



Mackenzie Valley Land and Water Board
Water Licence

Pursuant to the Mackenzie Valley Resource Management Act and Regulations, the Mackenzie Valley Land and Water Board, hereinafter referred to as the Board, hereby grants to:

Canadian Zinc Corporation
(Licensee)

of Suite 1710-650 West Georgia Street, Vancouver BC V6B 4N9
(Mailing Address)

hereinafter called the Licensee, the right to alter, divert, or otherwise use water subject to the restrictions and conditions contained in the Mackenzie Valley Resource Management Act made thereunder and subject to and in accordance with the conditions specified in this Licence.

Licence Number: MV2019L8-0002
Licence Type: B
Water Management Area: Northwest Territories 03
Location: KP 156.1 to 161.7 and KP 163 to 164.1 of the Canadian Zinc Corporation All Season Road connecting Prairie Creek Mine to the Liard Highway
Purpose: To dispose of waste and associated uses
Description: Miscellaneous
Quantity of Water not to be exceeded: 0 cubic metres (m³)
Effective date of licence: XXX, 2019
Expiry date of licence: XXX, 2039

Commented [JH1]: No water source has been proposed under IAB lands

Commented [KM2]: Board staff seeking reviewer input on the term of MV2019L8-0002. The Proponent has requested 20 years.

This Licence issued and recorded at Yellowknife includes and is subject to the annexed conditions.

Mackenzie Valley Land and Water Board

Chair

Witness

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Type B Water Licence MV2019L8-0002
Canadian Zinc Corporation – Prairie Creek All Season Road Project

Legend for Reviewers:

Green Highlighting reflects items to be determined through the regulatory proceeding; or seeking reviewer input

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Part A: Scope and Definitions

1. Scope:

- a) This Licence entitles the Licensee to use Water and dispose of Waste for construction, operation, closure and reclamation of the Prairie Creek All Season Road Project, Northwest Territories as described in the Environmental Assessment [and subsequent Preliminary Screening Report dated X].

The scope of this Licence includes the following activities:

- i. Deposit of Waste;
 - ii. Use of Explosives;
 - iii. Use and storage of fuel;
 - iv. Construction and operation of Camps;
 - v. Development and operation of Borrow Pits;
 - vi. Construction, operation, and maintenance of an All Season Road, including the Construction, operation, and maintenance of a temporary Winter Road;
 - vii. Construction, operation, and maintenance of Watercourse crossing(s);
 - viii. Construction, operation, and maintenance of Watercourse training;
 - ix. Construction, operation, and maintenance of flood control structures, and
 - x. Progressive Reclamation and associated Closure and Reclamation activities.
- b) This Licence is issued subject to the conditions contained herein with respect to the use of Water and the deposit of Waste of any type in any Water 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 Water. Whenever new Regulations are made or existing Regulations are amended by the Governor in Council under the *Mackenzie Valley Resource Management 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.
- c) Compliance with the 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.

Commented [KM3]: Board staff seeking input as to if ix. is necessary to include in the Scope.

2. Definitions¹:

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.

Adaptive Management – a systematic, rigorous approach for deliberately learning from management actions with the intent to improve management policy or practice, conducted in accordance with the Report of Environmental Assessment Appendix B.

¹ Defined terms are capitalized throughout the License, including when used in other definitions.

All Season Road – road, used in all seasons, that conforms to the alignment and material configuration as presented in the Design and Construction Plan and Design Drawings.

Analyst – an Analyst designated by the Minister under subsection 84(2) of the *Mackenzie Valley Resource Management Act*.

Avalanche Professional – a person registered with the Canadian Avalanche Association to practice as an Associate Member, and whose professional field of specialization is appropriate to address the components of the Project at hand.

Average Concentration – the arithmetic mean/discrete average of four consecutive analytical results, **for 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*.

Borrow – excavated material including clay, silt, sand, and quarry rock, as described in the approved Borrow Pit Management Plan.

Borrow Pit – an excavation made according to the approved Borrow Pit Management Plan in order to produce Borrow.

Closure Cost Estimate – has the same meaning as that in the Mackenzie Valley Land and Water Board, Government of the Northwest Territories, and Indigenous and Northern Affairs Canada's *Guidelines for Closure and Reclamation Cost Estimates for Mines*.

Closure Criteria – has the same meaning as that in the Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development Canada's *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*.

Closure Objectives – has the same meaning as that in the Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development Canada's *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*.

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, human activities, and the surrounding environment.

Closure and Reclamation Plan – a document, developed in accordance with this Licence and the Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development Canada's *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.

Concentrate – the product emanating from the processing of ore at the Prairie Creek Mine.

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.

Discharge – the direct or indirect release of any Waters 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 Mackenzie Valley Land and Water Board's *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.

Engineered Structure – any structure or facility associated with the Project and related to Water Use or the deposit of Waste that is designed by a Professional Engineer, including but not limited to the All Season Road, Non-Typical Winter Road, Hoverbarge Landings, Stream Crossing, Culvert, Camp, Staging Area.

Environmental Assessment – the totality of the Mackenzie Valley Environmental Impact Review Board's Public Registry for Environmental Assessment EA1415-01, including the Report of Environmental Assessment.

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

Groundwater – all Water in a zone of saturation beneath the land surface, regardless of its origin.

Independent Technical Review Panel (Panel) – the expert panel established by the Licensee to fulfill Measure 5-1 of the Report of Environmental Assessment.

Inspector – an Inspector designated by the Minister under subsection 84(1) of the *Mackenzie Valley Resource Management 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 grab sample.

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

Minister – the Minister of **Indigenous and Northern Affairs Canada**

Non-Typical Winter Road – sections of the Winter Road as documented in the Construction Plan and Design Drawings.

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).

Permafrost – ground (soil or rock) that remains at or below 0°C for at least two consecutive years.

Phase 1 – activities to support the Construction of the All Season Road in Phase 2, including the Construction and operation of the Winter Road to conduct geotechnical investigation and transport equipment and materials to Prairie Creek Mine.

Phase 2 activities to support the Construction of the All Season Road including the Construction and operation of the Winter Road and commencement of All Season Road Construction.

Phase 3 activities to support the operation of the All Season Road including transportation of loaded Concentrate, consumable materials and supplies to support mine operations, and road maintenance.

