Type A Water Licence MV2019L2-0004
De Beers Canada Inc. – Snap Lake Project

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Part A: Scope and Defined Terms

Scope:

1. This Licence entitles the Licensee to use Water and deposit Waste from mining and milling and associated activities at the Snap Lake Diamond Project Site.

   The scope of this Licence includes the following:
   a) Construction, operation, and maintenance of site facilities, roads, and laydown areas;
   b) Construction, operation, and maintenance of a winter ice road;
   c) Construction, operation, and maintenance of the North Pile Facility;
   d) Storage of fuel;
   e) Quarrying of materials from specified areas;
   f) Withdrawal of Water for domestic purposes;
   g) Depositing of Waste to the North Pile Facility; and
   h) Progressive reclamation and associated Closure and Reclamation activities.

2. This Licence is issued subject to the conditions contained herein with respect to the use of Water and the deposit of Waste in any Waters or in any place under any conditions where such Waste or any other Waste that results from the deposits of such Waste may enter any Waters. Whenever new Regulations are made or existing Regulations are amended by the Commissioner in Executive Council under the *Waters Act*, or other statutes imposing more stringent conditions relating to the quantity or type of Waste that may be so deposited or under which any such Waste may be so deposited, this Licence shall be deemed, upon promulgation of such Regulations, to be automatically amended to conform with such Regulations.

3. Compliance with the defined terms and conditions of this Licence does not relieve the Licensee from responsibility for compliance with the requirements of any applicable federal, territorial, or municipal legislation.

Defined Terms:

Acid Rock Drainage – acidic Water, often with elevated sulphate concentrations, that occurs as a result of oxidation of sulphide minerals contained in rock or other materials that are exposed as a result of natural weathering processes, Construction, or Project activities.

Action Level – a predetermined qualitative or quantitative trigger which, if exceeded, requires the Licensee to take appropriate actions.

Active Closure – the closure period during which closure and reclamation activities are being implemented and prior to breaching the Influent Storage Ponds to allow water to passively flow into Snap Lake.

Analyst – an Analyst designated by the Minister under subsection 65(1) of the *Waters Act*.

Annual Loading – total mass of a contaminant that is discharged to Snap Lake during a calendar year.

Aquatic Effects Monitoring Program (AEMP) – a monitoring program developed for the Project in accordance with this Licence and the MVLWB/GNWT *Guidelines for Aquatic Effects Monitoring Programs.*

Average Annual Loading – the sum of annual loads divided by the number of years for which annual loads are calculated.

Average Concentration – the arithmetic mean/discrete average of four consecutive analytical results, or if less than four analytical results, the arithmetic mean/discrete average of the analytical results collected during a batch decant, as submitted to the Board in accordance with the sampling and analysis requirements specified in the Surveillance Network Program.

Board – the Mackenzie Valley Land and Water Board established under subsection 99(1) of the *Mackenzie Valley Resource Management Act*.

Closure Cost Estimate – an estimate of the cost to close and reclaim a project.

Closure Criteria – standards that measure the success of selected closure activities in meeting closure objectives. Closure criteria may have a temporal component (e.g., a standard may need to be met for a pre-defined number of years). Closure criteria can be site-specific or adopted from territorial/federal or other standards and can be narrative statements or numerical values.

Closure Objectives – statements that describe what the selected closure activities are aiming to achieve; they are guided by the closure principles. Closure objectives are typically specific to project components, are measurable and achievable, and allow for the development of closure criteria.

Closure and Reclamation – the process and activities that facilitate the return of areas affected by the Project to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and human activities.

Closure and Reclamation Plan (CRP) – a document, developed in accordance with this Licence and the MVLWB/AANDC *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*, that clearly describes the Closure and Reclamation for the Project.

Commented [MS1]: Board staff will update final list based on the use of the defined term in the Conditions listed below.

Commented [MS2]: Board staff are seeking input into this definition to specify the closure period before the Influent Storage Ponds are breached. The intention of including this definition is to allow operational flexibility. See Part F, condition 21 (EQC).

Constructed Wetlands – the partially vegetated water control structures that receive water from the Influent Storage Ponds and actively remove nitrate through de-nitrification.

Commented [MS3]: Wording provided by De Beers.

Board staff are seeking input into this project specific condition.

Construction – any activities undertaken during any phase of the Project to construct or build any structures, facilities or components of, or associated with, the development of the Project.

Dam – a structure that meets the definition of a Dam as per the *Dam Safety Guidelines* and is intended to contain, withhold, divert, or retain Water or Waste.

Dam Class – the category of dam based on its failure consequences, as described in the *Dam Safety Guidelines.*

Dam Safety Guidelines – the Canadian Dam Association (CDA) *Dam Safety Guidelines,* including the CDA *Dam Safety Guidelines Technical Bulletins*.

Discharge – a direct or indirect deposit or release of any Water or Waste to the Receiving Environment.

Effluent – a Wastewater Discharge.

Effluent Quality Criteria (EQC) – numerical or narrative limits on the quality or quantity of the Waste deposited to the Receiving Environment.

Engagement Plan – a document, developed in accordance with the MVLWB *Engagement and Consultation Policy* and the *Engagement Guidelines for Applicants and Holders of Water Licences and Land Use Permits*, that clearly describes how, when and which engagement activities will occur with an affected party during the life of the Project.

Engineer of Record – a qualified and competent Professional Engineer who is responsible for the design and performance of the [enter list of structures/facilities].

Commented [MS4]: Board staff are seeking input into the list of structures/facilities to be included here.

Engineered Structure – any structure or facility related to Water Use or the deposit of Waste that is designed by a Professional Engineer, including but not limited to the [enter list of structures/facilities] associated with the Project.

Commented [MS5]: Board staff are seeking input into the list of structures/facilities to be included here.

Environmental Assessment (EA) – the totality of the Mackenzie Valley Environmental Impact Review Board's Public Registry for Environmental Assessments EA01-004 and EA1314-02.

Freeboard – the vertical distance between the Water or Wastewater line and the lowest elevation of the effective Water or Wastewater containment crest on the upstream slope of a containment structure.

Greywater – all liquid Waste from showers, baths, sinks, kitchens and domestic washing facilities, but does not include Toilet Waste.

Groundwater – as defined in section 1 of the Waters Regulations: all water in a zone of saturation below the land surface, regardless of its origin.

Hazardous Waste – a Waste which, because of its quantity, concentration, or characteristics, may be harmful to human health or the environment when improperly treated, stored, transported, or discharged.

Influent Storage Pond – includes the east and west influent storage ponds which receive and store Seepage and Runoff from the North Pile Facility.

Commented [MS6]: Wording provided by De Beers.

Board staff are seeking input into this project specific condition.

Inspector – an Inspector designated by the Minister under subsection 65(1) of the *Waters Act*.

Licensee – the holder of this Licence.
Maximum Average Concentration – the concentration of a parameter that cannot be exceeded by the running average of any four consecutive analytical results.

Maximum Grab Concentration – the concentration of a parameter that cannot be exceeded in any one analytical result.

Metal Leaching – the release of metals and metalloids in leachate, Seepage, or drainage from rock or other materials associated with the Project.

Minewater – Groundwater, surface Water or any Water that is pumped or flows out of any underground mine working or open pit.

Minister – the Minister of the Government of the Northwest Territories (GNWT) – Environment and Natural Resources.

North Pile – the North Pile Waste Rock and Processed Kimberlite storage facility which is comprised of the containment basins and the engineered structures designed to store and contain the Processed Kimberlite and other waste materials.

North Pile Facility – includes the North Pile and any other stockpiles of ore or Waste Rock associated with the Project as well as the Passive Water Treatment System.

North Pile Perimeter Water Control Structures – the ditches and sumps that convey water away from the North Pile.

Commented [MS7]: Wording provided by De Beers.

Board staff are seeking input into this project specific condition.

Ordinary High Water Mark – the usual or average level to which a Watercourse rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing Watercourses (rivers, streams), this refers to an active channel/bank-full level, which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments, it refers to those parts of the Watercourse bed and banks that are frequently flooded by Water so as to leave a mark on the land and where the natural vegetation changes from predominantly aquatic vegetation to terrestrial vegetation (excepting Water tolerant species). For reservoirs, this refers to normal high operating levels (full supply level).

Passive Water Treatment System – components related to the collection, conveyance and/or treatment of Water without active management.

Commented [MS8]: Wording provided by De Beers.

Board staff are seeking input into this project specific condition.

Post-Closure – the period following the approval of the Post-Closure and Reclamation Monitoring and Maintenance Plan.

Commented [MS9]: Board staff are seeking input into this definition.

Potentially Acid Generating Rock – any rock that has the potential to produce Acid Rock Drainage.

Processed Kimberlite – the material rejected from the process plant after the recoverable materials have been extracted.

Professional Engineer – a person registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists to practice as a Professional Engineer in the Northwest Territories as per the territorial

Engineering and Geoscience Professions Act and whose professional field of specialization is appropriate to address the components of the Project at hand.

Professional Geoscientist – a person registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists to practice as a Professional Geoscientist in the Northwest Territories as per the territorial *Engineering and Geoscience Professions Act* and whose professional field of specialization is appropriate to address the components of the Project at hand.

Progressive Reclamation – Closure and Reclamation activities conducted during the operating phase of the Project.

Project – the undertaking described in Part A, Condition 1.

Receiving Environment – the natural environment that, directly or indirectly, receives any deposit of Waste from the Project.

RECLAIM – the Government of the Northwest Territories' model for estimating Closure and Reclamation costs.

Remediation – the removal, reduction, or neutralization of substances, Wastes, or hazardous materials from a site in order to prevent or minimize any adverse effects on the environment and public safety, now or in the future.

Response Framework – a systematic approach to responding to the results of a monitoring program through adaptive management actions.

Response Plan – a document describing the actions that will be taken by a licensee in response to an Action Level exceedance.

Runoff – the overland flow of Water or Wastewater that occurs when precipitation, meltwater, or other Water is not absorbed by the land.

Seepage – any Water or Waste that drains, passes through, or escapes from any structure designed to contain, withhold, divert, or retain Water or Waste.

Sewage – all Toilet Wastes and Greywater.

Sewage Disposal Facilities – the area(s) and structures designated to contain and treat Sewage.

Solid Waste Disposal Facilities – the area(s) and structures designated to contain solid Waste.

Spill Contingency Plan (SCP) – a document, developed in accordance with INAC's *Guidelines for Spill Contingency Planning.*

Surveillance Network Program (SNP) – a monitoring program established to define environmental sampling, analysis, and reporting requirements, as detailed in Annex A of this Licence.

Toilet Wastes – all human excreta and associated products, not including Greywater.

Traditional Knowledge – the cumulative, collective body of knowledge, experience and values built up by a group of people through generations of living in close contact with nature. It builds upon the historic experiences of a people and adapts to social, economic, environmental, spiritual, and political change.

Unauthorized Discharge – a Discharge of any Water or Waste not authorized under this Licence.

Waste – as defined in section 1 of the *Waters Act:*

a) a substance that, if added to water, would degrade or alter or form part of a process of degradation or alteration of the quality of the water to an extent that is detrimental to its use by people or by an animal, fish or plant, or
b) water that contains a substance in such a quantity or concentration, or that has been so treated, processed or changed, by heat or other means, that it would, if added to other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water to the extent described in paragraph (a),

and includes

c) a substance or water that, for the purposes of the *Canada Water Act*, is deemed to be waste,
d) a substance or class of substances prescribed by regulations made under subparagraph 63(1)(b)(i),
e) water that contains a substance or class of substances in a quantity or concentration that is equal to or greater than a quantity or concentration prescribed in respect of that substance or class of substances by regulations made under subparagraph 63(1)(b)(ii), and
f) water that has been subjected to a treatment, process or change prescribed by regulations made under subparagraph 63(1)(b)(iii).

Waste Management Plan (WMP) – a document, developed in accordance with the Mackenzie Valley Land and Water Board's *Guidelines for Developing a Waste Management Plan,* that describes the methods of Waste management from Waste generation to final disposal.

Waste Rock – all rock materials, except ore and Processed Kimberlite, which are produced as a result of mining and milling operations.

Wastewater – any Water that is generated by Project activities or originates on-site, and which contains Waste, and may include, but is not limited to, Runoff, Seepage, Sewage, Minewater, and Effluent.

Wastewater Management Pond(s) – the area(s) and structures designated to collect and store Wastewater.

Wastewater Treatment Facilities – the area(s) and structures designated for the treatment of Wastewater.

Water – as defined in section 1 of the *Waters Act:* water under the administration and control of the Commissioner, whether in a liquid or frozen state, on or below the surface of land.

Watercourse – as defined in section 1 of the Waters Regulations: a natural watercourse, body of Water or Water supply, whether usually containing Water or not, and includes Groundwater, springs, swamps, and gulches.

Water Management Area – a geographical area of the Northwest Territories established by section 2 and Schedule A of the Waters Regulations.

Waters Regulations – the regulations proclaimed pursuant to section 63 of the *Waters Act*.

Water Supply Facilities – the area(s) and structures designated to collect, treat, and supply Water for the Project.

Water Use – as defined in section 1 of the *Waters Act*: a direct or indirect use of any kind, including, but not limited to,

(a) a diversion or obstruction of waters,
(b) an alteration of the flow of waters, and

(c) an alteration of the bed or banks of a river, stream, lake or other body of water, whether or not the body of water is seasonal,

but does not include a use connected with shipping activities that are governed by the *Canada Shipping Act*, 2001.

Water Use Fee – the fee for use of Water as per the Waters Regulations pursuant to section 63 of the *Waters Act* and the Mackenzie Valley Land and Water Board's *Water Use Fee Policy*.

