CAPSTONE MINING CORP.
MINTO MINE



QML - 0001 ENVIRONMENTAL AUDIT 2015

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Appendix A Environmental Audit Summary Table

ABBREVIATIONS

AEMP ..... Aquatic Environmental Monitoring Program
AMP ..... Adaptive Management Plan
CEQG ..... Canadian Environmental Quality Guidelines
CPUE ..... Catch Per Unit Effort
CWTS ..... Constructed Wetland Treatment System
DSTSF ..... Dry Stack Tailings Storage Facility
EEM ..... Environmental Effects Monitoring
EMSRP ..... Environmental Monitoring, Surveillance and Reporting Plan
EIN ..... Environmental Incident Notification
EIR ..... Environmental Incident Report
ERP ..... Emergency Response Plan
FDP ..... Final Discharge Point
HRPP ..... Heritage Resources Protection Plan
KP ..... Knight Piésold Ltd.
LTF ..... Land Treatment Facility
MMER ..... Metal Mine Effluent Regulations
QC ..... Quality Control
QML ..... Quartz Mining License
RCP ..... Reclamation and Closure Plan
ROD ..... Reclamation Overburden Dump
SCP ..... Spill Contingency Plan
SECP ..... Sediment and Erosion Control Plan
SFN ..... Selkirk First Nation
SWD ..... Southwest Waste Dump
TKN ..... Total Kjeldahl Nitrogen
TOC ..... Total Organic Carbon
TSS ..... Total Suspended Solids
WMA ..... Waste Management Area
WMP ..... Waste Management Plan
WPP ..... Wildlife Protection Plan
WSP ..... Water Storage Pond
WUL ..... Water Use License

1 – INTRODUCTION

1.1 PURPOSE

The Minto Mine is an open pit copper mine located 240 kilometres north of Whitehorse in central Yukon, Canada. Minto Mine is owned by Minto Explorations Ltd. (Minto), a subsidiary of Capstone Mining Corporation. The most recent Quartz Mining Licence (QML) issued to Minto Explorations Ltd. (QML - 0001) requires that the Licensee carry out an environmental audit no later than September 1st in every second year from the date the permit was issued. The purpose of the audit as stated in Part VI, Section 12.1 of QML - 0001 is to determine if the "environmental protection plans and regulatory controls set out in the License are sufficient to ensure that the environmental quality at, in, and around the mine is being protected and that the environmental management systems and controls are functioning as intended". This subsection of QML - 0001 also dictates that the audit must be conducted by an independent contractor acceptable to the Director. Knight Piésold Ltd. (KP) has not previously been engaged in environmental-related work for Minto and therefore meets the definition of an independent contractor to carry out the environmental audit.

The objective of this audit is to satisfy the requirements of Part VI, Section 12 of QML - 0001. An environmental audit is a systematic, documented process used to assess a facility's compliance with relevant legislative and regulatory requirements and to evaluate the effectiveness of a project's environmental management system in identifying risks. This audit evaluates whether the management plans that have been developed for the Minto Mine are being effectively implemented to identify, prevent or minimize potential environmental impacts.

1.2 SCOPE

The audit covers all work conducted as outlined in the monitoring and management plans that were prepared by Minto between December 18, 2014 (the date QML – 0001 was issued) and June 30, 2016 in order to meet the September 1st date for audit completion. Section 8.1 of QML - 0001 states that "unless otherwise indicated in writing by the Director, the Licensee must implement each approved plan as of the date each plan becomes an approved plan". The environmental audit focuses on evaluation of the Environmental Protection and Environmental Management Plans listed in Schedule B of QML - 0001. Under Part II, Section 6 of QML - 0001, if the Licensee wishes to amend an approved plan, the proposed plan or amendment is required to be submitted in writing, and the Licensee is not to undertake any of the activities described in the plan or the proposed amendment until the plan is approved. Approved plans listed in Schedule C of the QML supersede any prior approved plans. Schedule C of QML - 0001 (dated March 2nd, 2016) lists the current versions of the approved plans:

- Operations Adaptive Management Plan (December 2015)
- Emergency Response Plan (March 2014)
- Environmental Monitoring, Surveillance and Reporting Plan
  - Environmental Monitoring Plan (June 2011, Section 2 only)
  - Environmental Monitoring, Surveillance and Reporting Plan (December 2015, with conditions)
- Explosives Management Plan (June 2011)
- Heritage Resource Protection Plan (April 2014)
- Sediment and Erosion Control Plan (April 2014)

- Spill Contingency Plan (March 2014)
- Waste Management Plan (June 2014)
- Wildlife Protection Plan (April 2014, with conditions)

Since the period covered by this audit extends from December 18, 2014, work conducted in 2015 was assessed against previous versions of the following plans:

- Phase V/VI Adaptive Management Plan (November 2014)
- Environmental Monitoring, Surveillance and Reporting Plan (June 2014)

Schedule D of QML - 0001 outlines the information that must be included in the Annual Report; with respect to environmental monitoring, Minto is required to provide a summary of the programs outlined in the Environmental Monitoring, Surveillance and Reporting Plan and Wildlife Protection Plan. Schedule D does not list any reporting requirements for the other plans; however, the individual plans contain commitments to provide monitoring information within the annual report.

Minto Mine also operates under Water Use Licence (WUL) QZ14-031, which was granted by the Yukon Water Board on August 3rd, 2015; this licence was a renewal of and superseded licence QZ96-006. Review of compliance with the conditions of the WUL is not within the scope of this QML audit; however, during the course of this audit and in discussion with Minto environmental employees, it became apparent that there is some discrepancy between the monitoring and reporting conditions of the QML and the conditions of the WUL with respect to the environmental management plans, which confound the environmental audit required under the QML. Therefore, only the monitoring and reporting requirements of the QML are included in this audit.

In addition to the audit of the plans listed above, the Director, Mineral Resources, has stipulated that the audit include an evaluation of "*the progress and success of reclamation and closure efforts completed to date.*" in accordance with Section 12.2, sub clause (d) of QML - 0001.

1.3 APPROACH

Section 12.2 of QML - 0001 outlines the following criteria for evaluation of the environmental protection and management plans:

a) Compliance with the approved plans
b) Adequacy of the environmental protection plans to meet the objectives and intent of each plan
c) Compliance with the internal environmental policies and procedures of the Licensee
d) Progress and success of reclamation and closure efforts completed to date
e) Reliability and integrity of information relating to environmental reporting and compliance, and
f) Any other requirements, including the scope and focus of the audit, as directed by the Director in writing.

Evaluation of the environmental protection and environmental management plans is presented in Section 2 of this report. Each plan is assessed with respect to the following criteria:

- Compliance with the approved plans
- Adequacy of the environmental protection plans to meet the objectives and intent of each plan
- Compliance with the internal environmental policies and procedures of the Licensee, and
- Reliability and integrity of information relating to environmental reporting and compliance.

The Director did not stipulate any other requirements regarding the scope and focus of the audit.

The review process is tailored to each of the specific disciplines and includes: review of reports required under the QML; technical reports; monitoring data; on-site audit following review of the environmental protection and environmental management plans to fill any data gaps; and any additional information available to Minto as it relates to environmental monitoring. Although not explicitly stated in all of the plans, it is assumed that the overall objective and intent of the plans is to manage the environmental effects of the Project, as defined in the QML. As the plans have been developed and refined by Minto, in consultation with Yukon Energy, Mines and Resources, the Yukon Water Board, the Selkirk First Nation, and other stakeholders over the course of several years, it is assumed that by maintaining compliance with the plans Minto is managing the environmental effects of the Project, thereby meeting the overall objective and intent of the plans.

Evaluation of reclamation and closure efforts completed to date is presented in Section 3 of this report. In order to evaluate "the progress and success of reclamation and closure efforts completed to date" KP utilizes the following approach, given that an approved updated Minto Reclamation and Closure Plan will not be available until after September 1st (the date stipulated for the audit period in Section 12.1 of QML - 0001):

- Review the existing Reclamation and Closure Plan to understand the general intent of closure for the site
- Interview senior environmental team involved in developing the updated Reclamation and Closure Plan to understand the macro changes that are expected to be included in the updated plan
- Review reclamation-related information (e.g., reclamation research for wetland treatment; reports documenting soil stockpile quantities/quality/location; other reclamation research data; engineering design concepts for long-term stability of structures, etc.)
- Assess appropriateness of work as it relates to the current/projected reclamation and closure plan, and where improvements could be made (e.g., whether there is currently and/or projected to be enough soil stockpiled to achieve the stated goals; whether there are any uncertainties in the reclamation plan that are not currently addressed through research)
- Review the future mine plan and provide commentary as to whether the current/projected Closure Plan can be implemented as designed; opportunities for optimization will be included for consideration
- Assess ability to implement the reclamation and closure plan within the planned timeframe (e.g., if the closure period is expected to be five years after operations cease, the likelihood that this will be achieved)
- Conduct site visit to view current site reclamation, conduct interviews and review available documents, and
- Provide an opinion as to the ability of Minto to achieve the Closure Plan for the site.

To our knowledge, the Director has not indicated any other requirements, including any for the scope and focus of the audit.

1.4 MINTO ENVIRONMENTAL POLICIES AND PROCEDURES

The purpose of the Minto Environmental Policy #023 is to define how the mine will strive to minimize the impact of any site activities upon the environment. Minto has developed the following guidelines to meet the Statement of Intent of maintaining sound environmental practices in all of its activities:

- Examine the potential impact to the environment of all proposed activities and take steps to minimize or where possible, eliminate the impact
- Ensure that all activities are in compliance with all environmental legislation and regulations
- On a continuous basis, determine the Company's impact to the environment and through continuous improvement, strive to attain higher levels of environmental performance
- Maintain a high level of environmental protection by applying practices and technologies that minimize impacts and enhance environmental quality
- Maintain dialogue with the communities and other stakeholders within the area of influence of its exploration programs
- Progressively rehabilitate disturbed areas, develop closure plans that can be continuously improved and incorporate new technologies where practical, and
- Train all employees and contractors to understand their environmental responsibility related to its Mineral Exploration Properties.

Aspects of the Capstone Mining Corp. Integrated Environmental, Health, Safety and Sustainability Policy relevant to the environmental audit are:

- Continuously improve environmental performance and the occupational health and safety performance by minimizing adverse environmental impacts and risks to the safety and health of its employees
- Establish clearly defined environmental management programs
- Operate in accordance with recognized industry health, safety, and environmental standards, while complying with local and international applicable regulations and laws
- Investigate the causes of accidents and incidents, and develop effective and immediate preventative and remedial action
- Prevent environmental pollution and/or mitigate illness, accidents and impacts associated with production processes
- Maintain a high degree of emergency preparedness, and
- Comply with legislation and voluntary commitments in environmental and occupational health and safety matters.

The purpose of the Capstone Heritage Resource Protection Policy #031 is to define how Minto Mine strives to minimize the impact on any heritage resources in the area affected by the Company's activities. Minto has developed the following guidelines to meet the Statement of Intent of observing good practise with regard to the identification and protection of any Heritage Resources that may exist on the mine property, or areas affected by the mine operations:

- Ensure that all activities are in compliance with the relevant legislation, notably the Territorial Lands Act, the Quartz and Placer Land Use Regulations, the Historic Resources Act and the Archaeological Sites Regulation
- Make all reasonable efforts to identify Heritage Resources present on the mine lease property and plan activities so as, where possible, to avoid all disturbance to those sites or, where not possible, to minimize impacts
- Coordinate closely with Selkirk First Nation and Yukon Government's Heritage Resources Unit with regard to the protection of any Heritage Resources present on site, and
- Train all relevant employees and contractors to understand their responsibilities as they pertain to the protection of Heritage Resources.

Each of the management plans will be assessed for compliance with the guidelines of the relevant policies.

2 – ENVIRONMENTAL MANAGEMENT PLAN EVALUATION

2.1 OPERATIONS ADAPTIVE MANAGEMENT PLAN

The Adaptive Management Plan (AMP) prepared by Minto Explorations Ltd. was first issued in June 2014, with revisions in December 2015 and May 2016. The approved AMP under the current QML is the December 2015 AMP. However, for the purpose of this audit, required under the QML every two years, the work that was conducted in 2015 was assessed against the Phase V/VI Adaptive Management Plan, issued in November 2014. Minto staff, in anticipation of the revisions requested in the 2015 AMP, conducted work in the first few months of 2016 following the AMP issued in May 2016. For ease of reference, the various versions of the AMP will be referred to as:

- 2014 AMP: Phase V/VI Adaptive Management Plan, November 2014
- 2015 AMP: Operations Adaptive Management Plan, December 2015, and
- 2016 AMP: Operations Adaptive Management Plan 2016-01, May 2016.

The AMP outlines scenarios for unexpected events and the responses that Minto would undertake to minimize resulting adverse effects. Three components are included within the 2014 AMP:

- Surface water quality
- Water Management, and
- Physical Stability.

A fourth component, Groundwater Quality, was added in the 2015 AMP.

Six component plans were developed for the AMP:

- Minto Creek Surface Water Quality
- McGinty Creek Surface Water Quality (2015 AMP and 2016 AMP only)
- Groundwater Quality in Minto Creek Watershed (2015 AMP and 2016 AMP only)
- Groundwater Quality in McGinty Creek Watershed (2015 AMP and 2016 AMP only)
- Water Management, and
- Physical Stability.

Under the 2014 AMP, any updates, amendments, performance thresholds crossed, and trigger(s) activated are to be provided to the appropriate governmental department (including SFN) and included in the Annual Report. All activities carried out under the December 2015 AMP must be included in both the monthly and annual reporting for the WUL; monthly reporting of AMP activities is not required as part of QML; however, Minto has committed to reporting monthly in the AMP.

2.1.1 Plan Objective

The objective of the AMP is to provide a framework for Minto to make quick and effective decisions and guide responses to unforeseen events for each of the components. The AMP that is described in QML – 0001 is “A plan that provides detailed descriptions of procedures and actions that will be employed should negative effects on the environment be observed. The plan should demonstrate that actions can be taken prior to causing unacceptable effects.” The ultimate objective for the AMP therefore is to ensure that responses are implemented to curb possible negative impacts associated with unexpected situations. The AMP for each component follows the same approach:

1. Description of the component:
    - Description and understanding of the component, and

- Risk Narrative: description of possible environmental impacts and environmental conditions.

2. Monitoring the component:
   - Selecting Specific Indicators (measurable or observable environmental or physical parameters to be monitored and assessed)
   - Outlining a monitoring regime for the component, and
   - Selecting Specific Performance Thresholds (defining the conditions for specific indicators when action is triggered).
3. Implementing Specific Responses according to specific performance thresholds:
   - Notification
   - Review
   - Evaluation, and
   - Action.
4. Annual reporting and review: Updates, amendments, performance thresholds crossed, and trigger(s) activated are provided to relevant governmental organizations within the Annual Report.

Specific objectives for each of the components are:

- Minto Creek Surface Water Quality: to ensure that negative impacts to lower Minto Creek from mining activities are avoided
- McGinty Creek Surface Water Quality: to ensure that negative impacts to lower McGinty Creek from mining activities are avoided
- Groundwater Quality in Minto Creek Watershed: to ensure that negative impacts to lower Minto Creek from mining activities are avoided
- Groundwater Quality in McGinty Creek Watershed: to ensure that groundwater pathways do not cause surface water quality objectives to be exceeded in McGinty Creek at station MN-4.5
- Water Management: to ensure that water can be released from site in a way that protects the water quality in Minto Creek, and
- Physical Stability: to identify physical changes to the conditions of the facilities that may lead to future instability, and allow the mine to mitigate these conditions prior to any occurrence of instability.

2.1.2 Compliance with Approved Plan

The AMP notes that updates, amendments, performance thresholds crossed, and trigger(s) activated will be provided to the appropriate governmental (including SFN) organizations as required and will be part of the Annual Report. Therefore, in order to assess whether Minto was in compliance with the relevant approved AMP, this section assesses any Specific Response protocols that were enacted if or when Specific Performance Thresholds were triggered.

The following reports prepared by Minto were reviewed for this assessment:

- Minto Mine Water Licence QZ14-031 Quartz Mining Licence QML-0001 2015 Annual Report. March 2016
- Minto Mine Water Licence QZ14-031 August 2015 - December 2015 Monthly Reports, and
- Minto Mine Water Licence QZ14-031 January 2016 - May 2016 Monthly Reports.

2.1.2.1 Minto Creek Surface Water Quality

Indicators, performance thresholds, and responses specific to Minto Creek water quality and the monitoring program are provided in Table 2-1 of the AMPs. The Specific Indicators for this component are Aqueous Concentrations in Lower Minto Creek (W2) (nitrates and aluminum, arsenic, cadmium, chromium, copper, iron, lead, molybdenum, nickel, silver, selenium and zinc). In the 2014 AMP the specific indicators were total arsenic, molybdenum, nickel, lead, silver, and zinc; in the 2015 AMP the specific indicators were these same parameters but the dissolved concentrations were specified.