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

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 in accordance with 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 in accordance with 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 period of the Project.

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

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

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

Reclamation Research – has the same meaning as that in the MVLWB/AANDC *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*.

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.

Report of Environmental Assessment – the Mackenzie Valley Environmental Impact Review Board's Report of Environmental Assessment and Reasons for Decision for the EA1415-01, dated September 12, 2017, and adopted by the Minister of Crown-Indigenous Relations on October 9, 2018.

Runoff – the overland flow of Water that occurs when excess precipitation, meltwater, or other Water is not absorbed by the land, and instead drains downslope towards a Watercourse.

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 and structures designated to contain and treat Sewage.

Shut Down Period – the period of time between [DATE and DATE] each year during Phase 1 and Phase 2, for the purpose of this operation.

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

Spill Contingency Plan – a document, developed in accordance with Aboriginal Affairs and Northern Development Canada's *Guidelines for Spill Contingency Planning* that describes the set of procedures to be implemented to minimize the effects of a spill.

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

Temporary Closure – a state of care and maintenance, with the intent of resuming activities in the near future.

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.

Typical Winter Road – the road alignment, not including the Non-Typical Winter Road, that is for winter use only.

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

Waste – any substance defined as Waste by section 51 of the *Mackenzie Valley Resource Management Act*.

Waste Disposal Facilities – the area and structures designated for the disposal of Waste, including the [enter as relevant: Sewage Disposal Facilities, Solid Waste Disposal Facilities, and the Temporary Hazardous Waste Storage Facility]

Waste Management Plan – 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 – extracted material that is not utilized in construction or reclamation.

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

Water(s) – any Water as per section 51 of the *Mackenzie Valley Resource Management Act*.

Watercourse – a natural watercourse, body of Water or Water supply, whether usually containing Water or not, and includes Groundwater, springs, swamps, and gulches.

Winter Road – the Winter Road alignment including both the Typical and Non-typical Winter Road sections.

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Part B: General Conditions

1. The Licensee shall ensure a hard copy of this Licence is maintained on-site at all times.
2. The Licensee shall take every reasonable precaution to protect the 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.
4. In each submission required by this Licence or any directive from the Board, the Licensee shall identify all recommendations based on Traditional Knowledge received, describe how the recommendations were incorporated into the submission, and provide justification for any recommendation not adopted, to fulfill Report of Environmental Assessment Measures 10-1, 15-1, 15-4, and Suggestion 15-4.
5. 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.
6. 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*; and
 - b) Include a conformity statement or table which identifies where the pertinent requirements of this Licence, or other direction from the Board, are addressed.
7. 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.
8. The Licensee shall comply with all terms of reference, plans, reports, studies and programs approved as per the conditions of this Licence, including such revisions made as per the conditions of this Licence, and as approved by the Board.
9. The Licensee may propose revisions at any time by submitting revised terms of reference, plans, reports, and programs to the Board for approval. Unless otherwise specified, a minimum of 90 days prior to implementing any proposed updates or changes in the terms of reference, plans, reports, and programs, the Licensee shall submit all revisions to the Board, for approval. Any revision submission shall include a revision history table and a summary of the revisions previously made. The Licensee shall not implement revisions until approved by the Board.
10. The Licensee shall submit revised plans, reports, studies, and programs for Phases 1, 2, and 3 to the Board for approval, unless otherwise directed by the Board. Unless otherwise specified, a minimum of 90 days prior to commencement of each phase and implementing any proposed updates or changes in the plans, reports, studies, and programs, the Licensee shall submit all revisions to the Board for approval. Any revision submission shall include a revision history table and a summary of the revisions previously made. The Licensee shall not commence activities for each phase or implement revisions until approved by the Board.
11. The Licensee shall revise any submission as per the Board's direction and resubmit it for approval.
12. The Licensee shall not operate Phase 1 for more than two consecutive years.

Commented [JH4]: Board staff is seeking input on this condition to address revisions/updates for each phase.

13. The Licensee shall identify how an adaptive management framework has been incorporated in each plan and program submitted for Board approval to fulfill the Report of Environmental Assessment Appendix B.
14. If any date for any submission falls on a weekend or holiday, the Licensee may submit the item on the following business day.
15. The Licensee shall comply with the **Schedules**, which are annexed to and form part of this Licence, and any changes to the Schedules as may be made by the Board.
16. The Licensee shall comply with the **Surveillance Network Program**, which is annexed to and forms part of this Licence, and any changes to the Surveillance Network Program as may be made by the Board.
17. The Schedules, the Surveillance Network Program, and any compliance dates specified in this Licence may be updated at the discretion of the Board.
18. The Licensee shall ensure signs are posted for all active Surveillance Network Program stations within 30 days of establishment. All sign(s) shall be located and maintained to the satisfaction of an Inspector.
19. The Licensee shall install, operate, and maintain meters, devices, or other such methods used for measuring the volumes of Waste discharged to the satisfaction of an Inspector.
20. Beginning March 31, 2020 and no later than every March 31 thereafter, the Licensee shall submit an **Annual Report** to the Board and an Inspector. The Annual Report shall be in accordance with Schedule 1, condition 1.
21. The Licensee shall comply with the **Engagement Plan**, once approved, to fulfill Measure 15-1, 15-4 and Suggestion 15-4 of the Report of Environmental Assessment.
22. A minimum of 90 days prior to the commencement of Phase 1 activities, the Licensee shall submit to the Board, for approval, a revised Engagement Plan. The Licensee shall not commence Phase 1 activities prior to Board approval. Subsequent revisions shall be in accordance with Part B, condition 10.
23. A minimum of ten days prior to commencement of the Project including Phases 1, 2, and 3, the Licensee shall provide written notification to the Board and an Inspector. Notification shall include the commencement date, and the name and contact information of the Licensee's Field Supervisor. Any updates shall be provided to the Board and an Inspector in writing as changes occur.
24. A minimum of ten days prior to the commencement of the Project, the Licensee's Field Supervisor shall contact an Inspector.
25. At minimum of ten days prior to returning to the worksite following a seasonal Shut Down Period, the Licensee's Field Supervisor shall contact an Inspector.
26. The Licensee shall immediately provide written notification to the Board and an Inspector of any non-compliance with the conditions of this Licence or any direction from the Board pursuant to the conditions of this Licence.
27. The Licensee shall submit a revised Project schedule to the Board and an Inspector upon request.