Part B: General Conditions

1.	The Licensee shall ensure a copy of this Licence is maintained on site at all times.	COPY OF LICENCE
2.	The Licensee shall take every reasonable precaution to protect the environment.	PRECAUTION TO PROTECT ENVIRONMENT
3.	In conducting its activities under this Licence, the Licensee shall make every reasonable effort to consider and incorporate any scientific information and Traditional Knowledge that is made available to the Licensee.	INCORPORATE SCIENTIFIC INFORMATION AND TRADITIONAL KNOWLEDGE
4.	All references to policies, guidelines, codes of practice, statutes, regulations, or other authorities shall be read as a reference to the most recent versions, unless otherwise denoted.	REFERENCES
5.	The Licensee shall ensure all submissions to the Board: a) Are in accordance with the Mackenzie Valley Land and Water Board's *Document Submission Standards*; b) Include a conformity statement or table which identifies where the requirements of this Licence, or other directives from the Board, are addressed; and c) Include any additional information requested by the Board.	SUBMISSION FORMAT AND CONFORMITY
6.	The Licensee shall ensure management plans are submitted to the Board in a format consistent with the Mackenzie Valley Land and Water Board's *Standard Outline for Management Plans*, unless otherwise specified.	MANAGEMENT PLAN FORMAT
7.	The Licensee shall comply with all plans, programs, and studies approved pursuant to the conditions of this Licence, including such revisions made as per the conditions of this Licence, and as approved by the Board.	COMPLY WITH SUBMISSIONS AND REVISIONS
8.	The Licensee shall conduct an annual review of all plans, programs, and studies and make any revisions necessary to reflect changes in operations, contact information, or other details. No later than March 31 each year, the Licensee shall send a notification letter to the Board, listing the documents that have been reviewed and do not require revisions.	ANNUAL REVIEW
9.	The Licensee may propose changes at any time by submitting revised plans, programs, or studies to the Board, for approval, a minimum of 90 days prior to the proposed implementation date for the changes. The Licensee shall not implement the changes until approved by the Board.	REVISIONS
10.	The Licensee shall revise any submission and submit it as per the Board's directive.	REVISE AND SUBMIT
11.	If any date for any submission falls on a weekend or holiday, the Licensee may submit the item on the following business day.	SUBMISSION DATE
12.	The Licensee shall comply with the **Schedules**, which are annexed to and form part of this Licence, and any updates to the Schedules as may be made by the Board.	COMPLY WITH SCHEDULE(S)

13.	The Licensee shall comply with the **Surveillance Network Program**, which is annexed to and forms part of this Licence, and any updates to the Surveillance Network Program as may be made by the Board.	COMPLY WITH SURVEILLANCE NETWORK PROGRAM
14.	The Schedules, the Surveillance Network Program, and any compliance dates specified in this Licence may be updated at the discretion of the Board.	UPDATES TO COMPLIANCE DATE(S)
15.	The Licensee shall ensure signs are posted for all active Surveillance Network Program stations. All sign(s) shall be located and maintained to the satisfaction of an Inspector.	POST SURVEILLANCE NETWORK PROGRAM SIGN(S)
16.	The Licensee shall install, operate, and maintain meters, devices, or other such methods used for measuring the volumes of Water used and Waste discharged to the satisfaction of an Inspector.	MEASURE WATER USE AND WASTE DISCHARGED
17.	Beginning March 31, 2021 and no later than every March 31st thereafter, the Licensee shall submit an **Annual Water Licence Report** to the Board and an Inspector**.** The Report shall be in accordance with the requirements of Schedule 1, Condition 1.	ANNUAL WATER LICENCE REPORT
18.	The Licensee shall comply with the **Engagement Plan**, once approved.	ENGAGEMENT PLAN
19.	Within 90 days following the effective date of this Licence, the Licensee shall submit to the Board, for approval, a revised Engagement Plan.	ENGAGEMENT PLAN – REVISED
20.	A minimum of 48 hours prior to the initial commencement of Project activities, the Licensee shall provide written notification to the Board and an Inspector. Notification shall include the commencement date, and the name and contact information for the individual responsible for overseeing the Project. Written notification shall be provided to the Board and an Inspector if any changes occur.	NOTIFICATION – COMMENCEMENT
21.	A minimum of 48 hours prior to re-commencement of Project activities following a temporary shut-down period, the Licensee shall provide written notification to the Board and an Inspector. Notification shall include the commencement date, and the name and contact information for the individual responsible for overseeing the Project. Written notification shall be provided to the Board and an Inspector if any changes occur.	NOTIFICATION – RE-COMMENCEMENT
22.	The Licensee shall immediately provide written notification to the Board and an Inspector of any non-compliance with the conditions of this Licence or with any directive from the Board pursuant to the conditions of this Licence.	NOTIFICATION – NON-COMPLIANCE
23.	The Licensee shall ensure that a copy of any written authorization issued to the Licensee by an Inspector is provided to the Board.	COPY – WRITTEN AUTHORIZATION

24. The Licensee shall submit a current Project schedule to the Board and an Inspector upon request.	SUBMIT CURRENT PROJECT SCHEDULE

Part C: Security

1.	The Licensee shall post and maintain a security deposit with the Minister in accordance with Schedule 2. The Licensee shall not commence Project activities until the security deposit has been posted.	POST SECURITY DEPOSIT
2.	Upon request of the Board, the Licensee shall submit an updated Closure Cost Estimate using the current version of RECLAIM or another method acceptable to the Board.	UPDATE CLOSURE COST ESTIMATE
3.	The amount of the security deposit required by Part C, Condition 1 may be adjusted by the Board: a) Based on an updated Closure Cost Estimate as per Part C, Condition 2; or b) Based on such other information as may become available to the Board.	ADJUSTED SECURITY AMOUNT
4.	If the amount of the security deposit is adjusted by the Board as per Part C, Condition 3, the Licensee shall post the adjusted amount with the Minister within the timeframe set by the Board. The Licensee shall not commence any new activities associated with a security adjustment until the additional security deposit has been posted.	POST ADJUSTED SECURITY AMOUNT
5.	Unless otherwise approved by the Board, the Licensee may not submit security adjustment requests except with any of the following submissions: a) Closure and Reclamation Plans; b) Closure and Reclamation Completion Reports; or c) Performance Assessment Reports.	SECURITY ADJUSTMENT REQUESTS

Part D: Water Use

1.	The Licensee shall only obtain fresh Water for the Project from Snap Lake. The Licensee may withdraw up to 188,000 m^3/year of Water from this source.	WATER SOURCE AND MAXIMUM VOLUME
2.	In any single ice-covered season, the Licensee shall not withdraw greater than 10% of the available Water volume of any Watercourse, as calculated using the appropriate maximum expected ice thickness.	MAXIMUM UNDER-ICE WATER WITHDRAWAL VOLUME
3.	The Licensee may use Wastewater from the [enter list Wastewater sources] for [enter Wastewater uses] only if that Wastewater meets the Effluent Quality Criteria established in Part F, Conditions 21 and 28 of this Licence, or as otherwise approved by the Board.	WASTEWATER USE
4.	The Licensee shall only withdraw Water using the Water Supply Facilities, unless otherwise authorized temporarily in writing by an Inspector.	WATER WITHDRAWAL – FACILITIES
5.	Prior to obtaining Water from a licensed Water source, the Licensee shall post sign(s) to identify the intake for the Water Supply Facilities. All sign(s) shall be located and maintained to the satisfaction of an Inspector.	POST WATER INTAKE SIGN(S)
6.	The Licensee shall construct and maintain the Water intake(s) with a screen designed to prevent impingement or entrapment of fish.	WATER INTAKE SCREEN
7.	Each year, prior to the 14th day of June, and in advance of any Water use, the Licensee shall pay the Water Use Fee in accordance with the MVLWB *Water Use Fee Policy*.	WATER USE FEE

Commented [MS10]: Board staff are seeking input into the list of Wastewater sources and Wastewater uses.

Part E: Construction

1.	The Licensee shall ensure that all structures intended to contain, withhold, divert, or retain Water or Waste are designed, constructed, and maintained to minimize the escape of Waste to the Receiving Environment.	OBJECTIVE – CONSTRUCTION
2.	The Licensee shall ensure that all structures intended to contain, withhold, divert, or retain Water or Wastes, and which meet the definition of a Dam as per the *Dam Safety Guidelines* are designed, constructed, maintained, and monitored to meet or exceed the *Dam Safety Guidelines*.	DAMS – GENERAL
3.	The Licensee shall ensure that all Engineered Structures are constructed and maintained in accordance with the recommendations of the Professional Engineer responsible for the design, including, but not limited to, recommendations regarding field supervision and inspection requirements.	ENGINEERED STRUCTURES – GENERAL
4.	The Licensee shall ensure that all material used in Construction meets the geochemical criteria specified in the approved Acid Rock Drainage and Geochemical Characterization and Management Plan referred to in Part F, Condition 8.	CONSTRUCTION MATERIAL – GEOCHEMICAL CRITERIA
5.	The Licensee shall maintain records of Construction materials for all structures and make them available at the request of the Board or an Inspector.	CONSTRUCTION RECORDS
6.	The Licensee shall maintain geochemical records of Construction materials for the North Pile Closure Cover and the Passive Water Treatment System and make them available at the request of the Board or an Inspector.	GEOCHEMICAL RECORDS
7.	Unless otherwise authorized in writing by an Inspector, a minimum of 90 days prior to the commencement of Construction of all structures, excluding Engineered Structures, intended to contain, withhold, divert, or retain Water or Wastes, the Licensee shall submit to the Board, for approval, a **Structure Description and Construction Plan**. The Plan shall be in accordance with the requirements of Schedule 3, Condition 1. The Licensee shall not commence Construction prior to Board approval of the Plan.	STRUCTURE DESCRIPTION AND CONSTRUCTION PLAN
8.	A minimum of 90 days prior to the commencement of Construction of any Engineered Structures, the Licensee shall submit to the Board for approval, a **Design and Construction Plan.** The Plan shall be in accordance with the requirements of Schedule 3 Condition 2. The Licensee shall not commence Construction prior to Board approval of the Plan.	DESIGN AND CONSTRUCTION PLAN
9.	A minimum of 90 days prior to the commencement of Construction of any Engineered Structures, the Licensee shall submit to the Board, **Design Drawings** stamped and signed by a Professional Engineer. A minimum of 90 days prior to implementing any proposed changes, the Licensee shall submit revised Design Drawings to the Board.	DESIGN DRAWINGS

10. A minimum of 48 hours prior to the commencement of Construction of any Engineered Structure(s), the Licensee shall provide written notification to the Board and an Inspector. Notification shall include the Construction commencement date, and the name and contact information for the individual responsible for overseeing Construction. Written notification shall be provided to the Board and an Inspector if any changes occur.	NOTIFICATION – CONSTRUCTION – ENGINEERED STRUCTURES
11. A minimum of 48 hours prior to the commencement of Construction of any structure(s) intended to contain, withhold, divert, or retain Water or Wastes, the Licensee shall provide written notification to the Board and an Inspector. Notification shall include the Construction commencement date, and the name and contact information for the individual responsible for overseeing the Construction. Written notification shall be provided to the Board and an Inspector if any changes occur.	NOTIFICATION – CONSTRUCTION
12. The Licensee shall ensure that all structures intended to contain, withhold, divert, or retain Water or Wastes, excluding Engineered Structures, are constructed in accordance with the approved **Structure Description and Construction Plan(s)**.	CONSTRUCT AS DESIGNED – STRUCTURE(S)
13. The Licensee shall ensure that all Engineered Structures are constructed in accordance with the **Design Drawings** and approved **Design and Construction Plans**.	CONSTRUCT AS DESIGNED – ENGINEERED STRUCTURE(S)
14. Within 90 days of the completion of the Construction of each Engineered Structure, the Licensee shall submit to the Board, an **As-Built Report** stamped and signed by a Professional Engineer, which shall include, but not be limited to, the following information: a) final as-built drawings of the Engineered Structure(s), stamped and signed by a Professional Engineer; b) documentation, with rationale, of field decisions that deviate from **Design and Construction Plans** and **Design Drawings**; and c) any data used to support these decisions.	AS-BUILT REPORT – ENGINEERED STRUCTURE(S)

Part F: Waste and Water Management

1.	The Licensee shall manage Waste and Water with the objective of minimizing the impacts of the Project on the quantity and quality of Water in the Receiving Environment through the use of appropriate mitigation measures, monitoring, and follow-up actions.	OBJECTIVE – WASTE AND WATER MANAGEMENT

Management Plans and Monitoring Programs

2.	The Licensee shall comply with the **Waste Management Plan**, once approved.	WASTE MANAGEMENT PLAN
3.	Within 90 days following the effective date of this Licence, the Licensee shall submit to the Board, for approval, a revised Waste Management Plan in accordance with the Mackenzie Valley Land and Water Board's March 2011 *Guidelines for the Development of a Waste Management Plan*. The Licensee shall not implement the changes until Board approval of the Plan.	WASTE MANAGEMENT PLAN – REVISED
4.	The Licensee shall comply with the **Water Management Plan**, once approved. The Plan shall be in accordance with the requirements of Schedule 4, Condition 1.	WATER MANAGEMENT PLAN
5.	A minimum of 90 days prior to commencement of activities, the Licensee shall submit to the Board, for approval, a revised Water Management Plan. The Plan shall be in accordance with the requirements of Schedule 4, Condition 1. The Licensee shall not commence Construction of any Engineered Structures prior to Board approval of the Plan.	WATER MANAGEMENT PLAN – REVISED
6.	The Licensee shall comply with the **North Pile Management Plan**, once approved. The Plan shall be in accordance with the requirements of Schedule 4, Condition 2.	NORTH PILE MANAGEMENT PLAN
7.	A minimum of 90 days prior to commencement of activities, the Licensee shall submit to the Board, for approval, a revised North Pile Management Plan. The Plan shall be in accordance with the requirements of Schedule 4, Condition 2. The Licensee shall not commence Construction of North Pile Facility prior to Board approval of the Plan.	NORTH PILE MANAGEMENT PLAN – REVISED
8.	The Licensee shall comply with the **Acid Rock Drainage and Geochemical Characterization and Management Plan**, once approved. The Plan shall be in accordance with the requirements of Schedule 4, Condition 3.	ACID ROCK DRAINAGE AND GEOCHEMICAL CHARACTERIZATION AND MANAGEMENT PLAN
9.	Within 90 days following the effective date of this Licence, the Licensee shall submit to the Board, for approval, a revised Acid Rock Drainage and Geochemical Characterization and Management Plan. The Plan shall be in accordance with the requirements of Schedule 4, Condition 3. The Licensee shall not commence Construction of North Pile Facility prior to Board approval of the Plan.	ACID ROCK DRAINAGE AND GEOCHEMICAL CHARACTERIZATION AND MANAGEMENT PLAN – REVISED

Commented [MS11]: Board staff are seeking input into the project activity.

Commented [MS12]: Board staff are seeking input into the project activity.

Commented [MS13]: Board staff are seeking input into the project activity.

10. Within 90 days following the effective date of this Licence, the Licensee shall submit to the Board, for approval, **Erosion and Sedimentation Management Plan.** The Plan shall be in accordance with the requirements of Schedule 4, Condition 4. The Licensee shall not commence Construction of North Pile Facility prior to Board approval of the Plan. — EROSION AND SEDIMENTATION MANAGEMENT PLAN

Commented [MS14]: Board staff are seeking input into the project activity and whether this Plan could be incorporated into the North Pile Management Plan.

11. Within 90 days following the effective date of this Licence, the Licensee shall submit to the Board, for approval, **Explosives Management Plan.** The Plan shall be in accordance with the requirements of Schedule 4, Condition 5. The Licensee shall not commence handling or use of explosives to Board approval of the Plan. — EXPLOSIVES MANAGEMENT PLAN

Commented [MS15]: Board staff are seeking input into the project activity.