Five Specific Thresholds are defined in Table 2-1 of the AMPs based on Specific Performance Thresholds for Surface Water Quality at station W2, which are provided in Table 2-2 of the respective AMPs. There are three Specific Performance Thresholds based on the concentration of each water quality parameter. In the 2014 AMP the Specific Performance Thresholds for parameters with Water Quality Objectives were:

- Expected Case (Maximum) Water Quality Predictions (lowest total concentration)
- Worst Case Water Quality Predictions, and
- W2 Water Quality Objectives (highest parameter concentrations).

In the 2014 AMP the Specific Performance Thresholds for parameters without Water Quality Objectives were:

- Worst Case Water Quality Predictions, and
- Canadian Water Quality Guideline Concentration.

In the 2015 AMP the Specific Performance Thresholds specific indicators were all dissolved metals and the Specific Performance Thresholds for all parameters were:

- Expected Case (Maximum) Water Quality Predictions
- Worst Case Water Quality Predictions, and
- W2 Water Quality Objectives (highest parameter concentrations).

With the exception of selenium, the parameter concentration values for the Specific Performance Thresholds were the same in the 2014 and 2015 AMPS (i.e., the Worst Case Water Quality Prediction for dissolved arsenic in 2014 and total arsenic in 2015 were both 0.0007 mg/l). The Water Quality Objective for dissolved selenium decreased from 0.005 mg/l in 2014 to 0.002 mg/l in 2015. The Specific Response measures are increasingly stringent as each threshold is exceeded; the measures are the same for both the 2014 and 2015 AMPs.

Section 5.9 of the 2015 Annual Report provides a brief discussion of activities conducted under the AMP and notes that the plan had only been in use since WUL QZ14 - 031 (approved in August 2015) became active. Section 5.6., Clause 109 of WUL QZ14 - 031 states that “the Licensee shall submit to the Board for Review and Approval an updated Operational Adaptive Management Plan. This plan shall be submitted by December 18, 2015, and shall be implemented once approved.” Since WUL QZ14 - 031 was approved in August 2015, and the approved AMP under the QML – 0001 is dated December 2015, Minto presents results between mid-August and December 2015.

Minto provided the following AMP information in the 2015 Annual Report:

- No exceedances of the Water Quality Objectives between mid-August to December 2015, therefore the AMP was not triggered

- All parameters, with the exception of chromium, met the Expected Case Water Quality Predictions; for chromium, the analyzing laboratory detection limit of 0.001 mg/l was higher than the chromium standard (the expected case water quality prediction of 0.00062 mg/l), and
- Molybdenum, arsenic, and zinc exceeded the Worst Case Water Quality Predictions, therefore Specific Responses were implemented.

Minto was therefore in compliance with the AMP by implementing the Specific Response measures in response to the exceedance of Specific Threshold 3 (Predicted Worst Case maximum) for molybdenum, arsenic, and zinc; however, no documentation of the measures are included in the 2015 Annual Report for the August to December 2015 period. The Evaluation and Action Measures for Specific Threshold 3 outlined in the AMP are:

- Evaluation: Compare with W3 results and if comparison indicates mine loadings are responsible for exceedance then evaluate potential causes for load contribution and develop investigation plan.
- Action: maintain weekly monitoring at W2 and W3 and implement investigation plan, including, at a minimum:
  - Re-sampling both W2 and W3 within 24 hours of original sample result receipt
  - Site investigation of candidate load contributions, and
  - Evaluation of potential effects to aquatic resources.

Minto presented the weekly sampling results compared to Expected Case Water Quality Predictions and the Worst Case Water Quality Predictions in Table 7-1 and Table 7-2, respectively, of the August 2015 Monthly Report but did not provide documentation in the Annual Report. Minto subsequently provided to KP documentation of the measures enacted in response to the August 2015 exceedance (the comparison between W2 and W3 and weekly monitoring results). Weekly sampling was continued in September 2015 at site W2, with duplicates collected on two sampling occasions: molybdenum concentration exceeded the Worst Case Water Quality Predictions in one of the seven samples, while arsenic and zinc concentrations were marginally higher than the respective Worst Case Water Quality Predictions on one occasion each. As a result of these exceedances Minto reported that they implemented the Specific Responses outlined in Table 2-1 of the 2014 AMP; no details are provided in the September monthly report. Weekly sampling continued in October 2015: concentrations of molybdenum, arsenic, and zinc were less than the respective Worst Case Water Quality Predictions. Total zinc concentration again exceeded the Worst Case Water Quality Predictions in November 2015, requiring implementation of the Specific Responses. Site W2 was frozen in December 2015, and in January and February 2016 therefore no samples were collected during this period. None of the parameters exceeded the Specific Performance Thresholds in the March 2016 sample.

In April 2016 dissolved aluminum and chromium exceeded the Expected Case Water Quality Predictions; Minto implemented the Specific Responses and documented the steps that were taken, providing the weekly water quality results and comparison with the W3 results in the monthly report (as required under the WUL). The weekly results were also tabulated and compared to the Worst Case Water Quality Predictions – no thresholds were exceeded.

In May 2016 all Expected Case Water Quality Prediction thresholds were met but dissolved molybdenum exceeded the Worst Case Water Quality Prediction threshold during the last weekly

sampling event. Minto reported that Specific Actions were initiated in response to the exceedance; it is expected that the results will be documented in the June 2016 report.

Although Minto was not in compliance with this section of the 2014 AMP, as they did not provide discussion of performance thresholds crossed, and trigger(s) activated for the period January through July 2015 in the Annual Report, they are in compliance with the approved AMP, which is dated December 2015.

2.1.2.2 McGinty Creek Surface Water Quality

Indicators, performance thresholds, and responses specific to McGinty Creek water quality and the monitoring program are provided in Table 2-3 of the 2015 AMP; this component of the AMP applies only to work conducted between January and May 2016. The Specific Indicators for this component are Aqueous Concentrations at Station MN-4.5 for ammonia, nitrite, nitrate and total aluminum, arsenic, cadmium, chromium, copper, iron, lead, molybdenum, nickel, silver, selenium and zinc. Three Specific Thresholds are defined in Table 2-3, based on Threshold Values (80% of the Water Quality Objective and the Water Quality Objective), which are provided in Table 2-6 of the 2015 AMP. Minto started reporting on this component of the AMP in April 2016, as site MN-4.5 was frozen between January and March 2016 and the 2015 AMP was not approved until March 2016. Minto tabulated the monthly concentrations for each of the Specific Indicators along with the threshold values: no exceedances of the threshold values occurred in April or May. Minto was therefore in compliance with the AMP.

2.1.2.3 Groundwater Quality in Minto Creek Watershed

Groundwater originating from the mine area is expected to discharge to surface water in the vicinity of the Water Storage Pond, with minimal groundwater expected to discharge to Minto Creek down gradient of this point. The Specific Indicators, Specific Performance Thresholds and Specific Responses for this component are presented in Table 2-5 of the 2015 AMP. Specific Indicators are dissolved metals with water quality objectives in monitoring wells MW12-05 (downgradient of the Water Storage Pond) or MW12-06 (upgradient of the Water Storage Pond). The Specific Performance Threshold in both wells is the W2 surface Water Quality Objective.

Groundwater sampling is to occur quarterly at MW12-05 and MW12-06 in accordance with the December 2015 Environmental Monitoring, Surveillance, and Reporting Plan; this plan was however not approved until March of 2016, which did not give Minto sufficient time to implement the monitoring program in the first quarter. The first quarterly groundwater samples were collected in May 2016. Minto was technically in compliance with this section of the AMP; given that the Specific Performance Threshold is any exceedance of the W2 surface Water Quality Objective for the Minto Creek watershed AMP component, Minto could evaluate the May 2016 sample results from MW12-05 and MW12-06 against this threshold and determine if Specific Responses need to be applied. This information will need to be presented in the 2016 Annual Report.

2.1.2.4 Groundwater Quality in McGinty Creek Watershed

The Minto North Pit is the only mine facility in the McGinty Creek catchment; groundwater in the McGinty Creek catchment downgradient of the Minto North Pit is monitored at multi-level monitoring well MW09-03. The Specific Indicators, Specific Performance Thresholds and Specific Responses

for this component are presented in the 2015 AMP in Table 2-7. Three Specific Performance Thresholds are identified for this component, with the first two thresholds applying to all of the parameters except dissolved iron from MW-09-03-02, and the third threshold applying only to dissolved iron in MW-09-03-02:

- Specific Threshold 1: four consecutive exceedances of the MN4.5 surface water quality objective from a single monitoring port in MW09-03
- Specific Threshold 2: one result greater than ten times the MN4.5 surface water quality objective from a single monitoring port in MW09-03, and
- Specific Threshold 3: two consecutive dissolved iron results greater than 47.6 mg/l from MW-09-03-02.

Groundwater sampling is to occur quarterly in MW09-03: the first quarterly groundwater samples were collected in May 2016; therefore, Minto was not in compliance with the 2015 AMP however the EMSRP and AMP were not approved until March of 2016, which did not give Minto sufficient time to implement the monitoring program in the first quarter. Specific Performance Threshold 2 is any exceedance of ten times the MN-4.5 Surface Water Quality Objective, Minto should evaluate the May 2016 sample results from MW09-03 against this threshold to determine if Specific Responses need to be applied, and present this information in the monthly reports and in the 2016 Annual Report for compliance with the AMP. It is recommended that the results from each quarterly sampling period be included in the relevant monthly monitoring report for transparency and ease of tracking compliance; this is not a requirement of the Annual Report for QML - 0001 but Minto committed to including this information in the monthly reports.

2.1.2.5 Water Management

The Specific Indicator for the Water Management component of the 2014 and 2015 AMPs is Water Inventory in the Main Pit Tailings Management Facility or the Area 2 Pit Management Facility. There are three Specific Performance Thresholds based on the water inventory (capacity) target:

- Water inventory target is exceeded for a period of three months. The water storage capacity still exceeds 1,000,000 m^3
- The water storage capacity is less than 1,000,000 m^3, and
- The water storage capacity is less than 500,000 m^3.

Minto reported that the water storage capacity in the Main Pit Tailings Management Facility and the Area 2 Pit Tailings Management Facility was greater than 1,000,000 m^3 during the operational period in 2015 and in the first five months of 2016, therefore no Specific Performance Thresholds were triggered and Minto was in compliance with the AMP.

2.1.2.6 Physical Stability

The physical stability of the waste rock, tailings and water storage facilities are monitored according to the Physical Monitoring Plan of the EMSRP. The Specific Indicators for the Physical Stability component of the 2014 and 2015 AMPs were the same:

- Mass movement indicated by monitoring of geotechnical instrumentation
- Visual observations of physical damage
- Visual observations of evidence that could suggest mass movement, and
- Occurrence of seismic events.

The AMPs designate two Physical Stability Categories: Category 1 facilities are founded in areas of ice-rich periglacial foundations that have previously experienced deep seated foundation movement and Category 2 facilities consist of all the remaining waste rock dumps and the Main Dam. There are five Specific Performance Thresholds for Category 1 facilities and three for Category 2 facilities. The Specific Response for Exceedance of Specific Threshold 1 requires that Minto include information about the event in the Annual Report.

Results of the physical stability monitoring program are not included in the Operations Adaptive Management Plan section (Section 5.9) of the 2015 Annual Report; instead, the Physical Monitoring Program results are presented in Section 5.18 for survey hub and inclinometer readings and in Section 5.15 for vibrating wire piezometer, pore water pressure and ground temperature monitoring. These sections do not reference the Specific Indicators or Specific Performance Thresholds of the AMP.

Although the 2016 AMP is not approved, Minto compared the results of the Physical Monitoring Program to the Specific Performance Thresholds of the 2016 AMP for Category 1 facilities in the April and May 2016 monthly reports. It should be noted that the physical stability section of the 2016 AMP is similar to the 2015 AMP with the only differences being the addition of SFN and mines inspector notification in all thresholds, increased monitoring frequency in threshold 5 and the removal of a piezometer (15-DSP-09) which was destroyed during the construction of the Mill Valley Fill Extension Stage 2. One of the piezometers exceeded Specific Threshold 3 and three of the piezometers exceeded Specific Threshold 4 in both April and May 2016: Minto documented the Specific Responses that were applied in response to the exceedances. No stability concerns were identified by the Geotechnical Engineer or engineer of record.

It is recommended that Minto present the results of the Physical Stability Monitoring Program within the AMP section of the Annual Report, and continue to do so in the Monthly Reports, making clear reference to the Physical Stability Categories, Specific Indicators, and Performance Thresholds for both Category 1 and Category 2 facilities. Minto was in partial compliance with the AMP in the 2015 Annual Report; it is outside the Environmental Audit scope to evaluate the data to determine if Specific Performance Thresholds were exceeded in 2015.

2.1.3 Adequacy to Meet Plan Objective

To assess whether the Specific Responses were effective in meeting the objectives of the AMP, this section summarizes the results presented in the Annual Report and the monthly reports for each of the components and any Evaluation and Action steps that were implemented if Specific Performance Thresholds were triggered.

2.1.3.1 Minto Creek Surface Water Quality

Minto implemented the Specific Response measures in response to the exceedance of Specific Threshold 3 (Predicted Worst Case maximum) for molybdenum, arsenic, and zinc in 2015; however, the results of the Specific Response protocol steps for Evaluation and Action were not included in the Annual Report.

In order to assess whether the Specific Response measures were effective in meeting the objective of ensuring that negative impacts to lower Minto Creek from mining activities are avoided, the Annual Report should document the results of the Evaluation (comparison of W2 results with W3 results,

and if the comparison indicates that mine loadings are responsible for the exceedance develop an investigation plan) and Action measures (maintain weekly monitoring at W2 and W3, implement investigation plan), as was done in the 2016 monthly reports starting in March.

2.1.3.2 McGinty Creek Surface Water Quality

No exceedances of the threshold values occurred in April or May at the McGinty Creek monitoring site; therefore the AMP objective of ensuring that negative impacts to lower McGinty Creek from mining activities are avoided was achieved.

2.1.3.3 Groundwater Quality in Minto Creek Watershed

Groundwater quality monitoring in Minto Creek is a component of the approved December 2015 AMP; Minto is not required to provide the results of the May 2016 sampling program for MW12-05 and MW12-06 in the monthly report; therefore, it is not possible to assess the adequacy of the program to meet the AMP objective. It is assumed that this information will be presented in the 2016 Annual Report.

2.1.3.4 Groundwater Quality in McGinty Creek Watershed

Groundwater quality monitoring in McGinty Creek is a component of the approved December 2015 AMP; Minto is not required to provide the results of the May 2016 sampling program for MW09-03 in the monthly report; therefore, it is not possible to assess the adequacy of the program to meet the AMP objective. It is assumed that this information will be presented in the 2016 Annual Report.

2.1.3.5 Water Management

No Specific Thresholds related to water management were exceeded in 2015; therefore, the AMP objective of ensuring that water can be released from site in a way that protects the water quality in Minto Creek has been met.

2.1.3.6 Physical Stability

Minto did not present the results of the 2015 Physical Stability Monitoring Program with respect to Specific Performance Thresholds and did not indicate whether Specific Responses were implemented; therefore, it is not possible to assess the adequacy of the program to meet the AMP objective of identifying physical changes to the conditions of the facilities which may lead to future instability.

2.1.4 Compliance with Minto Policies and Procedures

The AMP complies with the overarching Minto policy by providing a clearly defined environmental management program, outlining procedures to follow if stated thresholds are exceeded, and implementing additional mitigation measures if the threshold exceedances are attributed to mining operations.

2.1.5 Information Reliability and Integrity

2.1.5.1 Minto Creek Surface Water Quality

The information reliability and integrity for the Minto Creek surface water quality sampling is high. The monthly reports contain copies of the Certificate of Analysis from the analyzing laboratories, which include Quality Assurance Reports.

2.1.5.2 McGinty Creek Surface Water Quality

The information reliability and integrity for the McGinty Creek surface water quality sampling is high. The monthly reports contain copies of the Certificate of Analysis from the analyzing laboratories, which include Quality Assurance Reports.

2.1.5.3 Groundwater Quality in Minto Creek Watershed

The groundwater quality component is a requirement of the December 2015 AMP – results of the 2016 monitoring program will be presented in the 2016 Annual Report. Minto is not required to present the AMP results in the monthly reports under QML – 0001.

2.1.5.4 Groundwater Quality in McGinty Creek Watershed

The groundwater quality component is a requirement of the December 2015 AMP – results of the 2016 monitoring program will be presented in the 2016 Annual Report. Minto is not required to present the AMP results in the monthly reports under QML – 0001.