Part C: Reclamation Security Requirements

1. The Licensee shall post and maintain a security deposit with the Minister in accordance with Schedule 2, condition 1.
2. Upon request of the Board, the Licensee shall submit an updated Closure Cost Estimate utilizing the current version of RECLAIM or another method acceptable to the Board.
3. The amount of the security deposit required by Part C, condition 1 may be adjusted by the Board:
 - a) Based on updated Closure Cost Estimates referred to in Part C, condition 2; or
 - b) Based on such other information as may become available to the Board.
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 90 days of the Board giving notice of the adjusted amount, or as otherwise directed by the Board.

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Part D: 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.
2. 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.
3. The Licensee shall ensure that all material used in Construction of the Project meets the geochemical criteria specified in the approved Geochemical Verification Program referred to in Part E, condition 11.
4. The Licensee shall only use material that is clean, non PAG and free of contaminants and is from a source within an approved area as per the approved Borrow Pit Management Plan, or that has been approved in writing by an Inspector.
5. The Licensee shall maintain Construction records and geochemical records of Construction materials for all structures and make them available at the request of the Board or an Inspector.
6. The Licensee shall establish and fund an **Independent Technical Review Panel** in accordance with Measure 5-1 of the Report of Environmental Assessment.
7. A minimum of 90 days prior to commencement of the Panel's activities, the Licensee shall submit the Panel's **Terms of Reference** to the Board for approval, to fulfill Report of Environmental Assessment Measure 5-1. The Licensee shall submit a revised Terms of Reference 90 days prior to implementation of any changes to the Terms of Reference.
8. The Licensee shall comply with the Panel's Terms of Reference, once approved.
9. Unless otherwise authorized 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**, in accordance with Schedule 3, condition 1. The Licensee shall not commence Construction prior to Board approval of the Plan.
10. A minimum of 90 days prior to the commencement of Construction of any Engineered Structures not reviewed and accepted the Panel, the Licensee shall submit to the Board for approval, a **Design and Construction Plan** in accordance with Schedule 3, condition 2.
11. A minimum of 90 days prior to the commencement of Construction of any Engineered Structures not reviewed and accepted by the Panel, 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.

Commented [JH5]: Board staff is seeking input on whether the Terms of Reference should be for Board approval. Measure 5-1 indicates that CZN shall engage with affected parties on the panel activities.

Commented [JH6]: Board staff is seeking input on whether this condition is required for non-engineered structures and facilities such as the water settling structure (from the Borrow Pit Management Plan section 2), but still is intended to contain, withhold, divert, or retain Water or Wastes

12. A minimum of 45 days prior to the commencement of Construction of any Engineered and non-Engineered Structures reviewed and accepted by the Panel, the Licensee shall submit to the Board the following:
 - i. a **Final Report** from the Panel that indicates their review and acceptance of the final road design, Design and Construction Plan, and Design Drawings to fulfill Report of Environmental Assessment Measure 5-1;
 - ii. a **Design and Construction Plan**, in accordance with Schedule 3, condition 2, reviewed and accepted by the Panel; and
 - iii. a **Design Drawing** stamped and signed by a Professional Engineer, and reviewed and accepted by the Panel.

13. The Licensee may propose revisions at any time to the Engineered Structures reviewed and accepted by the Panel by submitting to the Board the following:
 - i. a revised Final Report from the Panel that indicates their review and acceptance of the revised Design and Construction Plan and Design Drawings;
 - ii. a revised Design and Construction Plan reviewed and accepted by the Panel; and
 - iii. a revised Design Drawing stamped and signed by a Professional Engineer and reviewed and accepted by the Panel.

Any revision submission shall include a revision history table and a summary of the revisions made.

14. A minimum of ten days 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 Construction Field Supervisor. Any updates shall be provided to the Board and an Inspector in writing as changes occur.

15. The Licensee shall ensure that all structures, excluding Engineered Structures, are constructed in accordance with the approved Structure Description and Construction Plan(s).

16. The Licensee shall ensure that all Engineered Structures are constructed in accordance with the Design Drawings and approved Design and Construction Plans.

17. 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 the Design and Construction Plans and Design Drawings; and
 - c) any data used to support these decisions.

18. The Licensee shall comply with the **Road Construction and Management Plan**, once approved.

19. A minimum of 90 days prior to the commencement of Phase 1 activities, the Licensee shall submit to the Board, for approval, a revised Road Construction and Management Plan. The Licensee shall not commence any Phase 1 activities prior to Board approval. Subsequent revisions shall be in accordance with Part B, condition 10.

Part E: 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.
2. A minimum of ten days prior to depositing any Waste into a licenced municipal facility, the Licensee shall provide written notification to the Board and an Inspector.
3. The Licensee shall dispose of all Waste as described in the approved Waste Management Plan.

Management and Monitoring Submissions

4. The Licensee shall comply with the **Waste Management Plan**, once approved.
5. A minimum of 90 days prior to the commencement of Phase 1 activities, the Licensee shall submit to the Board, for approval, a revised Waste Management Plan. The Licensee shall not commence any Phase 1 activities prior to Board approval. Subsequent revisions shall be in accordance with Part B, condition 10.
6. The Licensee shall comply with the **Sediment and Erosion Control Plan**, once approved. The Plan shall fulfill Part E, condition 1 and be in accordance with the requirements of Schedule 4, condition 1.
7. A minimum of 90 days prior to the commencement of Phase 1 activities, the Licensee shall submit to the Board, for approval, a revised Sediment and Erosion Control Plan. The Licensee shall not commence any Phase 1 activities prior to Board approval. Subsequent revisions shall be in accordance with Part B, condition 10.
8. The Licensee shall comply with the **Permafrost Management and Monitoring Plan**, once approved. The Plan shall fulfill Part E, condition 1 and be in accordance with the requirements of Schedule 4, condition 2.
9. A minimum of 90 days prior to the commencement of Phase 1 activities, the Licensee shall submit to the Board, for approval, a revised Permafrost Management and Monitoring Plan. The Licensee shall not commence any Phase 1 activities prior to Board approval. Subsequent revisions shall be in accordance with Part B, condition 10.
10. The Licensee shall comply with the **Geochemical Verification Program**, once approved. The Plan shall be in accordance with the requirements of Schedule 4, condition 3.
11. A minimum of 90 days prior to the commencement of Phase 1 activities, the Licensee shall submit to the Board, for approval, a revised Geochemical Verification Program. The Licensee shall not commence any Phase 1 activities prior to Board approval. Subsequent revisions shall be in accordance with Part B, condition 10.
12. The Licensee shall comply with the **Borrow Pit Management Plan**, once approved. The Plan shall be in accordance with the requirements of Schedule 4, condition 4. The Licensee shall not develop any Borrow Pit until it is approved in the Borrow Pit Management Plan.
13. A minimum of 90 days prior to the commencement of Phase 2 activities, the Licensee shall submit to the Board, for approval, a revised Borrow Pit Management Plan. The Licensee shall not commence any Phase 2 activities prior to Board approval. Subsequent revisions shall be in accordance with Part B, condition 10.
14. The Licensee shall comply with the **Water Monitoring Plan**, once approved. The Plan shall be in accordance with the requirements of Schedule 4, condition 5.

