, provide an assessment of any exceedances of thresholds, and discuss the effectiveness of the monitoring program at targeting predicted impacts. Additional recommendations are made for any required mitigation or adaptive management. Any use of the monitoring data in regional monitoring initiatives is described.

12.2.1 Accuracy of Predictions

For each VEC, a summary of predicted impacts and the accuracy of those predictions (observed impacts) as determined through various monitoring programs is provided in Tables 12.6.

Overall, only one impact to terrestrial VECs exceeded the established threshold.

Table 12.6. Terrestrial impacts and associated effects predicted in the FEIS, proposed monitoring, actual monitoring (2014) and any observed impacts (2014). Adapted from Table 10.1 in the 2014 Wildlife Monitoring Summary Report (Appendix G14) and the 2014 SLRA (Appendix G15). Measured impacts exceeding predictions/thresholds are indicated in grey.

Potential Impact	Potential Cause(s)	Monitoring Methods	Monitoring Conducted (2014)	Threshold/ Prediction	Measured Impact
Vegetation (Wildlife Habitat)					
Habitat Loss	Mine site footprint, pits, roads, water management and collection systems	Ground Surveys, Mapping, GIS Analysis	Yes	Mine Site – 703 ha AWAR – 281 ha	Habitat loss is still within threshold levels. Habitat loss associated with the AWAR was considerably lower than predicted.
Habitat Degradation by Contamination	Dust from roads, TSF, airstrip	Vegetation and Soil Samples (SLRA)	Yes	>20% increase in COPCs in vegetation from baseline; no significant increase in risk predictions	Few COPC exceedances; Risks associated with onsite monitoring locations were not greater than background
Ungulates					
Habitat Loss and Degradation	Mine site footprint, pits, roads, water management and collection systems	Ground Surveys, Mapping, GIS Analysis	Yes	Growing season – 239 ha of high suitability habitat Winter – 145 ha of high suitability	Habitat loss is still within threshold levels. Habitat loss associated with the AWAR was considerably lower than

Potential Impact	Potential Cause(s)	Monitoring Methods	Monitoring Conducted (2014)	Threshold/ Prediction	Measured Impact
					predicted
Sensory Disturbance	Avoidance due to noise and activity (roads, airstrip, mine site)	Ground Surveys, Satellite-collaring	Yes	Avoidance of habitat more than 500 m from site; 1000 m from AWAR	No evidence of disturbance
Vehicle Collisions	Vehicular or air traffic collisions	Ground surveys, Collision Reporting System	Yes	One mortality per year	No mortalities
Hunting by Baker Lake Residents	Improved access to hunting along the AWAR	Hunter Harvest Study	Yes	+20% of baseline harvest related to road; no significant effects on herds	40% of harvest within 5 km of AWAR (18% historically); no significant impacts to herds
Other Mine-related Mortality	Falling into pits, TSF or other means	Ground surveys	Yes	One mortality per year	No mortalities
Exposure to Contaminated Water or Vegetation	Consumption of contaminated dust deposited on vegetation	Vegetation and Soil Samples (SLRA)	Yes	Contamination risks to ungulates utilizing the area will not occur	Negligible risk to ungulates
Predatory Mammals					
Project-related Mortality	Vehicular or air traffic collisions, falling into pits, TSF or other means	Ground Surveys, Collision Reporting System	Yes	One mortality per year	One wolf dispatched after multiple interactions
Small Mammals					
Habitat Loss and Degradation	Mine site footprint, pits, roads, water management and collection systems	Ground Surveys, Mapping, GIS Analysis	Yes	172 ha of high suitability habitat	Habitat loss is still within threshold levels. Habitat loss associated with the AWAR was considerably lower than predicted

Potential Impact	Potential Cause(s)	Monitoring Methods	Monitoring Conducted (2014)	Threshold/ Prediction	Measured Impact
Project-related Mortality	Vehicular or air traffic collisions, falling into pits, TSF or other means	Ground Surveys, Collision Reporting System	Yes	Mortality of 100 individuals per year	No mortalities
Exposure to Contaminated Water or Vegetation	Consumption of contaminated dust deposited on vegetation	Vegetation and Soil Samples	Yes	Contamination risks to small mammals utilizing the area will not occur	Negligible risk to small mammals
Raptors					
Healthy Prey Populations	Mine Footprint, dust and exhaust, noise (road, airstrip, mine site, Baker Lake barge area)	Vegetation and Soil Samples; PRISM plot surveys; ELC habitat mapping	Yes	Qualitative- see vegetation and prey sections	N/A
Disturbance of Nesting Raptors	Noise and Activity	Active Nest Monitoring	Yes	One nest failure per year	4 active nests
Project-related Mortality	Vehicle/ bird collisions	Ground Surveys, Collision Reporting System	Yes	One mortality per year	No mortalities
Waterbirds					
Habitat Loss and Degradation	Mine Footprint, dewatering dust and exhaust, noise (road, airstrip, mine site, Baker Lake barge area)	Ground Surveys, Mapping, GIS Analysis	Yes	386 ha of high suitability habitat	Habitat loss is still within threshold levels. Habitat loss associated with the AWAR was considerably lower than predicted
Disturbance of Nesting Waterfowl	Noise and Activity; dewatering	Waterfowl Nest Surveys	Yes	One nest failure per year	No known waterfowl nesting onsite
Exposure to Contaminated Water or Vegetation	Mine site dust; Secondary containment structures and	Vegetation and Soil Samples	Yes	Contamination risks to waterbirds utilizing the	Negligible risk to waterbirds

Potential Impact	Potential Cause(s)	Monitoring Methods	Monitoring Conducted (2014)	Threshold/ Prediction	Measured Impact
	tailings storage facilities			area will not occur	
Project-related Mortality	Vehicle/ bird collisions	Ground Surveys, Collision Reporting System	Yes	One mortality per year	One duck mortality onsite
Other Breeding Birds					
Habitat Loss and Degradation	Mine Footprint, dewatering dust and exhaust, noise (road, airstrip, mine site, Baker Lake barge area)	Ground Surveys, Mapping, GIS Analysis	Yes	288 ha of high suitability habitat	Habitat loss is still within threshold levels. Habitat loss associated with the AWAR was considerably lower than predicted
Project-related Mortality	Vehicle/ bird collisions	Ground Surveys, Collision Reporting System	Yes	50 project-related mortalities per year	No mortalities
Exposure to Contaminated Water or Vegetation	Mine site dust	Vegetation and Soil Samples	Yes	Contamination risks to birds utilizing the area will not occur	No increased risk compared to baseline or background
Changes in Breeding Bird Populations	Mine Footprint, dewatering dust and exhaust, noise (road, airstrip, mine site, Baker Lake barge area)	Breeding Bird Plots and Transects	Plots – 2012 Transects – 2011. Plots scheduled for 2015	For PRISM plots, threshold is > 20% from control plots. For transect surveys, threshold is reduced use beyond 100 m of road centreline.	N/A

12.2.2 Effectiveness of Monitoring

Current monitoring programs are effectively able to measure impacts as they relate to established threshold levels.