2.1.5.5 Water Management

Minto provides information on water storage volumes movement and tracking in Section 7.3 of the 2015 Annual Report. The information reliability and integrity for mine site water management is therefore high. It is recommended that Minto refer to this section of the Annual Report in the AMP section.

2.1.5.6 Physical Stability

The information reliability and integrity for physical monitoring presented in Sections 5.18 and 5.19 of the 2015 Annual Report is high. The monitoring program is outlined in detail and monitoring results are presented graphically.

2.2 EMERGENCY RESPONSE PLAN

2.2.1 Plan Objective

The purpose of the Minto Mine Emergency Response Plan (ERP) prepared by Minto Mine in March 2015 is to set out the response protocols (including reporting and investigation requirements) for emergencies that could occur on site. Emergencies as outlined in Section 2.1 of the ERP are:

- Any “serious injury” or “serious accident” as defined by the Yukon Occupational Health and Safety Act 30 (1)
- Any incident requiring first aid or rescue response to the scene, depleting resources to respond to secondary emergency
- Any fire requiring more action than initial suppression deployment
- Landslide, earthquake, avalanche, forest fire or flooding where injury or property damage results or may result
- Major power failure
- Missing person
- Loss of life, and
- Spill Emergency.

“Serious Accident” as outlined in the ERP means:

- An uncontrolled explosion
- Failure of a safety device on a hoist, hoist mechanism, or hoist rope
- Collapse or upset of a crane
- Collapse or failure of a load-bearing component of a building or structure regardless of whether the building or structure is complete or under construction
- Collapse or failure of a temporary support structure
- An inrush of water in an underground working
- Fire or explosion in an underground working
- Collapse or cave-in, of a trench, excavation wall, underground working, or stockpile
- Accidental release of a controlled product
- Brake failure on mobile equipment that causes a runaway, and
- Any accident that likely would have caused serious injury but for safety precautions, rescue measures, or chance.

The ERP does not cover spills – this is dealt with in the Spill Contingency Plan. The ERP does not contain detailed Emergency Responder Directives and Procedures: defined emergency response equipment and activities are directed by the Minto Safety Department.

2.2.2 Compliance with Approved Plan

Actions or measures outlined in the ERP that can be tracked for compliance when no incidents have occurred are:

- The controlled document will be regularly updated to reflect revisions; with next scheduled update in March 2016
- Visitor, employee, and contractor emergency training as part of the Minto Mine orientation package, and
- Emergency Response Equipment inventory.

The ERP was updated in March 2016. Minto keeps records of personnel that have been trained: orientations are tracked on Simply Safety under the heading of Safety Orientation. Emergency response equipment is checked through a weekly check system and hard copies are kept in the safety office.

The following actions or measures outlined in the ERP that can be tracked for compliance when an incident has occurred are implementation of:

- Emergency response protocols
- Incident Accountability System
- Incident Command System
- Employee responsibility, and
- Government reporting.

The 2015 Annual Report notes that in 2015 there were no loss time accidents, fifteen medical aids, and eight serious incidents reported to the Yukon Workers Compensation Health and Safety Board. The ERP does not require documentation of any incidents or follow up reporting; therefore, Minto was in compliance with the ERP in 2015.

2.2.3 Adequacy to Meet Plan Objectives

The ERP meets its stated purpose by outlining response protocols for emergencies that could occur on site. However, the incidents included in the definition of “Emergency”, with the exception of fire and spill emergency, are not related to the environment, and for Spill Emergency the reader is directed to refer to the Spill Contingency Plan March 2015. Similarly “Serious Accident” as defined within the ERP only lists one incident type (“accidental release of a controlled substance”) that could have an adverse effect on the environment, and again this would be managed under the Spill Contingency Plan.

2.2.4 Compliance with Minto Policies and Procedures

The ERP is in compliance with Minto policies and procedures.

2.2.5 Information Reliability and Integrity

No documentation or follow up reporting requirements are included in the ERP, therefore assessment of information reliability and integrity of data is not applicable for this plan.

2.3 ENVIRONMENTAL MONITORING, SURVEILLANCE, AND REPORTING PLAN

The Environmental Monitoring, Surveillance, and Reporting Plan (EMSRP) developed by Minto is comprised of the following component programs:

- Water monitoring
- Geochemical monitoring
- Meteorological monitoring
- Physical monitoring
- Aquatic environmental monitoring
- Terrestrial environment monitoring, and
- Progressive Reclamation Effectiveness Monitoring.

The two plans that were reviewed were:

- Environmental Monitoring, Surveillance, and Reporting Plan, prepared by Minto Explorations Ltd. June 2014, and
- Environmental Monitoring, Surveillance, and Reporting Plan, prepared by Minto Explorations Ltd. December 2015.

Although the approved EMSRP is the December 2015 version as noted by its listing in Schedule C of QML - 0001, the work conducted by Minto in 2015 was assessed against the requirements of the 2014 version.

The main difference between the 2014 and 2015 versions is the expansion of the Metal Mine Effluent Regulations Monitoring Programs (including the Environmental Effects Monitoring (EEM) program, and inclusion of sediment toxicity monitoring and periphyton and benthic invertebrate tissue analysis. The EMSRP was further revised in February 2016, but this plan is not yet listed in Schedule C of QML – 0001, therefore it is not yet considered to be approved.

Data generated from these programs under QML - 0001 are required to be submitted in the Annual Report, with the exception of the EEM program, which is submitted every 36 or 72 months, depending on the results of the previous biological monitoring program. The QML requires that the Annual Report include a summary of the programs and an analysis of the data, as well as any actions taken to monitor or address any changes in environmental performance.

The requirements of each of the component programs of the EMSRP are summarized, and the results presented in the Annual Report are assessed in this section of the environmental audit for most of the component programs: the Progressive Reclamation Effectiveness Monitoring Program is presented in Section 3.

2.3.1 Plan Objectives

The objectives for each of the components of the EMSRP are:

- Water Monitoring Program:
  - Surface Water Surveillance Program: to monitor surface water quality and hydrological conditions at stations within the operational mine area, downstream stations which are influenced by mine effluent discharge, and downstream reference stations which are not exposed to effluent.
  - Metal Mine Effluent Monitoring Program: to maintain compliance with the Metal Mine Effluent Regulations (MMER).

  - Groundwater Monitoring Program: to monitor potential impacts on groundwater from the mine project components.
  - Seepage Monitoring Program: to assess and monitor potential acid rock drainage and metal leaching conditions at the Minto Mine.
- Geochemical monitoring program:
  - Overburden and waste rock ABA test program: the stated objective of the program in the EMSRP is to classify all overburden, waste rock and low grade, partially oxidized material mined at the Minto Mine and disposed of on surface. Minto reports that a further objective is to include an assessment of the potential for waste rock to become acid generating and provide for the appropriate dispatch of waste.
  - Tailings solids monitoring program: to maintain an inventory of the geochemical properties of the tailings produced during the project life.
- Meteorological monitoring:
  - Climate Monitoring Program: to collect climatic data specifically for the Minto Mine site.
  - Snow Survey Program: to collect snow data used for calculating the snow water equivalent specifically at the Minto Mine.
- Physical monitoring: objective of the Mine Infrastructure and Workings (Physical) Monitoring Program is to monitor the performance of key mine infrastructure and workings.
- Aquatic Environmental Monitoring:
  - Sediment Monitoring Program: to monitor the sediment quality of Minto Creek and to provide data to allow interpretation of the potential influence of the Minto Mine on sediment quality.
  - Benthic Invertebrate Monitoring Program: to monitor the condition of the benthic invertebrate community of Minto Creek and to provide data to allow interpretation of the potential influence of the Minto Mine on the benthic invertebrate community.
  - Minto Creek Annual Fisheries Monitoring Program: to monitor, assess and characterize fish usage in Minto Creek and to provide data to allow interpretation of the potential influence of the Minto Mine on the fish community.
  - Periphyton Monitoring Program: to monitor the condition of the periphyton community in Minto Creek.
  - EEM Program: to characterize the impact of effluent on the receiving environment through water quality and biological monitoring.
- Terrestrial Environment Monitoring Program: to monitor invasive plant species, wildlife and erosion and sedimentation occurring in and around the mine site.

The QML requires that Minto present a summary of the EMSRP in the Annual Report. Information pertaining to the EMSRP is also required to be submitted in monthly and quarterly reports under the WUL.

2.3.2 Compliance with Approved Plan

2.3.2.1 Water Monitoring Program

Surface Water Surveillance Program

The Surface Water Surveillance Program outlined in the EMSRP contains weekly and monthly water quality monitoring requirements, and continuous, weekly and monthly monitoring requirements for

surface water hydrology and water conveyance flows. Measures which can be tracked for compliance are:

- Continuous flow monitoring (14 sites).
- Continuous flow when dewatering (10 sites).
- Water quality monitoring with samples analyzed by external laboratory (two sites quarterly; 35 sites monthly; eight sites weekly while discharging).
- Water quality monitoring with samples analyzed by internal laboratory (two additional weekly samples).
- Analytical requirements include *in situ* field parameters, physical parameters, nutrients, total and dissolved metals, dissolved organic carbon, and bioassays.
- The EMSRP approved in June 2014 has the following requirements for bioassay and chronic toxicity testing:
  - 96-Hr LT50 rainbow trout static bioassay and 48-Hr LT50 *Daphnia magna* static bioassay: W3 and W16A monthly while discharging, W50 monthly).
  - 7-day chronic toxicity testing with *Ceriodaphnia dubia* (one site (W2) monthly while discharging, one site (W50) monthly).
- The EMSRP approved in December 2015 has the following requirements for bioassay and chronic toxicity testing:
  - Chronic Toxicity *Ceriodaphnia dubia* (CD-7d): monthly while discharging at station W2 plus quarterly at station W2 and monthly at station W50.
  - Chronic toxicity 30 day Early Stage Toxicity for Rainbow Trout (CT-30d) and 72-hour chronic toxicity for Algae (CA-72hr): quarterly at station W2.
  - 96-Hr LT50 rainbow trout static bioassay and 48-Hr LT50 *Daphnia magna* static bioassay: W3 and W16A monthly while discharging, W50 monthly.

The Surface Water Surveillance Program monitoring results are presented in Section 5.1 of the Annual Report. Minto tabulated the number of water quality sampling events at each site and provided an explanation for sites where the sampling frequency was not in conformance with the schedule in the EMSRP (e.g., site frozen, site dry, pit sampling sites not established since new pits were not developed in 2015). The *in situ* field results are provided in the monthly reports.

The 2015 water quality results were compared to historical results in the Annual Report to identify trends and compare 2015 values with previous values. Water quality result statistics including the mean, minimum, and maximum, are presented in summary tables. The WUL effluent quality standards were compared to the water quality result statistic summaries at stations W16A, W17, W50 and WTP. The WUL water quality objectives were compared to the water quality result statistic summary at station W2. Selenium was the only parameter noted as exceeding the WUL Water Quality Objective in the 2015 Annual Report; however, Minto reports that the selenium WQO of 0.0001 mg/L provided in Table 5-3 of the 2015 Annual Report is incorrect - the previous license Selenium (total) WQO was 0.001 mg/L whereas the current WUL WQO is 0.002mg/L. There were no exceedances of the correct WUL WQO for selenium in 2015.

Results of the flow monitoring program are provided in the monthly reports. Minto notes in Section 5.3.1 of the 2015 Annual Report that hydrological monitoring on Minto Creek is conducted in accordance with the requirements of the WUL, and that during 2015 Minto maintained and collected data from four stations in Minto Creek. Minto notes in Section 5.3.2 of the 2015 Annual Report that

hydrological monitoring at three stations on McGinty Creek is conducted in accordance with the EMSRP. Discharge events are recorded in the monthly reports.

During 2015 Minto was required to conduct static bioassay tests (96-Hr LT50 rainbow trout and 48-Hr LT50 *Daphnia magna*) at W3 and W16A monthly while discharging and at W50 monthly, as well as chronic toxicity testing (7-day with *Ceriodaphnia dubia)* at W2 monthly while discharging and W50 monthly. A summary from the monthly reports indicating when water quality samples were collected from each of these sites, when a discharge to the environment occurred, and the months in which the tests were completed is provided in Table 1. Minto reports that biological testing occurred in March, April, and May 2016, but results were not included in the monthly reports.

Table 1 2015 and First Quarter 2016 Surface Water Surveillance Program Monitoring Summary

Year	Month	Water Quality Sampling				Discharge to Environment	Biological Test
		W2	W3	W16A	W50		
2015	January	dry	sampled	sampled	dry		
2015	February	dry	sampled	sampled	dry		
2015	March	dry	sampled	sampled	dry		
2015	April	sampled	sampled		sampled	From W17, W16a (WSP)	*Ceriodaphnia dubia (W2, W50); Daphnia magna (W3, W16A, W50);* rainbow trout *(W3, W16A, W50)*
2015	May	sampled	sampled	sampled	sampled	From W17, W16a (WSP)	*Ceriodaphnia dubia; Daphnia magna;* rainbow trout
2015	June	sampled	sampled	sampled	dry		
2015	July	sampled	sampled	sampled	dry		
2015	August	sampled	sampled	sampled	dry		
2015	September	sampled	sampled	sampled	dry		*Ceriodaphnia dubia (W2)*
2015	October	sampled	sampled	sampled	dry		
2015	November	frozen	sampled	sampled	dry		
2015	December	frozen	sampled	sampled	dry		
2016	January	frozen	sampled	sampled	dry		
2016	February	frozen	sampled	sampled	dry		
2016	March	sampled	sampled	sampled	dry		*Tested but not included in monthly reports*
2016	April	sampled	sampled	sampled	sampled	From WSP	
2016	May	sampled	sampled	sampled	sampled	From WSP	

Discharge to the environment occurred in April and May 2015, and Minto reported that the bioassay and chronic toxicity tests were conducted in these two months. Detailed sample results are appended to the April 2015 monthly report for the required sites; no lab results for toxicity testing are provided with the May 2015 monthly report.

Minto discharged water from the WSP in April and May 2016 and tabulated the water quality results at W16a and W50 in comparison to the Effluent Quality Standards but did not report the required bioassay and chronic toxicity tests in the monthly reports.

Metal Mine Effluent Monitoring Program

Effluent monitoring required under the MMER is included under the Water Management Program of the EMSRP separately from the Surface Water Surveillance Program in the 2014 EMSRP. The MMER monitoring station is W3, downstream of the end of pipe discharge. Site W3 is considered the Final Discharge Point (FDP) under MMER. Therefore, the MMER Regulations consider Minto to be discharging, as long as there is water flowing through FDP monitoring station W3; regardless of whether the mine is actively discharging from other effluent points upstream of W3 (Flemming 2016[1]). The following activities listed in the EMSRP are included in the MMER component of the program; it should be noted that this is not a complete list of the MMER requirements:

- Effluent water quality samples collected weekly during discharge at station W3.
- Sublethal toxicity samples collected quarterly, or monthly during discharge (Under Schedule 5 Environmental Effects Monitoring Studies, Section 5(1)(a) sublethal toxicity testing is conducted on fish species, an invertebrate species, a plant species, and an algal species in the case of effluent deposited into fresh waters).
- Radium 226 collected quarterly, or monthly during discharge.
- Acute lethality testing on rainbow trout and *Daphnia magna* conducted at least once per month during effluent discharges. If 12 acute lethality tests conducted on effluent are determined to be not acutely lethal, the testing frequency can be reduced to once per quarter according to the MMER(1).
- Acute lethality testing required immediately if a deposit occurs outside the normal course of events, and twice per month if the sample effluent is determined to be acutely lethal.
- Reporting of water quality results and discharge volumes required quarterly and annually to Environment Canada.

Minto has several years of sampling with “not acutely lethal” results and operates under a reduced frequency sampling program for MMER toxicity testing, with acute testing required quarterly and sub-lethal testing required annually(1).

Minto provided the results of the Effluent Monitoring Program submitted to Environment Canada as required under the MMER in Appendix B of the 2015 Annual Report. Minto conducted weekly effluent water quality monitoring throughout 2015; acute lethality testing on trout and *Daphnia magna* were conducted quarterly under the MMER reduced sampling frequency condition(1). According to Appendix B, acute toxicity samples were collected in March, June, August, and October 2015(1). Radium tests were conducted quarterly; in March, April, August and October 2015. Radium results are presented in Appendix B. The laboratory certificate of analyses provided in the monthly reports for 2015 show Radium 226 analysis results for March only; although the certificate of analysis

1 Flemming, 2016. Personal Communication.

contained in the October 2015 monthly report indicates that Radium 226 was sampled, no test results were provided. Minto submitted the data electronically to RISS in compliance with the MMER requirements and therefore the EMSRP.

