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March 13, 2020

File: MV2018X0017

Ms. Amanda Pierce
G360 Institute for Groundwater Research
50 Stone Road East
GUELPH ON N1G 2W1

Sent via email

Dear Ms. Pierce:

**Issuance of Type A Land Use Permit – Amendment #1
Groundwater Monitoring – Fort Liard Region, NWT**

Attached is the amended Type A Land Use Permit MV2018X0017 granted by the Mackenzie Valley Land and Water Board (MVLWB or the Board) in accordance with the *Mackenzie Valley Resource Management Act*.

Permit Conditions

Please read all conditions carefully.

Management Plans – Approved

The Board hereby approves the following Plan as summarized in Table 1:

Table 1: Plan that has been approved

| Condition Number | Title of Plan/Program/Report | Date Received |
|------------------|------------------------------|-------------------|
| 47 | Engagement Plan V5 | February 14, 2020 |

Public Registry

A copy of this Permit and all related correspondence and documents has been filed on the [Public Registry](#) at the MVLWB office. Please be advised that this letter, inspection reports, and related correspondence is part of the Public Registry and is intended to keep all interested parties informed of the manner in which the Permit requirements are being met. All Public Registry material will be considered if an amendment to the Permit is requested.

The full cooperation of University of Guelph – G360 Institute for Groundwater Research is anticipated and appreciated. If you have any questions or concerns, please contact Kimberley Murray at (867) 766-7458 or email kmurray@mvlwb.com.

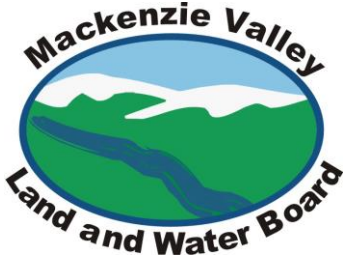
Yours sincerely,

A handwritten signature in blue ink, appearing to read "Mavis Cli-Michaud".

Mavis Cli-Michaud

Copied to: Distribution List
Kyle Christiansen, Resource Management Officer (Inspector)

Attached: Land Use Permit MV2018X0017



Land Use Permit

| | | |
|--------------|-------------|-----------------------|
| Permit Class | Permit No | Amendment No and Date |
| A | MV2018X0017 | #1 – March 13, 2020 |

Subject to the Mackenzie Valley Land Use Regulations and the terms and conditions in this Permit, authority is hereby granted to:

University of Guelph – G360 Institute for
Groundwater Research

Permittee

to proceed with the land use operation described in the Application of:

| | |
|---|-----------------------|
| Signature Ms. Amanda Pierce | Date July 30, 2018 |
| Type of Land Use Operation Miscellaneous | |
| Location Fort Liard area, NT | |

This Permit may be assigned, extended, discontinued, suspended, or cancelled pursuant to the Mackenzie Valley Land Use Regulations.

Dated at Yellowknife this 13 day of March, 2020

Signature Chair

Signature Witness

A handwritten signature in blue ink, appearing to read "Mavis Cli-Michaud".

A handwritten signature in black ink, appearing to read "Amanda Gauthier".

Mavis Cli-Michaud

Amanda Gauthier

Effective Date
December 10, 2018

Expiry Date
December 9, 2023

ATTENTION

It is a condition of this Permit that the Permittee comply with the provisions of the *Mackenzie Valley Resource Management Act* and Regulations and the terms and conditions set out herein. A failure to comply may result in suspension or cancellation of this Permit.

Conditions Annexed to and Forming Part of Land Use Permit # MV2018X0017

Part A: Scope of Permit

1. This Permit entitles the Permittee to conduct the following land-use operation:
 - a) Drilling Boreholes for long-term groundwater monitoring;
 - b) Use of drill equipment and vehicles; and
 - c) Brush clearing and disposal.
2. This Permit is issued subject to the conditions contained herein with respect to the use of land for the activities and area identified in Part A, item 1 of this Permit.
3. Compliance with the terms and conditions of this Permit does not excuse the Permittee from its obligation to comply with the requirements of any applicable Federal, Territorial, Tłıchǫ, or Municipal laws.

Part B: Definitions (defined terms are capitalized throughout the Permit)

Act - the *Mackenzie Valley Resource Management Act*.

Board - the Mackenzie Valley Land and Water Board established under Part 4 of the Act.

Borehole - a hole that is made in the surface of the ground by drilling or boring.