12.2.3 Recommendations for Additional Mitigation or Adaptive Management

As summarized in Table 12.5, one Terrestrial Ecosystem Monitoring Program threshold was exceeded in 2014 (percentage of road-related hunting of caribou). As stated in the TEMP (Cumberland 2006), the Hunter Harvest Survey was established to monitor the spatial distribution, seasonal patterns, and harvest rates prior to and following construction of the AWAR. Harvest rates along the AWAR have exceeded thresholds set by the EIA; however, the rate of harvest along the road appears to have stabilized. Hunting along the road is anticipated to remain relatively constant in future years given the current trends in data and the access and hunting arrangements between Agnico Eagle, the HTO, GN and NIRB; in addition to monitoring, ongoing communication with the HTO and GN will be required to confirm this assumption and to evaluate management and mitigation decisions over time.

12.2.4 Contributions to Regional Monitoring

In 2014, Meadowbank continued to contribute to the GN DOE caribou collaring which started in 2009. To date, Meadowbank has funded the deployment of 25 caribou collars (greater than $250 000). In early 2011, Meadowbank contributed an additional $35 000 towards the GN-led program to estimate the number of breeding females in the Beverly herd of taiga-wintering barren-ground caribou. In 2013, AEM finalized discussions with the GN and entered into a new Memorandum of Understanding (MOU) to commit to another long term (3 year) contribution in support of the regional GN caribou monitoring program. This agreement will continue to assist the GN- DOE- Wildlife branch in directing the implementation, data analysis and management of caribou populations in the Kivalliq region. The program continued in 2014.

In 2014, AEM continued working with Dr. Alastair Franke from the University of Alberta and he provided immediately advise on site-specific protective measures for raptors at Meadowbank. Regionally, AEM is working with Dr. Franke to conduct surveys near Rankin Inlet; in the future he may extend his work to the Baker Lake area.

12.3 NOISE

In support of the PEAMP, a review was conducted of the predictions made in the FEIS regarding sources of noise and potential effects. While noise generation was predicted for many minesite components, a significant effect of noise (disturbance of wildlife; reduced habitat effectiveness) was only associated with three components: pit development, the mine plant and the airstrip. Noise monitoring was therefore proposed in association with pit development, waste rock, tailings handling and the mine plant.

The following section summarizes the predicted sources with significant noise impacts at the Meadowbank site, identifies predicted sound levels at established monitoring locations, provides an assessment of the accuracy of the predictions and discusses the effectiveness of the monitoring program at targeting predicted impacts. Furthermore, additional recommendations are made for any required mitigation or adaptive management. Any use of the monitoring data in regional monitoring initiatives is described.

12.3.1 Accuracy of Predicted Impacts

Table 12.7, below, summarizes the noise impacts and associated effects predicted in the FEIS, identifies the monitoring measures conducted to assess actual impacts, and indicates the accuracy of predictions

based on results of monitoring conducted in 2014 (measured sound level). Since the potential impacts of noise were all identified as wildlife disturbance, the accuracy of these predictions is also monitored through the terrestrial environment monitoring programs, as discussed above.

In 2014, measured sound levels exceeded predicted sound levels only at station R5. This is likely because FEIS predictions for noise did not include the exploration camp and AWAR located adjacent to station R5 as noise sources in modeling. Therefore predicted noise levels for this location were not realistic based on actual site activities.

Table 12.7. Noise impacts and associated effects predicted in the FEIS, proposed monitoring, actual monitoring (2014) and any observed impacts (2014). *at indicated monitoring station, based on FEIS modeling. ** excludes noise due to AWAR traffic. * 24 h Leq**

Potential Impact	Potential Cause(s)		Proposed Monitoring	Monitoring Conducted	Predicted Sound Level*	Measured Sound Level***
Disturbance of wildlife; reduced habitat effectiveness	Pits	Noise from blasting, etc.	Monitor noise levels and responses of wildlife	Monitored noise levels (see Section 12.2 for wildlife monitoring)	R1 = 58-63 dBA R2 = 58-63 dBA R3 = 49-53 dBA R4 = 58-63 dBA R5 = 44-49 dBA**	R1 = 44 – 48 dBA R2 = 39 – 48 dBA R3 = 33 - 38 dBA R4 = 35 – 41 dBA R5 = 51 – 54 dBA
	Waste Rock /Tailings Facility	Noise from berm construction, material handling				
	Roads and Traffic	Noise from maintenance and use				
	Airstrip	Noise from air traffic				
	Mine plant and associated facilities	Noise				

12.3.2 Effectiveness of Monitoring

By monitoring sound levels at five locations around the minesite for a 3-4 day period annually, the current monitoring program is effectively able to assess the accuracy of impact predictions with respect to noise levels. Impacts of mine-related activities (including noise) on wildlife are monitored through the Terrestrial Ecosystem Monitoring Program (TEMP). However, calculated sound levels are compared to targets established in the Noise Monitoring and Abatement Plan, which are recommended in Environment Canada's Environmental Code of Practice for Metal Mines (55 dBA daytime; 45 dBA nighttime) based on considerations for wildlife. These values are generally lower than predicted sound levels, and few exceedances have occurred (see 2014 Noise Monitoring Report, Appendix G11).

12.3.3 Recommendations for Additional Mitigation or Adaptive Management

Overall, impact predictions are not being exceeded at four out of five monitoring stations. Noise levels at the fifth station are likely higher than predicted because noise levels were not adequately modelled in the

FEIS for the chosen monitoring location. Established target sound levels (which are generally lower than predicted sound levels) were exceeded in a total of two out of 19 monitoring periods in 2014. No Leq values exceeded the daytime target sound level of 55 dBA. Two values exceeded the nighttime target sound level of 45 dBA, at R1 and R5 (47.9 dBA each). These values were well within the range of those observed in previous years, and do not exceed impact predictions. An examination of the data for these time periods indicated that for both locations, Leq values for only the 5 am and 6 am hours exceeded the target of 45 dBA, with a total of 8-9 minutes exceeding 45 dBA during these hours. AEM aims to increase the monitoring frequency in 2015 to include two rounds of 3-4 days per station.