Operation of Structure and Facilities

12. The Licensee shall construct, operate, and maintain the North Pile Facility to the design specifications and engineering standards, such that: — NORTH PILE FACILITY
    a) the specifications described in the North Pile Facility **Design and Construction Plan**, referred to in Part E are maintained at all times;
    b) Seepage from the facility to the Receiving Environment is minimized, collected, and returned to the North Pile Facility;
    c) Any deterioration or erosion of constructed structures/facilities shall be reported immediately to an Inspector;
    d) Any deterioration or erosion of constructed structures/facilities that requires repair shall be reported to an Inspector and the Board, and repaired immediately;
    e) Monitoring of the facility is sufficient to ensure that:
        i. Performance design criteria, as described in the **Design and Construction Plan**, referred to in Part E, Condition 8 are being met; and
        ii. Necessary changes in operation of the facility, including any additional mitigations, are identified.

Commented [MS16]: Board staff are seeking input for the requirement of this Condition.

Inspection of Structures and Facilities

13. The Licensee shall conduct annual inspections of Engineered Structures, that are designed to contain, withhold, divert, or retain Water or Waste, or as otherwise directed by an Inspector or the Board. Records of these inspections shall be made available to the Board or an Inspector upon request. — ANNUAL INSPECTION OF ENGINEERED STRUCTURES

14. The Licensee shall conduct daily erosion inspections of Discharge locations during periods of Discharge, or more frequently as directed by an Inspector. Records of these inspections shall be made available to the Board or an Inspector upon request. — DAILY INSPECTIONS OF DISCHARGE LOCATIONS

15. The Licensee shall ensure that geotechnical inspections of all Engineered Structures are conducted annually during the summer months, by a Professional Engineer and following any events that exceed design criteria. The Licensee shall: — ANNUAL GEOTECHNICAL INSPECTION
    a) A minimum of two weeks prior to the annual inspection, provide written notification to an Inspector; and

b) Within 60 days of completing the inspection, submit the Professional Engineer's full **Geotechnical Inspection Report** to the Board and an Inspector. The Report shall include:
   i. a covering letter from the Licensee outlining an implementation plan to respond to any recommendations made by the Professional Engineer, including rationale for any decisions that deviate from the Professional Engineer's recommendations; and
   ii. a summary of any actions taken by the Licensee to address the recommendations made following the previous year's inspection.

16. The Licensee shall conduct a **Dam Safety Review** of all Engineered Structures intended to contain, withhold, divert, or retain Water or Wastes, and which meet the definition of a dam under the *Dam Safety Guidelines* at a frequency based on the Dam classification thereafter. The Dam Safety Review shall be conducted in accordance with the *Dam Safety Guidelines* by a Professional Engineer. — DAM SAFETY REVIEW

17. Prior to January 31 of the year following the year in which the Dam Safety Review was conducted, the Licensee shall submit the Professional Engineer's **Dam Safety Review Report** to the Board. The Report shall include a covering letter from the Licensee outlining an implementation plan to respond to any recommendations made by the Professional Engineer, including rationale for any decisions that deviate from the Professional Engineer's recommendations and a summary of any actions taken by the Licensee to address the recommendations made following the previous Dam Safety Review. — DAM SAFETY REVIEW REPORT

Discharge and Disposal Locations and Rates

18. The Licensee shall deposit all Waste as described in the approved **Waste Management Plan**. — WASTE – GENERAL

19. The Licensee shall direct all Potentially Acid Generating material to the North Pile Facility, as described in the approved **Acid Rock Drainage and Geochemical Characterization and Management Plan**. — POTENTIALLY ACID GENERATING MATERIAL – NORTH PILE FACILITY

20. The Licensee shall discharge all Effluent from North Pile Facility to Snap Lake as described in the approved **Water Management Plan**. — EFFLUENT DISCHARGE – NORTH PILE FACILITY

Effluent Quality Criteria – Discharges from Water Management Systems during Active Closure Phase

21. The Licensee shall ensure that all Water and Waste from the Project that enters the Receiving Environment, including all Discharges at Surveillance Network Program stations 02-17b (Water and Sewage treatment plant), 02-17c (East Influent Storage Pond Discharge), and 02-17d (West Influent Storage Pond Discharge), has a pH value between 6.0 and 9.0[(a)] and meets the following Effluent Quality Criteria (EQC): — EFFLUENT QUALITY CRITERIA – ACTIVE CLOSURE

Commented [MS17]: Board staff are seeking input for the requirement of this Condition.

Commented [JH20]: The following changes in the table are being proposed by De Beers.

Board staff seeking input on EQC. Please see footnotes for details.

Commented [MS18]: Board staff are seeking input into the list of Discharge locations that should be included in this condition

Parameter	EQC		
	mg/L		kg/yr
	Maximum Average Concentration	Maximum Grab Concentration	Annual Loading Limit
~~Total Dissolved Solids (TDS) (calculated)~~[1]	~~960~~	~~1253~~	~~n/a~~
Total Suspended Sediments (TSS)[2]	~~7~~15	~~14~~25	n/a
~~Ammonia as N~~	~~10~~	~~20~~	~~208,000~~
~~Nitrite as N~~[3]	~~0.35~~	~~0.6~~	~~n/a~~
Nitrate as N[4]	60~~12~~	80~~17~~	~~250,000~~
Total Phosphorous	n/a	n/a	229
Fluoride	1.3	2.0	n/a
~~Total Aluminum~~	~~0.1~~	~~0.2~~	~~n/a~~
~~Total Arsenic~~	~~0.003~~	~~0.01~~	~~n/a~~
~~Total Chromium~~	~~0.01~~	~~0.02~~	~~n/a~~
~~Total Copper~~	~~0.003~~	~~0.006~~	~~n/a~~
~~Total Lead~~	~~0.005~~	~~0.01~~	~~n/a~~
~~Total Nickel~~	~~0.05~~	~~0.1~~	~~n/a~~

[1] De Beers has proposed to remove the TDS EQC and AEMP benchmark at the edge of the mixing zone(s) in Snap Lake. Measure 1 requires the MVLWB to set numerical site-specific water quality objectives for TDS and constituent ions of concern in Snap Lake. Model results (LINK TO SNAP LAKE HYDRODYNAMIC REPORT V.2) indicate that TDS concentrations from the Passive Water Treatment System will not exceed the Health Canada Canadian Drinking Water Aesthetic Objective of 500 mg/L. Board staff are requesting input on removal of the EQC and maintaining an AEMP benchmark of 500 mg/L at the edge of the mixing zone(s) in Snap Lake.

[2] Board staff are requesting input on the proposed TSS EQC values. De Beers proposed values are included in the draft EQC table. Board staff note that recent Licences issued by MVLWB have set a maximum grab concentration for TSS at 30 mg/L.

[3] Board staff are requesting input on maintaining the existing EQC for ammonia and nitrite, as well as total aluminum, arsenic, chromium, copper, lead, nickel, and zinc. These existing EQC are based on operational conditions. De Beers proposed to eliminate EQC associated with these parameters.

[4] Board staff are requesting input on the proposed nitrate (as N) EQC. Originally, De Beers proposed lower nitrate EQC of 25 mg/L (maximum average concentration) and 50 mg/L (maximum grab concentration) (LINK TO EQC WKSHOP PRESENTATION), but increased proposed concentrations in the LINK TO EQC REPORT V2. Rationale for the increase was based on eliminating the need for passive wetland treatment system.

~~Total Zinc~~	~~0.01~~	~~0.02~~	~~n/a~~
~~Extractable Petroleum Hydrocarbons – F1 Fraction (C6C10)~~[5]	~~4.6~~	~~n/a~~	~~n/a~~
~~Extractable Petroleum Hydrocarbons – F2 Fraction (C11C16)~~	~~2.1~~	~~n/a~~	~~n/a~~
Faecal Coliforms[(b)][6]	10 CFU/100mL*	20 CFU/100mL*	n/a

* CFU - Colony-forming units
(a) Except surface runoff not reporting to the Water Management System, which shall have a pH between 5.0 and 9.0
(b) EQC only applicable during period when sewage is actively managed on site.

Commented [MS19]: Board staff seeking input on this exception.

22. The Licensee shall ensure that Discharge to Snap Lake shall not be acutely toxic to aquatic life as determined at SNP station 02-17b (Water and Sewage treatment plant), 02-17c (East Influent Storage Pond Discharge), and 02-17d (West Influent Storage Pond Discharge) by the test methods referenced in Part B of the Surveillance Network Program. — EFFLUENT QUALITY – TOXICITY – WATER TREATMENT PLANTS, INFLUENT STORAGE PONDS

23. The Licensee shall submit Water quality data for samples collected from Surveillance Network Program station 02-17b (Water and Sewage treatment plant), 02-17c (East Influent Storage Pond Discharge), and 02-17d (West Influent Storage Pond Discharge) to the Board and an Inspector as follows: — TESTING BEFORE DISCHARGE – WATER TREATMENT PLANTS, INFLUENT STORAGE PONDS
    a) A minimum of five days prior to commencing or resuming Discharge of Effluent to 02-17b (Water and Sewage treatment plant), 02-17c (East Influent Storage Pond Discharge), and 02-17d (West Influent Storage Pond Discharge); and
    b) A minimum of five days prior to commencing or resuming Discharge of Effluent to 02-17b (Water and Sewage treatment plant), 02-17c (East Influent Storage Pond Discharge), and 02-17d (West Influent Storage Pond Discharge) following an exceedance of the EQC specified in Part F, Condition 21 (the table).

    The Licensee shall not commence or resume the Discharge until the EQC are met and an Inspector has provided written authorization.

24. If Water quality data from any sample collected at Surveillance Network Program stations 02-17b (Water and Sewage treatment plant), 02-17c (East Influent Storage Pond Discharge), and 02-17d (West Influent Storage Pond Discharge) exceeds the EQC specified in Part F, Condition 21, or is determined to be acutely toxic as per Part F, Condition 22, the Licensee shall: — EFFLUENT QUALITY CRITERIA – EXCEEDANCE – WATER TREATMENT PLANTS, INFLUENT STORAGE PONDS
    a) Cease the Discharge;
    b) Notify the Board and an Inspector immediately;
    c) Report the spill immediately in accordance with the **Spill Contingency Plan** referred to in Part H, Condition 2;
    d) Comply with the approved **Water Management Plan** referred to in Part F, Condition 4; and

[5] Board staff are requesting input on maintaining hydrocarbon-related EQC for the Active Closure period, when fuel tanks and heavy equipment are on site.
[6] Board staff are requesting input on the proposed faecal coliform EQC, which De Beers is proposing to only apply during the Active Closure period when a camp is located on site and disposal of sewage is required.

e) Within 30 days of initially reporting the incident, or within a timeframe authorized by an Inspector, submit a detailed report on the occurrence, including a summary of corrective actions taken, to the Board and an Inspector within 30 days.

25. A minimum of 90 days prior to conducting the Plume Delineation Study, the Licensee shall submit to the Board for approval, a **Plume Delineation Study Design** for the Influent Storage Ponds discharge location. — PLUME DELINEATION STUDY DESIGN

Commented [MS21]: Board staff to update trigger based on GNWT's response to Undertakings due on January 24, 2020.

26. Within 90 days of the completion of the plume delineation study referred to in Part F, Condition 25, the Licensee shall submit to the Board for approval, a **Plume Delineation Study Report**. — PLUME DELINEATION STUDY REPORT

Commented [MS22]: Board staff to update trigger based on GNWT's response to Undertakings due on January 24, 2020

27. A minimum of X days prior to [insert trigger], the Licensee shall submit to the Board for approval, an **EQC Re-evaluation Report,** that includes, but is not limited to: — EQC RE-EVALUATION REPORT
    a) Tabulated Site Water quality data;
    b) A report summarizing the assumptions and results of an updated Site Water quality model;
    c) A description of how the updated Site Water quality model has considered monitoring data with rationale;
    d) A description of any implications of Site Water quality changes on the downstream environment; and
    e) An assessment based on the results of Part F, Conditions 27 (a), (b), and (c) of whether the EQC as outlined in Part F, Condition 21 require re-evaluation prior to breaching the Influent Storage Ponds and proceeding to a Passive Water Treatment System Discharge.

Commented [MS23]: Board staff are seeking input on this condition.

Effluent Quality Criteria – Discharges from Passive Water Treatment System

28. The Licensee shall ensure that all Water and Waste from the Project that enters the Receiving Environment, including all Discharges at Surveillance Network Program stations 02-17c (East Influent Storage Pond Discharge) and 02-17d (West Influent Storage Pond Discharge), has a pH value between 6.0 and 9.0 and meets the following Effluent Quality Criteria (EQC): — EFFLUENT QUALITY CRITERIA – PASSIVE WATER TREATMENT SYSTEM

Commented [JH24]: The following changes in the table are being proposed by De Beers.

Board staff seeking input on EQC. Please see footnotes for details.

Parameter	EQC	
	mg/L	
	Maximum Average Concentration	Maximum Grab Concentration

~~Total Dissolved Solids (TDS) (calculated)~~ [7]	~~960~~	~~1253~~
Total Suspended Sediments (TSS)	15	30
Nitrate as N [8]	60	80

29. The Licensee shall ensure that Discharge to Snap Lake shall not be acutely toxic to aquatic life as determined at SNP station 02-17c (East Influent Storage Pond Discharge) and 02-17d (West Influent Storage Pond Discharge) by the test methods referenced in Part B of the Surveillance Network Program. EFFLUENT QUALITY – TOXICITY – PASSIVE WATER TREATMENT SYSTEM

[7] De Beers has proposed to remove the TDS EQC and AEMP benchmark at the edge of the mixing zone(s) in Snap Lake. Measure 1 requires the MVLWB to set numerical site-specific water quality objectives for TDS and constituent ions of concern in Snap Lake. Model results (LINK TO SNAP LAKE HYDRODYNAMIC REPORT V.2) indicate that TDS concentrations from the Passive Water Treatment System will not exceed the Health Canada Canadian Drinking Water Aesthetic Objective of 500 mg/L. Board staff are requesting input on removal of the EQC and maintaining an AEMP benchmark of 500 mg/L at the edge of the mixing zone(s) in Snap Lake.

[8] Board staff are requesting input on the proposed nitrate (as N) EQC. Originally, De Beers proposed lower nitrate EQC of 25 mg/L (maximum average concentration) and 50 mg/L (maximum grab concentration) (LINK TO EQC WKSHOP PRESENTATION), but increased proposed concentrations in the LINK TO EQC REPORT V2. Rationale for the increase was based on eliminating the need for passive wetland treatment system.