Drilling Fluids - any liquid mixture of water, sediment, drilling muds, chemical additives or other wastes that are pumped down hole while drilling and are specifically related to drilling activity.

Drilling Waste - all materials or chemicals, solid or liquid, associated with drilling, including drill cuttings and Drilling Fluids.

Engagement Plan - a document, developed in accordance with the 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.

Flowing Artesian Well - a well in which water:

- a) Naturally rises above the ground surface or the top of any casing; and
- b) Flows naturally, either intermittently or continuously.

Fuel Storage Container - a container for the storage of petroleum or allied petroleum products with a capacity of less than 230 litres.

Habitat - the area or type of site where a species or an individual of a species of wildlife naturally occurs or on which it depends, directly or indirectly, to carry out its life processes.

Inspector - an Inspector designated by the Minister under the *Act*.

Minister - the Minister of Indian Affairs and Northern Development Canada or the Minister of the Government of the Northwest Territories – Department of Lands, as the case may be.

Ordinary High Water Mark - the usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “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 predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs, this refers to normal high operating levels (full supply level).

Permittee - the holder of this permit.

Secondary Containment - containment that prevents liquids that leak from Fuel Storage Tanks or containers from reaching outside the containment area and includes double-walled Tanks, piping, liners, and impermeable barriers.

Sewage - all toilet wastes and Greywater.

Spill Contingency Plan - a document, developed in accordance with Aboriginal Affairs and Northern Development Canada’s *Guidelines for Spill Contingency Planning* (April 2007), that describes the set of procedures to be implemented to minimize the effects of a spill.

Toxic Material - any substance that enters or may enter the environment in a quantity or concentration or under conditions such that it:

- a) Has or may have an immediate or long-term harmful effect on the environment or its biological diversity;
- b) Constitutes or may constitute a danger to the environment on which life depends; or
- c) Constitutes or may constitute a danger in Canada to human life or health.

Waste - any garbage, debris, chemical, or Toxic Material to be used, stored, disposed of, or handled on land, and also as defined in section 51 of the Act.

Waste Management Plan - a document, developed in accordance with the Board’s *Guidelines for Developing a Waste Management Plan*, that describes the methods of Waste management from Waste generation to final disposal.

Watercourse - a natural body of flowing or standing water or an area occupied by water during part of the year, and includes streams, springs, swamps and gulches but does not include groundwater.

Part C: Conditions Applying to All Activities (headings correspond to subsection 26(1) of the Mackenzie Valley Land Use Regulations)

| Condition | Category |
|--|----------------------------|
| 26(1)(a) Location and Area | |
| 1. The Permittee shall not conduct any part of the land-use operation within 300 metres of any privately owned or leased land or structure, unless otherwise authorized in writing by the Board, or at or adjacent to Reserve 095B03034. | PRIVATE PROPERTY |
| 2. Prior to the commencement of drilling, the Permittee shall submit the drill target locations on a 1:50,000-scale map with coordinates and map datum to the Board and an Inspector. | DRILL LOCATIONS |
| 3. The Permittee shall not conduct this land-use operation on any lands not designated in the complete application. | LOCATION OF ACTIVITIES |
| 4. The Permittee shall not conduct this land-use operation within 100 metres of a known fuel cache at Reserve 095B06006. | DRILLING NEAR A FUEL CACHE |
| 5. Prior to the commencement of the land-use operation, the Permittee shall accompany an Inspector during an inspection of the proposed land use area. | INSPECT LOCATIONS |
| 26(1)(b) Time | |
| 6. At least 48 hours prior to the commencement of the land-use operation, the Permittee's Field Supervisor shall contact an Inspector at (867) 695-2626 Ext. 205. | CONTACT INSPECTOR |
| 7. At least 48 hours prior to the commencement of the land-use operation at Reserve 095B06006, the Permittee's Field Supervisor shall contact the Government of the Northwest Territories -- Department of Environment and Natural Resources -- Regional Duty Officer at (867) 695-7485. | CONTACT GNWT-ENR |
| 8. At least 48 hours prior to the commencement of the land-use operation at Reserve 095B03017, the Permittee's Field Supervisor shall contact the Government of the Northwest Territories -- Department of Infrastructure -- Regional Superintendent at (867) 695-7651. | CONTACT GNWT-INF |
| 9. At least 48 hours prior to the commencement of the land-use operation adjacent to Reserve 095B03034, the Permittee's Field Supervisor shall contact the Government of the Northwest Territories -- Department of Infrastructure-- Highway Operations Manager at (867) 695-7660. | CONTACT GNWT-INF |