12.3.4 Contributions to Regional Monitoring

In 2014, Meadowbank has not contributed to regional monitoring of noise.

12.4 AIR QUALITY

A review was conducted of the predicted impacts to air quality identified in the FEIS. While dust generation or air emissions were predicted for many minesite components, a significant effect on terrestrial and aquatic environments was only associated with three components (pit development, the mine plant and the waste rock and tailings facilities).

The following sections summarize the predicted impacts to air quality, provide an assessment of the accuracy of the predictions and discuss the effectiveness of the monitoring program at targeting predicted impacts. Furthermore, additional recommendations are made for any required mitigation or adaptive management. Any use of the monitoring data in regional monitoring initiatives is described.

12.4.1 Accuracy of Predicted Impacts

Table 12.8, below, summarizes the predicted impacts to air quality, associated effects, monitoring measures proposed in the FEIS, and results of monitoring conducted in 2014.

The main monitoring program for air quality recommended in the FEIS is static dustfall, which is being continuously monitored at four locations around the minesite. In addition, AEM conducts monitoring of TSP, PM_{10}, $PM_{2.5}$ and NO_2, in accordance with the Air Quality and Dustfall Monitoring Plan.

In the FEIS, air quality modeling was conducted for fugitive dust ($PM_{2.5}$, PM_{10} and TSP) originating from the TSF, WRSF, and ore stockpile, for 24h and annual averaging times. Deposition rates for dust from these sources were also calculated ($g/m^2/30d$). Since field monitoring captures emissions from all sources (including mobile sources and background), accuracy of these quantitative predictions cannot adequately be assessed through field monitoring. However, modeling was also conducted for criteria pollutants (CO, NO_2, SO_2, PM_{10}, and $PM_{2.5}$) emitted from the power plant and mobile sources for 1h, 24h and annual averaging times (basis of criteria), and concentration contour plots were provided for most analyses. Carbon monoxide and sulphur dioxide were not required to be monitored as part of the program developed by AEM in consultation with regulatory agencies. Therefore, the following predicted values were able to be compared to measured values: NO_2 (annual), $PM_{2.5}$ and PM_{10} (24 h). However, it should be noted that for NO_2, modeling results were only provided for the maximum predicted ground-level concentration, which occurred adjacent to the power plant. The closest NO_2 monitoring station is at a distance of approximately 1 km southwest (cross-wind) from this location. Further, modeling results do not

account for background concentrations, or contributions from sources other than the power plant and mobile sources, while field monitoring results naturally include all inputs.

Despite the conservative nature of this comparison, the results provided in Table 12.8 indicate that only 12 out of 232 suspended particulate samples exceeded impact predictions in 2014. In addition, rates of dustfall along the AWAR appear to fall within impact predictions (though predictions of dustfall in the FEIS were somewhat qualitative), and GHG emissions are below the predicted value.

Table 12.8. Predicted impact to air quality, associated effects, monitoring measures proposed in the FEIS, and results of monitoring conducted in 2014. *see explanation in Section 12.4.1.

Potential Impact	Potential Cause(s)		Proposed Monitoring	Monitoring Conducted (2014)	Predicted Values	Measured Values
Poor air quality and terrestrial/aquatic contamination	Dikes	Generation of dust during placement of dike material	Static dustfall	N/A (no dikes constructed)	-	-
	Dewatered Basins	Generation of dust from exposed lake sediment	Static dustfall	As proposed plus NO_2 (four locations around site) and suspended particulates (2 locations)	NO_2 (ug/m^3; annual avg.)* = 9.5 PM_{10} (ug/m^3; 24 h): DF-1: 30-40 DF-2: 10-20 $PM_{2.5}$ (ug/m^3; 24 h): DF-1: 15-20 DF-2: 5-10	NO_2 (ug/m^3; annual avg.; DF-2)* = 3.6 PM_{10} (24 h): DF-1: 2/61 samples > 40 ug/m^3 DF-2: 7/55 samples >20 ug/m^3 $PM_{2.5}$ (24 h): DF-1: 0/61 samples > 10 ug/m^3 DF-2: 3/55 samples > 10 ug/m^3
	Pits	Generation of dust and gases from blasting, excavation etc.	Static dustfall			
	Waste Rock Pile and Tailings Facility	Generation of dust from material deposited on waste rock pile or tailings	Static dustfall			
	Airstrip	Generation of dust and emissions from development, maintenance and use	Static dustfall			
	Roads and Traffic	Generation of dust and emissions from development, maintenance and use	Static dustfall	As above, plus AWAR targeted study	As above for site. For AWAR: Majority of dustfall expected to occur within 100 m.	More than 2x reduction in dustfall occurred between 50 and 100 m; see 2014 All-Weather Access Road Dust Monitoring Report
	Sewage and Solid Waste Disposal	Release of pollutants from incineration	Maintain scrubbers; report emissions	GHG emissions reported	190,768 t CO2 equivalent	179,889 t CO2 equivalent

12.4.2 Effectiveness of Monitoring

Impacts to air quality were predicted in the FEIS through standard modeling procedures, which predict concentrations of criteria contaminants emitted from a designated source. Since field monitoring identifies concentrations occurring from the combination of all sources (including background), it is difficult to compare results of the air quality monitoring program with predicted values. Furthermore, while concentration contour plots were provided in the FEIS for several analyses (allowing for interpolation of predicted values at current monitoring stations), only maximum predicted ground-level concentrations were provided for others.

As a result of these issues, air quality monitoring results are more effectively compared to established regulatory guidelines and standards (as in the 2014 Air Quality Monitoring Report), which in all cases are higher than predicted concentrations at the current monitoring stations. This comparison is considered to be conservative, since air quality standards are typically for emissions above background, while monitoring results are total values.

12.4.3 Recommendations for Additional Mitigation or Adaptive Management

Based on this analysis, no additional mitigation or management actions are recommended.

12.4.4 Contributions to Regional Monitoring

In 2014, Meadowbank has not contributed to regional monitoring of air quality.

12.5 PERMAFROST

In agreement with the PEAMP objectives the results of permafrost were evaluated and a comparison was made to the potential effect predictions by subdividing the project components. The following tables and concluding text summarize the impacts on permafrost due to specific mine activities in 2014 as compared to the FEIS predictions, provides an assessment of the accuracy of the predictions, effectiveness of the monitoring program and provides conclusions. Furthermore, recommendations are made for mitigation or adaptive management.