15. Within 90 days following the effective date of this Licence, the Licensee shall submit to the Board, for approval, a Water Monitoring Plan. The Licensee shall not commence Phase 1 activities prior to Board approval. Subsequent revisions shall be in accordance with Part B, condition 10.
16. The Licensee shall comply with the **Explosives Management Plan**, once approved. The Plan shall be in accordance with the requirements of Schedule 4, condition 6. The Licensee shall not commence Construction of any explosive storage or handling areas until the Board has approved the Explosives Management Plan.
17. A minimum of 90 days prior to the commencement of Phase 1 activities, the Licenses shall submit to the Board, for approval, a revised Explosives Management Plan. The Licenses shall not commence Phase 1 activities prior to Board approval. Subsequent revisions shall be in accordance with Part B, condition 10.

Operations of Structures and Facilities

18. The Licensee shall construct, operate, and maintain the [enter name of structure/facility] to the design specifications and engineering standards, such that:
 - a) Any constructed structures/facilities are maintained and operated to the specifications described in the [facility name] Design and Construction Plan, referred to in Part E are maintained at all times, and the structures/facilities are maintained and operated to the satisfaction of an Inspector;
 - b) Seepage from the facility to the Receiving Environment is minimized, collected, and returned to the [facility name(s)]; ~~OR~~ Any Seepage from the facility to the Receiving Environment that does not meet Effluent Quality Criteria, as specified in Part E, condition 25 shall be collected and returned to the [structure/facility name(s)];
 - c) Any deterioration or erosion of constructed structures/facilities shall be reported to an Inspector and the Board, and repaired immediately;
 - d) 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 D are being met; and
 - ii. necessary changes in operation of the facility, including any additional mitigations, are identified.
19. The Licensee shall not Discharge Waste, including Wastewater, to any Watercourse, or to the ground surface within 100 metres of the Ordinary High Water Mark of any Watercourse.
20. The Licensee shall operate and maintain the **Sewage Disposal Facilities and Solid Waste Disposal Facilities** to prevent structural failure and to the satisfaction of an Inspector.

Inspections of Structures and Facilities

21. The Licensee shall conduct [enter frequency] inspections of the [enter names of structures/facilities], or as directed by an Inspector or the Board. Records of these inspections shall be made available to the Board or an Inspector upon request.
22. 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.

Commented [JH7]: Board staff is seeking input on whether this condition is needed to set any specifications or limitations on any particular Engineered structures.

Commented [JH8]: Board staff is seeking input on whether this condition is needed to set any specifications or limitations on any particular Engineered structures

23. The Licensee shall ensure that geotechnical **and geochemical** inspections of all Engineered Structures are conducted annually, during the summer months, by a Professional Engineer **and Professional Geoscientist**, and following any extreme events (such as earthquakes, flooding, cracks, sinkhole formation, etc.). The Licensee shall:
- A minimum of two weeks prior to the annual inspection, provide written notification to an Inspector; and
 - Within 90 days of completing the inspection, submit the Professional Engineer's and Professional Geoscientist's full **Geotechnical and Geochemical Inspection Report** to the Board and an Inspector. The Report shall include:
 - a covering letter from the Licensee outlining an implementation plan to respond to any recommendations made by the Professional Engineer and Professional Geoscientist, including rationale for any decisions that deviate from the Professional Engineer's **and Professional Geoscientist's** recommendations; and
 - a summary of any actions taken by the Licensee to address the recommendations made following the previous year's inspection.

Effluent Quality Criteria

24. The Licensee shall ensure that Wastewater from the Sewage Disposal Facility at Surveillance Network Program station SNP 2019-3 has a pH value between 6 and 9, and meets the following Effluent Quality Criteria (EQC):

Parameter	EQC in mg/L	
	Maximum Average Concentration	Maximum Grab Concentration
Carbonaceous biochemical oxygen demand (CBOD)	25	
Suspended Solids	25	
Un-ionized Ammonia (as Nitrogen)		1.25
Oil and Grease		5

Commented [KM9]: Board staff are seeking input on EQC.

Should the Proponent require discharge of Sewage from a Sewage Disposal Facility, Board staff has included Effluent authorization limits outlined in the [Wastewater Systems Effluent Regulations](#).

25. The Licensee shall submit Water quality data for samples collected from Surveillance Network Program station SNP 2019-3 (Sewage Disposal Facility) to the Board and an Inspector as follows:
- No later than five days prior to commencing or resuming Discharge of Effluent to **[location]**; and
 - No later than five days prior to commencing or resuming Discharge of Effluent to **[location]** following an exceedance of the Effluent Quality Criteria specified in Part E, condition 25 (the table).

The Licensee shall not commence or resume the Discharge until authorized in writing by an Inspector.

26. If Water quality data from any sample collected at Surveillance Network Program stations SNP 2019-3 exceeds the Effluent Quality Criteria specified in Part E, condition 25, the Licensee shall:
- Cease the Discharge;
 - Notify the Board and an Inspector within 24 hours;
 - Report the spill immediately in accordance with the Spill Contingency Plan referred to in Comply with Part F, condition 2; and
 - Submit a detailed report on the occurrence, including a summary of corrective actions taken, to the Board and an Inspector within 30 days.

