



Permit Number: **Q-9-050**

Mine Number: **1641424**

Permittee: **British Columbia Hydro and Power
Authority
1111 West Georgia Street, 9th Floor
Vancouver BC V6E4G2**

Name of Property: **Portage Mountain Quarry**

Map Reference: **Lat: 55.9750000 Long: -122.1150000**

Date of Issuance: May 12, 2017

Approval End Date: Dec 31 2023

Date of Amendment: Apr 23 2021

A handwritten signature in blue ink, appearing to read "Todd Wikjord", written over a horizontal line.

Todd Wikjord P. Geo
Sr Inspector of Mines – Permitting

PREAMBLE

A Notice of Work application for the **Portage Mountain Quarry - Site C Quarry - Construction Aggregate** project was filed with the Chief Permitting Officer, submitted on **Feb 12 2021** and last updated on **Apr 23 2021**. The application included a plan of the proposed work system (“Mine Plan”) and a program for the protection and reclamation of the surface of the land and watercourses (“Reclamation Program”), affected by the Notice of Work.

The *Mines Act*, the **Health, Safety and Reclamation Code for Mines in British Columbia** (“Code” or “HSRC”), and this *Mines Act Permit* contain the requirements of the Chief Permitting Officer for the execution of the Mine Plan and Reclamation Program, including the deposit of reclamation securities. Nothing in this permit limits the authority of other government agencies to set additional requirements or to act independently under their respective authorizations and legislation.

THE MINE PLAN AND RECLAMATION PROGRAM

The Chief Permitting Officer considered the following Mine Plan and Reclamation Program(s) for the stated period(s):

1. **Notice of Work Mine Plan and Reclamation Program**
 - 1.1. Notice of Work **1641424-2021-01** tracking number **100339110** submitted **Feb 12 2021** and last updated on **Apr 23 2021**
 - 1.2. 1 SITE C CLEAN ENERGY PROJECT PORTAGE MOUNTAIN QUARRY – MINING AND OPERATIONS PLAN, dated Feb 04 2021, prepared by Duz Cho Construction LP
 - 1.3. Portage Mountain Quarry Reclamation and Closure Plan, dated Jan 31 2021, prepared by BC Hydro
 - 1.4. PORTAGE MOUNTAIN QUARRY – MINING AND OPERATIONS PLAN, dated Feb 04 2021, prepared by Duz Cho Construction Ltd.

PERMIT CONDITIONS

The Chief Permitting Officer hereby issues this permit subject to the following conditions that the permittee must comply with:

A. General

1. Approval - This permit authorizes only the following mining activities as outlined in the Mine Plan and Reclamation Program. Mining activities conducted that are not listed below are considered to be undertaken without a permit as required by Mines Act 10(1):
 - a. Approved Activities:
 - i. Mining Areas, Stockpiles, Laydown, Processing, Camps and Buildings: 40.0 ha
 - b. This permit approval is valid until December 31, 2023.
2. Definitions
 - a. Unless otherwise specified, the definitions in the Mines Act, the regulations and the Code apply to the use of the terms in this permit.
3. Documentation and Reporting
 - a. This Permit and the associated approved Mine Plan and Reclamation Program must be kept at the mine and must be available to an Inspector upon request.
 - b. A completed Annual Summary of Work and Reclamation form must be submitted to mmd-PrinceGeorge@gov.bc.ca prior to March 31 annually and must be accompanied by:
 - i. A detailed as-built map of the mine site.
 - ii. Shapefiles of the as built disturbances which include attribution data for the status of reclamation.
 - c. Seven days prior to commencement of crushing, screening, or washing operations, written notification must be provided to the regional Inspector. The notification must include the start date and the anticipated end date of the operation and be submitted to mmd-PrinceGeorge@gov.bc.ca.
4. Reports to be signed by a Qualified Professional:
 - a. Unless otherwise approved in writing by the Chief Permitting Officer, all reports required to be submitted under this permit must be signed by a Qualified Professional.