Part G: Aquatic Effects Monitoring

1.	The Licensee shall design and implement an Aquatic Effects Monitoring Program (AEMP) in accordance with the MVLWB/GNWT *Guidelines for Aquatic Effects Monitoring Programs.*	OBJECTIVE – AEMP
2.	Within 90 days of the effective date of this Licence, the Licensee shall submit to the Board, for approval, an **AEMP Design Plan**. The Plan shall be in accordance with the MVLWB/GNWT *Guidelines for Aquatic Effects Monitoring Programs.*	AEMP DESIGN PLAN
3.	Three years following implementation of the **AEMP Design Plan**, and every three years thereafter, or as directed by the Board, the Licensee shall submit to the Board, for approval, an **AEMP Re-Evaluation Report**. The Report shall be in accordance with the MVLWB/GNWT *Guidelines for Aquatic Effects Monitoring* Programs and shall evaluate the overall effectiveness of the AEMP to date.	AEMP RE-EVALUATION REPORT
4.	Every three years following implementation of the **AEMP Design Plan**, or as directed by the Board, the Licensee shall submit to the Board, for approval, a revised **AEMP Design Plan**. The revised Plan shall be in accordance with the MVLWB/GNWT *Guidelines for Aquatic Effects Monitoring Programs.*	AEMP DESIGN PLAN – REVISED
5.	Beginning May 1, 2021, and no later than May 1st of each year thereafter, the Licensee shall submit to the Board, for approval, an **AEMP Annual Report**. The Report shall be in accordance with the MVLWB/GNWT *Guidelines for Aquatic Effects Monitoring Programs* and the requirements of Schedule 5, Condition 1.	AEMP ANNUAL REPORT
6.	If any low Action Level established in the approved **AEMP Design Plan** is exceeded, the Licensee shall, at a minimum, implement the response actions described in the approved **AEMP Design Plan**, and report the exceedance in the **AEMP Annual Report**.	LOW ACTION LEVEL EXCEEDENCE
7.	If any moderate or high Action Level established in the approved **AEMP Design Plan** is exceeded, the Licensee shall: a) Within the timeframe identified in the approved **AEMP Design Plan**, notify the Board and an Inspector; and b) Within the timeframe identified in the approved **AEMP Design Plan**, or as otherwise directed by the Board, submit an **AEMP Response Plan** to the Board for approval. The Response Plan shall be in accordance with the MVLWB/GNWT *Guidelines for Aquatic Effects Monitoring Programs.*	MODERATE OR HIGH ACTION LEVEL EXCEEDENCE

PART H: Spill Contingency Planning

1.	The Licensee shall ensure that Unauthorized Discharges associated with the Project do not enter any Waters.	OBJECTIVE – PREVENT WASTE INTO WATER
2.	The Licensee shall comply with the **Spill Contingency Plan**, once approved.	SPILL CONTINGENCY PLAN
3.	Within 60 days following the effective date of this Licence, the Licensee shall submit to the Board, for approval, a revised **Spill Contingency Plan**. The Licensee shall not commence Project activities prior to Board approval of the Plan.	SPILL CONTINGENCY PLAN – REVISED
4.	During the period of this Licence, if a spill or an Unauthorized Discharge occurs or is foreseeable, the Licensee shall: a) Implement the approved Spill Contingency Plan referred to in Part H, Condition 2; b) Report it immediately using the NU-NT Spill Report Form by one of the following methods: • Telephone: (867) 920-8130 • Fax: (867) 873-6924 • E-mail: spills@gov.nt.ca • Online: Spill Reporting and Tracking Database c) Notify the Board and an Inspector immediately; and d) Within 30 days of initially reporting the incident, or within a timeframe authorized by an Inspector, submit a detailed report to the Board and an Inspector, including descriptions of causes, response actions, and any changes to procedures to prevent similar occurrences in the future. Written notification shall be provided to the Board and an Inspector if any changes occur.	REPORT SPILLS
5.	The Licensee shall ensure that spill prevention infrastructure and spill response equipment is in place prior to commencement of the Project.	SPILL PREVENTION AND RESPONSE EQUIPMENT
6.	The Licensee shall restore all areas affected by spills and Unauthorized Discharges to the satisfaction of an Inspector.	CLEAN UP SPILLS

PART I: Closure and Reclamation

1.	The Licensee shall comply with the final **Closure and Reclamation Plan**, once approved. The Plan shall be in accordance with the MVLWB/AANDC *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*.	CLOSURE AND RECLAMATION PLAN
2.	Within 90 days following the effective date of this Licence, the Licensee shall submit to the Board, for approval, a revised final **Closure and Reclamation Plan**.	CLOSURE AND RECLAMATION PLAN – REVISED
3.	Every three years during Closure and following the previous approval, or as directed by the Board, the Licensee shall submit to the Board, for approval, a revised final **Closure and Reclamation Plan**.	CLOSURE AND RECLAMATION PLAN – UPDATE
4.	The Licensee shall endeavor to carry out approved Progressive Reclamation as soon as is reasonably practicable.	PROGRESSIVE RECLAMATION
5.	The Licensee shall not conduct Progressive Reclamation except as approved by the Board.	PROGRESSIVE RECLAMATION – CARRY OUT AS APPROVED
6.	Beginning May 1, 2021, and no later than May 1st thereafter, the Licensee shall provide written notification to the Board and an Inspector of any approved Progressive Reclamation that will be conducted in the upcoming year**.** Notification shall include the name and contact information for the individual responsible for overseeing the Progressive Reclamation. Written notification shall be provided to the Board and an Inspector if any changes occur.	PROGRESSIVE RECLAMATION – NOTIFICATION
7.	Within 90 days of completing Closure and Reclamation of any specific component of the Project, the Licensee shall submit to the Board a **Closure and Reclamation Completion Report**. The Report shall be in accordance with the MVLWB/AANDC *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*.	CLOSURE AND RECLAMATION COMPLETION REPORT
8.	A minimum of one year prior to completing Closure and Reclamation of the Project, or as otherwise directed by the Board, the Licensee shall submit a table of contents or draft schedule for the **Post-Closure and Reclamation Monitoring and Maintenance Plan** to the Board for approval.	POST-CLOSURE AND RECLAMATION MONITORING AND MAINTENANCE PLAN – TABLE OF CONTENTS
9.	Within x months of completing the Closure and Reclamation of the Project, or as otherwise directed by the Board, the Licensee shall submit to the Board for approval, a **Post-Closure and Reclamation Monitoring and Maintenance Plan**. The Plan shall be in accordance with the requirements of Schedule 6, Condition 1.	POST-CLOSURE AND RECLAMATION MONITORING AND MAINTENANCE PLAN

Commented [MS25]: Board staff are seeking recommendations on when the Post-Closure and Reclamation Monitoring and Maintenance Plan should be submitted.

10. Within x months of completing Closure and Reclamation of any specific component of the Project, the Licensee shall submit to the Board for approval, a **Performance Assessment Report**. The Report shall be in accordance with the MVLWB/AANDC *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*. The Licensee shall submit subsequent Reports as directed by the Board. PERFORMANCE ASSESSMENT REPORT – COMPONENT-SPECIFIC

Commented [MS26]: Board staff are seeking recommendations on when the Performance Assessment Report should be submitted.

Schedule 1: Annual Water Licence Report

1. The **Annual Water Licence Report** referred to in Part B, Condition 18 of this Licence shall include, but not be limited to, the following information about activities conducted during the previous calendar year:

   a) A brief summary of Project activities;

   b) An updated Project schedule;

   c) A summary of the calibration and status of the meters and devices referred to in Part B, Condition 17 of this Licence;

   d) A summary of engagement activities conducted in accordance with the approved **Engagement Plan**, referred to in Part B, Condition 19 of this Licence;

   e) A summary of Construction activities conducted in accordance with Part E of this Licence;

   f) A summary of activities conducted in accordance with the **Structure Description and Construction Plans** and the **Design and Construction Plans**, referred to in Part E of this Licence, including:
      i. A summary of structures constructed;
      ii. A summary of source and annual quantities of all materials used for construction, including an updated map or diagram showing the location of the deposited materials;
      iii. A summary of monitoring conducted under the Structure Description and Construction Plans and/or Design and Construction Plan; and
      iv. A summary of exceedances of Action Levels, and actions taken in response to the exceedance.

   g) A summary of major maintenance activities conducted in accordance with this Licence;

   h) A summary of activities conducted in accordance with the approved **Waste Management Plan**, referred to in Part F, Condition 2 of this Licence, including:
      i. A summary of approved updates or changes to the process or facilities required for the management of Waste;
      ii. Monthly and annual quantities, in cubic metres, of domestic waste, hazardous waste disposed, by location;
      iii. Monthly and annual quantities of Sewage liquid discharged, by location; and
      iv. Monthly and annual quantities, in cubic metres, of Sewage solids removed from the Sewage Treatment Plant, identified by disposal location.

   i) A summary of activities conducted in accordance with the approved **Water Management Plan**, referred to in Part F, Condition 4 of this Licence, including:
      i. A summary of approved updates or changes to the process or facilities required for the management of Water and Wastewater;
      ii. Monthly and annual quantities, in cubic metres, of Water obtained from each approved source;
      iii. Monthly and annual quantities, in cubic metres, of recycled Water, identifying both the source and use;
      iv. Monthly and annual quantities of Water, in cubic metres, used for dust control;
      v. Monthly and annual quantities, in cubic metres, of all Discharges, identified by Discharge location;
      vi. Monthly and annual quantities in cubic metres, of Water and Wastewater pumped into the Water Management Pond and Influent Storage Ponds;
      vii. Monthly and annual estimates and/or measurements of precipitation and Runoff;

viii. Monthly elevations of Water in Snap Lake during the open Water season;
ix. Monthly elevations of Water in the Water Management Pond during the open water season and a stage volume curve for the pond;
x. A comparison of Water and Wastewater quantities measured in the year to the Water balances predicted for that year in the approved Plan, and an explanation of any significant differences between predictions and actual measurements;
xi. A comparison of Water and Wastewater quality measured in the year to the predicted water quality models for that year in the approved Plan, and an explanation of any significant differences between predictions and actual measurements;
xii. An updated Water balance if required as per the approved Plan;
xiii. A summary and interpretation of monitoring results, including any Action Level exceedances; and
xiv. A description of actions taken in response to any Action Level exceedances.

j) A summary of activities conducted in accordance with the approved **North Pile Management Plan**, referred to in Part F, condition 6, including:
   i. A summary and interpretation of closure and Post-Closure monitoring results, including any Action Level exceedances; and
   ii. A description of actions taken in response to any Action Level exceedances under the Response Framework.

k) A summary of activities conducted in accordance with the approved **Acid Rock Drainage and Geochemical Characterization and Management Plan**, referred to in Part F, Condition 8, including:
   i. A summary of approved updates or changes to the processes for characterizing and managing Acid Rock Drainage and/or Metal Leaching;
   ii. A summary of annual quantities of all Potentially Acid Generating materials, including an updated map or diagram showing the location of the deposited materials;
   iii. A comparison of the annual quantities of each type of Waste Rock generated to the quantities predicted in the approved Acid Rock Drainage and Geochemical Characterization and Management Plan;
   iv. A summary and interpretation of results from the geochemical monitoring performed under the approved Geochemical Characterization and Management Plan;
   v. A summary and interpretation of results from seepage monitoring performed under the approved Acid Rock Drainage and Geochemical Characterization and Management Plan, including:
      a. a site map with Seepage locations;
      b. comparisons to reference locations;
      c. an analysis of major trends over the year and since Project inception; and
      d. a summary of recommendations for future Seepage monitoring and/or management actions;
   vi. A summary of results from investigations or activities related to field test cells;
   vii. A summary and interpretation of Water quality monitoring results for each of the main source areas and how these compare to predicted values;
   viii. A summary of any exceedances of the Action Levels described in the Acid Rock Drainage and Geochemical Characterization and Management Plan; and
   ix. A description of actions taken in response to any Action Level exceedances under the Acid Rock Drainage and Geochemical Characterization and Management Plan.

l) A summary of activities conducted in accordance with the approved **Erosion and Sedimentation Management Plan**, referred to in Part F, Condition 10 of this Licence, including:
   i. A summary of approved updates or changes to the process or facilities required for the management of erosion and sedimentation;
   ii. A description of any erosion susceptible areas encountered;

iii. A summary of activities undertaken to prevent or mitigate erosion;
iv. A report of the performance of mitigations applied to each area;
v. A summary and interpretation of monitoring results, including any Action Level exceedances; and
vi. A description of actions taken in response to any Action Level exceedances.

m) A summary of activities conducted in accordance with the approved **Explosives Management Plan**, referred to in Part F, Condition 11 of this Licence, including:
   i. A summary of approved updates or changes to the process or facilities required for the management of explosives;
   ii. A summary of activities undertaken to prevent or mitigate effects with respect to storage, handling, blasting, and spills;
   iii. A report of the performance of mitigations applied to each area;
   iv. A summary and interpretation of monitoring results, including any Action Level exceedances; and
   v. A description of actions taken in response to any Action Level exceedances.

n) A summary of activities conducted in accordance with the approved **Spill Contingency Plan**, referred to in Part H, Condition 2 of this Licence, including:
   i. A list and description for all Unauthorized Discharges, including the date, NWT spill number, volume, location, summary of the circumstances and follow-up actions taken, and status (i.e. open or closed), in accordance with the reporting requirements in Part H, Condition 4 of this Licence; and
   ii. An outline of any spill training carried out.

o) A summary of activities conducted in accordance with the **Closure and Reclamation Plan**, required in Part I, Condition 1 of this Licence, including:
   i. Details of any Progressive Reclamation undertaken;
   ii. A discussion on whether planning and implementation remains on schedule, and a summary of any new scheduling setbacks;
   iii. A summary of engagement conducted regarding Closure and Reclamation; and
   iv. A list of any factors that would increase or decrease the Closure Cost Estimate the next time the Estimate is updated.

p) A summary of the results and any actions taken as a result of the following inspections:
   i. Inspections conducted to fulfill Part F of this Licence; and
   ii. Dam Safety Reviews conducted as required in Part F of this Licence.

q) Tabular summaries of all data and information generated under the SNP annexed to this Licence and graphical summaries of parameters with EQC referred to in Part F, Conditions 21 and 28, at the points of compliance (SNP Stations 02-17, 02-17b, 02-17c, and 02-17d in Excel format;

r) A list of any non-compliance(s) with the conditions of this Licence or any directive from the Board pursuant to the conditions of this Licence;

s) A summary of actions taken to address concerns, non-conformances, or deficiencies in any reports filed by an Inspector;

t) A table detailing all commitments related to Water use and the deposit of Waste made during the Environmental Assessments EA01-004 and EA1314-02, with descriptions of how each commitment is being or has been met; and

u) Any other details requested by the Board by November 1 of the year being reported.