Part F: Contingency Planning

1. The Licensee shall ensure that Unauthorized Discharges associated with the Project do not enter any Waters.
2. The Licensee shall comply with the **Spill Contingency Plan**, once approved.
3. A minimum of 90 days prior to the commencement of Phase 1 activities, the Licensee shall submit to the Board, for approval, a revised Spill Contingency Plan. The Licensee shall not commence Phase 1 activities prior to Board approval. Subsequent revisions shall be in accordance with Part B, condition 10.
4. If, during the period of this Licence, a spill or an Unauthorized Discharge occurs or is foreseeable, the Licensee shall:
 - a) Implement the approved Spill Contingency Plan referred to in Part F, condition 2;
 - b) Immediately report it 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) Within 24 hours, notify the Board and an Inspector; and
 - d) Within 30 days of initially reporting the incident, submit a detailed report, including descriptions of causes, response actions, and any changes to procedures to prevent similar occurrences in the future, to the Board and an Inspector. Any updates to this report shall be provided to the Board and an Inspector in writing as changes occur.
5. The Licensee shall ensure that adequate spill prevention infrastructure and spill response equipment is in place prior to commencement of the Project.
6. The Licensee shall restore all areas affected by spills and Unauthorized Discharges to the satisfaction of an Inspector.
7. The Licensee shall not establish any fuel storage facilities or refueling stations, or store chemical or deleterious substances within 100 metres of the Ordinary High Water Mark of any Watercourse, unless otherwise authorized in writing by an Inspector.
8. The Licensee shall comply with the **Emergency Response Plan**, once approved.
9. A minimum of 90 days prior to the commencement of Phase 1 activities, the Licensee shall submit to the Board, for approval, a revised Emergency Response Plan. The Licensee shall not commence Phase 1 activities prior to Board approval. Subsequent revisions shall be in accordance with Part B, condition 10.

Part G: Closure and Reclamation

1. A minimum of 90 days prior to the commencement of Phase 1 activities, the Licensee shall submit to the Board, for approval, a **Closure and Reclamation Plan**. The Plan shall be in accordance with the requirements of Schedule 5, condition 1.
2. A minimum of 90 days prior to the commencement of Phase 2 activities, or as directed by the Board, the Licensee shall submit to the Board, for approval, a revised Closure and Reclamation Plan. The Plan shall be in accordance with the requirements of Schedule 5, condition 1.
3. Three years prior to the expiration of this Licence, or a minimum of two years prior to the end of operations, whichever occurs first, the Licensee shall submit to the Board, for approval, a final Closure and Reclamation Plan to fulfill Report of Environmental Assessment Suggestion 14-1. The Plan shall be in accordance with the requirements of Schedule 5, condition 1.
4. One year prior to Closure and Reclamation of any specific component of the Project, and until a final Closure and Reclamation Plan is approved, the Licensee shall submit to the Board, for approval, a component-specific Closure and Reclamation Plan. The Plan shall be in accordance with Schedule 5, condition 2. The Licensee shall not commence activities described in the Plan prior to Board approval.
5. The Licensee shall endeavor to carry out Progressive Reclamation as soon as is reasonably practicable.
6. The Licensee shall conduct Progressive Reclamation in accordance with the most-recently approved Closure and Reclamation Plan, or as otherwise approved by the Board.
7. A minimum of ten days prior to the commencement of any Progressive Reclamation, the Licensee shall provide written notification to the Board and an Inspector. Notification shall include the name and contact information for the Construction Field Supervisor.
8. 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 Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development Canada's *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*.
9. Within 90 days 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 Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development Canada's *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*.

Schedule 1
Attached to Water Licence MV2019L8-0002
Canadian Zinc Corporation – All Season Road

Part B: General Conditions

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 how Traditional Knowledge influenced decision making;
 - f) A summary of Construction activities conducted in accordance with Part D of this Licence;
 - g) A summary of repairs and maintenance activities conducted in accordance with this Licence;
 - h) A summary of activities conducted in accordance with the approved Waste Management Plan, required 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 Waste;
 - ii. Monthly and annual quantities, in cubic metres, of all solid Waste discharged, identified by location;
 - iii. Monthly and annual quantities, in cubic metres, of all liquid Waste discharged, identified by location;
 - iv. Monthly and annual quantities, in cubic metres, of hazardous Waste generated and removed;
 - v. Monthly and annual quantities, in cubic metres, of Sewage solids removed from the [enter facility name], identified by disposal location;
 - vi. Monthly elevations in metres of the [enter facility name]; and
 - vii. A map depicting the location of the sumps;
 - i) A summary of activities conducted in accordance with the approved Sediment and Erosion Control Plan, required in Part E, condition 6 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 (provide a map and photos);
 - iii. A summary of activities undertaken to prevent or mitigate erosion;
 - iv. A report of the performance of mitigations applied;
 - 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.
 - j) A summary of activities conducted in accordance with the approved Permafrost Management and Monitoring Plan, required in Part E, condition 8 of this Licence, including:
 - i. A summary and interpretation of any monitoring results, including any Action Level exceedances; and
 - ii. A list of any Action Level exceedances and a description of actions taken in response to any Action Level exceedances.
 - k) A summary of activities conducted in accordance with the approved Geochemical Verification Program, required in Part E, condition 10, including:
 - i. A summary of approved updates or changes to the processes for characterizing and managing Acid Rock Drainage and Metal Leaching material;
 - ii. A comparison of the annual quantities of each type of Waste Rock generated to the quantities predicted in the approved Geochemical Verification Program;