12.5.1 Accuracy of Predicted Impacts

A summary of potential project effects, as described in the FEIS and results of monitoring in 2014 to assess the accuracy of these predictions is provided in Table 12.9.

Table 12.9 Permafrost

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted	Predicted Effect in the FEIS	Observed Impact
Permafrost aggradation and stabilization of new active layer in dikes	-	Monitor ground temperatures; monitor slopes; monitor sub-permafrost pore pressures (tailings dike)	Thermistor monitoring of permafrost are done for East Dike, Central Dike, Bay Goose Dike, Vault Dike, and South Camp Dike. **<u>For Tailings Dike:</u>** -AEM began field trials to determine capping thickness in 2009 by installing thermistor SD1-T2, SD1-T3 and SD1-T4 on Saddle Dam 1 to monitor the thermal condition within the structure and its foundation. Another thermistor (SD1-T1) was also installing in 2009 to monitor the thermal condition of the deposited tailings. -AEM also installed thermistor SD2-T1, SD2-T2, SD2-T3 and SD2-T4 on Saddle Dam 2. SD2-T1 was installed in 2012 in the center of the upstream face of the dike immediately on top of the geomembrane	Net increase in permafrost distribution and/or decrease in ground temperatures Effect is restricted to the component being considered Effect occurs during the mine operation period	Please refer to Section 4 of the 2014 Annual Geotechnical Inspection report for a complete review of the monitoring made on all dike. Overall, the instrumentation shows (see below) that the dike are in a frozen state with an active layer which is in compliance with the FEIS prediction – increase in permafrost and effect localize to the dike. -East Dike – upper 2 m thawed during last summer (active layer) but the remaining portion remain frozen. Temperature of -5°C app. 10m into the bedrock. -South Camp Dike - soils located beneath the dike foundation and liner remained frozen (permafrost) and foundation of the dike below the thermal cap stayed frozen all year long. Bay Goose Dike – refer to Section 4 of the 2014 Annual Geotechnical Inspection. Vault Dike - entire foundation of Vault Dike (till and bedrock) is frozen and presence of an active layer at the top of the rockfill.

			liner to monitor the thermal regime of the tailings in contact with the structure. SD2-T2 to SD2-T4 was installed to monitor the thermal condition within the structure and its foundation.		Central Dike - refer to Section 4 of the 2014 Annual Geotechnical Inspection **<u>For Tailings Dike:</u>** Overall thermistor data (SD1-T1 to SD1-T4) from within the structure indicates that the dike foundation remained frozen. Below the rockfill shell, the foundation soil or bedrock remained in a frozen state. At the upstream toe, the compacted till base material below the liner remained frozen. SD2-T1 records values similar to the ambient air temperature above the tailings. The tailings were frozen during the winter of 2013-2014. Temperatures above 0 were recorded in the summer of 2014. Overall, thermistor data (SD2-T2 – SD2-T4) from within the structure indicates that the dike foundation remained frozen from September 2013 to September 2014 with temperatures ranging from about -5°C to -20°C. At the upstream toe of the dike, the semi-pervious backfill remained frozen

					during the year Most of the rockfill stayed in frozen condition with the exception of the upper 3.5 m (active layer) that thawed in summer 2014.
Permafrost changes in 2PL NW arm area	Dewatering, reclaim and attenuation pond filling, and tailings deposition	Representative monitoring of ground temperatures; assessment of anticipated ice entrapment (i.e. ground ice development)	To monitor the permafrost aggradation and talik beneath SPL, AEM has installed, in 2012, a single deep thermistor (T147-1) at the downstream toe of Stormwater Dike. In 2013, new thermistors were installed on Central Dike. These thermistors will	Net increase in permafrost distribution and/or decrease in ground temperatures Effect is restricted to the component being considered Effect occurs during the mine operation period and continues beyond the mine life	Overall monitoring results show an increase in the permafrost aggradation in SPL talik. The effect will not be permanent for the pit (until flooding) but will be for the TSF. This is compliant with the FEIS prediction. Thermistor T147-1 shows the existence of a frozen crust of material from El. 120 m to El. 115 m that stayed frozen during the summer of 2014. Below El. 113 m, the

			provide information on the permafrost aggradation of SPL.		temperature varied between 0.3°C and 0.1°C indicating a slow cooling of the near surface talik. Thermistor on Central Dike indicates: -The instruments installed along the central key trench show thawed condition within the in situ Till and the bedrock. -The instruments installed along the final Central Dike downstream toe show below 0º Celsius temperature within the rockfill and the in situ Till and thawed condition below the bedrock surface.
Permafrost changes in TPL north central shoreline and Portage Pit area	Portage pit development	Assessment of suspected ground ice development in conjunction with permafrost aggradation. Assessment of ground ice content of select shoreline polygons.	The permafrost in Goose pit is monitored by the thermistor SD-09-A which is located on South Camp Dike approximately 20 m further upstream within Third Portage Lake. 33 thermistors (from T1 to T30 and T3' to T5') are installed on Bay-Goose Dike New thermistors were installed in 2012 between Bay Goose Dike and Bay Goose Pit to monitored aggradation of permafrost. No thermistors were installed in Portage Pit because of the mining activities. However, the permafrost aggradation can be monitored with the thermistor installed in the	Net increase in permafrost distribution and/or decrease in ground temperatures Loss of permafrost and development of a new active layer in terrestrial areas as pit slope are pushed back.	Overall, AEM observed a net increase in permafrost aggradation and structure remains in a frozen state. An active layer development is also observed in the pit during the summer season due to the development. All observation in compliance with the FEIS prediction. See below for a summary of the results. The temperature profile at SD-09 on the upstream side of the dike shows that the soils located beneath the dike foundation and liner appear to have remained frozen (permafrost) below El. 130 m; Please refer to Section 4.3.2 of the 2014 Annual Geotechnical Inspection report for a complete review of the Bay Goose Thermistors.