Schedule 2: Conditions Applying to Security Deposits

1. Pursuant to section 35 of the *Waters Act* and section 11 of the Waters Regulations, the Licensee shall post and maintain a security deposit totaling $XX.XX.

Schedule 3: Conditions Applying to Construction

1. The **Structure Description and Construction Plans** referred to in Part E, condition 7, shall include, but not be limited to the following:

   a) Information about the design of the facilities:
      i. A description of the facilities to be constructed, including the purpose of the facilities;
      ii. Relevant background information for the area beneath the footprint of the containment and runoff control structures, including the results of geotechnical and geochemical investigations; hydrogeological investigations; programs to characterize soil, rock, Groundwater, ground ice, and ground temperature conditions to the depth expected to be affected by the proposed facilities; and any other relevant information;
      iii. Design specifications and performance parameters;
      iv. A description of how the design has been optimized for Closure and Reclamation;
      v. A description of any operations and maintenance requirements associated with the design of the facility; and
      vi. An explanation of why the facility design does not need to be prepared by a Professional Engineer.

   b) Information about the Construction of the facilities:
      i. Construction schedule, including sequencing information;
      ii. A description of the materials required for Construction, including, but not limited to:
         a. sources;
         b. quantities;
         c. physical characteristics; and
         d. geochemical characteristics;
      iii. A description of any potential impacts on the Receiving Environment associated with Construction of the facilities; and
      iv. A description of any mitigation measures that will be undertaken to minimize the potential impacts identified above.

   c) Information regarding monitoring, including:
      i. A description of any monitoring that will be conducted to determine the potential impacts to the Receiving Environment and the effectiveness of the mitigation measures described above, including, but not limited to:
         a. locations; and
         b. parameters.

2. The **Design and Construction Plans** referred to in Part E, condition 8, shall include, but not be limited to the following:

   a) Information about the design of the facilities:
      i. A description of the facilities to be constructed;
      ii. The proposed location(s) of the facilities, with GPS coordinates and a map to scale;
      iii. Relevant background information for the area beneath the footprint of the containment and runoff control structures, including the results of geotechnical and geochemical investigations; hydrogeological investigations; programs to characterize soil, rock, Groundwater, ground ice, and ground temperature conditions to the depth expected to be affected by the proposed facilities; and any other relevant information, as deemed adequate by the Professional Engineer responsible for the design;

iv. Design specifications and performance parameters;
v. Stability analyses;
vi. A description of how the design has been optimized for Closure and Reclamation;
vii. A description of any instrumentation that will be installed as part of the facilities, including locations and rationale; and
viii. A description of any operations and maintenance requirements associated with the design of the facility.

b) Information about the Construction of the facilities:
   i. A Construction schedule, including sequencing information;
   ii. A description of the materials required for Construction, including, but not limited to:
      a. sources;
      b. quantities;
      c. physical characteristics; and
      d. geochemical characteristics.
   iii. A description of any potential impacts on the Receiving Environment associated with Construction of the facilities; and
   iv. A description of any mitigation measures that will be undertaken to minimize the potential impacts identified above.

c) Information regarding monitoring, including:
   i. A description of any monitoring that will be conducted to determine the potential impacts to the Receiving Environment and the effectiveness of the mitigation measures described above, including, but not limited to:
      a. locations;
      b. parameters;
      c. frequencies; and
      d. rationale.

d) Information about responses to monitoring results, including:
   i. Definitions, with rationale, for Action Levels applicable to the performance of the mitigation measures;
   ii. For each Action Level, a description of how exceedances of the Action Level will be assessed and, generally, which types of actions may be taken by the Licensee if the Action Level is exceeded; and
   iii. A description of adaptive management processes that systematically link monitoring results to management activities and allow management activities to be developed adaptively, in response to changes in the Receiving Environment.

e) A **Quality Control Plan** stamped by a Professional Engineer, a component of which includes a plan for a Professional Engineer to supervise and field check Construction activities.

Schedule 4: Conditions Applying to Waste and Water Management

1. The **Water Management Plan** referred to in Part F, condition 4, shall include, but not be limited to the following:

   a) Information regarding Water and Wastewater management during closure and Post-Closure:
      i. A description of the facilities to be constructed, including the purpose of the facilities;
      ii. Relevant background information for the area beneath the footprint of the containment and runoff control structures, including the results of geotechnical and geochemical investigations; hydrogeological investigations; programs to characterize soil, rock, Groundwater, ground ice, and ground temperature conditions to the depth expected to be affected by the proposed facilities; and any other relevant information;
      iii. The process and facilities for the collection and management of surface runoff generated on site;
      iv. The process and facilities for the collection and management of any Wastewater resulting from closure and Post-Closure activities;
      v. The process and facilities for the water treatment and Discharge of effluent from the Water management system to Snap Lake;
      vi. Details of the final hydraulic design of all Water management structures and Water balance estimates on a monthly basis for each year of the proposed Licence;
      vii. A summary of the results of the site water models, including Water quality and quantity predictions;
      viii. A summary of any linkages to activities described in the North Pile Management Plan; and
      ix. Any other information required to describe how Water and Wastewater will be managed such that the objectives referred to in Part F, condition 1 of this Licence will be met.

   b) Information regarding monitoring during closure and Post-Closure including:
      i. Details of monitoring, including a rationale for each component of the Water management system;
      ii. Linkages to other monitoring programs required in this Licence; and
      iii. Any other information about the monitoring that will be performed to meet the objectives referred to in Part F, Condition 4 of this Licence.

   c) Information about responses to closure and Post-Closure monitoring results:
      i. A description of how site Water monitoring results will be compared to modeling predictions for Water quality and quantity, including the frequency for calibrating and updating site water models; and
      ii. A description of the Response Framework that will be implemented by the Licensee to link the results of monitoring to those corrective actions necessary to ensure that the objectives referred to in Part F, condition 1 of this Licence are met including:
         a. Definitions, with rationale for Action Levels applicable to the performance of the Water management system with respect to geotechnical stability, thermal characteristics, seepage quality and quantity, and run-off; and
         b. For each Action Level, a description of how exceedances of the Action Level will be assessed, and generally which types of actions may be taken if the Action Level is exceeded.

2. The **North Pile Management Plan** referred to in Part F, condition 6, shall include, but not be limited to the following:

   a) Information regarding operation and management:
      i. A summary, with appropriate maps or diagrams, of the North Pile Facility and all the Waste streams that report to it;
      ii. A description of the geochemical criteria for management and placement of Potentially Acid Generating Waste Rock including linkages to the Acid Rock Drainage and Geochemical Characterization and Management Plan referred to in Part F, condition 8 of this Licence;
      iii. A description of Water management procedures for the North Pile Facility including:
         a. An identification of all potential sources of drainage from each storage site and the distance to the downstream receiving environment;
         b. A detailed description, including a map or diagram, of the structures intended to contain, withhold, divert, or retain Water or Wastes related to the North Pile Facility and their predicted performance in terms of flow, capacity, and Water quality parameters;
         c. A summary of proposed contingency measures for controlling runoff and seepage Water volume, routing, and quality; and
         d. A summary of any linkages to activities described in the Water Management Plan.
      iv. Any other information required to describe how the North Pile Facility will be managed and operated such that the objectives referred to in in Part F, condition 1 of this Licence will be met.

   b) Information regarding closure and Post-Closure monitoring including:
      i. Details and rationale for monitoring of geotechnical stability, thermal characterization, seepage quality and quantity, and run-off for all components of the North Pile Facility including:
         a. Monitoring locations, types of instrumentation used, and frequency of monitoring, including a site map to scale; and
         b. Predicted performance values based on expected facility design.
      ii. Linkages to other monitoring programs required in the Licence; and
      iii. Any other information about the monitoring that will be performed to meet the objectives referred to in Part F, condition 1 of this Licence.

   c) Information about responses to closure and Post-Closure monitoring results:
      i. A description of the Response Framework that will be implemented by the Licensee to link the results of monitoring to those corrective actions necessary to ensure that the objectives listed in Part F, condition 1 of this Licence are met including:
         a. Definitions, with rationale for Action Levels applicable to the performance of the North Pile Facility with respect to geotechnical stability, thermal characteristics, seepage quality and quantity, and run-off; and
         b. For each Action Level, a description of how exceedances of the Action Level will be assessed, and generally which types of actions may be taken if the Action Level is exceeded.

3. The **Acid Rock Drainage and Geochemical Characterization and Management Plan** referred to in Part F, condition 8, shall include, but not be limited to the following:

   a) A characterization of all representative rock types, (geology and mineralogy of typical rock units) used during all blasting and earthworks activities, including the anticipated quantities of each rock type;

   b) An assessment of the potential for acidic, neutral or alkaline drainage and for metal leaching from the North Pile Facility both during closure and Post-Closure;

c) Description of estimated loadings and change in receiving water chemistry and the internal contaminant loading balance from each source, and description of how results of seepage surveys will be incorporated;

d) A geochemical characterization of material to be used for construction and reclamation, including a geochemical assessment conducted in areas where the acid generation potential of cover construction material requires confirmation;

e) A rationale describing how the sampling plan and sampled materials are representative of the materials used;

f) A description of placement of Potentially Acid Generating material, including those encountered during Construction of the North Pile Facility and any linkages to the requirements of Design Drawings and/or Design and Construction Plans; and

g) A description of the proposed means for preventing, monitoring, and managing Acid Rock Drainage and Metal Leaching including a map or diagram of monitoring locations.

4. The **Erosion and Sedimentation Management Plan** referred to in Part F, condition 10, shall include, but not be limited to the following:

a) Information regarding erosion and sediment control methodologies:
   i. A summary, with appropriate maps or diagrams, of the Project site identifying areas susceptible to erosion;
   ii. The process and criteria for assessing erosion risk;
   iii. A description of the best management practices that will be employed for different Project activities and for different levels of assessed risk; and
   iv. Any other information required to describe how erosion and sediment release into the Receiving Environment will be minimized.

b) Information about monitoring including:
   i. Details for monitoring, including rationale, that will be undertaken with respect to erosion and sediment control during all phases of the Project include closure and Post-Closure;
   ii. Linkages to other monitoring programs required in this Licence; and
   iii. Any other information about monitoring that will be performed to meet the objectives in Part F, condition 1 of this Licence.

c) Information about responses to monitoring results:
   i. A description of how the monitoring information will be assessed and generally what types of actions will be taken in response to the monitoring results.

5. The **Explosives Management Plan** referred to in Part F, condition 11, shall include, but not be limited to the following:

a) The quantity and type of explosives predicted to be used onsite;

b) The predicted ammonium nitrate dissolution rate, by type;

c) Identification of mitigation approaches to be employed with respect to storage, handling, blasting and spills;

d) Description of the monitoring required to evaluate whether the mitigation approaches for storage, handling, and blasting procedures are effective, with rationale, for Action Levels applicable to the performance of the plan:
    i. For each Action Level, a description of how exceedances of the Action Level will be assessed, and generally which types of action will be taken of the Action Level is exceeded.

Schedule 5: Conditions Applying to Aquatic Effects Monitoring Program

1. The **AEMP Annual Report** referred to in Part G, condition 5 of this Licence shall include, but not be limited to, the following:

    a) A plain language summary and interpretation of the major results obtained in the preceding calendar year;

    b) A summary of activities conducted under the AEMP;

    c) A summary of any spills, activities, or other considerations within the report time frame that could influence the results of the AEMP;

    d) Tabular summaries of all data and information generated under the AEMP, in Excel format;

    e) An interpretation of the results, including an evaluation of any identified environmental effects that occurred as a result of the Project;

    f) A comparison of predicted mixing and dilution of Effluent in Snap Lake in comparison to monitoring data;

    g) An analysis that integrates the results of individual monitoring components collected in a calendar year and describes the ecological significance of the results;

    h) A comparison of monitoring results to Action Levels as defined in the approved **AEMP Design Plan**;

    i) For any low Action Level exceedances, a summary of the nature and extent of the exceedance, as well as a description of actions taken in response to the exceedance;

    j) An evaluation of any adaptive management response actions implemented;

    k) Recommendations, with rationale, for changes to any aspect of the **AEMP Design Plan**; and

    l) Any other information specified in the approved **AEMP Design Plan**.

Schedule 6: Conditions Applying to Closure and Reclamation

1. The **Post-Closure and Reclamation Monitoring and Maintenance Plan** referred to in Part I, Condition 9 of this Licence shall include, but not be limited to the following information:

    a) *To be updated in accordance with Part I, Condition 8.*

Annexes
Annexed to Water Licence MV2019L2-0004
De Beers Canada Inc. – Snap Lake Project

Table of Contents

Annex A – Surveillance Network Program (SNP)

Part A: Station Description and Monitoring Requirements

1. The location of sampling stations and specific monitoring requirements are as follows:

SNP station Quick Reference Table

SNP station #	Description
~~02-01~~	~~Final Minewater collection sump, underground~~
02-02	North Pile drainage collection ditch north of Water Management Pond
~~02-03~~	~~Core facilities area collection ditch east of the center of Water Management Pond~~
02-02b	East Influent Storage Pond
02-02c	West Influent Storage Pond
~~02-04.1~~	~~Uncontrolled surface runoff at culvert on north side of center of airstrip~~
~~02-04.2~~	~~Uncontrolled surface runoff at culvert on north side of western end of airstrip~~
~~02-04.3~~	~~Uncontrolled surface runoff at culvert on north side of airstrip~~
~~02-05~~	~~Uncontrolled surface runoff at Bulk Sample Mine Rock Pad~~
~~02-06~~	~~Uncontrolled surface runoff at Quarry Site on south side of North Pile~~
~~02-07.1~~	~~Uncontrolled surface runoff and standing water at Road to Bulk Emulsion Plant, pond downstream of explosive magazine~~
~~02-07.2~~	~~Uncontrolled surface runoff and standing water at Road to Bulk Emulsion Plant, pond west of small Ammonium Nitrate Pad~~
~~02-07.3~~	~~Uncontrolled surface runoff and standing water at Road to Bulk Emulsion Plant, pond west side of small Ammonium Nitrate Pad~~
~~02-08~~	~~Uncontrolled surface runoff at Winter Access Road~~
~~02-09~~	~~Uncontrolled surface runoff and standing water at Emulsion Plant Area; pond north of Bulk Emulsion Ammonium Nitrate Pad~~
~~02-09.2~~	~~Uncontrolled surface runoff and standing water at Emulsion Plant Area; pond downslope and north-northeast from Ammonium Nitrate Pad~~
~~02-09.3~~	~~Uncontrolled surface runoff and standing water at Emulsion Plant Area; downslope from SNP 02-09~~
~~02-09.4~~	~~Uncontrolled surface runoff and standing water at Emulsion Plant Area, base of Ammonium Nitrate Pad Sump, south of Ammonium Nitrate Pad~~
~~02-09.5~~	~~Uncontrolled surface runoff and standing water at Emulsion Plant Area, pond downslope of Ammonium Nitrate Pad~~
~~02-10~~	~~Any other points where observable flow to Snap Lake or Inland Lake 5 (IL5) is observed.~~
~~02-11~~	~~Seepage monitoring well downgradient from Water Management Pond Dam 1, near Snap Lake shoreline~~
~~02-12~~	~~Seepage monitoring well downgradient from Water Management Pond Dam 1~~
~~02-13~~	~~Seepage monitoring well downgradient from Water Management Pond Dam 2~~
02-14	Water Management Pond (stilling well near the pumphouse)
02-15	Water Intake from Snap Lake
~~02-16i~~	~~Replaced by 02-16j~~
02-16j	Sewage effluent from Sewage Treatment Plant, prior to mixing with Water Treatment Plant effluent

Commented [MS27]: SNP changes proposed by De Beers (link to De Beers Response to Undertaking)

Board staff note that GNWT has recommended all existing SNP be retained until sufficient evidence is provided to demonstrate whether or not higher concentrations measured at the current SNP locations are indicative of a continuing trend during active closure

Board staff is seeking input on changing sampling parameter BOD to CBOD for all SNP stations.

