Newfoundland Labrador

Government of Newfoundland and Labrador
Department of Municipal Affairs and Environment
Water Resources Management Division

PERMIT TO ALTER A BODY OF WATER

Pursuant to the *Water Resources Act*, SNL 2002 cW-4.01, specifically Section(s) 48

Date: **FEBRUARY 28, 2017**

File No: **534-11**
Permit No: **ALT9067-2017**

Permit Holder: **Canada Fluorspar (NL) Inc.**
P.O. Box 337
1 Clarke's Pond Road
St. Lawrence, NL, A0E 2V0

Attention: **Mr. Frank Pitman**

Re: **St. Lawrence Fluorspar Mine- Tailing Management Facility Dams**

Permission is hereby given for : the construction of two earthfill/rockfill dams (AGS East Tailings Impoundment Dam, AGS East Polishing Pond Dam) and associated activities as part of the St. Lawrence Fluorspar Tailings Management Facility as per the "AGS East Tailings Management Facility Design Summary" prepared by Knight Piesold Consulting, as detailed in the application received from Canada Fluorspar (NL) Inc. on January 24, 2017 and supporting documentation received on February 27, 2017.

- This Permit does not release the Permit Holder from the obligation to obtain appropriate approvals from other concerned municipal, provincial and federal agencies.
- The Permit Holder must obtain the approval of the Crown Lands Administration Division if the project is being carried out on Crown Land.
- This Permit is subject to the terms and conditions indicated in Appendices A and B (attached).
- It should be noted that prior to any significant changes in the design or installation of the proposed works, or in event of changes in ownership or management of the project, an amendment to this Permit must be obtained from the Department of Municipal Affairs and Environment under Section 49 of the *Water Resources Act*.
- Failure to comply with the terms and conditions will render this Permit null and void, place the Permit Holder and their agent (s) in violation of the *Water Resources Act* and make the Permit Holder responsible for taking any remedial measures as may be prescribed by this Department.

MINISTER

APPENDIX A

Terms and Conditions for Permit

Dam/Reservoir Design

1. Reservoirs must be provided with a spillway of adequate capacity to safely discharge design flows at non-erosive velocities without causing flooding of the reservoir or damage to the spillway or downstream channel.

2. The dam and appurtenant structures shall be constructed at the following coordinates:

Name	Datum	Northing (m)	Easting (m)	Zone
Polishing Pond Dam	NAD83	5195750	618000	21
Tailings Dam	NAD83	5196250	618000	21

3. The dam(s) must have the following dimensions:

Name	Height/Elev of Dam (m)	Elev of Spillway (m)	Maximum Water Elevation (m)	Minimum Water Elevation (m)	Minimum Freeboard (m)
Polishing Pond Dam	7/101	99.5	100	94	0.9
Tailings Dam	17/111	109	108.7	varies	1.6

4. To safely convey peak flows the dam(s) must be designed according to the following hydraulic criteria:

Name	Design Return Period (years)	Minimum Flow Capacity (m^3/s)
Polishing Pond Dam	2/3 between 1:1000 and PMF	6.42
Tailings Dam	2/3 between 1:1000 and PMF	20.3

General Alterations

5. Any work that must be performed below the high water mark must be carried out during a period of low water levels.

6. Any flowing or standing water must be diverted around work sites so that work is carried out in the dry.

7. Water pumped from excavations or work areas, or any runoff or effluent directed out of work sites, must have silt and turbidity removed by settling ponds, filtration, or other suitable treatment before discharging to a body of water. Effluent discharged into receiving waters must comply with the *Environmental Control Water and Sewage Regulations, 2003*.

8. All operations must be carried out in a manner that prevents damage to land, vegetation, and watercourses, and which prevents pollution of bodies of water.

9. The use of heavy equipment in streams or bodies of water is not permitted. The operation of heavy equipment must be confined to dry stable areas.

10. All vehicles and equipment must be clean and in good repair, free of mud and oil, or other harmful substances that could impair water quality.

11. Any areas adversely affected by this project must be restored to a state that resembles local natural conditions. Further remedial measures to mitigate environmental impacts on water resources can and will be specified, if considered necessary in the opinion of this Department.

12. The bed, banks and floodplains of watercourses, or other vulnerable areas affected by this project, must be adequately protected from erosion by seeding, sodding or placing of rip-rap.

13. All waste materials resulting from this project must be disposed of at a site approved by the Department of Service NL.

14. Periodic maintenance such as painting, resurfacing, clearing of debris, or minor repairs, must be carried out without causing any physical disruption of any watercourse. Care must be taken to prevent spillage of pollutants into the water.

15. The owners of structures are responsible for any environmental damage resulting from dislodgement caused by wind, wave, ice action, or structural failure.

16. Sediment and erosion control measures must be installed before starting work. All control measures must be inspected regularly and any necessary repairs made if damage is discovered.