The Environmental Effects Monitoring (EEM) component of MMER was met in 2015: water quality monitoring was characterized quarterly at the FDP- W3, and in May, June, August and October for the Reference station – W7 , and the Exposure station – W2[(1)]. The reference and exposure stations were not sampled until May because they were frozen solid in the first quarter[(1)].

According to Appendix B, effluent samples were collected in May, June, August, and October 2015. Discharge was occurring at the MMER FDP – W3; therefore it is compliant with the MMER reduced frequency of an annual requirement for the sublethal testing[(1)].

Groundwater Monitoring Program

Groundwater well monitoring for water level and water quality instrumentation includes multi-level monitoring wells, stand pipe wells, drivepoint wells, vibrating wire piezometer strings, and thermistor strings. In accordance with the 2014 EMSRP sampling was to occur twice per year, once in the spring and once in the fall, at 12 wells (eight “operational” and four “baseline”); monitoring frequency was increased to quarterly in the 2015 EMSRP at 14 wells (11 operational and 3 baseline).

Results of the 2015 groundwater monitoring program are discussed in Section 5.15.1 of the 2015 Annual Report. Groundwater sampling frequency was increased to quarterly when conditions allowed in 2015: not all wells were sampled quarterly and some of the wells were not sampled at all due to the wells being dry or frozen. For wells that were sampled three or more times in 2015, Minto provides a statistical summary (mean, minimum, maximum) of the analytical water quality results in Section 5.15.1. The analytical results for the wells that were sampled are provided as Appendix L of the Annual Report; the sampling dates for each of the wells have been compiled from this appendix and are summarized in Table 2.

Seven of the wells were dry or frozen throughout 2015; of the wells that were not dry or frozen, three (MW12-06, MW12-07, MW12-05) were sampled at the frequency and timing outlined in the 2014 EMSRP – the remaining two (MW09-03 and MW11-04) were sampled only in spring or fall, not both; however, at MW11-04 sampling was attempted three times but the well only contained enough water for sampling on one occasion. The first set of groundwater samples for 2016 were collected in May; the EMSRP prepared by Minto Exploration Ltd. in December 2015 was not approved until March of 2016, which did not give Minto sufficient time to conduct the first quarterly sampling.

Minto presents the results of the ground temperature profiles in Section 5.15.3 of the 2015 Annual Report. A vibrating wire piezometer summary is provided in Section 5.15.2 of the 2015 Annual Report. *In situ* well parameters (pH, conductivity, temperature) are not provided in the 2015 Annual Report, therefore Minto was not in compliance with the EMSRP for this aspect of the program.

Table 2 2015 Operational Groundwater Monitoring Conformance

Well	2015 Sampling	Notes
MW09-01	None	Dry; noted as Operational in 2015 Annual Report
MW12-DP1	None	Noted as Operational in 2015 Annual Report; not produced water since it was installed in 2012
MW12-DP2	None	Noted as Operational in 2015 Annual Report; dry and/or frozen throughout 2015.
MW12-DP3	None	Noted as Operational in 2015 Annual Report; did not produce enough water to analyze during 2015
MW12-DP4	October 10	Noted as destroyed after completion of October sample session during construction of the Mill Valley Fill Extension Stage 2 in 2015 Annual Report; analytical data not provided in Appendix L
MW12-06	May 5 August 17 September 19	Noted as Operational in 2015 Annual Report; produced results from all sampling zones (02, 04, 06).
MW12-07	January 12 March 20 April 24 May 22 July 18 September 18 October 11	Noted as Operational in 2015 Annual Report; produced results from all sampling zones (01 and 02).
MW12-05	January 1 February 16 May 15 August 8 September 19	Noted as Operational in 2015 Annual Report; produced results from all sampling zones (01, 03, 05 and 07).
MW09-03	August 18 September 19	Noted as Operational in 2015 Annual Report; three sampling zones
MW11-02		Noted as Operational (sometimes frozen) in 2015 Annual Report; dry throughout 2015
MW11-03		Noted as Operational (sometimes frozen) in 2015 Annual Report; dry throughout 2015
MW11-04	May 9	MW11-04A in 2015 Annual Report; Noted as Operational; sampling attempted three times but well only contained enough water for sampling on one occasion

NOTES:

1. Required monitoring frequency as per June 2014 EMSRP.

Seepage Monitoring Program

The following measures outlined in the EMSRP for the Seepage Monitoring Plan to assess acid rock drainage and metal leaching conditions can be tracked to assess compliance:

- Seepage monitoring completed twice per year, once in the spring and once in the fall.
- Survey for seepage of all project components including the ore stockpile area; overburden dump; waste rock dumps; dry stack tailing storage facility; mill valley fill area; mill area; dam seepage.
- Seepage surveys carried out along the toe of each location; survey routes recorded and sample collection where actively flowing seepage encountered.
- Analytical parameters required for water quality samples are:
  - Physical parameters
  - Conductivity
  - Total Dissolved Solids
  - Alkalinity
  - Sulphate
  - ICP Scan- Dissolved Metals
  - Ammonia-N, Nitrate-N, Nitrite-N and Phosphorous, and
  - *In-situ* parameters- pH, Conductivity and Temperature.
- Three photos are taken at each sample location; field data and observations are recorded on a purpose-designed form.

Results of the seepage water quality monitoring program are presented in Section 5.4 of the 2015 Annual Report; the analysing laboratory certificates of analysis are found in Appendix E. The seepage survey lines are shown on Figure 5-13. Minto was therefore in compliance with the EMSRP in conducting the seepage monitoring program twice in 2015, surveying and recording the seepage routes, graphically presenting the water quality results, and providing the raw data. Although no photos of the sample locations or field data and observation forms are provided, this is not technically required in the Annual Report in accordance with QML - 0001.

MCDS Seepage Monitoring Program

Minto was required to complete the following activities as part of the 2014 EMSRP MCDS seepage monitoring program in 2015:

- MCDS pond water level recording, installation and monitoring of ground temperature cables and assessment of foundation thawing, contaminant monitoring and transport assessment, and the establishment of appropriate triggers and adaptive responses.
- Annual physical monitoring: after spring thaw and prior to on-set of winter by a qualified professional engineer licensed to practice in the Yukon.
- Monthly physical monitoring (during non-winter months) by Minto based on an inspection checklist.
- Groundwater sampling spring and fall (as part of the previously mentioned program).
- Water quality data gathered from groundwater well MW12-06 located downstream of the MCDS analyzed in conjunction with the data collected from the drive point piezometers, surface water downgradient of the MCDS (W37 station) and the MCDS pond (W36 station).
- Additional responses are required if the following triggers are exceeded:
  - Physical monitoring: if deficiencies are observed by the Engineer, then the Engineer will develop a remedial action plan to manage the observed deficiencies.

- Pond levels monitoring: if the Water Storage Pond levels reach the point where freeboard is limited, then water is to be pumped to the Area 1 Pit.
- Groundwater quality: if groundwater quality trends toward that contained in the MCDS then functionality of MCDS is re-assessed in terms of its water retention capabilities.

Minto notes in Section 5.20 (physical monitoring) of the 2015 Annual Report that the MCDS was decommissioned and replaced by MVFE2 collection sump in 2015, though it is not clear when this occurred Minto subsequently reported that the MCDS was decommissioned in December 2015[(2)]. Water quality summary statistics (12 samples) for station W36 (the Minto Creek Detention Structure Pond) are provided in Section 5.1.17 of the Annual Report. Minto presents the water quality results for station W37 in Section 5.4.3 of the 2015 Annual Report: four samples were collected between January and mid-July 2015. Site W37 was dry until the MCDS was decommissioned in December 2015[(2)]. Copies of the monthly physical monitoring inspection checklist were not provided.

Water quality results from groundwater well MW12-06 were presented in Section 5.15.1.12 of the 2015 Annual Report. The W37 data were not analyzed in conjunction with the results from station W36 (the MCDS pond), and Minto did not provide a comparison of the W36 results with groundwater well MW12-06, as required to assess the functionality of the MCDS in terms of its water retention capabilities for the period in 2015 during which it was functional. Minto was therefore not in full compliance with the EMSRP in not providing comparison of W37 results with the MW12-06 results and not providing water level data in the MCDS during the time the MCDS was operational. Due to the pond size it was difficult to comply with this requirement[(2)].

2.3.2.2 Geochemical Monitoring Program

The Geochemical Monitoring Program is comprised of:

- Acid Base Accounting (ABA) Program for monitoring of overburden and waste rock derived from the underground and open pit mining operations, and tailings from milling
- Waste Rock Management Verification Program, and
- Low Grade and Oxide Ore Metals Leaching Characterization Program (2015 EMSRP only – under development).

ABA Monitoring Program

The components of the ABA monitoring program that can be tracked for compliance with the EMSRP are:

- On-site ABA monitoring carried out on drill cuttings from every blast hole
- A portion of each sample sent for total sulphur (S(T)) and total carbon (C(T)) analyses at the on-site laboratory
- S(T) and C(T) results converted into equivalent acid potential (AP-S(T)) and neutralization potential (NP-C(T)) values, and NP-C(T):AP-S(T) ratios calculated for each sample
- Samples are used to define polygons outlining contiguous zones of waste rock types - either bulk waste or waste with an NP-C(T):AP-S(T) ratio less than 3.0
- Composite samples from each waste class for each blast formed from the individual samples are sent off - site to a commercial laboratory to provide external verification for quality control purposes

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- External verification samples analysed for paste pH, total sulphur, sulphate sulphur, total inorganic carbon, modified neutralization potential (Modified NP) and metals by aqua regia digestion with ICP finish
- ABA sample frequency, sample type and analysis requirements are:
  - Overburden: representative sampling whenever overburden is mined.
  - Open pit waste rock: each blast hole and one composite sample per waste class per blast containing >25% waste (2014 EMSRP); ABA sampling occurs every 4-5 drill holes with the aim of ensuring even coverage throughout the drill pattern (2015 EMSRP).
  - Underground Waste Rock: one sample for every 50 m of development.
  - Tailings Solids: monthly sampling, one composite sample per month comprised of weekly final tailings sample.
- Annual report must include comparison between new and historical data (including discussion) and comparison of NP/AP and sulphide sulphur (log NP/AP versus log percent sulphide sulphur graph), and
- ABA test work must be conducted on all mined materials proposed for use in construction; Construction material must have NP-C(T):AP-S(T) greater than 3 and total sulphur content less than 0.3%.

Waste Rock Management Verification Program

The Waste Rock Management Verification Program includes detailed record-keeping on the types and quantity of waste rock placed at each location, and monitoring and verification of the characteristics of the waste rock stored at each location. Procedures that can be tracked for compliance with the EMSRP are:

- Waste rock manually sampled at 25 m intervals along each active dump crest
- Each sample analyzed at site for copper, S(T), and C(T); S(T) and C(T) values are converted into equivalent acid potential (AP-S(T)) and NP-C(T) values, and NP-C(T):AP-S(T) ratios are calculated for each sample
- Resulting NP-C(T):AP-S(T) ratio values compared to the segregation criteria and assigned ‘Pass’ or ‘Fail’ verification designations
- If two or more adjacent failures occur, the crest is resampled at 5 m intervals over each 25 m crest section represented by the failed samples, and
- If the calculated bulk zone NP-C(T):AP-S(T) ratio is below the segregation criteria for the dump, further sampling is carried out to define the limits of the zone in three dimensions. The non-conforming material is excavated and relocated to one of the waste rock dump locations that will ultimately be saturated.

Geochemical testing records are included in the monthly reports. Minto discusses the Waste Rock Verification Program in Section 5.16 of the 2015 Annual Report, with sample results provided in Appendix M. A total of 68 waste samples were collected from the Main Waste Dump Extension and the Mill Valley Fill Extension, and each sample was analysed for Cu (T), S (T), and C (T) content. Results were converted into AP-S(T) and NP-C (T), and NP-C(T):AP-S(T) ratios were calculated for each sample. Of the 68 samples, 67 met the segregation criteria. Minto discusses the Acid-Base Accounting Program in Section 5.17 and Appendix N of the 2015 Annual Report. Minto was in full compliance with the EMSRP for the Geochemical Monitoring Program.

2.3.2.3 Meteorological Monitoring Program

Meteorological monitoring consists of collection of maximum wind speed, minimum wind speed, average wind speed, wind direction, precipitation (rain and snow), temperature, relative humidity, barometric pressure, solar radiation and calculated evapotranspiration, as well as snow depth, snow density, and snow water equivalent.

Minto presents the rainfall, snowfall, temperature, evaporation, wind speed and direction, and total sunshine hour data collected during 2015 from the meteorological station located approximately 70 m northeast of the north end of the airstrip in Section 5.7.1 of the 2015 Annual Report and in the monthly reports. Minto reports the results of the snow courses in Section 5.7.2 of the 2015 Annual Report; snow survey data are summarized in Appendix H. Minto was in compliance with the EMSRP for the Meteorological Monitoring Program.

2.3.2.4 Physical Monitoring Program

The physical monitoring program consists of two main components: instrumentation to measure ground conditions and deformation (survey hubs, inclinometers, real-time radar-based slope stability measurements, ground temperature cables, piezometers) and regular geotechnical inspections (weekly inspections and prism readings). The 2014 EMSRP outlines the monitoring locations and procedures for 2015 and 2016.

Minto discusses the Physical Monitoring Program in Section 5.18 of the 2015 Annual Report and presents the results of the survey hubs and inclinometers in the Physical Deformation Monitoring Instrumentation (Section 5.19). Monthly movement rates for the survey hubs are provided in the monthly reports. Data collected from DSTSF thermistors are presented in Section 5.15.3.1 and data collected from the Mill Water Pond thermistors are presented in Section 5.15.3.2. Minto reports in Section 5.15.3.6 that data are collected monthly from the Water Storage Pond Dam thermistors. Vibrating wire piezometer data are summarized in Section 5.15.2 of the 2015 Annual Report. Results of the physical monitoring program conducted in 2016 to date are presented in the monthly reports for January to May. Minto was therefore in full compliance with the EMSRP for the Physical Monitoring Program.

2.3.2.5 Aquatic Environmental Monitoring Program

The Aquatic Environmental Monitoring Program (AEMP) at Minto Mine outlined in the June 2014 EMSRP was comprised of a Biological Monitoring Program and an EEM Program: the June 2014 EMSRP applied to the work conducted in 2015. The Biological Monitoring Program outlined in the June 2014 EMSRP has the following sub-components:

- Sediment monitoring
- Benthic invertebrate community monitoring
- Periphyton Monitoring Program, and
- Fisheries Monitoring Program.

The Environmental Effects Monitoring Program outlined in the June 2014 EMSRP has two sub-components:

- EEM Water Quality Monitoring Program, and
- EEM Biological Monitoring Program.

The AEMP program in the December 2015 EMSRP was substantially revised, and currently includes the Metal Mine Effluent Monitoring Program components, sediment toxicity testing, periphyton tissue monitoring, and benthic invertebrate tissue monitoring. The frequency of sampling or monitoring for the 2015 AEMP is to occur once per year or once every three years, depending on the study design component: results of the studies conducted in 2015 will be presented in the 2016 annual report.

Biological Monitoring Program

The sample locations, frequency, and data collected for each component of the Biological Monitoring Program against which Minto can be tracked for compliance with the June 2014 EMSRP are provided in Table 3.