- iii. A summary and interpretation of results from the geochemical monitoring performed under the approved Geochemical Verification Program;
 - iv. A summary and interpretation of results from seepage monitoring performed under the approved Geochemical Verification Program, 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.
 - v. A summary and interpretation of Water quality monitoring results for each of the main source areas and how these compare to predicted values;
 - vi. A summary of any exceedances of the Action Levels described in the Geochemical Verification Program; and
 - vii. A description of actions taken in response to any Action Level exceedances under the Geochemical Verification Program.
- l) A summary of activities conducted in accordance with the approved Borrow Pit Management Plan, required in Part E, condition 12, including:
- i. A summary of borrow sources approved through the Borrow Pit Management Plan;
 - ii. A summary and interpretation of any monitoring results including any Action Level exceedances; and
 - iii. A list of any Action Level exceedances and a description of actions taken in response to any Action Level exceedances.
- m) A summary of activities conducted in accordance with the approved Water Monitoring Plan, required in Part E, condition 14 of this Licence, including:
- i. A summary of approved updates or changes to the processes for monitoring Water;
 - ii. A summary and interpretation of any monitoring results; and
 - iii. A list of any Action Level exceedances and a description of actions taken in response to any Action Level exceedances.
- n) A summary of activities conducted in accordance with the approved Explosives Management Plan, required in Part E, condition 16 of this Licence, including:
- i. A summary and interpretation of any monitoring results including any Action Level exceedances; and
 - ii. A list of any Action Level exceedances and a description of actions taken in response to any Action Level exceedances.
- o) A summary of activities conducted in accordance with the approved Spill Contingency Plan, required in Part F, 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 F, condition 4 of this Licence; and
 - ii. A summary of any spill training carried out.
- p) A summary of any Closure and Reclamation work completed. The Report shall be in accordance with the Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development Canada's *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*.
- q) Tabular summaries of all data and information generated under the Surveillance Network Program annexed to this Licence and graphical summaries of parameters with Effluent Quality Criteria referred to in Part E, condition 25, at the points of compliance (SNP Stations 2019-03), in Microsoft Excel™ format.
- r) A list of any non-compliance(s) with the conditions of this Licence or any direction 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 the deposit of Waste made during the Environmental Assessment, with descriptions of how each commitment is being or has been met; and

- u) Any other details requested by the Board by [enter date] of the year being reported.

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Schedule 2
Attached to Water Licence MV2019L8-0002
Canadian Zinc Corporation – All Season Road

Part C: Reclamation Security Requirements

1. Pursuant to section 72.11 of the *Mackenzie Valley Resource Management Act* and section 12 of the *Mackenzie Valley Federal Areas Water Regulations*, the Licensee shall post a security deposit referred to in Part C, condition 1 of this Licence, totaling \$XXXX, based on the schedule set out below:
 - a) Prior to commencement of Phase 1 activities, the Licensee shall post and maintain a security deposit of \$XXXX; and
 - b) Prior to commencement of Phase 2 activities, the Licensee shall post and maintain an additional security deposit of \$XXXX, to maintain a total security deposit in the amount \$XXXXX.

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Schedule 3
Attached to Water Licence MV2019L8-0002
Canadian Zinc Corporation – All Season Road

Part D: Construction

1. The **Structure Description and Construction Plan** referred to in Part D, condition 9, 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;
 - iv. Design specifications and performance parameters; and
 - v. Design analysis and results.
 - 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;
 - iv. A description of any mitigation measures that will be undertaken to minimize the potential impacts identified above;
 - v. A description of the Construction monitoring program to demonstrate conformance with design specifications; and
 - vi. A description of the operational monitoring program to demonstrate conformance with the design performance.
 - c) 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.
2. The **Design and Construction Plan** referred to in Part D, condition 10, 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; and
 - v. Stability analyses.

- 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;
 - iv. A description of any mitigation measures that will be undertaken to minimize the potential impacts identified above;
 - v. A description of the Construction monitoring program to demonstrate conformance with design specifications; and
 - vi. A description of the operational monitoring program to demonstrate conformance with the design performance.
- c) 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.
- d) 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.

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Schedule 4
Attached to Water Licence MV2019L8-0002
Canadian Zinc Corporation – All Season Road

Part E: Waste and Water Management

1. The **Sediment and Erosion Control Plan**² referred to in Part E, condition 6, shall include, but not be limited to the following for the activities associated with each phase:
 - a) Inspections on land, including but not limited to:
 - i. Short- and long-term inspection methods, locations (provide a map), and parameters;
 - ii. Inspection form(s) that denote the items/parameters that will be assessed during inspection;
 - iii. Inspection frequency including any criteria that will be used to modify this frequency or discontinue;
 - iv. Quality assurance and quality control; and
 - v. A mechanism for reporting the findings of inspections.
 - b) Monitoring on land, including but not limited to:
 - i. Short- and long-term monitoring (survey, sampling, testing) methods;
 - ii. Monitoring locations and collection methodology including supporting rationale and parameters;
 - iii. Monitoring duration and frequency including any criteria that will be used to modify this frequency or discontinue monitoring;
 - iv. Quality assurance and quality control;
 - v. A mechanism for reporting and interpretation of the monitoring data;
 - vi. Proposed control and mitigation measures, including specific measures that will be used in riparian areas; and
 - vii. A description of an adaptive management framework that satisfies the requirements of Report of Environmental Assessment Appendix B, including but not limited to:
 - a. a decision tree which outlines the path of adaptive management decisions based on results of both the short- and long-term monitoring program.
 - c) Details specific to the hoverbarge, including but not limited to:
 - i. Details outlining sedimentation and erosion management during construction of the hoverbarge;
 - ii. Operational details of the hoverbarge, including sedimentation and erosion management following construction;
 - iii. Hoverbarge associated inspections and monitoring;
 - iv. Proposed sedimentation and erosion control and mitigation measures associated with hoverbarge operations; and
 - v. A description of an adaptive management framework that satisfies the requirements of Report of Environmental Assessment Appendix B, including but not limited to:
 - a. a decision tree which outlines the path of adaptive management decisions based on results of both the short- and long-term monitoring program.
 - d) [insert schedule items].
2. The **Permafrost Management and Monitoring Plan** referred to in Part E, condition 8, shall include, but not be limited to the following for the activities associated with each phase:
 - a) Fulfills Report of Environmental Assessment Measure 12-1 Part 4;
 - b) Identification of monitoring (survey, sampling, testing) methods, locations (provide a map), site selection and parameters for permafrost baseline collection and short/long term monitoring;