			East Dike and Central Dike:		To date, result of thermistors between Bay Goose Dike and Bay Goose Pit show that the freezeback occurred. Monitoring in the next year will provide more useful data about this aggradation of permafrost. -East Dike – upper 2 m thawed during last summer (active layer) but the remaining portion remain frozen. Temperature of -5°C app. 10m into the bedrock. Thermistor on Central Dike indicates: The instruments installed along the central key trench show thawed condition within the in situ Till and the bedrock. -The instruments installed along the final Central Dike downstream toe show below 0º Celsius temperature within the rockfill and the in situ Till and thawed condition below the bedrock surface.
Permafrost changes in waste rock area	Construction of waste rock facility	Internal and foundation temperatures to be monitored.	In 2012, AEM installed 2 thermistors (T121-1 and T122-1) on the first bench of the RSF. Additional thermistor (RSF1) was installed in February 2013 on the RSF. In November 2013, more thermistors (RSF3 to RSF6) were installed on the RSF. Results of these thermistors will be provided in the 2014 Annual Report.	A - Fall, winter and spring placement will continue to bury the natural ground surface and permafrost will aggrade into the waste rock where a new and temporary active layer will form - POSITIVE; B - Placement of lifts on natural ground in the summer may continue to cause temporary and localized. Deepening of the active layer, warming of near surface permafrost and possible subsidence, particularly in low lying areas; C - where new lifts are added to older lifts, permafrost will continue to aggrade into both new and older	Dike around RSF indicated that the foundation is in a frozen state. Thermistor (T121-1) installed on RF1 shows temperatures varying from 0.5°C to -5°C Thermistor (T122-1) installed on RF2 shows temperature varying from -2°C to -7°C, indicating that the RF2 foundation is in a frozen state. RSF1 is installed in the waste dump and shows that below app 5.6 m from the surface the temperature remains below 0°C all year long.

				waste rock and new active layers will form, although summer placement conditions will include temporary and localized loss of new permafrost, the net effect will be permafrost aggradation and general ground	
Potential settlement of buildings	Loss of permafrost under heated structures	Ground temperature measurements where there is a need to monitor foundation temperatures	None	Net decrease in permafrost distribution and/or increase in ground temperatures	No ground temperature measurements but no sign of thawing of the foundation during the year.
Permafrost changes below pipelines	Stabilization of permafrost temperature and active layer thickness	Monitor pipeline alignment for potential permafrost degradation	None	Minor and undifferentiated net gain or loss of permafrost	No ground temperature measurements but no sign of thawing due to pipeline.

12.5.2 Effectiveness of Monitoring

Overall, the potential impact predicted for mine activities impacts to permafrost were adequately estimated during the FEIS.

Aggradation of permafrost and stabilization of the active layer can be monitoring adequately for dike and tailings storage facility. However, no instrumentation was in place to monitor stabilization or loss of permafrost for pipeline and infrastructure. As the pipeline and the infrastructure are stable, we can assume that the permafrost is lightly impacted by the mine activities. Furthermore, monitoring and ground surveys reduced any occurrences around the mine site.

12.5.3 Recommendations for Additional Mitigation or Adaptive Management

Generally, FEIS predictions were consistent with the result.

Throughout the year, Meadowbank staff routinely monitored thermistors, dike, pits and pipelines. Some additional thermistors were installed in 2012, 2013 and 2014 to monitor aggradation of permafrost within Bay Goose Pit and Second Portage Lake. Thermistors were also installed in the North Cell TSF in 2013 to increase monitoring of tailings freezeback. In 2014 additional thermistors were installed in the North and South Cell TSF's to monitor freezeback of tailings and permafrost aggradation. Regular monitoring and assessment of the monitoring data should continue on regular basis in 2015.

12.6 SOCIO ECONOMIC

In the Meadowbank IIBA AEM has committed to prepare an annual report on the wellness of the Inuit residents of Baker Lake. The KIA has agreed that the report will be community based and driven. The Hamlet of Baker Lake is directing the wellness report with support from the University of Guelph.

The objective of each Wellness Report and Implementation Plan is to provide an overview of any impacts of the Meadowbank Mine on the wellness of the Inuit residents of Baker Lake in as much detail as practically possible, including any impacts on:

a) the state of the physical and mental health of the Inuit residents of Baker Lake;

b) the extent of alcohol and drug abuse in the community of Baker Lake;

c) personal and family relationships of the Inuit residents of Baker Lake, including any impacts attributable to employment at a remote work site under a rotational work schedule;

d) migration into or out of the community;

e) the prevalence and use of Inuktitut in the community of Baker Lake;

f) Inuit culture and traditional practices;

g) job satisfaction of the Inuit residents of Baker Lake employed at the Meadowbank Project;

h) management of personal finances by the Inuit residents of Baker Lake; and

i) any other aspect of the wellness of the Inuit residents of Baker Lake that the Meadowbank Mine could reasonably be expected to affect.

For the purpose of developing Hamlet wellness indicators that is meaningful to Baker Lake residents, qualitative community-based research was conducted to capture how Baker Lake residents define and perceive their Hamlet's wellness. Between July and September 2012, two focus groups and 45 semi-structured interviews were conducted. One focus group was held with women and another with youth, with a total of 15 participants. Interview participants represented a diverse cross-section of the community in terms of age, gender, education and socio-economic background. These 45 interviews included elders, young adults, Meadowbank Mine employees, community leaders, front-line workers and administrators.

A proposed list of wellness indicators, based upon interviews and focus groups with Baker Lake residents as well as a draft version of the Wellness report were provided in 2013. The final version of the report and the Implementation plan are still under development as further discussions need to be held between AEM, the Hamlet of Baker Lake and KIA. Due to 2014 being a Municipal election year the outgoing Mayor requested that the draft report be put aside until a new Mayor and Council were elected. The Company plans to organize a meeting with the representatives of the Hamlet in May 2015 to discuss the Wellness report program.

12.6.1 Accuracy of Predicted Impacts

Based on results of this report, the accuracy of both positive and negative impacts as predicted in the FEIS are assessed below in Table 12.10.