Table 3 June 2014 EMSRP Study Design Components

Program	Sample Location	Reference Area	Sampling and Analytical Details
Sediment Monitoring	Upper Minto Creek (near W3)	Upper McGinty	• Each monitoring area sampled 5 times • Samples analyzed for particle size, total organic carbon (TOC), metals, Total Kjeldahl Nitrogen (TKN) analysis • Supporting water quality measures collected • Sediment data analysis using temporal and spatial comparisons and comparisons to the Canadian Environmental Quality Guidelines (CEQG) for sediment • Conducted annually (late August or early September)
	Lower Minto Creek (downstream of W2)	Lower Wolverine Creek	
Benthic Invertebrate Community Monitoring	Lower Minto Creek (downstream of W2)	Lower Wolverine Creek	• Each monitoring area is sampled 5 times using a Hess sampler, with each sample a composite of 3 grabs • Supporting habitat measures and *in-situ* water quality parameters are recorded at each monitoring area; habitat measures collected following Canadian Aquatic Biomonitoring Network Field Manual • Taxonomy performed to “lowest practical level” and data to be summarized using the endpoints specified by Environment Canada • Conducted annually (late August or early September) • In addition to benthic invertebrate community monitoring required every three years as part of EEM

Program	Sample Location	Reference Area	Sampling and Analytical Details
Periphyton Monitoring Program	Lower Minto Creek (downstream of W2)	Lower Wolverine Creek	• Chlorophyll a density measured • Community assessment: 5 replicate samples • Taxonomy to the “lowest practical level” • Supporting habitat measures and *in-situ* water quality parameters are measured • Conducted annually (late August or early September)
Fisheries Monitoring Program	Lower Minto Creek below the canyon	Lower Big Creek	• Gee-type Minnow traps placed at monitoring site locations, and left to soak for 24 hours • Traps baited with Yukon River origin Chinook salmon roe • *In situ* water quality is recorded • Trapping location information recorded, including physical description, weather conditions, photographs of sites • Captured fish data to include fish species, number of fish, length, presence of abnormalities, CPUE • Conducted monthly (during the open water season) • Reporting will include description of water chemistry and mine discharge during the open water period
EEM Water Quality Monitoring	W2	W7	• Samples collected at receiving environment station W2 and reference station W7 • Collected four times a year while the mine is discharging effluent • Water quality monitoring results are reported annually through Environment Canada’s RISS website
EEM Biological Monitoring			• Outlines fish population, fish tissue and benthic invertebrate • Tests conducted under Schedule 5, Part 2 of the MMER • Fish population, fish tissue and benthic invertebrate tests - conducted early 2014 and reported early 2015

Sediment Monitoring

Sediment monitoring studies were conducted in September 2015. Minto presented the results of the 2015 sediment monitoring program in Section 5.6.1.1 and Appendix F of the 2015 Annual Report. Methodology followed the EMSRP. Analysis included a spatial comparison of TOC, TKN and particle

size, and a spatial and temporal comparison of copper concentrations, which was the only parameter greater than the CEQG Interim Sediment Quality Guidelines for the protection of aquatic life. Mean arsenic concentrations were higher in the reference sites than in the control sites, and maximum concentrations exceeded the Interim Sediment Quality Guidelines for the protection of aquatic life at all sites. Minto was in full compliance with the Sediment Monitoring requirements of the EMSRP.

Benthic Invertebrate Community Monitoring

Benthic Invertebrate Community Monitoring studies were conducted in September 2015. Methodology followed the EMSRP. Benthic invertebrate communities at erosional areas of lower Minto Creek were summarized and compared to erosional areas of lower Wolverine Creek and lower Big Creek in Section 5.6.1.3 and Appendix F of the 2015 Annual Report. Community data from control and reference sites were compared to the Environment Canada endpoints (density, Simpson's diversity, Simpson's evenness, etc.). Supporting habitat measures and *in situ* water quality were presented and were used to explain and differences or similarities in control and reference sites. Minto was therefore in compliance with the EMSRP for this component.

Periphyton Monitoring Program

Periphyton Monitoring studies were conducted in September 2015. Methodology followed the EMSRP. Minto presented the results of the 2015 periphyton monitoring program in Section 5.6.1.2 and Appendix F of the 2015 Annual Report. Data analysis included a spatial comparison of chlorophyll a results and a spatial and temporal comparison of community composition. Community data from control and reference sites were compared to the Environment Canada endpoints (density, Simpson's diversity, Simpson's evenness, etc.). Supporting habitat measures and *in situ* water quality were presented and were used to explain and differences or similarities in control and reference sites. Minto was therefore in compliance with the EMSRP for this component.

Fisheries Monitoring Program

Minto presented the results of the 2015 fisheries monitoring program in Section 5.6.1.4 and Appendix G of the 2015 Annual Report. Methodology followed the EMSRP. Fish monitoring of Minto Creek and Big Creek was conducted monthly during the open water season (June to October 2015). All fish captured were identified, enumerated and measured for fork length or total length (+ 1 mm), inspected for abnormalities, and released in the vicinity of their trapping location. The CPUE for juvenile chinook and all other species combined from Minto Creek and from Big Creek are summarized in Appendix G. Additional supporting information collected included photo documentation of the creek, water level readings at W1 staff gauge, *in situ* water parameters in Minto Creek, Big Creek and the Yukon River (temperature, dissolved oxygen, conductivity, pH, ORP), discharge at W1, as well as weather conditions at time of sampling. Continuous temperature loggers were deployed in the Yukon River and Big Creek for the duration of the project, while data loggers recorded continuous temperature and stage in Minto Creek. Supporting variables also included monitoring of the previously identified fish barrier. Minto was therefore in full compliance with the requirements of the Fisheries Monitoring Program.

Environmental Effects Monitoring Program

The EEM Program, part of the MMER, is comprised of a Water Quality Monitoring Program and a Biological Monitoring Program, and was developed to characterize the impact of effluent on the receiving environment. The June 2014 EMSRP dictated sampling at stations W2 and W7 four times

per year while the mine is discharging effluent; under the MMER, if there is water at station W3 the mine is considered to be discharging. Minto presented the results of water quality sampling at sites W2 and W7 in Section 5.2.2 and Appendix B of the 2015 Annual Report. Samples were collected at W2 and W7 in May, June, August and October 2015; since discharge occurred year round at site W3 in 2015 Minto was in full compliance with this component. A total of 35 routine samples were collected from W2 in 2015, with summary statistics presented in Section 5.1.2 of the 2015 Annual Report, and 10 routine samples were taken at W7 during the 2015 monitoring period, with results presented in Section 5.1.7.

No sampling or monitoring was conducted under the EEM Biological Monitoring program in 2015, as reported in Section 5.2.3 of the 2015 Annual Report. Minto prepared the Phase 4 EEM Study Design Report (provided as Appendix C) in 2015, outlining work to be conducted in 2016. Minto is in compliance with the EMSRP for this component.

2.3.2.6 Terrestrial Environmental Monitoring Program

Invasive Plant Species Monitoring Program

The main pathways by which invasive species may be introduced to the Minto Mine site include distribution through reclamation efforts and introduction though vehicle traffic to the mine site; therefore the Invasive Plant Species Monitoring Program includes mitigation measures (site access, plant selection for reclamation, erosion control, soil salvage) and invasive plant monitoring and reporting. Components of the program that can be tracked for compliance are:

- Vegetation surveys conducted annually in high risk areas
- Vegetation surveys identify vegetative cover and species types (within the dry land seed mix)
- Should invasive species be detected, the following information should be included in the survey: location; species name; health and size of the plant; pictures taken of the plant as well as reference points so the location can be more easily found in the future; percent coverage in the area, and
- Should any invasive plant species listed by the Yukon Invasive Species Council be encountered, Minto will report the findings to Yukon Government.

Results of the Invasive Plant Species Monitoring Program are presented in Section 5.10 of the 2015 Annual Report. The focus of the 2015 invasive species program was primarily on the site access road: invasive species encountered during the survey are tabulated - no high-risk species were observed. Supporting information and photographs of the invasive species encountered during the monitoring program were not provided in the 2015 Annual Report; however, since the EMSRP only requires a summary of the information and does not specifically state that the supporting information be included, Minto was in compliance with this component.

Wildlife Monitoring Program

The activities under the Wildlife Monitoring Program that can be tracked for compliance with the EMSRP are:

- Wildlife monitoring:
  - Maintaining a wildlife observation log onsite; reporting wildlife encounters
  - Monitoring measures to ensure birds do not settle on tailings facilities

  - Environmental personnel on site will monitor project activities and modify operations to address wildlife concerns, and
  - Monitoring of planned areas of disturbance prior to work to ensure nesting birds are not present.
- Migratory Birds:
  - Monitoring to ensure waterfowl and shorebirds do not settle on impacted water bodies, such as the Mill Water Storage Pond or the Main Pit, and
  - Environmental personnel on site will monitor project activities and modify operations to address wildlife concerns.
- Species at Risk/of Concern:
  - Any caribou observations will be reported to the Conservation Officer in Carmacks, and
  - Residuum piles that contain bank swallow nests will be cordoned off and left undisturbed until after the late summer migration, or re-sloped prior to nesting season to deter nesting.

Minto indicates that the Wildlife Monitoring activities listed above were completed in 2015 (Section 5.8 of the 2015 Annual Report). Minto provided a copy of the wildlife observation log; results of the programs, however, are not included in the 2015 Annual Report. Minto subsequently stated that they were in compliance with the Wildlife Monitoring Program and that no migratory birds were observed to settle on impacted water bodies therefore modifications to operations were not required. For transparency, it is recommended that Minto document the results of all activities undertaken, and provide rationale where the monitoring programs were not required, in future Annual Reports to document compliance.

Erosion and Sedimentation Monitoring Program

According to the EMSRP, monitoring of surface structures and of the receiving environment for evidence of erosion and sediment accumulation is required by the WUL. Although not stated in the EMSRP, erosion and sedimentation monitoring is also a requirement of the QML. Monitoring activities outlined as part of the Erosion and Sedimentation Monitoring Program include:

- Visual inspections along bottoms of slopes and depressions of large structures and road routes as needed following heavy rain events, and during freshet
- Water quality monitoring for total suspended solids (TSS) at stations W2, W50 and W17 weekly and during heavy runoff periods, and
- Physical inspection of surface facilities by a Yukon registered Engineer after the spring thaw period in May/June of each year.

Minto indicates that the activities listed above were completed in 2015 (Section 5.12 of the 2015 Annual Report); however, other than providing a summary of the TSS results for stations W2, W50 and W17, results of the other monitoring activities are not included in the 2015 Annual Report. Geotechnical inspections were completed and submitted to Energy, Mines and Resources[(2)]. Since the EMSRP states that this program is a requirement of the WUL, Minto is in full compliance with the requirements of the QML.

2.3.2.7 Progressive Reclamation Effectiveness Monitoring Program

The reclamation effectiveness program is provided in Section 3 of this report.

2.3.3 Adequacy to Meet Plan Objective

The measures outlined in the Water Monitoring Program components are adequate to meet the following stated objectives:

- Surface Water Surveillance Program: to monitor surface water quality and hydrological conditions at stations within the operational mine area, downstream stations which are influenced by mine effluent discharge, and downstream reference stations which are not exposed to effluent
- Metal Mine Effluent Monitoring Program: to maintain compliance with the MMER
- Groundwater Monitoring Program: to monitor potential impacts on groundwater from the mine project components, and
- Seepage Monitoring Program: to assess and monitor potential acid rock drainage and metal leaching conditions at the Minto Mine.

The measures outlined in the Geochemical Monitoring Program are adequate to meet the objective of the overburden and waste rock ABA test program to classify all overburden, waste rock and low grade, partially oxidized material mined at the Minto Mine and disposed of on surface, as well as to meet the objective of the tailings solids monitoring program to maintain an inventory of the geochemical properties of the tailings produced during the project life.

The measures outlined for the Meteorological Monitoring Program meet the objectives of collecting climatic data specifically for the Minto Mine site, and snow data used for calculating the snow water equivalent.

The Mine Infrastructure and Workings Monitoring Program Requirements are adequate to meet the objective of the Physical Monitoring Program to monitor the performance of key mine infrastructure and workings.

The monitoring measures outlined for the Aquatic Environmental Monitoring Program are adequate to meet the following objectives:

- Sediment Monitoring Program: to monitor the sediment quality of Minto Creek and to provide data to allow interpretation of the potential influence of the Minto Mine on sediment quality
- Benthic Invertebrate Monitoring Program: to monitor the condition of the benthic invertebrate community of Minto Creek and to provide data to allow interpretation of the potential influence of the Minto Mine on the benthic invertebrate community
- Minto Creek Annual Fisheries Monitoring Program: to monitor, assess and characterize fish usage in Minto Creek and to provide data to allow interpretation of the potential influence of the Minto Mine on the fish community
- Periphyton Monitoring Program: to monitor the condition of the periphyton community in Minto Creek
- EEM Program: to characterize the impact of effluent on the receiving environment through water quality and biological monitoring, and
- Terrestrial Environment Monitoring Program: to monitor invasive plant species, wildlife and erosion and sedimentation occurring in and around the mine site.

2.3.4 Compliance with Minto Policy and Procedures

The EMSRP is in compliance with Minto Environmental Policy #023 guidelines. The component programs are designed to assess the potential impact to the environment of all proposed activities and results of the monitoring programs are used to minimize the impact. The component plans are revised as necessary based on feedback from regulators and the SFN.

2.3.5 Information Reliability and Integrity

Minto retained an independent consultant (Minnow Environmental Consultants) to conduct the AEMP studies in 2015; results are present in Appendix F of the 2015 Annual Report (Minto Creek Sediment, Periphyton and Benthic Invertebrate Community Assessment – 2015). Data quality was assessed by Minnow Environmental Consultants prior to data analysis and interpretation, and was judged to be of good quality. Copies of the laboratory analytical results are provided in the 2015 Annual Report. Information reliability and integrity for the AEMP is therefore judged to be high.

Information reliability and integrity for the remaining component programs of the EMSRP are also high: monitoring and sampling were conducted by Minto environmental staff and results are provided within the Annual Reports or monthly reports.

2.4 EXPLOSIVES MANAGEMENT PLAN

2.4.1 Plan Objective

The objective of the Explosives Management Plan developed by Minto in June 2011 is to outline management practices employed at Minto Mine that are aimed at minimizing the safety and environmental risks of handling nitrates, which are present in blasting agents. The Explosives Management Plan outlines the blasting agent types used, transportation, and storage.

2.4.2 Compliance with Approved Plan

The following standard operating procedures and best management practices are outlined in the Explosives Management Plan:

- Emphasizing to blast crews the importance of minimizing spillage and dealing properly with any that may occur
- Requiring that holes loaded with water soluble products be lined if there is any possibility of wet ground in the area
- blasts are designed to maximize efficiency of blasting agents
- Minimize sleep time: holes are not loaded with blasting agents until necessary in order to reduce the time elapsed between loading and detonation
- Disposal of blasting reagent packaging and related waste is done so in accordance with the Disposal Guidance document, and
- Practices used at site will be reviewed in conjunction with industry best practices and observed water quality.

There is no requirement for tracking any of the procedures, practices or reporting on the activities outlined in the plan, therefore it is not possible to assess compliance.

2.4.3 Adequacy to Meet Plan Objective

Since there is no requirement for tracking any of the procedures or practices, it is not possible to assess the adequacy of the plan to meet its stated objectives.

2.4.4 Compliance with Minto Policy and Procedures

The Explosives Management Plan is in compliance with Minto Policy and Procedures in ensuring that all activities are in compliance with all environmental legislation and regulations.

2.4.5 Information Reliability and Integrity

The information reliability and integrity criteria are not applicable to the Explosives Management Plan, as only standard operating procedures and best management practices are outlined, and there are no requirements for monitoring or reporting.

2.5 HERITAGE RESOURCES PROTECTION PLAN

2.5.1 Plan Objective

Minto was required, under QML – 0001, to develop a Heritage Resources Protection Plan (HRPP) that would:

- Describe measures to identify and protect historic sites, historic objects, and works of archaeological, paleontological, pre-historic, historic, scientific or aesthetic value, and
- Provide a schedule for training all employees and contractors of the Licensee respecting its heritage awareness policy; and a protocol for the identification, reporting and protection of historic objects and human remains.

The purpose of the HRPP, developed in April 2014 by Minto, is to establish guidelines for how to identify and protect heritage resources in the project area.

2.5.2 Compliance with Approved Plan

Measures outlined in the HRPP against which mine operations can be evaluated for compliance are:

- Completion of a Heritage Resource Site Observation Form in any instance where it is believed a heritage resources site has been encountered
- If a potential heritage resource site is observed, it will be immediately reported to the Yukon Archaeologist and to the Selkirk First Nation (SFN) Heritage Office
- Discovery of evidence of human use: Stop work immediately; contact a supervisor or member of the Environment Department; ensure that the area is secure; determine if the find is a heritage resource in discussion with the SFN and Yukon Government
- Discovery of human remains: Stop work immediately; contact Site Manager; notify RCMP; follow Yukon Tourism Heritage Branch guidelines, and
- Paleontological resource: Stop work immediately; contact a supervisor or member of the Environment Department; ensure that the area is secure; contact SFN and Department of Tourism and Culture.

Minto reports that no heritage resources were encountered in 2015; the HRPP does not require that this information be documented in the Annual Report.

2.5.3 Adequacy to Meet Plan Objective

Minto reports that no heritage resources were encountered in 2015; the HRPP does not require that this information be documented in the Annual Report.

2.5.4 Compliance with Minto Policy and Procedures

Procedures to ensure that Minto is in compliance with the Heritage Resource Protection Policy #031 are stated as:

- Ensure that all activities are in compliance with the relevant legislation
- Make all reasonable efforts to identify Heritage Resources present on the mine lease property and plan activities so as, where possible, to avoid all disturbance to those sites or, where not possible, to minimize impacts

- Coordinate closely with Selkirk First Nation and Yukon Government's Heritage Resources Unit with regard to the protection of any Heritage Resources present on site, and
- Train all relevant employees and contractors to understand their responsibilities as they pertain to the protection of Heritage Resources.