² Note: all water quality monitoring related to sediment and erosion will be captured and referred to in Schedule 5.
MV2019L8-0002 – Canadian Zinc Corporation – All- Season Road
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- c) A summary of findings from baseline collection and how it will be used to inform detailed and final design of the Winter Road, All Season Road, Borrow Pits, and other infrastructure in a way that anticipates and avoids permafrost degradation and associated impacts on the surrounding environment;
 - d) Monitoring duration and frequency including any criteria that will be used to modify this frequency or discontinue monitoring;
 - e) Quality assurance and quality control measures;
 - f) A mechanism for reporting and interpreting the baseline, short- and long-term monitoring data;
 - g) Proposed control and mitigation measures;
 - h) A description of an adaptive management framework that satisfies the requirements of Report of Environmental Assessment Appendix B, including but not limited to:
 - i. A decision tree which outlines the path of adaptive management decisions based on results of both the short- and long-term monitoring program.
 - i) [insert schedule items].
3. The **Geochemical Verification Program**³ referred to in Part E, condition 10, shall include, but not be limited to the following for the activities associated with each phase:
- a) Identification of monitoring (survey, sampling, testing) methods for geochemical characterization studies (Acid Rock Drainage/Metal Leaching potential) of bedrock, Borrow sources, and overburden, with supporting rationale and parameters;
 - b) A summary of findings from geochemical characterization studies (Acid Rock Drainage/Metal Leaching potential) on the bedrock, borrow sources, and overburden;
 - c) Monitoring locations (provide a map) for follow-up verification testing, with supporting rationale;
 - d) Monitoring duration and frequency including any criteria that will be used to modify this frequency or discontinue monitoring;
 - e) Criteria for defining PAG, non-PAG and Metal Leaching materials with supporting rationale;
 - f) Criteria for defining high, moderate, and low risk Waste Rock, with supporting rationale;
 - g) A mechanism for reporting results and interpretation of the data;
 - h) Quality assurance and quality control measures;
 - i) A contingency plan in the event of increasing trends in metal leaching or acid generation potential; and
 - j) A description of an adaptive management framework that satisfies the requirements of Report of Environmental Assessment Appendix B including but not limited to:
 - i. A decision tree which outlines the path of adaptive management decisions based on results of both the short- and long-term monitoring program.
 - k) [insert schedule items].
4. The **Borrow Pit Management Plan** referred to in Part E, condition 12, shall include, but not be limited to the following for the activities associated with each phase:
- a) Details regarding the design of each Borrow Pit, including but not limited to:
 - i. Physical characteristics;
 - ii. Hydrogeological considerations (maintaining natural drainage); and
 - iii. Intended purpose of each Borrow Pit (long-term versus construction only).
 - b) Rationalization for all proposed Borrow Pits, including a consideration of permafrost conditions at each Borrow Pit;
 - c) A description of efforts to reduce the number of Borrow sources;
 - d) Reference to the results of the Geochemical Verification Program for each Borrow Pit, including an incorporation of any necessary mitigations;
 - e) Erosion and sedimentation control details for each Borrow Pit; and

³ Note: all geochemical water quality monitoring will be captured and referred to in Schedule 5.

- f) A schedule, including proposed sequence and timing of Borrow development.
 - g) [insert schedule items].
5. The **Water Monitoring Plan** referred to in Part E, condition 14, shall include, but not be limited to the following for the activities associated with each phase:
- a) Baseline monitoring that fulfill the Report of Environmental Assessment Measure 8-1, Part 2, including but not limited to:
 - i. Hydrological conditions;
 - ii. Areas with concerns of Acid Road Drainage and Metal Leaching, total suspended sediment and turbidity, and blast residue;
 - iii. Water quality in watercourses listed in the Surveillance Network Program annexed to this licence; and
 - iv. An assessment of hydrological conditions in the proposed Liard River landing areas and a proposed groundwater monitoring program or rationale supporting exclusion of groundwater monitoring.
 - b)
 - i. Identification of short- and long-term monitoring (survey, sampling, testing) methods;
 - ii. Monitoring locations (provide a map) for follow-up verification testing, with supporting rationale;
 - iii. Monitoring duration and frequency including any criteria that will be used to modify this frequency or discontinue monitoring;
 - iv. Analytical requirements;
 - v. Quality assurance and quality control;
 - vi. A mechanism for reporting results and interpretation of the data; and
 - vii. Proposed control and mitigation measures.
 - c) A description of an adaptive management framework that satisfies the requirements of Report of Environmental Assessment Measure 8-1 Part 5 and Appendix B, including but not limited to:
 - i. A decision tree which outlines the path of adaptive management decisions based on results of both the short and long-term monitoring program.
 - d) Rationale for keeping a certain aspect of water monitoring separate from the Water Monitoring Plan.
 - e) [insert schedule items].
6. The **Explosives Management Plan**, referred to in Part E, condition 16, shall include, but not be limited to the following for the activities associated with each phase:
- a) Mitigation approaches to be deployed in handling, use, and storage of explosives;
 - b) How the Licensee proposes to minimize nitrogen species loading to the environment;
 - c) A description of an adaptive management framework that satisfies the requirements of Report of Environmental Assessment Appendix B, including but not limited to:
 - i. A decision tree which outlines the path of adaptive management decisions based on results of both the short and long-term monitoring program.
 - d) A description of the monitoring required to evaluate whether the mitigation approaches for storage, handling, and blasting procedures are effective, with rationale.

Schedule 5
Attached to Water Licence MV2019L8-0002
Canadian Zinc Corporation – All Season Road