Table 12.10 Socio-economic – positive impacts as compared to FEIS predictions

Potential Impact	Proposed Monitoring	After Mitigation Significance	Monitoring Conducted (2011-2014)	Observed Positive impacts as compared to FEIS predictions (2011-2014)
Expenditure of $23 million annually over 10 years	Employment and contracting reporting	Moderate, relative to size of regional economy	*Benefits delivered for Nunavut-based businesses:* As of September 1, 2011, 52.2% ($479 million) of total expenditures were attributed to Nunavut-based companies, an increase from $237.4 million in 2010. In 2012 this increased to 58.8% of total expenditures, and all Nunavut-based vendors for AEM in 2012 were at least 51% Inuit-owned businesses. Of the $479 million captured by Nunavut-based companies in 2011, $159 million (33%) went to Baker Lake-based suppliers; this is a significant increase from $17 million in 2009. In 2012, 30.8% of expenditures were allocated to businesses located in Baker Lake, an overall increase since 2010 (26.5%: $62.8 million) but slight decrease from 2011 (33%: $159 million). The majority of these dollars spent in Baker Lake were captured by Baker Lake Construction and Supply, Peter's Expediting, and Arctic Fuel; these three companies took in 22.4% of AEM expenditures in 2011.	The indirect influence of mining contracts and the increase in traffic through Baker Lake has infused significant new money into the town's economy. As with the individual impacts of direct employment, these benefits have been felt unevenly across the community. When construction for the Meadowbank Mine began, three main community businesses signed large contracts with Agnico Eagle and have generated substantial revenues In the context of high economic growth spearheaded by mineral development, these data further highlight the significant potential for further business growth and development in Baker Lake and the Kivalliq region. AEM has developed a program, the Building People Initiative, to assist Kivalliq business development in order to meet their market needs. They also launched the AEM Inuit Business Opportunities Initiative in April 2010 to assist Inuit businesses seeking contract opportunities through Meadowbank.
Employment of at least 60 workers	Employment reporting, by ethnicity, point of hire, gender etc.	High, at the individual level and relative to size Baker Lake labour force	*AEM statistic*: As of the end of August 2011, 37.2% of new permanent hires for the year were Inuit beneficiaries, representing an increase of 57 individuals since 2010.	Direct employment is the most substantial impact from the mine With the arrival of the mine, anyone who wanted to be employed could be. Residents highlighted the fact that before the mine, many

Potential Impact	Proposed Monitoring	After Mitigation Significance	Monitoring Conducted (2011-2014)	Observed Positive impacts as compared to FEIS predictions (2011-2014)
			Most of the Inuit beneficiary employees at Meadowbank have been from Baker Lake; at the end of 2014, there were 155 employees from the Hamlet. The overall number of Inuit employed at Meadowbank has remained steady since production began, with 249 in 2011 (36.8% of the workforce), 247 in 2012 (31.4% of the workforce) and 269 in 2014 (34.13%). Most of these new Inuit beneficiary hires in 2011 were men – 229 men compared with 60 female. Overall the percentage of Inuit female employees was 20.8% in 2011, which increased to 35.1% in 2012, demonstrating a relatively low but growing representation of women. In 2012, 31% of the Baker Lake Inuit workforce was female and 69% was male. Of the contract workforce in 2011, a small number (5.4%) were Inuit beneficiaries, equal to 25 of 457 workers.	people in Baker Lake were unable to access employment, even with a high school diploma.
Goods and service contracts for local businesses	Contract reporting, by type of good and location and status of business	High for individual businesses, but overall moderate relative to the size of the regional market	See Above – Potential Impact "Expenditure of $23 million annually over 10 years"	See Above – Potential Impact "Expenditure of $23 million annually over 10 years"
Overall increased economic activity, including indirect and induced effects	Government economic indicators	Moderate given importance accorded to developing and diversifying the economy of the	*Tax-filers with employment, SEMC:* The 2009 SEMC Report stated that "[t]he Kivalliq has not seen economic growth in the wage economy of [this] magnitude since first contact." A need for Kivalliqmiut to adapt to	With employment at Meadowbank, salaries range between $20 and $40 per hour. For many, this new income has enhanced their quality of life by offering a reliable means to afford food, hunting equipment, and consumer goods, such as vehicles and entertainment

Potential Impact	Proposed Monitoring	After Mitigation Significance	Monitoring Conducted (2011-2014)	Observed Positive impacts as compared to FEIS predictions (2011-2014)
Increased individual, family and community wellness		region High, on the assumption that overall, increased income is correlated with increase wellness	these rapid changes in order to benefit from regional economic growth is recognized. Median annual employment income in Baker Lake has increased since construction began for the Meadowbank Mine: from $12,600 in 2004 to $22,020 in 2009	systems. As a result of increased demand, a greater abundance and variety of foods are available at the community grocery stores. While there are still families asking for Inuit food over the local radio, the number of people waiting in line for the monthly food bank has decreased substantially. This was noted as being the most positive impact of the mine. When employment was very low, many residents accumulated considerable debt with the housing corporation, the power corporation, the Northern, and credit cards, and they are now paying that back. Expectations of financial support to younger siblings or other family members places an added strain on some workers, who have their own financial obligations. For those without extensive debt, homeownership has become an attainable goal, though the community lacks legal and banking services that would enable easier navigation of these processes.
Increased capacity of local labour force to participate in project and in formal economy more generally	Training and human resource reporting, government economic indicators, possibly special purpose studies	High particularly at the individual level and because capacity building contributes to life long success in formal wage economy.	AEM statistic. The majority of the Nunavummiut workforce is in unskilled and semi-skilled positions at the mine. At the end of August 2010, there were 8 Inuit working in skilled positions and at the end of 2014 there were 35 inuits. From 2010 to 2010,the trend has changed with the establishment of the Kivalliq Mine Training Society (towards which AEM has contributed funding) and the addition of more on-site	These data suggest that Baker Lake is taking advantage of training initiatives offered at Meadowbank, such as the on-site haul-truck simulator purchased in 2010 and the “Career Path” program for driver advancement

Potential Impact	Proposed Monitoring	After Mitigation Significance	Monitoring Conducted (2011-2014)	Observed Positive impacts as compared to FEIS predictions (2011-2014)
			training and apprenticeship programs, allowing for greater income capture among the Inuit workforce accessing these higher-paying jobs. At the end of August 2011, 58% of training offered by AEM was provided to Inuit employees, an increase of 3,740 hours since 2010. For 2012, 46% of the training offered was provided to Inuit employees, and 85% of this training offered was general and specific job training (i.e., for career advancement). There are a number of Inuit employees who started their employment with AEM in unskilled positions and have since advanced through training to skilled level positions. By the end of August 2011, 75% of the Baker Lake Inuit employees were working in skilled positions, and Baker Lake has the highest proportion of Meadowbank employees from Kivalliq working such jobs. In comparison, the average for across Kivalliq is 66.8%, though only Baker Lake and Rankin Inlet have a representation of more than 62% employment in skilled positions.	
Some increase in interest in school on part of youth	Government social indicators, consultation results	Moderate as project initiatives alone will not suffice but will only contribute to the ongoing effort although for any specific individual the significance could be high.	*Nunavut Bureau of Statistics:* Throughout Kivalliq, the rate of high school graduates has been increasing, and this can be attributed partly to population growth While the rising number of high school graduates is promising, graduation rates further demonstrate an increase in the percentage of 17 to 18 year-olds in Kivalliq graduating from high school, with a high of 44% in 2010, more	Since the opening of the Meadowbank mine, many informants have observed decreasing dropout rates and higher graduation rates, which is encouraging for the future of Baker Lake. Some parents said that students now are more focused on graduating because they have something concrete to have as a goal for employment