17. Fill material must be of good quality, free of fines or other substances including metals, organics, or chemicals that may be harmful to the receiving waters.

18. The attached Completion Report (Appendix C) for Permit No. 9067 must be completed and returned to this Department upon completion of the approved works. Pictures must be submitted along with the completion report, showing the project site prior to and after development.

19. This Permit is valid for two years from the date of issue for all construction related work. Construction work must be completed by that date or the application and approval procedure must be repeated. The following terms are valid for the life cycle of the mine dam structures: 22, 37, 38, 39.

20. The location of the work is highlighted on the Location Map for this Permit attached as Appendix D.

21. All work must be carried out within the Permit Holder's legal property boundaries.

Dam Safety

22. The dams have been conditionally classified in the VERY HIGH Consequence category based on the 2007 Canadian Dam Association (CDA) guidelines. To meet the CDA's Dam Safety guidelines (Current Edition) for dams of this classification, the owner must:
    - Carry out an annual Dam Safety Inspection and provide the results to this Department,
    - Carry out a Dam Safety Review and submit a Dam Safety Report to this Department within two years of the start commissioning of the Polishing Pond Dam and Tailings Dam, and a maximum of every **five years** after that,
    - Develop within one year of the issuance of this permit, and in consultation with this Department, an Operation, Maintenance and Surveillance (OMS) Manual for the operation and closure phases,
    - Prepare an Emergency Preparedness and Response Plan (EPRP) prior to reservoir filling.

Dam Construction

23. Foundation preparation will be carried out to ensure a stable and competent foundation is present under each embankment. Prepared foundations will be inspected by a qualified geotechnical engineer prior to fill placement to verify conditions are acceptable. Exposed foundation soils will be compacted using a large vibratory roller compactor. Prepared foundations should be covered with fill as soon as possible to protect foundations once verified acceptable.

24. Fill material must be obtained from an approved quarry site. It must not be taken from beaches or streams, and must not be dredged from a body of water.

25. Reservoir shorelines with moderately steep slopes or vulnerability to wave induced erosion, must be adequately protected

with armour stone, rip-rap, or by other suitable measures.

26. An HDPE geomembrane liner shall be installed overlaying a non-woven geotextile layer that is placed on a 0.5 m bedding layer along the upstream face of the tailings pond and polishing pond dam embankments. The geomembrane will be anchored in a trench at the dam crest and tied into the foundation under 1.5 m of screened till at the toe to form a hydraulic barrier.

27. The finished downstream side of the Tailings Dam shall have a slope of 2 horizontal to 1 vertical. The finished upstream side of the dam shall have a slope of 2 horizontal to 1 vertical.

28. The finished downstream side of the Polishing Pond Dam shall have a slope of 2 horizontal to 1 vertical. The finished upstream side of the dam shall have a slope of 2 horizontal to 1 vertical.

29. The spillways shall be constructed with a geomembrane over geotextile lined inlet and a protective rip-rap barrier lining the outlet channel to prevent erosion of the structure when overtopping occurs. The Tailings Dam spillway outlet channel shall be lined with rip-rap of D50= 300 mm. The Polishing Pond Dam spillway outlet channel shall be lined with rip-rap of D50= 500 mm.

30. The liner on the upstream side of the dams shall be separated from the rockfill used for core dam construction by a 1 m transition zone of material.

31. The area to be flooded by the reservoir must be prepared by removing timber, brush, and slash up to the maximum water elevation. Organics and unsuitable soils will be removed from the embankment footprint as part of foundation preparation.

32. The transportation of labour and materials to the site must be along existing access roads.

33. The dam and spillway must be inspected regularly to identify any indications of structural failure, leaking, erosion or other problem so that immediate action can be taken to rectify the problem.

34. A toe drain shall be installed behind the liner tie-in of both dams. Foundation drains will be connected to the toe drains and constructed transecting the dam embankments to discharge at the original ground surface at the downstream toe to ensure that any seepage is collected and directed away from the structure. Toe and foundation drains shall be constructed in 1m x 1m trenches into the foundation soils, filled with gravel and lined with non-woven geotextile. Toe and foundation drains will consist of corrugated polyethylene tube surrounded by drain gravel.

Special Conditions

35. The dam and associated works shall be designed according to the Canadian Dam Association Dam Safety Guidelines and associated Bulletins (most recent edition).

36. The dam and associated works must be designed and constructed under the direct supervision of an engineer eligible for membership with the Professional Engineers and Geoscientists of Newfoundland and Labrador who is able to demonstrate competence in the design, construction, and surveillance of dams.

37. The tailings dam and management area (TMA) must meet the requirements of the Environmental Protection Plan (latest version) and mine Rehabilitation and Closure Plan for the project.