Commented [JH28]: Board staff is seeking input on seepage monitoring locations

~~02-17~~	~~Final Combined Water Treatment Plant and Sewage Treatment Plant effluent that is discharged via a diffuser into Snap Lake. In conditions where greater capacity is needed, 02-17 can be used as it represents the effluent from the temporary water treatment plant.~~
02-17b	Final Combined Water Treatment Plant and Sewage Treatment Plant effluent that is discharged via a diffuser into Snap Lake. Under normal conditions 02-17b is used which measures the permanent water treatment plant.
02-17c	Discharge from East Passive ~~wetland~~ Influent Storage Pond~~system~~ to Snap Lake
02-17d	Discharge from West Passive Influent Storage Pond ~~wetland system~~ to Snap Lake
~~02-18~~	~~Monitoring stations in the main basin of Snap Lake that are used to calculate a whole lake average concentration of Total Dissolved Solids~~
~~02-19~~	~~Sewage discharge from the temporary Sewage Disposal Facility~~
02-20d	In Snap Lake, one of four stations located in a radius of 120 degrees at 200 meters from the diffuser, on the edge of the mixing zone around the diffuser
02-20e	In Snap Lake, one of four stations located in a radius of 120 degrees at 200 meters from the diffuser, on the edge of the mixing zone around the diffuser
02-20f	In Snap Lake, one of four stations located in a radius of 120 degrees at 200 meters from the diffuser, on the edge of the mixing zone around the diffuser
~~02-20g~~	~~In Snap Lake, one of four stations located in a radius of 120 degrees at 200 meters from the diffuser, on the edge of the mixing zone around the diffuser~~
02-20h,i	Mixing Zone Stations (from East Influent Storage Pond) within Snap Lake
02-20j,k	Mixing Zone Stations (from West Influent Storage Pond) within Snap Lake
~~02-21~~	~~Outlet from Snap Lake flowing into the Lockhart River System~~
~~02-22~~	~~Diffuser construction~~
~~02-23~~	~~Water intake construction~~
~~02-24~~	~~Snap Lake sites in close proximity to fisheries compensation works. Corresponds to AEMP stations SNAP05, and SNAP29 (Water intake).~~

SNP station 02-01:

Commented [JH29]: De Beers proposed removing this SNP station

Description:	Final Minewater collection sump, underground		
Location:	N 7052640, E 0506400		
Sampling Frequency:	Continuously by in-line monitoring during active pumping operations	Weekly during active pumping operations	Monthly during active pumping operations
Sampling Parameters:	Flow, temperature, pH, conductivity, turbidity	pH, turbidity, total dissolved solids (TDS) (calculated[10]), total suspended solids (TSS), total ammonia, chloride, calcium	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]
Rationale:	Operational Monitoring: 1) Initially, the weekly results were used to develop regression relationships between conductivity and TDS, and between turbidity and TSS, to allow for continuous estimates to be made for the in-line monitoring; 2) To determine amount and quality of Minewater collected from the underground mine and prior to entering the Water Management Pond. Data from this station is evaluated as part of the Acid Rock Drainage and Geochemical Characterization Monitoring Report.		
Status:	Active		

SNP station 02-02:

Description:	North Pile drainage collection ditch north of Water Management Pond		
Location:	N 7052663, E 0506400		
Sampling Frequency:	Continuously by in-line monitoring during pumping operations	~~Weekly during spring freshet and Heavy Rainfall events~~	Every two weeks when pumping ~~Monthly during freshet, during periods of flow, and/or ice free conditions~~
Sampling Parameters:	Flow, temperature, pH, conductivity, turbidity	~~TSS, turbidity~~	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], ICP-MS scan[3] (total and dissolved), ~~total mercury, total arsenic, extractable petroleum hydrocarbon~~s, BTEX[4]
Rationale:	~~Operational Monitoring; during construction and operations~~ Closure monitoring to evaluate the quantity and quality of all seepage and runoff coming from the North Pile Facility. ~~Data from this station is evaluated as part of the Acid Rock Drainage and Geochemical Characterization Monitoring Report.~~ Discontinue during Post-Closure because sump will be allowed to flow into Passive Water Treatment System.		
Status:	Active during Closure; Inactive during Post-Closure		

SNP station 02-02b:

Description:	East Influent Storage Pond	
Location:		
Sampling Frequency:	Once annually	Monthly during discharge
Sampling Parameters:	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], ICP-MS scan[3] (total and dissolved), TDS	Elevation (masl) to calculate Volume (m^3)
Rationale:	Closure monitoring to evaluate the quantity and quality of seepage and runoff coming from the North Pile Facility and collected in the influent storage pond.	
Status:	Active once water is routed to the pond Active during Post-Closure	

Commented [JH30]: Revisions proposed by De Beers.

Board staff note that GNWT recommended monthly representative water quality samples from sump 3, 5, and the water management pond be sampled monthly to assess changes in water quality over closure period.

Commented [JH31]: New SNP station proposed by De Beers

Commented [MS32]: @Jacqueline Hoto capitalize

SNP station 02-02c:

Commented [JH33]: New SNP station proposed by De Beers

Description:	West Influent Storage Pond	
Location:		
Sampling Frequency:	Once annually	Monthly during discharge
Sampling Parameters:	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], ICP-MS scan[3] (total and dissolved), temperature, TDS	Elevation (masl) to calculate Volume (m^3)
Rationale:	Closure monitoring to evaluate the quantity and quality of seepage and runoff coming from the North Pile Facility and collected in the influent storage pond.	
Status:	Active once water is routed to the pond; Active during Post-Closure	

SNP station 02-03:

Commented [JH34]: De Beers proposed removing this SNP station as years of monitoring during construction and operations has been collected and there is no evidence of acid generation, which is the primary rationale for this site, therefore, additional monitoring is not warranted.

Description:	Core facilities area collection ditch east of the center of the Water Management Pond This station was inactivated in 2010 but recommended for reactivation during the 2011/2012 Licence renewal process.		
Location:	N 7052640, E 0506400		
Sampling Frequency:	Continuously by in-line monitoring during pumping operations	Weekly during spring freshet and heavy rainfall events	Monthly during freshet, during periods of flow, and/or ice free conditions
Sampling Parameters:	Flow, temperature, pH, conductivity, turbidity	TSS, turbidity	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]
Rationale:	Operational Monitoring; during construction and operations to evaluate runoff from core facilities. To provide information about the geochemical stability/rate of weathering of the rock used for construction at the site.		
Status:	Active		

SNP stations 02-04.1; 02-04.2; and 02-04.3:

Description:	Uncontrolled surface runoff at culvert on north side of airstrip; three (3) locations	
Location:	More than one location; 02-04.1: N 7051774, E 0504790; 02-04.2: N 7051744, E 0504456; 02-04.3: N 7051775, E 0504680	
Sampling Frequency:	Twice per week during spring freshet	Daily during heavy rainfall events if measurable flow is present
Sampling Parameters:	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]
Rationale:	Operational Monitoring; during construction and operations to evaluate the composition of the uncontrolled runoff from the airstrip for physical and/or chemical weathering of rock placed to construct the airstrip. Data from this station is evaluated as part of the Acid Rock Drainage and Geochemical Monitoring Characterization Report.	
Status:	Active	

Commented [JH35]: De Beers recommended removing this SNP station as year of monitoring data from construction and operations have been collected, and there is no evidence of acid generation, which is the rationale for this SNP. De Beers has also proposed eliminating the Acid Rock Drainage and Geochemical Monitoring Program for closure. Therefore, additional monitoring is not warranted.

GNWT has recommended retaining the ARD and Geochemical Monitoring Program

SNP station 02-05:

Description:	Uncontrolled surface runoff at Bulk Sample Mine Rock Pad	
Location:	N 7053192, E 0506838	
Sampling Frequency:	Twice per week during spring freshet	Daily during heavy rainfall events if measurable flow is present
Sampling Parameters:	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS S scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]
Rationale:	Operational Monitoring; during construction and operations to evaluate runoff from the BSMRP that was constructed in 1999. Data from this station is evaluated as part of the Acid Rock Drainage and Geochemical Characterization Monitoring Report.	
Status:	Active	

Commented [JH36]: De Beers has proposed removing this SNP station, as there is no evidence of acid generating after a decade of monitoring. De Beers has also proposed eliminating the Acid Rock Drainage and Geochemical Monitoring Program for closure. Therefore, additional monitoring is not warranted.

ENR has recommended retaining the ARD and Geochemical Monitoring Program

SNP station 02-06:

Description:	Uncontrolled surface runoff at Quarry Site on south side of North Pile	
Location:	De Beers will provide coordinates in the event of sampling uncontrolled runoff.	
Sampling Frequency:	Twice per week during spring freshet	Daily during heavy rainfall events if measurable flow is present
Sampling Parameters:	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]
Rationale:	Operational Monitoring; during construction and operations. Data from this station is evaluated as part of the Acid Rock Drainage and Geochemical Characterization Monitoring Report.	
Status:	Active	

Commented [JH37]: De Beers has proposed to remove this SNP stations as there is no evidence of acid generation from a decade of monitoring. De Beers has also proposed eliminating the Acid Rock Drainage and Geochemical Monitoring Program for closure. Therefore, additional monitoring is not warranted.

GNWT has recommended retaining the ARD and Geochemical Monitoring Program

SNP stations 02-07.1, 02-07.2 and 02-07.3:

Description:	Uncontrolled surface runoff and standing water at Road to Bulk Emulsion Plant; three (3) locations	
Location:	More than one location: 02-07.1: Pond downstream of explosive magazine, N 7052373, E 0504205; 02-07.2: Pond west of small AN Pad, N 7052338, E 0503820; 02-07.3: Pond west side of small AN Pad, N 7052420, E 0503820	
Sampling and Analysis Frequency:	Twice per week during spring freshet	Daily during heavy rainfall events if measurable flow is present
Sampling Parameters:	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]
Rationale:	Operational Monitoring; during construction and operations to evaluate potential spills of ammonium nitrate from trucks using the road. Data from this station is evaluated as part of the Acid Rock Drainage and Geochemical Characterization Monitoring Report.	
Status:	Active	

Commented [JH38]: De Beers proposed removing this SNP station as mining has creased and bulk AN is no longer transported around the site in large quantities.

SNP station 02-08:

Description:	Uncontrolled surface runoff at Winter Access Road	
Location:	De Beers will provide coordinates in the event of sampling uncontrolled runoff.	
Sampling Frequency:	Twice per week during spring freshet	Daily during heavy rainfall events if measurable flow is present
Sampling Parameters:	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]
Rationale:	Operational Monitoring; during construction and operations.	
Status:	Active	

Commented [JH39]: De Beers proposed removing this SNP station as there will not be a winter access road in most years, and when there is a winter access road, there is no reason to monitor surface runoff, monitoring of previous winter roads has not resulted in any surface water quality concerns.

SNP stations 02-09, 02-09.2, 02-09.3, 02-09.4, and 02-09.5:

Description:	Uncontrolled surface runoff and standing water at Emulsion Plant Area; five (5) locations	
Location:	More than one location: 02-09: Pond north of Bulk Emulsion Ammonium Nitrate Pad, N 7052816, E 0503604; 02-09.2: Pond downslope and north-northeast from Ammonium Nitrate Pad; 02-09.3: Downslope from SNP station 02-09, N 7052924, E 0503555; 02-09.4: Base of Ammonium Nitrate Pad Sump, south of Ammonium Nitrate Pad; 02-09.5: Pond downslope of Ammonium Nitrate Pad	
Sampling Frequency:	Twice per week during spring freshet	Daily during heavy rainfall events if measurable flow is present
Sampling Parameters:	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]
Rationale:	Operational Monitoring; during construction and operations to evaluate the water quality of uncontrolled runoff at the former ammonium nitrate storage pad. Data from this station is evaluated as part of the Acid Rock Drainage and Geochemical Characterization Monitoring Report.	
Status:	Active	

Commented [JH40]: De Beers proposed removing this SNP station as they were used to monitor uncontrolled surface runoff and standing water at the Emulsion Plant to evaluate water quality due to surface runoff over AN, and for acid rock drainage from construction of the pad itself.

SNP station 02-10:

Description:	Any other points where observable flow to Snap lake or Inland Lake 5 (IL5) is observed.	
Location:	De Beers will provide coordinates in the event of sampling uncontrolled runoff.	
Sampling Frequency:	Twice per week during spring freshet	Daily during heavy rainfall events if measurable flow is present
Sampling Parameters:	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]
Rationale:	Operational Monitoring; during construction and operations to evaluate quality of runoff into the Receiving Environment.	
Status:	Active	

Commented [JH41]: De Beers proposed removing this SNP station as patterns of surface runoff at Snap Lake are well established and controlled and well monitored via other SNP stations.

SNP station 02-11:

Description:	Seepage monitoring well downgradient from Water Management Pond Dam 1, near Snap Lake shoreline.	
Location:	N 7052303, E 0506501	
Sampling Frequency:	Monthly	Quarterly when water is present
Sampling Parameters:	Water level	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]
Rationale:	Operational Monitoring; during construction and operations to evaluate dam performance.	
Status:	Active	

Commented [JH42]: De Beers proposed removing this SNP station as the water management pond dam has not shown any indication of concern. De Beers noted this station is unnecessary. Engineer structures including the water management pond and other water retaining dykes at site are inspected by the Engineer of Record on an annual basis. Therefore, additional downstream monitoring is not warranted.