Potential Impact	Proposed Monitoring	After Mitigation Significance	Monitoring Conducted (2011-2014)	Observed Positive impacts as compared to FEIS predictions (2011-2014)
			than double the 21% graduation rate in 200	

Table 12.11. Socio-economic – negatively perceived and observed impacts

Potential Impact	Proposed Monitoring	After Mitigation Significance	Monitoring Conducted (2011-2014)	Observed Negatively impacts as compared to FEIS predictions (2011-2014)
Reduced access to traditional land	Consultation results	Moderate, for any specific individual although overall number of users is likely to be limited	Interview	Many reported an increase in the number of trips on the land by those with employment-generated monies used to buy equipment, some residents suggested that the stress associated with life in a community, and increasingly busy work and school schedules, limit the length of time that individuals can spend on the land
Reduction in traditional activities including harvesting	Government social indicators, consultation results, possibly special purpose studies	Low negative, as less traditional activity is more likely to be choice rather than lack of opportunity and potentially positive at least for some individuals	Interview	A number of community members are concerned with the influx of money, Southern material goods and technologies that are providing "too many distractions", and limiting healthy socializing and volunteerism in the community. There is concern that growing individualism and materialism are displacing Inuit values and the influence of elders. Mine impacts on harvesting activities were discussed more frequently than general environmental impacts, and seem to be the most important environmental concern for Baker Lake residents.

Potential Impact	Proposed Monitoring	After Mitigation Significance	Monitoring Conducted (2011-2014)	Observed Negatively impacts as compared to FEIS predictions (2011-2014)
				For some people, the two weeks off provide a chance to recover from the 12-hour shifts at camp. Some reported being too tried to participate in family or community events, including hunting and land-based activities during their two weeks off. However, others reported that they enjoyed using this time specifically for harvesting, using the mine road to access caribou grounds, and enjoying quality time with their family
Undervaluing traditional ways and loss of knowledge	Government social indicators, consultation results	Low as project initiatives alone will not suffice but will only contribute to other ongoing efforts in support of traditional ways of life.	*NBS indicator* In Baker Lake in 2011, 1,170 of 1,865 local residents reported Inuktitut as their mother tongue, or first language learned and still understood. This can be compared with 645 residents who indicated English to be their mother tongue (ibid). In terms of the language spoken most often at home in 2011, 525 Baker Lake residents indicated this to be Inuktitut, compared with 1,320 who speak English most often at home (NBS 2012). The more frequent use of English at home over Inuktitut has been increasing over the past decade. In 2001, 61.3% of Baker Lake residents reported English to be the main language spoken at home compared to 36.1% who spoke Inuktitut most frequently. In 2011,	In 2011, issues of language use and culture clashes between Inuit and Southern workers were cited by participants as reasons some Baker Lake employees left Meadowbank to pursue other opportunities in town. At this time, Inuit were unable to speak Inuktitut while working on the job site, but resented the fact that French-speaking workers were speaking their native language. In 2012, this situation improved: Inuktitut was accepted as a language spoken on site for safety reasons. Participants stressed the importance of open communication and working together as a team at camp to address social and cultural tensions. The levels of Inuktitut speaking and number of residents who claim Inuktitut to be their mother tongue is lower in Baker Lake than in several other Kivalliq and Nunavut communities. Community and school-based language initiatives are hoping to reverse these trends while promoting literacy in both English and Inuktitut.

Potential Impact	Proposed Monitoring	After Mitigation Significance	Monitoring Conducted (2011-2014)	Observed Negatively impacts as compared to FEIS predictions (2011-2014)
			70.8% indicated English to be the main home language and 28.2% spoke Inuktitut predominately (NBS 2012).	
Poor financial decision making	Government social indicators, consultation results, possibly special purpose studies	Low to high negative or positive at the individual level depending on assistance program effectiveness, although overall it is expected that comparatively few will make consistently poor choices	*NBS Indicator* With an increased standard of living, there are some concerns associated with spending. Across Nunavut, sales of alcoholic beverages have been increasing. The total income and revenue from legal alcohol sales between 2010 and 2011 increased 55.4% across the territory. While regional or community-specific data on alcohol sales are not publically available, the proportion of newly earned monies spent towards alcohol, drugs and gambling is of concern to Baker Lake residents.	Every respondent in 2012 mentioned drug and alcohol use as a concern for community wellness, affected by underlying structural issues, rising incomes, the two-week schedule, and population growth. The two weeks of downtime without structure, combined with a lack of money management skills, was also identified as a concern, and a cause of reckless spending, including gambling and drug and alcohol consumption.
Increased income disparity	Government social indicators, consultation results, possibly special purpose studies	Moderate, although community initiatives may help to mitigate impact.	Interview	Making money is not the only concern for Inuit working at Meadowbank; for many Inuit, other responsibilities, such as family, take priority over employment and income. Problematically, when incomes grow, an employee's rent in Baker Lake can increase substantially (e.g. upwards of 25x the cost before employment). This has created a disincentive for some to continue employment, given that the majority of Kivalliq Inuit are home renters.

Potential Impact	Proposed Monitoring	After Mitigation Significance	Monitoring Conducted (2011-2014)	Observed Negatively impacts as compared to FEIS predictions (2011-2014)
Increased public health and safety risks	Government social indicators, consultation results	Low as public health and safety is a function of many things out of a single project's control but project effects on community prosperity should produce an overall positive impact on individual behaviour	DPA, NBS At the 2011 SEMC meeting in Baker Lake, the RCMP clearly stated that Agnico's provision of income has stimulated staggering increases in crime due to incomes being used to purchase alcohol and drugs. Agnico is currently in the midst of developing a new Employee Assistance Program that will include education to our employees on managing a paycheque and counselling related to assisting families cope with adjusting to shift rotations and employment" Across the territory of Nunavut, crime rates have been increasing over the last decade. However, crime rates have been rising in Kivalliq over the last several years at a rate faster than the territory of Nunavut is experiencing on average. In Baker Lake, the number of criminal code violations (including traffic violations) has increased from 316 in 2006 to 753 in 2011 (NBS 2012). The majority of these criminal violations are incidents of mischief, disturbing the peace and assault. Crimes against persons, including	Population growth and an increase in consumer goods, drugs, alcohol and gambling were affecting crime-rates, and particularly thefts and home break-ins. It is not uncommon to hear of vehicle theft now in the community, and participants were concerned by this lack of respect for personal property. With more vehicles on the road, several participants were concerned with increased traffic, drinking and driving, and the safety of youth in particular. Several participants noted there are more "unsavoury characters" on the streets than there used to be, making it less safe for families to let their children, especially girls, out in the town without supervision. Respondents discussed not knowing who their neighbours are anymore, locking their doors when home in the middle of the day, and a concern for their family's safety. A few participants expressed a social reluctance in the community to report incidents such as disturbing the peace and domestic abuse to the authorities, but noted that this attitude is changing as priorities ultimately lie in ensuring the safety of one's family and home.