38. The Permit Holder is required to adhere to the Memorandum of Agreement as set forth by the Department of Municipal Affairs and Environment. This agreement relates to the operation of hydrometric and water quality stations in the vicinity of the mine site. The following monitoring stations must remain active for the life of the project through the renewal of the Memorandum of Agreement with the Department of Municipal Affairs and Environment: Outflow Grebes Nest Pond (02ZG006) and Outflow of Unnamed Pond south of Long Pond (02ZG007). The Department may require the setup of additional monitoring stations in the Memorandum of Agreement as per provisions of Section 31 of the Water Resources Act, SNL2002 Chapter W-4.01.

39. The following instrumentation shall be included for long term monitoring of the Polishing Pond Dam: 3 piezometers installed along the toe drain and 2 survey monuments. The following instrumentation shall be included for long term monitoring of the Tailings Dam: 10 piezometers installed along the toe drain and 3 survey monuments.

40. An experienced geosynthetics installer will install the geomembrane liner and non-woven geotextile associated with this project. Installation will be carried out in accordance with the International Association of Geosynthetics Installers and Geosynthetics Research Institute industry standards.

41. Armour stone or rip-rap material must be of good quality, free of fines or other substances including metals, organics, or chemicals that may be harmful to the receiving waters.

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Municipal Affairs and Environment

File No: **534-11**
Permit No: **ALT9067-2017**

APPENDIX B

Special Terms and Conditions for Permit

1. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall keep all systems and works in good condition and repair and in accordance with all laws, by-laws, directions, rules and regulations of any governmental authority. The Permit Holder or its agent(s), subcontractor(s), or consultant(s) shall immediately notify the Minister if any problem arises which may threaten the structural stability of the systems and works, endanger public safety and/or the environment or adversely affect others and/or any body of water either in or outside the said Project areas. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall be responsible for all damages suffered by the Minister and Government resulting from any defect in the systems and works, operational deficiencies/inadequacies, or structural failure.

2. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall operate the said Project and its systems and works in a manner which does not cause any water related and/or environmental problems, including but not limited to problems of erosion, deposition, flooding, and deterioration of water quality and groundwater depletion, in or outside the said Project areas. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall be responsible for any and all damages associated with these problems caused as a result of changes, deficiencies, and inadequacies in the operational procedures by the Permit Holder or its agent(s), subcontractor(s), or consultant(s).

3. If the Permit Holder or its agent(s), subcontractor(s), or consultant(s) fails to perform, fulfil, or observe any of the terms and conditions, or provisions of this Permit and/or Ministerial orders and guidelines, as determined by this Department, the Minister may, after providing ten (10) day notice to the Permit Holder, amend, modify, suspend or cancel this Permit in accordance with the *Water Resources Act*.

4. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) indemnify and hold the Minister and Government harmless against any and all liabilities, losses, claims, demands, damages or expenses including legal expenses of any nature whatsoever whether arising in tort, contract, statute, trust or otherwise resulting directly or indirectly from granting this Permit, systems and works in or outside the said Project areas, or any act or omission of the Permit Holder or its agent(s), subcontractor (s), or consultant(s) in or outside the said Project areas, or arising out of a breach or non-performance of any of the terms and conditions, or provisions of this Permit by the Permit Holder or its agent(s), subcontractor(s), or consultant(s).

5. This Permit is subject to all provisions of the *Water Resources Act* and any regulations in effect either at the date of this Permit or hereafter made pursuant thereto or any other relevant legislation enacted by the Province of Newfoundland and Labrador in the future.

6. This Permit shall be construed and interpreted in accordance with the laws of the Province of Newfoundland and Labrador.

cc: File Copy for Binder

cc: Ms. Paula Dawe, P.Eng.
Manager, Drinking Water and Wastewater Section
Water Resources Management Division
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cc: Mr. Alex McIntyre, P.Eng.
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cc: Mr. Alex Smith, P. Eng.
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Government of Newfoundland and Labrador
Department of Municipal Affairs and Environment
Water Resources Management Division

Appendix C - Completion Report

Pursuant to the *Water Resources Act*, SNL 2002 cW-4.01, specifically Section(s) 48

Date: **FEBRUARY 28, 2017**

File No: **534-11**
Permit No: **ALT9067-2017**

Permit Holder: **Canada Fluorspar (NL) Inc.**
P.O. Box 337
1 Clarke's Pond Road
St. Lawrence, NL, A0E 2V0

Attention: **Mr. Frank Pitman**

Re: **St. Lawrence Fluorspar Mine- Tailing Management Facility Dams**

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I (the Permit Holder named above or agent authorized to represent the Permit Holder) do hereby certify that the project described above was completed in accordance with the plans and specifications submitted to the Department of Municipal Affairs and Environment and that the work was carried out in strict compliance with the terms and conditions of the Permit issued for this project.

Date: _____ Signature: _____

This completion report must be completed and forwarded to the following address upon completion of the approved work.

Department of Municipal Affairs and Environment
Water Resources Management Division
PO Box 8700
St. John's NL A1B 4J6

APPENDIX D

Location Map for Permit