Board staff seeking input on seepage monitoring locations

SNP station 02-12:

Description:	Seepage monitoring well downgradient from Water Management Pond Dam 1	
Location:	N 7052303, E 0506501	
Sampling Frequency:	Monthly	Quarterly when water is present
Sampling Parameters:	Water level	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]
Rationale:	Operational Monitoring; during construction and operations	
Status:	Active	

Commented [JH43]: De Beers proposed removing this SNP station has the water management pond dam has not shown any indication of concern. This station is not needed as Engineered structures including the water management pond and other water retaining dykes at site are inspected by the Engineer of Record on an annual basis. Therefore, additional downstream monitoring is not warranted.

Board staff seeking input on seepage monitoring locations

SNP station 02-13:

Description:	Seepage monitoring well downgradient from Water Management Pond Dam 2	
Location:	N 7052321, E 0506512	
Sampling Frequency:	Monthly	Quarterly when water is present
Sampling Parameters:	Water level	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]
Rationale:	Operational Monitoring; during construction and operations	
Status:	Active	

Commented [JH44]: De Beers proposed removing this SNP station as the water management pond dam has not shown any indication of concern. This station is not needed as Engineered structures including the water management pond and other water retaining dykes at site are inspected by the Engineer of Record on an annual basis. Therefore, additional downstream monitoring is not warranted.

Board staff seeking input on seepage monitoring locations

SNP station 02-14:

Commented [JH45]: De Beers proposed the following changes.

Description:	Water Management Pond ~~(stilling well near the pumphouse)~~		
Location:	N 7052620, E 0506480		
Sampling Frequency:	Continuously when pumping to the Water Treatment Plant	Every two weeks ~~Weekly~~ when pumping to the Water Treatment Plant	~~Quarterly~~
Sampling Parameters:	Flow	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]	~~Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4]~~
Rationale:	Closure monitoring to monitor water quality in the water management pond ~~Operational Monitoring; during construction and operations. Data from this station is evaluated as part of the Acid Rock Drainage and Geochemical Characterization Monitoring Report.~~		
Status:	Active during closure; Inactive during Post-Closure.		

SNP station 02-15:

Commented [JH46]: De Beers proposed the following changes.

Description:	Water Intake from Snap Lake		
Location:	N 7053276, E 0506515		
Sampling Frequency:	Monthly, if extracting water from Snap Lake	Quarterly, if extracting water from Snap Lake	Annually, if extracting water from Snap Lake
Sampling Parameters:	*E. coli*, Major Ions, nitrate, TDS (measured and calculated[10])	Microbial Pathogens (*Gardia, Cryptosporidium*, and total heterotrohic plate count)	Turbidity, TSS, pH, conductivity, major ions[1], nutrients[2], CCMS scan[3] (total and dissolved), total mercury, total arsenic
Rationale:	~~Operational~~ Closure Monitoring; ~~during construction and operations~~ to evaluate safety of drinking water and amount of water withdrawal.		
Status:	Active during Closure; Inactive during Post-Closure.		

SNP station 02-16j:

Description:	This station is used to monitor Greywater discharge from the Sewage Treatment Plant ~~Sewage effluent from Sewage Treatment Plant, prior to mixing with Water Treatment Plant effluent (Surveillance Network Program station 1735-10 under "B" license – N1L2-1735)~~ ~~Surveillance Network Program station 02-16, as referred to in Licence MV2001L2-0002, was removed from the Surveillance Network Program and replaced by 16i (Nov 15, 2007). The only change to sampling requirements is to change the frequency of sampling from every six (6) days to once a week to harmonize with outgoing flights from the Snap Lake Mine Site (change approved by Board on December 3, 2009). SNP station 02-16i was replaced by 02-016j on May 26, 2015 to reflect relocation of the Sewage Treatment Plant.~~		
Location:	n/a		
Sampling Frequency:	Continuously, by in-line monitoring during periods of operation	Once every two weeks ~~on alternate dates~~ during pumping operations	Annually if in operation
Sampling Parameters:	Flow, pH, temperature, conductivity, turbidity	CBOD, Nutrients[2], Total Oil and Grease, TSS, *E. Coli*, Faecal Coliforms	CCMS scan[3] (total and dissolved)~~, total mercury, total arsenic~~
Rationale:	~~Operational~~ Closure monitoring: to evaluate whether sewage has been adequately treated before discharge ~~mixing with other Waste streams in the Water Management Pond.~~		
Status:	Active during Closure; Inactive during Post-Closure		

SNP stations ~~02-17 and~~ 02-17b:

Description:	Final Combined Water Treatment Plant and Sewage Treatment Plant effluent that is discharged via a diffuser into Snap Lake. ~~Under normal conditions, Surveillance Network Program station 02-17b is used which measures the permanent Water Treatment Plant. In conditions where greater capacity is needed, Surveillance Network Program station 02-17 can be used as it represents the effluent from the temporary Water Treatment Plant.~~				
Location:	~~More than one location:~~ ~~02-17: N 7052420, E 0506618;~~ ~~02-17b:~~ N 7052727, E 0506761				
Sampling Frequency:	Continuously, by in-line monitoring during periods of flow	~~Daily, on-site, in-line during periods of flow~~	~~Every six (6) days~~Every two weeks when discharging to Snap Lake	~~Quarterly~~Once annually	Monthly during periods of discharge
Sampling Parameters:	Flow, pH, temperature, conductivity, turbidity	~~Electrical Conductivity~~	TDS (measured and calculated[10]), Nutrients[2], TSS, Turbidity, Conductivity, Chloride, Calcium, Faecal coliforms, extractable petroleum hydrocarbons~~, any metal parameter that has an EQC~~	Acute and chronic toxicity tests[5]	pH, Major Ions[1], CCMS scan[3] (total only~~and dissolved~~), ~~total mercury, total arsenic,~~ extractable petroleum hydrocarbons, BTEX[4], *E. Coli*, ~~Total Oil and Grease~~, CBOD, ~~dissolved oxygen~~
Rationale:	Water Licence Compliance Monitoring during ~~construction and operations.~~closure. discontinue during Post-Closure because discharge will not occur at this location during Post-Closure.				
Status:	~~02-17: Inactive~~ ~~02-17b:~~ Active during closure; Inactive during Post-Closure				

SNP station 02-17c:

Description:	Discharge from East Passive ~~Wetland~~Influent Storage Pond to Snap Lake main basin. Monitoring to characterize the quality of water from the passive ~~wetland~~ treatment system to Snap Lake		
Location:	Outflow from the East Influent Storage Pond to Snap Lake		
Sampling Frequency:	~~Once monthly~~ Weekly during discharge (June, July, August, September)	Acute toxicity tests	Chronic toxicity tests
Sampling Parameters:	Turbidity, TSS, conductivity, TDS (measured and calculated), major ions, nutrients, ~~TSS,~~ pH, ~~conductivity, major ions,~~ total metals ~~CCMS scan (total only)~~, carbonaceous biological oxygen demand (CBOD)[a]	Once ~~annually~~monthly during discharge	Once quarterly during discharge
Rationale:	To evaluated water quality from the North Pile that is treated in the East ~~passive~~Influent Storage Pond ~~wetland~~ treatment system that ~~then~~ passively drains~~ing~~ to Snap Lake. To compared against EQC.		
Status:	Active once the East Influent Storage Pond treatment system is discharging to Snap Lake and during Post-Closure.		

a – only required during discharge of Sewage

Commented [JH47]: Proposed by De Beers

Board staff seeking input on the sampling frequency and the status of this SNP - whether this station should be active once the water treatment system is fully passive.

SNP station 02-17d:

Description:	Discharge from West Influent Storage Pond to northwest arm of Snap Lake. Monitoring to characterize the quality of water from the West Influent Storage Pond to Snap Lake (and coming from PS5) to Snap Lake.		
Location:	Outflow from the West Influent Storage Pond to Snap Lake		
Sampling Frequency:	~~Once monthly~~ Weekly during discharge (June, July, August, September)	Acute toxicity tests	Chronic toxicity tests
Sampling Parameters:	Turbidity, TSS, conductivity, TDS (measured and calculated), major ions, nutrients, ~~TSS,~~ pH, ~~conductivity, major ions,~~ total metals ~~CCMS scan (total only)~~, CBOD	Once ~~annually~~monthly during discharge	Once quarterly during discharge
Rationale:	To evaluated water quality from the North Pile that is treated in the West Influent Storage Pond treatment system that passively draining to Snap Lake. To compared against EQC.		
Status:	Active once the West Influent Storage Pond is discharging to Snap Lake, and during Post-Closure.		

Commented [JH48]: Proposed by De Beers.

SNP station 02-18:

Description:	Monitoring stations in the main basin of Snap Lake that are used to calculate a whole lake average concentration of Total Dissolved Solids. [6] The eight (8) stations that make up Surveillance Network Program station 02-18 include: • three (3) monitoring stations located near the diffuser outfall (Surveillance Network Program stations 02-20d, 02-20e, 02-20f); • one (1) AEMP station at the outlet of Snap Lake (SNAP08); and, • four (4) additional AEMP stations located throughout the main basin of Snap Lake (SNAP03, SNAP05, SNAP06, , SNAP11A). The method for calculating the whole lake average concentrations of TDS is described in Section D, Condition 2 of Annex A of this Licence (below).	
Location:	See attached map	
Sampling Frequency:	Two samples during the ice-free period (early summer (July) and late summer (August/September))	Sample during the period of ice cover (immediately prior to ice out)
Sampling Parameters:	Samples taken from the depth of maximum conductivity or the mid depth if no gradient present: measurements of temperature, dissolved oxygen, pH, and conductivity; TDS (measured and calculated[10]), chloride, calcium, nitrate	At one (1) metre intervals from surface to one (1) metre above bottom: measurements of temperature, dissolved oxygen, pH, and conductivity, TDS (measured and calculated[10]), chloride, calcium, nitrate
Rationale:	During operations, to establish the whole lake average concentrations of TDS in the main basin of Snap Lake.	
Status:	Active: 02-20d, 02-20e, 02-20f Inactive: 02-20g, SNAP09	

Commented [JH49]: De Beers proposed removing this SNP station because the discharge volume to Snap Lake during closure and post-closure will be a fraction of the volume during operation. Monitoring has demonstrated a decrease in the whole lake average concentration of TDS in the main basin of Snap Lake since operations ceased in 2015. This decline is predicted to continue. The Aquatic effects monitoring program will continue to report on aquatic health including water quality in Snap Lake.

SNP station 02-19:

Commented [JH50]: De Beers proposed removing this SNP station as discharge from the Sewage Treatment Plant is already monitored at SNP 2-16j

Description:	Sewage discharge from the temporary Sewage Disposal Facility (Surveillance Network Program station 1735-10 under 'B' Licence- N1L2-1735). This station was removed from the Surveillance Network Program and replaced with 16i (Nov 15, 2007).		
Location:	More than one location: 02-19: N 7052940, E 0506330; 02-19b: N 7052736, E 0506112		
Sampling Frequency:	Monthly	Every six (6) days	Annually
Sampling Parameters:	pH, CBOD, oil and grease, Faecal Coliforms, TSS	CBOD, Nutrients[2], Total Oil and Grease, TSS, *E. Coli*, Faecal Coliforms	CCMS scan[3] (total and dissolved), total mercury, total arsenic
Rationale:	Previously a Water Licence compliance monitoring point under MV2001L2-0004.		
Status:	Inactive		

SNP station 02-20 d, e, f:

Commented [JH51]: Revisions proposed by De Beers as per its Response to Undertaking

Description:	In Snap Lake, 3 stations located in ~~a radius of 120 degrees at~~ 200 meters from the diffuser, on the edge of the mixing zone ~~around the diffuser (Surveillance Network Program~~ 02-20d, e, and f).			
Location:	More than one location: 02-20d: N 7052845, E 0507411; 02-20e: N 7052607, E 0507158; 02-20f: N 7052949, E 0507316; ~~02-20g: N 7053089, E 0507501~~			
Sampling Frequency:	~~Once annually during ice-cover conditions, and~~ monthly during discharge.	Once annually ~~during ice-free period and once annually during ice-cover~~	~~Surficial sediment sample once annually.~~	~~Once yearly[9]~~
Sampling Parameters:	At the depth of maximum conductivity: measurements of temperature, dissolved oxygen, pH, and conductivity Samples taken from the depth of maximum conductivity shall be analyzed for: turbidity, TDS (measured and calculated[10]), TSS, pH, conductivity, major ions[1], nutrients[2], CBOD, ~~ICP-MS~~CCMS scan[3] (total ~~and dissolved~~only), ~~total mercury, total arsenic, extractable petroleum hydrocarbons, BTEX[4], *E. Coli*, total oil and grease~~ If no conductivity gradient is observed, a sample shall be taken at mid-depth between surface and bottom.	At depth of maximum conductivity (or mid-depth if no conductivity peak is observed) for chronic toxicity tests[7]	~~Total metals (strong acid digestion), total organic carbon~~	~~An early life stage (egg) toxicity test with the rainbow trout *Oncorhynchus mykiss*. The test shall be run with 100% effluent only and no dilutions.~~ ~~A 7-day test of Larval Growth and Survival Using Fathead Minnows (*Pimephales promelas*).~~
Rationale:	~~Snap Lake Operational~~Closure Monitoring~~,~~ to evaluate whether Water Quality Objectives are being met at the edge of the mixing zone.			
Status:	Active: SNP 02-20d, e, f during discharge from the diffuser; Inactive during Post-Closure			

SNP station 02-20h,i:

Description:	In Snap Lake main basin, two stations located on the edge of the mixing zone 200 m from the East Influent Storage Pond discharge location	
Location:		
Sampling Frequency:	Once annually	Once annually
Sampling Parameters:	Samples taken from the depth of maximum conductivity shall be analyzed for: turbidity, TDS (measured and calculated), nutrients, TSS, pH, conductivity, major ions, CCMS scan (total only), CBOD If no conductivity gradient is observed, a sample shall be taken at mid-depth between surface and bottom.	Chronic toxicity
Rationale:	Once the Passive Water Treatment System is established to confirm that water quality within Snap Lake, at the edge of the mixing zone is acceptable.	
Status:	Active during discharge from the East Influent Storage Pond, and Post-Closure.	