2.5.5 Information Reliability and Integrity

Minto reports that no heritage resources were encountered in 2015; the HRPP does not require that this information be documented in the Annual Report.

2.6 SEDIMENT AND EROSION CONTROL PLAN

2.6.1 Plan Objective

Minto was required, under QML – 0001, to develop a Sediment and Erosion Control Plan (SECP) that would "describe methods and techniques for protecting undisturbed lands, minimizing mining footprints and reducing erosion of soils due to land disturbance and weathering by wind and water". The stated objective of the SECP is "to minimize local site impacts from erosion and prevent sedimentation to the receiving environment of Minto Creek". The SECP is not intended to dictate specific measures to be implemented, but rather to identify mitigation measures that could be used based on site conditions.

2.6.2 Compliance with Approved Plan

Measures outlined in the SECP against which mine operations can be evaluated for compliance are:

- Visual inspections: conducted as needed following heavy rain events and during freshet
- Water quality monitoring for TSS: weekly monitoring plus during heavy runoff periods, and
- Physical inspection of surface facilities: inspection of mine facilities by a Yukon registered engineer in May/June and September of each year.

No reporting requirements are included in the SECP; however, the monitoring strategies presented in Section 2 of the SECP are included in Section 7.3 of the 2014 EMSRP. Minto states in Section 5.12 of the 2015 Annual Report that the measures outlined in the SECP were implemented at the required location and frequency. Since there are no reporting requirements in the SECP, Minto was in compliance with the QML - 0001 in 2015.

2.6.3 Adequacy to Meet Plan Objective

No reporting requirements are included in the SECP; therefore, it is not possible to assess the adequacy of the work to meet the plan objective of minimizing local site impacts from erosion and prevent sedimentation to the receiving environment of Minto Creek.

2.6.4 Compliance with Minto Policy and Procedures

The SECP complies with overarching Minto policy for protection of the environment.

2.6.5 Information Reliability and Integrity

Results of the SECP measures are not required to be provided in the Annual Report; therefore, it is not possible to assess the reliability and integrity of the results of the SECP.

2.7 SPILL CONTINGENCY PLAN

2.7.1 Plan Objective

The stated purpose of the 2014 Spill Contingency Plan (SCP) prepared by Minto is to outline a general set of procedures to be followed to assess, prevent, contain and clean-up a spill at the Minto Mine. The SCP includes practices to further reduce the potential for environmental contamination and other spill-related impacts.

The objectives of the SCP are to:

- Identify potentially hazardous materials located on site
- Identify spill prevention measures
- Establish a high order of preparedness in the event that a spill occurs
- Ensure an orderly and timely decision-making, response and reporting process, and
- Describe current and planned protective measures for all areas of the Mine Site.

The ERP contains information related to spill response procedures – these are not defined in the SCP.

2.7.2 Compliance with Approved Plan

Measures outlined in the SCP against which mine operations can be evaluated for compliance are:

- The SCP must be reviewed annually and a summary of the review, including any revisions to the plan, must be included as a component of the Annual Report
- Any spill that occurs at the Minto Mine site must be reported through the internal reporting chain of command and follow the procedures for assessment, prevention, containment and clean-up and reporting
- Should a spill exceed the thresholds set by the Yukon Government then it must be reported to external authorities
- All spills (whether reportable externally or not) must be verbally reported by the discoverer to his or her immediate supervisor, and either the Site Safety or the Environmental Department following assessment of the scene
- The Environmental Department will issue an Environmental Incident Notification to site directors, including senior management. This typically occurs concurrently with spill response (prevention, containment and clean-up) activities
- Following the spill response, responsible department heads will document the spill on an Environmental Incident Report (EIR); the EIR will include photos, a description of clean-up activities, subsequent actions, and identify root cause and any required corrective actions
- The environmental lead will call the 24-hour Yukon Spill Report line should a spill of a reportable quantity occur
- Minto will contact the Selkirk First Nation Lands Director; Energy Mines and Resources Client Services and Inspections; and Environment Canada via email or phone after discovery of a reportable spill
- A detailed written report will be submitted to the regulatory authorities within 10 days after the event
- Copies of the SCP kept on site, and
- Location of spill kits and contents.

Appendix D of the SCP is the Tug and Barge Emergency Contingency Plan prepared by Capstone Mining Corporation on January 15, 2013. The purpose of this plan is to outline measures to mitigate an accident or malfunction associated with the tug and barge during unloading, loading, or instream operation. The Tug and Barge Emergency Contingency Plan outlines emergency response measures for sinking; loss of power or control; onboard fire; man overboard; freight or vehicle overboard; onboard medical emergency; and spill response. Measures outlined in this document against which mine operations can be evaluated for compliance are:

- Mutual aid agreement in place between Minto and JDS, with the intention to have the agreement in place before the 2013 barge operating season, and
- Installation of an anchor on the barge to mitigate the risk of losing control of the barge downstream.

Minto reports in Section 2.5.4 of the 2015 Annual Report that the updated 2016 Minto Mine Spill Contingency Plan is provided in Appendix A. Minto did not provide a summary of the review or of the revisions that were made to the SCP, therefore they are technically out of compliance with the SCP. A cursory review of the 2016 plan indicates the following revisions:

- Updated mining phase information
- Updated contact information for Minto Personnel and External Agencies
- Re-organization of Section 7 (Spill Prevention and Response Training), and
- Tug and Barge Emergency Contingency Plan: both the 2013 SCP and the 2016 SCP contain the January 15, 2013 version of the Tug and Barge Emergency Contingency Plan, however the Tug and Barge Emergency Contingency Plan contained in the 2016 SCP version has appended the Minto Mine Emergency Response Plan (November 2012 version) and the Spill Contingency Plan (June 6, 2012 version).

It is recommended that Minto indicate revisions that were made to the SCP in a summary table within the introduction, indicating the pages on which changes were made, a brief description of the change, and the reason(s) for the revision.

It is recommended that Minto review and revise the Tug and Barge Emergency Contingency Plan, and rather than including superseded versions of the Emergency Response Plan and Spill Contingency Plan as appendices, reference the latest versions of these documents in the relevant sections of the main body of the SCP.

Minto summarises the details of three reportable spills that occurred at the mine site in 2015 in Section 2.5.3 of the Annual Report. The EIR forms are not provided in the 2015 Annual Report, but these can be found on the Yukon Water Board Waterline website. The EIRs document the date and time of each incident; provide a brief description of the cause; clean up actions and corrective actions; internal reporting sequence; and the date and time that the spills were reported to the Yukon Spill Report, SFN Lands Director; Energy Mines and Resources Client Services and Inspections; and Environment Canada. Minto was therefore in compliance with documentation and reporting requirements of the SCP.

The location and contents of spill kits were evaluated during the August 2016 site trip. The spill kit contents are summarized in Table 6-1 and locations are shown on Figure 6.2 of the 2014 SCP. The Knight Piesold Ltd Specialist Scientist, in the site audit in August 2016, verified the spill kit contents of a number of the Yellow Barrels and Blue Bins. The Yellow Barrels was found to be primarily stocked with the correct number of spill kit items, with the exception of shovels and rakes. Minto staff

indicated that these items do not fit into the barrels but are carried by site supervisors and are readily available on most site vehicles. Minto staff also indicated that the locations of some of the spill kits do not match those shown in the SCP - it is recommended that the SCP be updated to reflect the current locations of barrels and bins.

2.7.3 Adequacy to meet Plan Objective

The 2014 SCP adequately meets its stated objectives. A list of potentially hazardous materials, reporting thresholds, special handling precautions, personal protective equipment, and special cleanup and disposal information is summarized in Appendix B of the SCP. Section 5 of the SCP outlines the Minto Spill Action Plan that establishes a high order of preparedness in the event of a spill. Section 7 (Spill Prevention and Response Training) outlines measures to ensure an orderly and timely decision-making, response and reporting process, while Section 8 (Routine Maintenance and Monitoring) describes current and planned protective measures.

2.7.4 Compliance with Minto Policies and Procedures

The SCP complies with overarching Minto policy by providing a clearly defined environmental management program and outlining measures to prevent environmental pollution.

2.7.5 Information Reliability and Integrity

Information reliability and integrity is high – Minto followed the reporting procedures outlined in the SCP following the three spills that occurred at the mine site in 2015 and provided documentation of the measures enacted in response to the spill to the Yukon government website.

2.8 WASTE MANAGEMENT PLAN

2.8.1 Plan Objective

The objective of the Waste Management Plan (WMP) prepared by Minto Explorations Ltd. (June 2014) is to describe the mitigation measures and methods used to manage solid, liquid, and special wastes to ensure protection of the environment and human health.

2.8.2 Compliance with Approved Plan

Actions or measures outlined in the WMP which can be tracked for compliance during the site audit are:

- Non-hazardous solid waste is segregated into two streams: putrescible and non-putrescible wastes
- Non-putrescible wastes are further segregated into three categories: recyclable, burnable and non-burnable material
- A sea can located at the Waste Management Area (WMA) is used to store recyclables until a sufficient amount of material has accumulated to warrant a removal from the mine site
- The landfill accommodates non-putrescible and non-recyclable waste:
  - Waste is placed in 50 cm lifts buried with a minimum of 10 cm of soil (or other suitable material).

- Cover material is sourced from remediated soils from the Land Treatment Facility (LTF) and/or stockpiled residuum.
- When ash is disposed of, it is buried upon arrival to prevent dispersal by wind.
- All loads are checked by the WMA attendant before being dropped off to ensure no food waste is deposited in the landfill.

- Land Treatment Facility:
  - Used for remediation of hydrocarbon and glycol contaminated soil; material is considered remediated once concentrations are below those outlined in the Yukon Contaminated Sites Regulations for Industrial Sites; following approval from Yukon Environment it is removed from the facility for use in industrial land use activities.
  - Soils and snow contaminated with hydrocarbons and glycol may be disposed of in the LTF; however, soils with a grain size greater than 15 mm are not able to be treated in the LTF, and require disposal in the Main Pit or processed through the mill.
  - Quantities less than 1 m³ are placed on a “Small Hydrocarbon Spills” pile or a “Small Glycol Spills” pile. Quantities greater than 1 m^3 are identified with an Environmental Incident Report number (EIR number) marked permanently on stakes. The maximum permissible height of piles of contaminated soil is 1.4 metres.
  - Contaminated soils resulting from spills are excavated and hauled to the LTF where they are placed in a staging area for initial characterization; they cannot be placed in the treatment cell until analytical results for the contaminants of concern are received.
  - Once under treatment, interim samples are taken annually at the end of August or in early September.
  - Initial characterization requires *in situ* sampling during the excavation of contaminated materials, of both the materials excavated and the material left behind, to ensure that all contaminated materials are excavated. Sampling is done at a rate of one composite for every 50 m³ of material, except where there is reason to believe that Petroleum Hydrocarbons may be at Special Waste levels (30,000 ppm or 3% and above) in which case a sample must be taken for every 10 m³ of material.
  - For soil sampling, a 250 ml glass jar with a Teflon cap liner is filled with sample, and analyzed for Benzene, Toluene, Ethylbenzene and Xylene; Total, Light and Heavy Extractable Petroleum Hydrocarbons; Polycyclic Aromatic Hydrocarbons; styrene; chlorinated and non-chlorinated phenols; and pH. Analytical results are compared to Yukon Government 2002 Contaminated Sites Regulations Schedules1 and 2.
  - Soil must be free from debris (e.g., piping, concrete, wiring conduit, etc.) before spreading in the treatment cell; soil can be placed in the treatment cell only when tillable (i.e., not frozen).
  - Stockpiles of contaminated material from different spills can be consolidated and treated together provided their combined volume does not exceed 500 m³.
  - During the first tilling or the placement in the treatment cell, fertilizer is applied by hand broadcast to achieve approximately the PHC: Nitrogen: Phosphorous ratio of 50:2:1.
  - Confirmatory sampling (at a rate of one sample per 100 m³ of soil using composite sampling techniques outlined in Protocol 11 of the Regulations, with each composite composed of soil from the deeper horizons of the treatment cell where remediation rates are lowest) is conducted once interim samples indicate that the soil has been remediated to below Yukon Government 2002 Contaminated Sites Regulations standards.

  - Once remediated material meets the Contaminated Sites Regulations standards, an application to the Yukon Government Environmental Programs Branch is sent to request permission to remove the soil from the treatment facility.
  - LTF inspections are conducted bi-weekly to ensure that all signage is visible, berms are not damaged, and new material has been properly labeled and staged in the appropriate sections of the LTF; record keeping ensures that tillage is occurring as required, that laboratory results are up to date, and that all material that has been confirmed as being acceptable is moved from the staging to the treatment cell in a timely manner.
- Recyclable materials are stored in a bear proof container until transported off site for recycling and/or refund
- Only used tires with rim size greater than 24.5” may be buried at the landfill; tires not buried or used for the purpose of protection barriers or other on-site uses are hauled off-site
- Special Waste Management:
  - All Special Wastes are transported off-site to a facility permitted in the Yukon or other jurisdiction to receive them, in accordance with applicable transport laws by a carrier permitted in the Yukon or another jurisdiction to receive and transport Special Wastes. If the facility is in the Yukon, both the facility and the carrier are permitted in the Yukon according to the Transportation of Dangerous Goods Regulations.
  - A manifest is completed to document each shipment of Special Waste, as per Transportation of Dangerous Goods Regulations.
  - Inventory of special waste is done weekly and all materials that have been packaged and are ready for shipping are communicated to the Warehouse.
  - Waste oil is either collected and disposed of via incineration in a waste oil burner or stored in the special waste oil tanker, which is periodically removed from site and brought to a licenced oil recovery facility; the volume of waste oil transported from site is documented according to Transportation of Dangerous Goods Regulations.
  - Waste oil filters are crushed and drained of oil and crushed filters are stored in 205 L drums and backhauled to Whitehorse to be disposed of as scrap metal.
  - Used antifreeze is stored in leak-proof containers with tight fitting lids, stored in the Special Waste pole barn and periodically shipped to a disposal facility.
  - Solvents are collected and stored in appropriate drums for regular shipment to a licensed recycle or disposal facility; containers are covered and kept separate from other waste products.
- Inspections of the incinerator, land treatment facility and waste management area are conducted regularly with records kept in the Environment department office.

Minto was therefore in compliance with the WMP.

2.8.3 Adequacy to meet Plan Objective

The Waste Management Plan objectives are being adequately achieved by the Minto Environmental Department. An inspection of the WMA provided the opportunity to see that spill materials, recyclable products and special wastes are being managed in the spirit of the Plan. While Minto is not required to control access to the WMA, they have chosen to do so, such that the quality of the segregation and placement of each type of material within the WMA is high. Ample signage throughout the WMA is clear to minimize mis-placement of materials in the incorrect areas as well. Finally, the

Environmental Department staff conduct regular audits/inspections with the site services team to check that materials are sorted correctly.

The LTF has signage for the various types of spill, along with stakes to mark new spill piles. A separate area exists for the treatment of the spilled materials. Water collection pond collects runoff from the LTF, and the outlet piping to drain the collection pond has suitable valves to allow for filling of a containment truck, when required.

2.8.4 Compliance with Minto Policies and Procedures

The WMP complies with the overarching Minto policy by providing a clearly defined environmental management program and operating in accordance with recognized industry health, safety, and environmental standards, while complying with local and international applicable regulations and laws.

2.8.5 Information Reliability and Integrity

The information reliability and integrity is considered high. Access to the WMA is controlled by the Environmental Department staff, as well as the site services team. Once per week the WMA is opened for all personnel to transport materials to the WMA, where they can be checked by the Environmental Department staff prior to placement within the appropriate recycling and/or disposal area. This hands-on management provides for a high-level of confidence that materials will be sorted and managed as stated in the Plan.

Documentation of spills and packaging of special wastes for removal is managed by the Environmental Department staff through their tracking system. They have daily safety and planning sessions that allow for a team review of all activities on site, including recording of spills and/or special wastes that are pending removal from the site.

2.9 WILDLIFE PROTECTION PLAN

2.9.1 Plan Objective

The Minto 2014 Wildlife Protection Plan (WPP) describes the methods used at Minto Mine to ensure protection of wildlife, minimize disturbance to animals; and minimize adverse impacts on wildlife habitat. The purpose of the WPP is to establish guidelines for minimizing wildlife disturbance at the Minto Mine site and along the development corridor and to develop a monitoring program that will yield information about wildlife use in the area.