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|-----|---|------------------------------------|
| 10. | At least 48 hours prior to the commencement of the land-use operation at Reserve 095B03034, the Permittee's Field Supervisor shall contact NorthwesTel, at (867) 874-2360, (867) 393-7712, or (867) 668-5351. | CONTACT NORTHWESTEL |
| 11. | At least 48 hours prior to commencement of the land-use operation, the Permittee shall provide the following information, in writing, to the Board and an Inspector: a) the name(s) of the person(s) in charge of the field operation; b) alternates; and c) all methods for contacting the above person(s). | IDENTIFY AGENT |
| 12. | At least ten days prior to the completion of the land-use operation, the Permittee shall advise an Inspector of: a) the plan for removal or storage of equipment and materials; and b) when final cleanup and reclamation of the land used will be completed. | REPORTS BEFORE REMOVAL |
| | 26(1)(c) Type and Size of Equipment | |
| 13. | The Permittee shall not use any equipment except of a similar type, size, and number to that listed in the complete application. | ONLY APPROVED EQUIPMENT |
| | 26(1)(d) Methods and Techniques | |
| 14. | Prior to the expiry date of this Permit, the Permittee shall replace all excavated material, unless otherwise authorized in writing by an Inspector. | EXCAVATED MATERIAL |
| | 26(1)(e) Type, Location, Capacity, and Operation of All Facilities | |
| 15. | The Permittee shall ensure that the land use area is kept clean at all times. | CLEAN WORK AREA |
| | 26(1)(f) Control or Prevention of Ponding of Water, Flooding, Erosion, Slides, and Subsidence of Land | |
| 16. | The Permittee shall minimize erosion by installing erosion control structures as the land-use operation progresses. | PROGRESSIVE EROSION CONTROL |
| 17. | The Permittee shall, where flowing water from a Borehole is encountered: a) plug the Borehole in such a manner as to permanently prevent any further outflow of water; and b) immediately report the occurrence to the Board and an Inspector. | FLOWING ARTESIAN WELL |
| 18. | The Permittee shall suspend overland travel of equipment or vehicles at the first sign of rutting. | SUSPEND OVERLAND TRAVEL |

19. The Permittee shall not move any equipment or vehicles unless the ground surface is in a state capable of fully supporting the equipment or vehicles without rutting or gouging. **VEHICLE MOVEMENT FREEZE-UP**

26(1)(g) Use, Storage, Handling, and Ultimate Disposal of Any Chemical or Toxic Material

20. At least seven days prior to the use of any chemicals that were not identified in the complete application, the MSDS sheets must be provided to the Board and an Inspector. **CHEMICALS**

21. When drilling within 100 meters of the Ordinary High Water Mark of any Watercourse the Permittee shall contain all drill water and Drilling Waste in a closed circuit system for reuse or off-site disposal, or deposit into a natural depression. **DRILLING NEAR WATER**

22. The Permittee may deposit Drilling Waste that does not contain Toxic Material in a natural depression. Any natural depressions used to deposit Drilling Waste must be located at least 100 metres from the Ordinary High Water Mark of any Watercourse, unless otherwise authorized in writing by an Inspector. **DRILLING WASTE**

23. The Permittee shall remove all Drilling Waste containing Toxic Material to an approved disposal facility. **DRILLING WASTE DISPOSAL**

24. The Permittee shall not allow any Drilling Waste to spread to the surrounding lands or Watercourses. **DRILLING WASTE CONTAINMENT**

25. The Permittee shall maintain a record of all spills. For all reportable spills, in accordance with the *GNWT Spill Contingency Planning and Reporting Regulations*, the Permittee shall:
- a) immediately report each spill to the 24-hour Spill Report Line (867) 920-8130;
 - b) report each spill to an Inspector within 24 hours; and
 - c) submit, to the Board and an Inspector, a detailed report on each spill within 30 days.
- REPORT SPILLS**

26. The Permittee shall dispose of all combustible Waste petroleum products by removal to an approved disposal facility. **WASTE PETROLEUM DISPOSAL**

26(1)(h) Wildlife and Fish Habitat

27. The Permittee shall take all reasonable measures to prevent damage to wildlife and fish Habitat during this land-use operation. **HABITAT DAMAGE**