SNP station 02-20 j, k:

Description:	In Snap Lake main basin, two stations located on the edge of the mixing zone 200 m from the West Influent Storage Pond discharge location	
Location:		
Sampling Frequency:	Once annually	Once annually
Sampling Parameters:	Samples taken from the depth of maximum conductivity shall be analyzed for: turbidity, TDS (measured and calculated), nutrients, TSS, pH, conductivity, major ions, CCMS scan (total only), CBOD If no conductivity gradient is observed, a sample shall be taken at mid-depth between surface and bottom.	Chronic toxicity
Rationale:	Once the Passive Water Treatment System is established to confirm that water quality within Snap Lake, at the edge of the mixing zone is acceptable.	
Status:	Active during discharge from the West Influent Storage Pond, and Post-Closure.	

Commented [JH52]: Proposed by De Beers

ENR recommended the Board require De Beers to conduct a Plume Delineation Study and use the results to determine the exact mixing zone dimension for each effluent discharge location, which could be included in the SNP.

SNP station 02-21:

Description:	Outlet from Snap Lake flowing into the Lockhart River System
Location:	N 7053958, E 0511872
Sampling Frequency:	Once per year (ie. September)
Sampling Parameters:	Turbidity, TSS, TDS (calculated[10]), pH, conductivity, CCMS scan[3] (total and dissolved), total mercury, total arsenic, nutrients[2], major ions[1]
Rationale:	Snap Lake Operational Monitoring; during construction and operations.
Status:	Active

Commented [JH53]: De Beers proposed removing this SNP station as the annual discharge volume to Snap Lake is a fraction of operational volume and poses no concern for flow at the outlet. This station will continue to be monitored as part of the AEMP.

Board staff note that this SNP station is for monitoring chemistry of water in the downstream lakes.

SNP station 02-22:

Description:	Diffuser construction
Location:	n/a
Sampling Frequency:	Quarterly
Sampling Parameters:	TSS and turbidity, in the vicinity of this station, in a pattern and frequency to be established by the Department of Fisheries and Oceans (DFO)
Rationale:	Fisheries Authorization Monitoring; during construction for the diffuser and effluent pipeline in Snap Lake
Status:	Inactive

Commented [JH54]: De Beers proposed removing this SNP station as the diffuser is already constructed and therefore this station doesn't apply.

SNP station 02-23:

Description:	Water intake construction
Location:	n/a
Sampling Frequency:	Quarterly
Sampling Parameters:	TSS and turbidity, in the vicinity of this station, in a pattern and frequency to be established by the Department of Fisheries and Oceans (DFO)
Rationale:	Fisheries Authorization Monitoring; during construction for the water intake link in Snap Lake
Status:	Inactive

Commented [JH55]: De Beers proposed removing this SNP station as the intake is already constructed and therefore this station doesn't apply.

SNP station 02-24:

Description:	Snap Lake sites in close proximity to fisheries compensation works. Corresponds to AEMP stations SNAP05 (artificial reef area), and SNAP29 (Water intake).
Location:	More than one location: SNAP05: N 7052958, E 0508376; SNAP29: N 7053378, E 0506563
Sampling Frequency:	Samples taken at 1 metre depth intervals once during ice-covered conditions, and twice during open water conditions.
Sampling Parameters:	Specific Conductivity
Rationale:	Operational Monitoring. This monitoring, originally required under the Fisheries Authorization (SC00196), is reported in Annual AEMP Report; however, more frequent reporting of results (i.e., through monthly Surveillance Network Program reports) is desirable as these results will give an early warning of increased TDS levels near the outlet and fisheries compensation locations.
Status:	Active

Commented [JH56]: De Beers proposed removing this SNP station as volume of Water has drastically reduced and TDS is no longer a concern. This will be monitored as part of the AEMP.

Footnotes:

Commented [JH57]: Revisions proposed by De Beers.

Board staff seeking input on proposed changes.

[1] Major Ions shall include the following parameters: Magnesium (Mg), Fluoride (F), Calcium (Ca), Chloride (Cl), Alkalinity, Hardness, Sulphate (SO_4^{2-}), Sodium (Na), Potassium (K), Total Dissolved Solids (TDS).

[2] Nutrients shall include the following parameters: Ammonia (NH_3), Nitrite (NO_3-N), Nitrate (NO_2-N), Total Kjeldahl Nitrogen (TKN), total Phosphorus (P), dissolved Phosphorous (P), Orthophosphate (PO_4^{3-}), ~~Total~~ Dissolved Organic Carbon (~~T~~DOC)

[3] Collision Cell Inductively Coupled Plasma Mass Spectrometry (CCMS) or equivalent shall include at a minimum, the following parameters: Aluminum (Al), Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Cadmium (Cd), Cobalt (Co), Copper (Cu), Chromium (Cr), Cesium (Cs), Iron (Fe), Lead (Pb), Lithium (Li), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Rubidium (Rb), Selenium (Se), Strontium (Sr), Titanium (Ti), Thallium (Tl), Uranium (U), Vanadium (V), Zinc (Zn). Total metals shall be analyzed in an unfiltered sample and dissolved metals shall be analyzed after passing an unpreserved sample through a 0.45 micron filter.

[4] BTEX shall include the following parameters: Benzene, Toluene, Ethylene, Xylene

[5] Acute and chronic toxicity tests for Surveillance Network Program station 02-17b shall include: (a) Acute lethality to rainbow trout *Oncorhyncus mykiss* (as per Environment Canada's Environmental Protection Series Biological Test Method *EPS/1/RM/13);* (b) Acute lethality to the cladoceran crustacean *Daphnia magna* (as per Environment Canada's Environmental Protection Series Biological Test Method EPS/1 *IRM/14); and* (c) Chronic toxicity to the cladoceran crustacean *Ceriodaphnia dubia* (as per Environment Canada's Environmental Protection Series Biological Test Method *EPS/1/RM/21);* ~~and (d) Chronic toxicity to the alga *Pseudokirchneriella subcapitata* (as per Environment Canada's Environmental Protection Series Biological Test Method *EPS/1/RM/25).*~~

~~[6] Main Basin of Snap Lake: DBCMI's whole-lake model for TDS concentration does not include the Northwest Arm of Snap Lake, as the Northwest Arm is physically isolated from mixing with the rest of the lake. The model predicts concentrations of TDS for the main basin of Snap Lake.~~

[7] Chronic toxicity tests for Surveillance Network Program station 02-20 shall include: ~~(a)~~ Chronic toxicity to the cladoceran crustacean *Ceriodaphnia dubia* (as per Environment Canada's Environmental Protection Series Biological Test Method EPS/1/RM/21) ~~and (b) Chronic toxicity to the alga *Pseudokirchneriella subcapitata* (as per Environment Canada's Environmental Protection Series Biological Test Method EPS/1/RM/25).~~

~~[8] Sampling at Surveillance Network Program station 02-20g will commence only after the installation of the second permanent diffuser is complete.~~

[9] ~~Annual toxicity tests for Surveillance Network Program station 02-20 shall be conducted in accordance with Environment Canada`s Methods *EPS/1/RM/28* (Rainbow Trout) and *EPS/1/RM/22* (Fathead Minnow).~~

[10] Total dissolved solids (calculated) shall be calculated as per the American Public Health Association's *Standard Methods for the Examination of Water and Wastewater, 21st Edition (2005):*

TDS_{calc} (mg/L) = (0.6 x Total Alkalinity as $CaCO_3$) + Na^+ + Mg^+ + K^+ + Ca^{2+} + SO_4^- + Cl^- + NO_3^- + F- + SiO_3^{2-}

2. The location of sampling sites is subject to approval of an Inspector.

3. More frequent sample collection may be required at the request of an Inspector.

4. All sampling, sample preservation, and analyses shall be conducted in accordance with methods prescribed in the current edition of American Public Health Association`s (APHA) *Standard Methods for the Examination of Water and Wastewater* at the time of analysis, or by such other methods approved by an Analyst.

5. All analyses shall be performed in a laboratory accredited by the Canadian Association for Laboratory Accreditation (CALA) for the specific analyses to be performed or as approved by an Analyst.

6. A **Quality Assurance/Quality Control Plan** (QA/QC Plan) which includes both field and laboratory requirements shall be submitted to an Analyst, for approval, not less than sixty (60) days in advance of any sampling conducted.

7. The Licensee shall act in accordance with the approved QA/QC Plan and shall review the Plan annually or as directed by the Board and make any necessary revisions to reflect changes in operations. Revisions to the Plan shall be submitted to an Analyst, for approval.

8. If the Quality Assurance and Quality Control Plan is not approved by the Analyst, the Licensee shall revise the Plan according to the Analyst's direction and re-submit it to the Analyst for a decision.

Part B: Flow and Volume Measurements

Commented [JH58]: Revisions proposed by De Beers.

1. All flow and volume measurements shall be measured and recorded continuously (ie., using electronic data storage chips or equivalent) during periods of flow or pumping and reported on a monthly basis in cubic metres (m^3) as per Part D, Condition 1 of this Annex:

Commented [MS59]: @Jacqueline Ho to update

   a) The daily volume of water pumped from Snap Lake for all purposes (Surveillance Network Program station 02-15);
   b) The daily volume of water pumped from the Water Management Pond (Surveillance Network Program station 02-14);
   ~~c) The daily volume of water pumped from the Mine Water Sump to the Water Treatment Plant (Surveillance Network Program station 02-01);~~
   ~~d)~~c) The daily volume of water pumped from the controlled runoff sites (Surveillance Network Program stations 02-02 ~~and 02-03~~) to the Water Treatment Plant;
   ~~e) Spot measurements of flow made during sampling at uncontrolled runoff sites (Surveillance Network Program stations 02-04 through 02-10);~~
   ~~f)~~d) The daily volume of water discharged from the sewage treatment plant to the main outfall (Surveillance Network Program station 02-16);
   ~~g)~~e) The daily volume of water discharged from the combined outfall from the Water Treatment Plant and the Sewage Treatment Plant to Snap Lake (Surveillance Network Program station 02-17);
   ~~h) Volumes of solids (in tonnes) and liquid wastes (in cubic metres) discharged to the North Pile;~~
   ~~i) The daily volume of paste backfill (in tonnes and cubic metres) pumped to the underground mine workings for disposal;~~

~~j) Continuously at the Snap Lake Outflow (Surveillance Network Program station 02-21) during the ice free period; and~~
~~k) Spot measurements of flow will be made at the small tributary to Snap Lake referenced by the Licensee in Table 10-1 of the September 2003 *Proposed Hydrology Monitoring Program* during periods of observable flow.~~

2. The following water level measurements shall be made and recorded:

a) ~~Continuous~~ Monthly water level in Snap Lake during periods of occupancy; and
~~b) Water levels in monitoring wells at Surveillance Network Program stations 02-11, 02-12 and 02-13 whenever water is present during water quality sampling.~~

Part C: Other Monitoring Requirements

1. The Licensee shall measure and record the following meteorological data during periods of occupancy:

a) Precipitation, measured and recorded in hourly and daily totals;
~~b) Evaporation, as calculated from the parameters listed below with hourly and daily averages;~~
~~c)~~b) Wind speed ~~at approximately 2.0 metres above the water surface,~~ including daily minima and maxima;
~~d)~~c) Wind direction on an hourly basis and air temperature ~~at approximately 0.75 and 2.0 metres above the water surface,~~ including daily minima and maxima;
~~e) Relative humidity at approximately 0.75 and 2.0 metres above the water surface;~~
~~f) Water temperature at one (1) and two (2) metre depths below surface;~~
~~g) Net solar radiation over the water surface; and~~
~~h) Water level.~~

~~Weather data for evaporation calculations shall be measured and recorded at a site on Snap Lake near mine operations and away from any manmade structures.~~

2. The Licensee shall submit to the Board, for approval, the location, methods and frequency for measuring and recording the **meteorological data** identified in Part C, Condition 1(a) of this Annex.

3. The methods and frequency referred to in Part C, Condition 1(a) of this Annex shall be implemented as and when approved by the Board.

~~4. The quantity of ore processed shall be measured daily, recorded in tonnes and reported monthly as per Part D, item 1 of this Annex.~~

~~5.~~4. The volumes of solids, measured daily, in tonnes, and liquid Wastes, measured daily in cubic metres, which are discharged to the North Pile shall be recorded and reported monthly as per Part D, Condition 1 of this Annex.
~~6. The volume of paste backfill, measured in tonnes and cubic metres pumped to the underground mine workings for disposal, shall be measured daily and recorded and reported monthly as per Part D, item 1 of this Annex.~~

Part D: Reporting Requirements

1. The Licensee shall, within thirty (30) days following the month being reported, submit to the Board and an Inspector, in electronic and printed formats acceptable to the Board, all data and information required by the Surveillance Network Program, including the results of the approved QA/QC program and any interpretive comments and calculations. Monthly **Surveillance Network Program Reports** should also include:

Commented [JH60]: Revisions proposed by De Beers.

Board staff are seeking input to these proposed changes.

Commented [JH61]: Revisions proposed by De Beers.

Board staff are seeking input to these proposed changes.

a) For parameters regulated under Part F, Conditions 21 and 28 of this Licence, graphs showing trends in parameter concentrations in the effluent compared to Effluent Quality Criteria over the past two years; and

~~b) For total dissolved solids, a whole lake average concentration should be calculated as per Part D, item 2 of this Annex from quarterly measurements made at Surveillance Network Program station 02-18 and a graph showing trends the whole lake average TDS concentration.~~

~~2. The whole lake average concentration of TDS shall be calculated and reported as follows:~~

~~a) For the purposes of reporting the whole lake average total dissolved solids, calculated total dissolved solids concentrations (i.e. calculated based on ionic constituent concentrations) shall be used; and~~

~~b) The total dissolved solids concentration at each individual station within Surveillance Network Program station 02-18 to be used in the calculation shall be either collected at the point of highest concentration gradient, or if no gradient exists, samples will be taken from the mid-depth. The whole lake average concentration shall be the mean of the average concentrations from eight (8) stations within Surveillance Network Program station 02-18.~~

~~3. The Licensee shall determine the relationship between chloride (as measured on-site) and total dissolved solids (as measured/calculated in a laboratory) in effluent from SNP station number 17b. A report detailing the correlation between on-site measurements of chloride and total dissolved solids concentrations reported from an accredited laboratory shall be filed with the Board within two (2) months of the issuance of this Licence.~~

~~4. The Licensee shall update the correlation required in Part D, item 3 of this Annex at the request of the Inspector or the Board.~~

~~5. Upon request from the Board or an Inspector, the Licensee shall provide weekly reports of daily on-site chloride measurements and estimates of total dissolved solids in the effluent to the Inspector.~~

Annex B – Concordance Table of Items Requiring Submission

Commented [JH62]: Board staff to update

This table summarizes the information the Licensee is required to submit as per the Water Licence conditions.

Part of Licence	Item	Date

Annex C – Table of Revision History

Table 1: Updates and changes that have been made to the Water Licence:

Date	Location of change	Description of change