2.9.2 Compliance with Approved Plan

Procedures and measures outlined in the WPP that can be tracked for compliance are:

- All incidents (any interaction between human and wildlife which results in harm to one or both) involving wildlife shall be reported to the District Conservation Officer, Department of Environment, Carmacks
- Waste is kept in bear proof containers, and combustible waste is incinerated completely on a daily basis to avoid attraction of nuisance animals

- Segregated waste bins (e.g. waste metal, wood, etc.) and the landfill and burn pit are inspected regularly to ensure food scraps and other attractants are not getting into non-attractant waste streams
- Wildlife monitoring: maintaining a wildlife observation log onsite; and reporting wildlife encounters; data are compiled and reported in the Annual Report
- Migratory Birds: monitoring to determine if waterfowl and shorebirds settle on impacted water bodies, such as the Main or Area 2 Pits. Environmental personnel on site monitor project activities and modify operations to address wildlife concerns, and
- Hazing Program: In order to minimize wildlife stress and disturbance, potentially dangerous animals are only hazed if they are encountered in areas of high extravehicular human traffic, such as close to camp or workshops. If seen in other areas of the mine, they are monitored only.

Wildlife incidents are reported in Section 2.5.2 of the 2015 Annual Report. Two incidents were reported in 2015: the Conservation Officer was notified of a hare that had been run over by a vehicle on the Access Road and of a dead calf moose that had been discovered in the Main Pit.

The wildlife monitoring program is discussed in Section 5.8 of the 2015 Annual Report. Minto reports that monitoring activities summarized in the WPP were conducted in 2015, although no information is provided on the migratory bird monitoring program. The wildlife monitoring log is appended to the 2015 Annual Report. The wildlife monitoring log provides a record of all hazing activities; Appendix B of the WPP includes wildlife notices posted around the Minto Mine camp to alert employees and contractors of nuisance wildlife, or important wildlife protocols: the “How to Report Dangerous Wildlife Notice” states that “Dangerous wildlife that are not an immediate threat to humans (example: a bear on the Access Road at KM 5)” should be reported to the Environment/Wildlife Officer. The entry into the wildlife log does not indicate if these measures were implemented before the animals were hazed.

No documentation is required, in either the WPP or the EMSRP, regarding waste management inspections designed to ensure food scraps and other attractants are not getting into non-attractant waste streams. While these are conducted and tracked internally, there is no requirement to report on these inspections.

Minto was in compliance with the WPP, wildlife observation and hazing logs are included in the 2015 Annual Report.

2.9.3 Adequacy to Meet Plan Objective

Insufficient information is provided in the 2015 Annual Report to determine if the WPP is adequate to minimize wildlife disturbance at the mine site and along the development corridor. In order to determine if the WPP meets its stated objective, information on the migratory bird monitoring program, such as monitoring methods, date and time of monitoring, monitoring results, and any of operations modifications that were implemented to address wildlife concerns is required.

2.9.4 Compliance with Minto Policies and Procedures

The WPP complies with the overarching Minto policy by providing a clearly defined environmental management program and operating in accordance with environmental standards.

2.9.5 Information Reliability and Integrity

Insufficient documentation is provided in the 2015 Annual Report to assess information reliability and integrity. At a minimum the annual report should include:

- Waste bin inspection records
- Results of the migratory bird monitoring program and any modifications to operations, and
- Nuisance or Potentially Dangerous Animal Observation Forms.

3 – RECLAMATION AND CLOSURE EVALUATION

3.1 OVERVIEW

The document titled “Minto Mine Phase V/VI Reclamation and Closure Plan, Revision 5.1”, dated August 2014, was the Reclamation and Closure Plan (RCP 2014) reviewed and approved by EMR to issue the Quartz Mining License QML – 0001. As stated in Section 1.2 (Scope) of this audit report, the timeframe for which this audit was conducted was from the issuance date of the current version of QML – 0001 (i.e., December 18, 2014) and June 30, 2016. Minto had been working towards updating its RCP, and has since issued an update version entitled, “Minto Mine – Reclamation and Closure Plan, 2016-01”, dated August 2016 (RCP 2016).

The scope of this section of the audit can be found in Section 12.2, sub-clause (d) of QML – 0001, which is as follows:

- The audit must evaluate the progress and success of reclamation and closure efforts completed to date.

In addition to this sub-clause, EMR provided further guidance to Minto more recently with respect to this aspect of the audit as follows:

- For greater clarity, the audit should examine the reclamation and closure efforts (e.g. reclamation activities, reclamation research and results) completed at site, and evaluate whether the program is adequate to ensure that the final closure schedule can be implemented successfully and on schedule.

The main areas that were evaluated, based on the above-mentioned terms-of-reference and guidance, are:

- Reclamation and closure efforts conducted to date
- Soil cover quantities and evaluation of revegetation success for upland areas
- Constructed Wetland Treatment System (CWTS) research, and
- Proposed Reclamation and Closure Plan schedule.

While the RCP 2016 was not published prior to the closing date of the audit, it presents a comprehensive update to the reclamation conducted to date, as well as the findings of the research to support the closure objectives for the Minto Mine. Hence, it was utilized to provide the most relevant evaluation of Minto’s substantial effort and progress towards meeting Section 12.2, sub-clause (d) of QML – 0001, as listed above.

3.2 PROGRESS TOWARDS MEETING OBJECTIVES

3.2.1 Reclamation and Closure Efforts Conducted to Date

While there has not been much opportunity for progressive reclamation at the Minto Mine during its operating life, there have been a number of activities completed. Waste rock dumps have undergone resloping at the Main Waste Dump, followed by the application of growth medium and vegetation trials to identify the most suitable combination of growth medium, soil amendment and vegetation type to be applied during final reclamation.

The Southwest Waste Dump (SWD) underwent a more complex recontouring application, with consideration of surface drainage channels and visual optics with the surrounding natural terrain.

This latter process has been deemed quite successful and is expected to be the method chosen for the recontouring of other waste dumps that have yet to be resloped.

Some selective reclamation of infrastructure components has occurred. As the mine moves towards the end of its mine life, an increasing number of opportunities for progressive reclamation will present themselves and will be incorporated within the activities planned for each of the final years of operations. However, the majority of reclamation will occur during the active closure phase.

3.2.2 Soil Cover Quantities and Revegetation Research

The current concept of utilizing overburden from either the Reclamation Overburden Dump (ROD) or other areas that have yet to be stripped for direct (progressive) reclamation provides excess material to meet the nominal cover thickness identified for most of the waste dumps and features across the site that require a growth medium. Currently, the ROD has in excess of 4M m^3 of material. As an indicator of the volume requirements for the site, the total footprint of the waste rock and overburden stockpiles is less than 2M m^2. Hence, since the typical cover thickness for much of the site is identified as 0.5 m, there is more than sufficient overburden available to meet this objective.

It is recognized that there is additional overburden available from areas that are yet to be stripped for mine development. However, this only strengthens the excess volume of growth medium for the covers across the site.

Revegetation research has occurred on the site at a number of areas. The Main Waste Dump Trials considered a number of variables for progressive and final reclamation, such as overburden type and amendments to provide nutrients for improved vegetative growth.

Additional plans for future revegetation research include the delineation of Reclamation Land Units for the post-closure landscape. The purpose of this next phase is to identify knowledge gaps or uncertainties that require further investigation to discern the most suitable cover designs and vegetation types to achieve the stated closure objectives at Minto on upland areas.

3.2.3 Constructed Wetland Treatment System (CWTS) Research

A great deal of focused effort has been directed towards developing a Constructed Wetland Treatment System (CWTS) since 2013. A specialist consultant, Contango, has been retained by Minto to develop a site-specific design to achieve passive or semi-passive treatment of mine contact water for the closure and post-closure period. Both bench-scale and on-site pilot trials have been underway for the past three years to test various designs and arrive at the most suitable concept for the Minto site.

The pace of learning, both from the on-site trials, as well as from the natural wetland located adjacent to the SWD, is providing valuable and reliable site-specific data to inform the final design of passive treatment through a CWTS. While not all questions can be answered at this time with the available data, the research plans and support to complete this work will likely provide the necessary design information required for the final CWTS to be constructed.

3.2.4 Proposed Reclamation and Closure Plan Schedule

The proposed schedule for closure is generally as follows:

- Active Closure – 3 years (starting in 2018)

- Post-Closure I – 5 years, and
- Post-Closure II – 10 years.

Both active and passive water treatments are expected to occur starting at the beginning of the Post-Closure I phase. At the end of the Post-Closure I phase, active water treatment would cease, with all water treatment occurring via the passive system thereafter.

The timeframe of three years to actively reclaim the site, where infrastructure is dismantled, covers are applied, upland areas are revegetated and the CWTS is fully constructed and commissioned is considered reasonable. While some questions remain about the appropriate covers to apply, as well as some of the passive treatment details, there remain approximately three years to have those questions answered. Given the focus by Minto with its reclamation research programs, it is reasonable to assume they will be ready when active closure commences.

Minto has also given itself five years to monitor and adapt the CWTS, with simultaneous active water treatment during this timeframe. Again, given the pace of learning with the onsite trials, as well as having an additional three years prior to the onset of active closure, a five-year timeframe to test a full-scale CWTS is a reasonable period of time.

4 – SUMMARY AND RECOMMENDATIONS

A summary of the results of the environmental audit are tabulated in Appendix A.

Minto was in full or partial compliance with all the requirements of the individual plans. In order to document that the requirements of the plans have been met it is recommended that a revised annual report structure be implemented that improves program titles and helps clarify the location of the information with in the annual report. Since similar monitoring and reporting requirements are provided for the Physical Stability Monitoring component of the AMP and the Physical Monitoring Program of the EMSRP Minto should indicate in the section of the Annual Report which plans are being addressed. Similarly, there is some overlap between the sediment and erosion control monitoring requirements of the EMSRP and the stand-alone SECP. It is also recommended that Minto work with Energy, Mines and Resources and the Yukon Water Board to develop a plan submission structure that will lead to clarification and streamline the monitoring and reporting requirements of the QML, and the WUL.

The level of effort towards reclamation and closure are well documented. While not all questions have been addressed for final closure, the research programs that have been underway for some years have addressed many of the questions and have allowed for a refined and detailed closure plan to be developed. Based on the results collected to date and the timeframes identified prior to the onset of active closure, as well as the timeframes for Post-Closure I (five years) and Post-Closure II (10 years), Minto is well positioned to achieve the closure objectives for this site.

5 – CERTIFICATION

This report was prepared and reviewed by the undersigned.

Prepared:

Stephanie Eagen, R.P. Bio.
Senior Scientist

Reviewed:

Greg Smyth, B.Sc.
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Approval that this document adheres to Knight Piésold Quality Systems:

APPENDIX A

ENVIRONMENTAL AUDIT SUMMARY TABLE

(Pages A-1 to A-2)