Potential Impact	Proposed Monitoring	After Mitigation Significance	Monitoring Conducted (2011-2014)	Observed Negatively impacts as compared to FEIS predictions (2011-2014)
			acts and threats of violence, have been on the rise as well (NBS 2012). In Baker Lake, the rate of crimes against the person (calculated as crimes per 1,000 residents) increased from 66 in 2006 to 85 in 2010 (SEMC 2011). Rates of suicide, violence and sexual assault, have been also increasing in recent years, some of which can be attributed to overcrowded housing and associated stressors Community health centre visits have been decreasing per annum since 2006 when there were 12,903 visits to 2011 with 9,652 visits recorded	
Stress from rotational employment	Government social indicators, consultation results	Low particularly over time as families learn to manage rotations, and benefit from the positive effects of participation in the mixed economy	The two-week rotation has contributed to spousal stress in Baker Lake, and that gossip and rumours of infidelity are causing relationship problems Important are childcare responsibilities and lack of community childcare facilities that can prevent Inuit, and particularly single mothers, from accessing or maintaining a job at Meadowbank. The relationship between supervisors and workers and	The relative impact of the two week in-two week out schedule varies greatly as well. Participants indicated that working out of the community for 2 weeks at a time is a big adjustment for many who are “not used to that type of time” maintaining a strict work schedule. For some, leaving the community for two weeks at a time presents a huge challenge for childcare and other family obligations. Single mothers in particular noted that they are unable to access job opportunities with the mine because of inadequate childcare within Baker Lake. This raises concerns of socio-economic inequality, particularly given the high costs of

Potential Impact	Proposed Monitoring	After Mitigation Significance	Monitoring Conducted (2011-2014)	Observed Negatively impacts as compared to FEIS predictions (2011-2014)
			amongst workers was also discussed at the 2011 meeting as an area of concern, with issues of gossip and miscommunication creating tension between employees. While no previous data appear to exist, marital status rates for ages 15+ indicate 20 cases of separation and 15 cases of divorce in Baker Lake during 2011. If these statistics continue to be collected, they could serve as an indicator of family stability	living in the Arctic.
Increased traffic accidents and emergencies	Project health and safety reporting	Low to high at the individual level, depending on the seriousness of the accident however mitigation is expected to keep accidents to a minimum	NA	NA
Disturbance by project activities	Consultation results	Negligible, as very little of the project physical activity will take place in Baker Lake	Interview	There are some concerns about the environmental impacts of mining and industrial development, but most feel that Agnico-Eagle is following the required procedures and taking necessary precautions. Some respondents expressed concerns about the mine's impacts on the spiritual health of the land, with 23 reports of spirit disturbances at the Meadowbank site; healing measures have been undertaken to address these concerns. There is significant scepticism about land reclamation, however, as the tundra takes longer to regenerate

Potential Impact	Proposed Monitoring	After Mitigation Significance	Monitoring Conducted (2011-2014)	Observed Negatively impacts as compared to FEIS predictions (2011-2014)
				compared with other ecosystems.
Shortage of housing and other infrastructure	Consultation results	Low as numbers of in migrants are expected to be low	The lack of sufficient and adequate housing contributes to household stress. About 300 Baker Lake residents over the age of 15 reported being on the waiting list for public housing at the time of this survey. Of these individuals, 100 had been on the waiting list for between one and three years, and about 50 others indicated being on the waiting list for five years or longer (NBS 2011). These housing data, while merely a snapshot from a one-year period, provide an indication of community wellness as Baker Lake continues to grow and more demand is placed on community housing and infrastructure.	The development of the Meadowbank Mine has generated in-migration of individuals from the Kivalliq and across Canada seeking employment. This has accelerated the need for improvements in Baker Lake's housing and infrastructure.
Increased demand for social services	Government social indicators, consultation results	Low but positive on assumption that increased income will decrease need for government transfers for some individuals; potential long term affects would result from capacity building	SEMC: The number of households collecting social assistance has decreased in recent years. In 2006, the monthly average social assistance caseload was 239 households, representing 706 individuals, compared with 124 households and 537 individuals in 2010. The main attributable factor for these lower levels is the more than 150 residents of Baker Lake	Levels of social assistance have decreased with the mine, with a large impact on material well-being for those able to access new employment opportunities. Of course, there are still people living on social assistance or working minimum wage jobs in town, meaning that there may actually be a widening economic gap with the increase in the number of higher wage employees in town.

Potential Impact	Proposed Monitoring	After Mitigation Significance	Monitoring Conducted (2011-2014)	Observed Negatively impacts as compared to FEIS predictions (2011-2014)
			working at the Meadowbank camp, and new job opportunities in town. The same trend is occurring in Rankin Inlet, while other communities in Kivalliq are experiencing a rising number of social assistance cases.	
Potential degradation of historically significant sites	Consultation results	Negligible, project as designed avoids sites and archaeology and traditional knowledge studies indicate little potential for encountering as yet unknown sites	Archeology study	No destruction

12.6.2 Effectiveness of Monitoring

Potential impacts to socio economic identified in the FEIS are realistic based on interview with focus groups with Baker Lake residents in 2011 and 2012. Overall, the mines have a positive economic impact on Nunavut Community. AEM contributes to the development of the community by giving contract and jobs to people, even if are unskilled. Meadowbank thru is socioeconomic program help the worker to develop itself. AEM also have a positive impact on the scholarship of the young. The students want to graduate because they have now something concrete to have as a goal for employment. On the other side, with an increased standard of living, there are some concerns associated with the lack of money management skills and the expenditure for drug, alcohol and gambling. Community also have some concerns regarding the environmental impact of mining and industrial development, but most feel that AEM is following the required procedures and taking necessary precautions. Overall, the predictions made in the FEIS are accurate.

12.6.3 Recommendations for Additional Mitigation or Adaptive Management

AEM will continue to listen to the Nunavut Community and worker about all the concern that they have and will address this concern in the best manner possible. AEM will also continue to do the annual report on the wellness of the Inuit residents of Baker Lake as request by the Meadowbank IIBA

12.6.4 Contributions to Regional Monitoring

Overall, AEM contribute to the regional economy and socio economic part of the Nunavut Community.