Part G: Closure and Reclamation

1. The **Closure and Reclamation Plan** referred to in Part G, condition 1, shall include, but not be limited to, the following:
 - a) A description of how the Report of Environmental Assessment Suggestion 14-1 is fulfilled;
 - b) A plain language summary of the Plan;
 - c) A description of the overall goals for Closure and Reclamation of the Project, including expected future land use;
 - d) A description of the Closure and Reclamation planning team;
 - e) A description of engagement related to Closure and Reclamation planning, including a summary of completed and planned engagement, and links to the Engagement Plan referred to in Part B, condition 20 for the Project;
 - f) A list of any other regulatory instruments required for Closure and Reclamation of the Project;
 - g) A description of the pre-existing and current Project environment, including, but not limited to:
 - i. Climatic conditions;
 - ii. Physical conditions;
 - iii. Chemical conditions;
 - iv. Biological conditions;
 - v. Physical or chemical assessments of soil, water, and permafrost; and
 - vi. Traditional uses.
 - h) A description of the Project, including, but not limited to:
 - i. Site history;
 - ii. Project development;
 - iii. Current status of the Project;
 - iv. Maps delineating all disturbed areas, Borrow locations, site facilities, hydrological features, and elevation contours; and
 - v. Photographs.
 - i) A description of each Project component, including, but not limited to:
 - i. Stream crossings;
 - ii. Camp and laydown area;
 - iii. Liard River barge crossing and landing areas;
 - iv. Borrow Pits;
 - v. Areas affected by spills or Unauthorized Discharges; and
 - vi. Other areas affected by Project activities.
 - j) For the Project site, a description of Closure and Reclamation plans, including, but not limited to:
 - i. Closure Objectives and Criteria;
 - ii. Preferred Closure and Reclamation option and method for each Project component identified in Part G condition 4 above;
 - iii. Design drawings, signed and stamped by a Professional Engineer, for any Engineered structures;
 - iv. Water management and restoration of natural drainage;
 - v. Predicted environmental effects during and after Closure and Reclamation activities;
 - vi. Post-closure monitoring, maintenance, and reporting;
 - vii. Description of an adaptive management framework that satisfies the requirements of Report of Environmental Assessment Appendix B;
 - viii. Uncertainties and contingencies;
 - ix. Climate change considerations; and

- x. Reclamation Research plans.
 - k) A description of any planned Progressive Reclamation, including, but not limited to:
 - i. Progressive Reclamation goals and objectives;
 - ii. A description of activities (including timing) and methods (including techniques and materials);
 - iii. A description of an adaptive management framework that satisfies the requirements of Report of Environmental Assessment Appendix B;
 - iv. Contingencies; and
 - v. An implementation schedule.
 - l) A plan for Temporary Closure, including, but not limited to the following information:
 - i. Temporary Closure goals and objectives;
 - ii. A description of activities and methods;
 - iii. A description of monitoring, maintenance, and reporting;
 - iv. A description of an adaptive management framework that satisfies the requirements of Report of Environmental Assessment Appendix B;
 - v. Contingencies; and
 - vi. An implementation schedule.
 - m) The plan for post-closure and reclamation monitoring and maintenance, including but not limited to the following information:
 - i. insert schedule items
 - n) An implementation schedule that includes Progressive Reclamation and final Closure and Reclamation activities; and
 - o) A Closure Cost Estimate.
2. The component-specific **Closure and Reclamation Plan** referred to in Part G, condition 4, shall include, but not be limited to the following:
- a) A plain language summary of the Plan;
 - b) A description of the overall goals for closure and Reclamation of the Project, including expected future land use;
 - c) A description of engagement related to Closure and Reclamation planning for the Project component, including a summary of completed and planned engagement, and links to the Engagement Plan referred to in Part B, Condition 20 for the Project;
 - d) A description of the pre-existing and current Project environment as it relates to the Project component, including, but not limited to:
 - i. Climatic conditions;
 - ii. Physical conditions;
 - iii. Chemical conditions;
 - iv. Biological conditions;
 - v. Physical or chemical assessments of soil, water, and permafrost; and
 - vi. Traditional uses.
 - e) A description of the Project, including, but not limited to:
 - i. Site history;
 - ii. Project development; and
 - iii. Current status of the Project.
 - f) A description of the Project component being closed, including, but not limited to:
 - i. Purpose, development, history, and current status;
 - ii. Maps and elevation contours;
 - iii. Photographs;
 - iv. A summary of inspections and any other assessments;
 - v. A summary of monitoring results; and

- vi. A summary of any non-compliance events.
- g) For the Project component being closed, a description of Closure and Reclamation plans, including, but not limited to:
 - vii. Closure Objectives and Criteria;
 - viii. Closure and Reclamation options and selected closure activity;
 - ix. Design drawings, signed and stamped by a Professional Engineer, for any Engineered Structures;
 - x. Water management and restoration of natural drainage;
 - xi. Predicted environmental effects during and after Closure and Reclamation activities;
 - xii. Post-closure monitoring, maintenance, and reporting;
 - xiii. Uncertainties and contingencies;
 - xiv. Climate change considerations;
 - xv. Closure and Reclamation Research plans; and
 - xvi. A description of how Closure and Reclamation of the component relates to the Closure and Reclamation Plan for the Project.
- h) An implementation schedule; and
- i) A revised/updated Closure Cost Estimate.

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ANNEX A: SURVEILLANCE NETWORK PROGRAM

Commented [KM10]: Board staff seeking input on SNP.
Pending Water Monitoring Plan.

LICENSEE: Canadian Zinc Corporation

LICENCE NUMBER: MV2019L8-0002

EFFECTIVE DATE OF LICENCE:

EFFECTIVE DATE OF SURVEILLANCE NETWORK PROGRAM (SNP):

Part A – Surveillance Network Program Description and Monitoring Requirements

1) The location of sampling sites and specific monitoring requirements are as follows:

SNP station Quick Reference Table

SNP Station ID	Description	Status
SNP 2019-3	Sewage Disposal Facility Point of Discharge	Active during open water

a) Surveillance Network Program (SNP) 2019-3

Description:	XXX (Sewage Disposal Facility Point of Discharge)
Location:	XXX
Sampling Frequency:	June (spring freshet) and August (summer)
Sampling Parameters	<ul style="list-style-type: none"> Field parameters (pH, electrical conductivity [EC], temperature, dissolved oxygen [DO], carbonaceous biochemical oxygen demand [CBOD], turbidity) Suspended Solids Un-ionized Ammonia (as Nitrogen) pH Total Metals (Metals shall include, but not be limited to, analysis of the following parameters: Aluminum, Arsenic, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Mercury, Molybdenum, Nickel, Selenium, Thallium, Uranium, and Zinc) Fecal coliforms
Rationale	Compliance monitoring site, in accordance with criteria identified in Part G, condition 25 of this Licence. To monitor the quality of effluent Water prior to Discharge from the Sewage Disposal Facility

Part B – Volume and Temperature Measurement Requirements

- 1) All volume and temperature measurements shall be measured and recorded continuously (i.e., using electronic data storage chips or equivalent) during periods of discharges and reported on a monthly basis:
- a) The water temperature at Surveillance Network Program Station Numbers and 2019-3 measurements shall be measured and recorded in degrees Celsius.

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