Minto QML - 0001 Environmental Audit
Appendix A

Line Item	Approved Plan	Component	Commitment	Compliance with Plan Objective (Full/Partial/No)	Adequacy to meet Plan Objective (Full/Partial/No)	Compliance with Minto Policy and Procedure (Full/Partial/No)	Information Reliability and Integrity (High/Low/NA)	Note
1	Operations Adaptive Management Plan (issued December 2015)	Minto Creek Surface Water Quality	Performance thresholds crossed, and trigger(s) activated will be provided to the appropriate governmental (including SFN) organizations as required and will be part of the Annual Report	Full	Full	Full	High	Work conducted in 2015 was assessed against the Phase IV/V Adaptive Management Plan (issued November 2014). Minto only presents results for 2015 between mid-August and December and did not provide discussion of performance thresholds crossed, and trigger(s) activated for the period January through July 2015. However, they were technically in full compliance with the approved Operations Adaptive Management Plan issued December 2015, since Section 6.1 of the QML - 0001 states that "When the Licensee is required to submit a plan under this License or wishes to amend an approved plan, the Licensee must ... (c) not undertake any of the activities described in the plan or the proposed amendment until the plan becomes an approved plan, as evidenced by its listing in Schedule C. Section 8.1 of the QML - 0001 states that "unless otherwise indicated in writing by the Director, the Licensee must implement each approved plan as of the date each plan becomes an approved plan".
2				Partial	Full	Full	High	Implementing the Specific Response measures in response to the exceedance of Specific Threshold 3 (Predicted Worst Case maximum) for molybdenum, arsenic, and zinc; however, no documentation of the measures are included in the 2015 Annual Report for the August to December 2015 period. Minto subsequently provided documentation of Specific Response Measures therefore compliance and adequacy are assessed as Partial and High, respectively, and relaibility and integrity of information if rated as High.
3				Full	Full	Full	High	In April 2016 dissolved aluminum and chromium exceeded the Expected Case Water Quality Predictions; Minto implemented the Specific Responses and documented the steps that were taken, providing the weekly water quality results and comparison with the W3 results in the monthly report. The weekly results were also tabulated and compared to the Worst Case Water Quality Predictions
4				Full	Full	Full	High	Did not provide discussion of AMP activities in the January through March 2016 monthly reports - AMP water quality stations frozen solid to March
5		McGinty Creek Surface Water Quality (2015 AMP and 2016 AMP only)		Full	Full	Full	High	Did not provide discussion of AMP activities in the January through March 2016 monthly reports - AMP water quality stations frozen solid to March
6		Groundwater Quality in Minto Creek Watershed (2015 AMP and 2016 AMP only)		Partial	Full	Full	High	Specific Performance Threshold is any exceedance of the W2 surface Water Quality Objective for the Minto Creek watershed AMP component - Minto should evaluate the May 2016 sample results from MW12-05 and MW12-06 against this threshold and determine if Specific Responses need to be applied. Minto subsequently provided documentation of results compared to threshilds in AMP 2016-1 that is currently under review. Compliance with approved plan is therefore Partial, but adequacy, relaibility and integrity of information are rated as High.
7		Groundwater Quality in McGinty Creek Watershed (2015 AMP and 2016 AMP only)		Full	Full	Full	High	Specific Performance Threshold 2 is any exceedance of ten times the MN-4.5 Surface Water Quality Objective - Minto should evaluate the May 2016 sample results from MW09 -03 against this threshold and determine if Specific Responses need to be applied. Minto subsequently provided documentation of results compared to thresholds - no triggers were met therefore compliance and adequacy are both assessed as High and relaibility and integrity of information if rated as High.
8		Water Management		Full	Full	Full	High	No Specific Performance Thresholds were triggered
9		Physical Stability		Partial	Partial	Full	High	Updates, amendments, performance thresholds crossed, and trigger(s) activated are required in the annual report in accordance with the November 2014 AMP. Results of the physical stability monitoring program are not included in the AMP section of the 2015 Annual Report and there is no discussion of performance thresholds, but physical monitoring activities are presented in Section 5.18 for survey hub and inclinometer readings and in Section 5.15 for vibrating wire piezometer, pore water pressure and ground temperature monitoring.
11	Emergency Response Plan		Regularly updated to reflect revisions; with next scheduled update in March 2016	Full	Full	Full	NA	
12			Visitor, employee, and contractor emergency training are included in the Minto Mine orientation package	Full	Full	Full	NA	
13			When an incident has occurred, implementation of: o Emergency response protocols; o Incident Accountability System; o Incident Command System; o Employee responsibility; and o Government reporting.	Full	Full	Full	NA	ERP does not require documentation of any incidents or follow up reporting; therefore, Minto was in compliance with the ERP in 2015
14	Environmental Monitoring, Surveillance, and Reporting Plan	Water Monitoring Program - Surface Water Surveillance	Weekly and monthly water quality monitoring requirements, and continuous, weekly and monthly monitoring requirements for surface water hydrology and water conveyance flows	Full	Full	Full	High	Bioassay and chronic toxicity tests were conducted in April and May when discharge occurred. Detailed summaries of the water quality monitoring program are provided in the Annual Report.
15		Water Monitoring Program - Metal Mine Effluent Monitoring	Sublethal toxicity samples at station W3 collected quarterly, or monthly during discharge ; Sublethal toxicity samples collected quarterly, or monthly during discharge; Radium 226 collected quarterly, or monthly during discharge;	Full	Full	Full	High	Sublethal toxicity tests were conducted in October 2015 from samples collected at W3, rather than monthly or quarterly during discharge as required in the 2014 EMSRP; however, Minto indicates that they follow the reduced sampling frequency allowed in the EMSRP , with sampling occurring annually - usually in Sep/Oct. No test results for Radium 226 are presented in the Annual Report but Minto notes that it was reported to RISS four times in 2015. Data reliability and integrity assumed high as samples are sent to accredited analyzing laboratory.
16			Acute lethality testing on rainbow trout and *Daphnia magna* is conducted at least once per month during effluent discharges	Full	Full	Full	High	The MMER program considers the discharge station to be W3 (this is to capture both active surface water discharge and any groundwater movement). Therefore, discharge is considered to be occurring whenever there is water at W3. W3 discharges continuoulsy year-round. Minto is under a reduced sampling frequency (quarterly) for acute lethality for W3, therefore the samples in March/June/Aug/Sep are in full compliance with MMER. Data reliability and integrity assumed high as samples are sent to accredited analyzing laboratory.
17			Reporting of water quality results and discharge volumes is required quarterly and annually to Environment Canada	Full	Full	Full	High	Not a requirement of the QML. Water quality results and discharges are provided in the Annual Report
18		Water Monitoring Program - Groundwater Monitoring	2014 EMSRP - sampling twice per year, once in the spring and once in the fall, at 12 wells	Full	Full	Full	High	MW11-04 was sampled in May and Aug (reduced parameters bc of limited water) MW09-03 was sampled in June, Aug & Sept. In situ well parameters (pH, conductivity, temperature) are not provided in the 2015 Annual Report, but QML only requires a summary of the programs under EMSRP - In situ parameters are collected and tracked in the Water quality Tracking Sheets and uploaded to EQWin. Lab results are attached to the report
19			December 2015 EMSRP - sampling quarterly at 14 wells	Full	Full	Full	High	The first set of groundwater samples were collected in May of 2016, therefore Minto was not in compliance with the EMSRP quarterly sampling requirement. The December 2015 EMSRP was not approved until March 2016, however, and therefore Minto was still in compliance with the previous version.
20		Water Monitoring Program - Seepage Monitoring	Seepage monitoring completed twice per year; provide water quality sample analytical results; provide photos, field data and observations recorded on a purpose-designed form	Full	Full	Full	High	Conducted seepage monitoring program twice in 2015,annual report includes surveying and recording of seepage routes, graphical presentation of water quality results, and raw data. However, no photos of the sample locations or field data and observation forms are provided. However, Minto technically provided a "summary" of the data and the EMSRP does that specifically indicate that photos are to be included in the Annual Report.
21			MCDS seepage monitoring program: regular physical monitoring, MCDS pond water level recording, installation and monitoring of ground temperature cables and assessment of foundation thawing, contaminant monitoring and transport assessment, and the establishment of appropriate triggers and adaptive responses; water quality data gathered from groundwater well MW12-06 located downstream of the MCDS analyzed in conjunction with the data collected from the drive point piezometers, surface water downgradient of the MCDS (W37 station) and the MCDS pond (W36 station)	Partial	Partial	Full	High	Water quality results from groundwater well MW12-06 are presented in Section 5.15.1.12 of the 2015 Annual Report. The W37 data are not analyzed in conjunction with the results from station W36 (the MCDS pond), and Minto did not provide a comparison of the W36 results with groundwater well MW12-06. Minto also did not provide water level data in the MCDS during the time the MCDS was operational, reporting that due to pond this this was difficult. The 2015 Annual Report was completed with reference to the December 2015 version of the EMSRP (approved in March 2016).
22		Geochemical monitoring program - ABA monitoring	• ABA sample frequency, sample type and analysis requirements are: o Overburden: representative sampling whenever overburden is mined o Open pit waste rock: each blast hole and one composite sample per waste class per blast containing >25% waste (2014 EMSRP); ABA sampling occurs every 4-5 drill holes with the aim of ensuring even coverage throughout the drill pattern (2015 EMSRP) o Underground Waste Rock: one sample for every 50 m of development o Tailings Solids: monthly sampling, one composite sample per month comprised of weekly final tailings sample • Annual report must include comparison between new and historical data (including discussion) and comparison of NP/AP and sulphide sulphur • ABA test work must be conducted on all mined materials proposed for use in construction	Full	Full	Full	High	Detailed results provide in Appendix M and Appendix N of 2015 Annual Report.
23		Geochemical monitoring program - Waste Rock Management Verification	detailed record-keeping on the types and quantity of waste rock placed at each location, and monitoring and verification of the characteristics of the waste rock stored at each location	Full	Full	Full	High	Detailed results provide in Appendix M and Appendix N of 2015 Annual Report.
24		Meteorological Monitoring Program	collection of maximum wind speed, minimum wind speed, average wind speed, wind direction, precipitation (rain and snow), temperature, relative humidity, barometric pressure, solar radiation and calculated evapotranspiration, as well as snow depth, snow density, and snow water equivalent	Full	Full	Full	High	Detailed results provided in monthly reports.
25		Physical Monitoring Program	instrumentation to measure ground conditions and deformation (survey hubs, inclinometers, real-time radar-based slope stability measurements, ground temperature cables, piezometers) and regular geotechnical inspections (weekly inspections and prism readings). Results are required to be presented in monthly, quarterly and annual water use license reporting.	Full	Full	Full	High	Detailed results provided in other sections of the Annual Report
26		AEMP Biological Monitoring - Sediment	• 2 control and 2 reference sites; each monitoring area sampled 5 times • samples analyzed for particle size, total organic carbon (TOC), metals, Total Kjeldahl Nitrogen (TKN) analysis • Supporting water quality measures collected • Sediment data analysis using temporal and spatial comparisons and comparisons to the Canadian Environmental Quality Guidelines (CEQG) for sediment • Conducted annually (late August or early September)	Full	Full	Full	High	Detailed results appended to Annual Report; work conducted by independent consultants.
27		AEMP Biological Monitoring - Benthic Invertebrate Community	• one control and one reference site; each monitoring area is sampled 5 times using a Hess sampler, with each sample a composite of 3 grabs • Supporting habitat measures and in-situ water quality parameters are recorded at each monitoring area; habitat measures collected following Canadian Aquatic Biomonitoring Network Field Manual • Taxonomy performed to "lowest practical level" and data to be summarized using the endpoints specified in Environment Canada • Conducted annually (late August or early September)	Full	Full	Full	High	Detailed results appended to Annual Report; work conducted by independent consultants.
28		AEMP Biological Monitoring - Periphyton	• Chlorophyll a density measured • one control and one reference site; 5 replicates per site • Taxonomy to the "lowest practical level" • Supporting habitat measures and in-situ water quality parameters are measured • Conducted annually (late August or early September)	Full	Full	Full	High	Detailed results appended to Annual Report; work conducted by independent consultants.
29		AEMP Biological Monitoring - Fisheries monitoring	• one control and one reference site; Gee-type Minnow traps left to soak for 24 hours • Traps baited with Yukon River origin Chinook salmon roe • In situ water quality is recorded • Trapping location information recorded, including physical description, weather conditions, photographs of sites • Captured fish data to include fish species, number of fish, length, presence of abnormalities, CPUE • Conducted monthly (during the open water season) • Reporting will include description of water chemistry and mine discharge during the open water period	Full	Full	Full	High	Detailed results appended to Annual Report; work conducted by independent consultants.
30		AEMP EEM - water quality	June 2014 EMSRP Section 6.2.1: • Samples collected at receiving environment station W2 and reference station W7 • Collected four times a year while the mine is discharging effluent • Water quality monitoring results are reported annually through Environment Canada's RISS website	Full	Full	Full	High	Samples collected at W2 and W7 in May, June, August and October 2015 were reported to Environment Canada's RISS website;under the MMER, if there is water at station W3 the mine is considered to be discharging, therefore Minto is in full compliance with the 2014 EMSRP for this component. Minto has indicated that station W3 is considered the discharge station under EEM and that May/June/Aug/Oct samples do meet the requirement of the 4x/yr when discharging. However, the December 2015 EMSRP also states that stations W2 and W7 are the MMER water quality monitoring points; recommend that Minto clarify this discrepancy in the EMSRP.
31		AEMP EEM - biological monitoring	• Outlines fish population, fish tissue and benthic invertebrate • Tests conducted under Schedule 5, Part 2 of the MMER • Fish population, fish tissue and benthic invertebrate tests - conducted early 2014 and reported early 2015	Full	Full	Full	High	No sampling or monitoring was conducted under the EEM Biological Monitoring program in 2015. Minto prepared the Phase 4 EEM Study Design Report (provided as Appendix C) in 2015 Annual Report.
32		Terrestrial Environmental Monitoring Program - Invasive Plant Species Monitoring Program	Mitigation measures (site access, plant selection for reclamation, erosion control, soil salvage) and invasive plant monitoring and reporting • Vegetation surveys will be conducted annually in high risk areas; • Vegetation surveys will identify vegetative cover and species types (within the dry land seed mix); • Should invasive species be detected, the following information should be included in the survey: location; species name; health and size of the plant; pictures of taken of the plant as well as reference points so the location can be more easily found in the future; percent coverage in the area; and • Should any invasive plant species listed by the Yukon Invasive Species Council be encountered, Minto will report the findings to Yukon Government	Full	Full	Full	High	Supporting information and photographs of the invasive species encountered during the monitoring program was not provided in the 2015 Annual Report, but the EMSRP only requires reporting a "summary" of the information.
33		Terrestrial Environmental Monitoring Program -Wildlife Monitoring Program	• Wildlife monitoring: o Maintaining a wildlife observation log onsite; reporting wildlife encounters; o Monitoring measures to ensure birds do not settle on tailings facilities; o Environmental personnel on site will monitor project activities and modify operations to address wildlife concerns; o Monitoring of planned areas of disturbance prior to work to ensure nesting birds are not present. • Migratory Birds: o Monitoring to ensure waterfowl and shorebirds do not settle on impacted water bodies, such as the Mill Water Storage Pond or the Main Pit; o Environmental personnel on site will monitor project activities and modify operations to address wildlife concerns. • Species at Risk/of Concern: o Any caribou observations will be reported to the Conservation Officer in Carmacks; o Residuum piles that contain bank swallow nests will be cordoned off and left undisturbed until after the late summer migration, or re-sloped prior to nesting season to deter nesting.	Full	Full	Full	High	Results of the programs are not included in the 2015 Annual Report. For full compliance with the EMSRP Minto should provide results of: • Monitoring programs designed to ensure birds do not settle on tailings facilities, Mill Water Storage Pond or the Main Pit; observational reports did not indicate that this was an issue in 2015 so no formal monitoring programs were implemented - first observation in 2016 so Minto developed a formal monitoring program • If wildlife concerns were identified, how operations were modified to address them; and • Nesting bird surveys in areas to be disturbed: areas disturbed occurred in August to December
34		Terrestrial Environmental Monitoring Program - Erosion and Sedimentation Monitoring	Monitoring of surface structures and of the receiving environment for evidence of erosion and sediment accumulation is required by the WUL • Visual inspections along bottoms of slopes and depressions of large structures and road routes as needed following heavy rain events, and during freshet; • Water quality monitoring for total suspended solids (TSS) at stations W2, W50 and W17 weekly and during heavy runoff periods; • Physical inspection of surface facilities by a Yukon registered Engineer after the spring thaw period in May/June of each year.	Full	Full	Full	High	Other than providing a summary of the TSS results for stations W2, W50 and W17, results of the other monitoring activities are not included in the 2015 Annual Report; however, this is not required for the QML.
35	Explosives Management Plan		standards operating procedures and best management practices	NA	NA	NA	NA	No requirements for tracking, reporting or monitoring.
36	Heritage Resources Protection Plan		• Completion of a Heritage Resource Site Observation Form in any instance where it is believed a heritage resources site has been encountered; • If a potential heritage resource site is observed, it will be immediately reported to the Yukon Archaeologist and to the Selkirk First Nation (SFN) Heritage Office; • Discovery of evidence of human use: Stop work immediately; contact a supervisor or member of the Environment Department; ensure that the area is secure; determine if the find is a heritage resource in discussion with the SFN and Yukon Government; • Discovery of human remains: Stop work immediately; contact Site Manager; notify RCMP; follow Yukon Tourism Heritage Branch guidelines; and • Paleontological resource: Stop work immediately; contact a supervisor or member of the Environment Department; ensure that the area is secure; contact SFN and Department of Tourism and Culture.	Full	Full	Full	High	No heritage resources encountered, therefore not applicable. Recommendation to note this in Annual Report.
37	Sediment and Erosion Control Plan		• Visual inspections: conducted as needed following heavy rain events and during freshet; • Water quality monitoring for TSS: weekly monitoring plus during heavy runoff periods; and • Physical inspection of surface facilities: inspection of mine facilities by a Yukon registered engineer in May/June and September of each year.	Full	Full	Full	High	No reporting requirements are included in the SECP.

Minto QML - 0001 Environmental Audit
Appendix A

Line Item	Approved Plan	Component	Commitment	Compliance with Plan Objective (Full/Partial/No)	Adequacy to meet Plan Objective (Full/Partial/No)	Compliance with Minto Policy and Procedure (Full/Partial/No)	Information Reliability and Integrity (High/Low/NA)	Note
38	Spill Contingency Plan		• The SCP must be reviewed annually and a summary of the review, including any revisions to the plan, must be included as a component of the annual report. • Any spill that occurs at the Minto Mine site must be reported through the internal reporting chain of command and follow the procedures for assessment, prevention, containment and clean-up and reporting. • Should a spill exceed the thresholds set by the Yukon Government then it must be reported to external authorities. • All spills (whether reportable externally or not) must be verbally reported by the discoverer to his or her immediate supervisor, and either the Site Safety or the Environmental Department following assessment of the scene. • The Environmental Department will issue an Environmental Incident Notification (EIN) to site directors, including senior management. This typically occurs concurrently with spill response (prevention, containment and clean-up) activities. • Following the spill response, responsible department heads will document the spill on an Environmental Incident Report (EIR); the EIR will include photos, a description of clean-up activities, subsequent actions, and identify root cause and any required corrective actions. • The environmental lead will call the 24-hour Yukon Spill Report line should a spill of a reportable quantity occur. • Minto will contact the Selkirk First Nation Lands Director; Energy Mines and Resources Client Services and Inspections; and Environment Canada via email or phone after	Partial	Partial	Full	High	Minto reports in Section 2.5.4 of the 2015 Annual Report that the updated 2016 Minto Mine Spill Contingency Plan is provided in Appendix A. Minto did not provide a summary of the review or of the revisions that were made to the SCP Unclear what revisions, if any, were made to the Tug and Barge Emergency Contingency Plan appended to the SCP. Minto summarises the details of three reportable spills that occurred at the mine site in 2015 in Section 2.5.3 of the Annual Report. The EIR forms are not provided in the 2015 Annual Report, but these can be found on the Yukon Water Board Waterline website. The spill kit contents and locations should be updated in the SCP.
39	Waste Management Plan		• Non-hazardous solid waste is segregated into two streams: putrescible and non-putrescible wastes; Non-putrescible wastes are further segregated into recyclable, burnable and non-burnable material • Recyclables are stored in a sea can/bear proof container until removed from the mine site; • LTF: Quantities greater than 1 m3 are identified with Environmental Incident Report number (EIR number) marked permanently on stakes • Contaminated soils resulting from spills are excavated and hauled to the LTF where they are placed in a staging area for initial characterization; they cannot be placed in the treatment cell until analytical results for the contaminants of concern are received; once under treatment, interim samples are taken late August/early September • Soil in LTF must be free from debris (e.g., piping, concrete, wiring conduit, etc.) before spreading in the treatment cell • LTF inspections are conducted bi-weekly to ensure that all signage is visible, berms are not damaged, and new material has been properly labeled and staged in the appropriate sections of the LTF; record keeping ensures that tillage is occurring as required, that laboratory results are up to date, and that all material that has been confirmed as being acceptable is moved from the staging to the treatment cell in a timely manner • Only used tires with rim size greater than 24.5" may be buried at the landfill; tires not buried or used for the purpose of protection barriers or other on-site uses are hauled off-site; • All Special Wastes are transported off-site to a facility permitted in the Yukon or other jurisdiction to receive them, in accordance with applicable transport laws by a carrier permitted in the Yukon or another jurisdiction to receive and transport Special Wastes • Inspections of the incinerator, land treatment facility and waste management area are conducted regularly with records kept in the Environment department office.	Full	Full	Full	High	
40	Wildlife Protection Plan		• All incidents (any interaction between human and wildlife which results in harm to one or both) involving wildlife shall be reported to the District Conservation Officer, Department of Environment, Carmacks. • Waste is kept in bear proof containers, and combustible waste is incinerated completely on a daily basis to avoid attraction of nuisance animals. • Segregated waste bins (e.g. waste metal, wood, etc.) and the landfill and burn pit are inspected regularly to ensure food scraps and other attractants are not getting into non-attractant waste streams. • Wildlife monitoring: maintaining a wildlife observation log onsite; and reporting wildlife encounters; data are compiled and reported in the Annual Report. • Migratory Birds: monitoring to determine if waterfowl and shorebirds settle on impacted water bodies, such as the Main or Area 2 Pits. Environmental personnel on site monitor project activities and modify operations to address wildlife concerns. • Hazing Program: In order to minimize wildlife stress and disturbance, potentially dangerous animals are only hazed if they are encountered in areas of high extravehicular human traffic, such as close to camp or workshops. If seen in other areas of the mine, they are monitored only.	Full	Full	Full	Low	Documentation of the wildlife monitoring programs conducted in 2015 were not included in the 2015 Annual Report -Minto reports that monitoring activities summarized in the WPP were conducted in 2015, however, this information is not required to be included in the Annual Report