26(1)(i) Storage, Handling, and Disposal of Refuse or Sewage

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|--|---|---|
| 28. | The Permittee shall adhere to the Waste Management Plan , once approved, and shall annually review the plan and make any necessary revisions to reflect changes in operations, technology, chemicals, or fuels, or as directed by the Board. Revisions to the plan shall be submitted to the Board for approval. | WASTE MANAGEMENT |
| 29. | The Permittee shall dispose of all garbage, Waste, and debris as described in the approved Waste Management Plan, unless otherwise authorized in writing by an Inspector. | REMOVE GARBAGE |
| 26(1)(j) Protection of Historical, Archaeological, and Burial Sites | | |
| 30. | The Permittee shall not operate any vehicle or equipment within 150 metres of a known or suspected historical or archaeological site or burial ground. | ARCHAEOLOGICAL BUFFER |
| 31. | The Permittee shall not knowingly remove, disturb, or displace any archaeological specimen or site. | SITE DISTURBANCE |
| 32. | The Permittee shall, where a suspected archaeological or historical site, or burial ground is discovered: | SITE DISCOVERY AND NOTIFICATION |
| | a) Immediately suspend operations on the site; and | |
| | b) notify the Board at (867) 699-0506 or an Inspector at (867) 695-2626 Ext. 205, and the Prince of Wales Northern Heritage Centre at (867) 767-9347 ext. 71250 or ext. 71251. | |
| 26(1)(k) Objects and Places of Recreational, Scenic, and Ecological Value | | |
| <i>Intentionally left blank</i> | | |
| 26(1)(l) Security Deposit | | |
| 33. | All costs to remediate the area under this Permit are the responsibility of the Permittee. | RESPONSIBILITY FOR REMEDIATION COSTS |
| 26(1)(m) Fuel Storage | | |
| 34. | The Permittee shall not place any Fuel Storage Containers or Tanks within 100 metres of the Ordinary High Water Mark of any Watercourse, unless otherwise authorized in writing by an Inspector. | FUEL NEAR WATER |
| 35. | The Permittee shall set up all refueling points with Secondary Containment. | SECONDARY CONTAINMENT – REFUELING |
| 36. | The Permittee shall not allow petroleum products to spread to surrounding lands or Watercourses. | FUEL CONTAINMENT |
| 37. | The Permittee shall adhere to the Spill Contingency Plan , once approved, and shall annually review the plan and make any necessary revisions to reflect | SPILL CONTINGENCY PLAN |

changes in operations, technology, chemicals, or fuels, or as directed by the Board. Revisions to the plan shall be submitted to the Board for approval.

38. Prior to commencement of the land-use operation the Permittee shall ensure that spill-response equipment is in place to respond to any potential spills. **SPILL RESPONSE**

39. All equipment that may be parked for two hours or more, shall have a haz-mat/drip tray under it or be sufficiently diapered. Leaky equipment shall be repaired immediately. **DRIP TRAYS**

40. The Permittee shall clean up all leaks, spills, and contaminated material. **CLEAN UP SPILLS**

26(1)(n) Methods and Techniques for Debris and Brush Disposal

41. Prior to the expiry date of this Permit, the Permittee shall progressively dispose of all brush and trees and shall complete all brush disposal; all disposal shall be completed. **BRUSH DISPOSAL/ TIME**

42. The Permittee shall not clear areas larger than identified in the complete application. **MINIMIZE AREA CLEARED**

26(1)(o) Restoration of the Lands

43. Prior to the expiry date of this Permit, the Permittee shall complete all cleanup and restoration of the lands used. **FINAL CLEANUP AND RESTORATION**

44. The Permittee shall carry out progressive reclamation of disturbed areas as soon as it is practical to do so. **PROGRESSIVE RECLAMATION**

26(1)(p) Display of Permits and Permit Numbers

45. The Permittee shall keep a copy of this Permit on hand at all times during this land-use operation. **COPY OF PERMIT**

26(1)(q) Biological and Physical Protection of the Land

46. If any plan is not approved by the Board, the Permittee shall revise the plan according to the Board's direction and re-submit it to the Board for approval. **RESUBMIT PLAN**

47. The Permittee shall adhere to the **Engagement Plan**, once approved, and shall annually review the plan and make any necessary revisions to reflect changes in operations or as directed by the Board. Revisions to the plan shall be submitted to the Board for approval. **ENGAGEMENT PLAN**

48. All revised plans submitted to the Board shall include a brief summary of the changes made to the plan. **SUMMARY OF CHANGES**