B. Health and Safety

1. Mine Emergency Response Plan (MERP)
 - a. The MERP required under 3.7.1 of the Code must be maintained on the mine site and made available to an inspector upon request.
2. Fuels and Lubricant Handling, Transportation and Storage

- a. Handling, transportation and storage of fuels and lubricants must conform to the requirements of the document: BC Fuel Guidelines, 9th Edition, March 2020 (NorthWest Response Ltd), or most recent version thereof.

3. Blasting

- a. Blast patterns must be designed by a qualified person.
- b. Controlled blasting methods (e.g. trim and buffer, pre/post shear) must be implemented to minimize damage to the crest and bench face of all final walls and on any interim walls that will be in place for a period exceeding 12 months.
- c. Controlled blasting may be omitted where a Professional Engineer assesses conditions and states in writing that worker safety will not be adversely endangered by the proposed excavation.
- d. A signed copy of the Blast Log for each blast must be maintained at on the mine site. Such records must be made available to the Inspector on request.

C. Geotechnical

1. Reporting

- a. The Chief Inspector must be advised in writing at the earliest opportunity of any unforeseen conditions that could adversely affect the extraction of materials, site stability, erosion control or the reclamation of the site;
- b. An Advice of Geotechnical Incident form must be submitted to the Chief Inspector for any geotechnical incident that:
 - i. Is classified as a dangerous occurrence,
 - ii. Requires changes to an existing standard operating procedure or the creation of a site-specific safe work plan,
 - iii. Is considered a multi-bench pit slope failure,
 - iv. Is considered a spoil failure resulting in full loss of the crest berm, or

2. Site Stability

- a. Stockpiles of waste, overburden or soil must not be placed in areas identified as Terrain Class IV or V.
- b. Final pit walls must be scaled during pit development to limit the potential for rock fall.

3. Design

- a. Berms must be constructed at the toe of all waste dumps where rock rollout could present a safety hazard.
- b. All access roads, drill sites, equipment laydowns, trenches, and locations where cuts and/or fills exceed 6.0 meters on terrain Class IV or V must be constructed maintained and operated per the written recommendations of a qualified professional. The signed and sealed design reports must be maintained on site and made available an inspector upon request.

4. Monitoring

- a. Geological, geotechnical, and hydrological conditions encountered during quarry operations and development shall be assessed to detect early signs of instability and to confirm design basis information and assumptions. The frequency of assessment shall be annually or as determined by a qualified professional engineer.

D. Environmental Land and Watercourses

1. Environmental Protection

- a. Garbage and other attractants must be removed from work sites daily and must either be incinerated or stored in an airtight container until removed from the mine site.
- b. Water intakes must comply with the Freshwater Intake End-of-Pipe Fish Screen Guideline, 1995 (Department of Fisheries and Oceans), or most recent version thereof.
- c. No excavation is to be made within 1.5 meters of the groundwater table.
- d. Settling ponds must be maintained regularly, with maintenance to include [xxx activities].
- e. A schedule and procedure for sediment removal from settling ponds must be implemented to ensure adequate settling of suspended solids. The information must be maintained on site and be available to an Inspector upon request.
- f. Sediment removed from settling ponds must be contained and stockpiled for reclamation.
- g. Dust originating from the mine site must be controlled at the source.

2. Invasive Species

- a. Invasive plants on the site must be identified, monitored, controlled and documented. Monitoring and treatment records must be made available to an Inspector upon request.
- b. Reasonable efforts must be taken to ensure that weeds do not migrate from the site to adjacent areas.
- c. The control of invasive plants must consider using non-toxic means for weed control.

3. Receiving Foreign Materials

- a. The receipt, storage, treatment/processing and or use of imported materials including but not limited to garbage, refuse, concrete, asphalt, asphalt shingles, biosolids and soils originating from off site is not permitted unless authorized in writing by an Inspector.

4. Metal Leaching / Acid Rock Drainage

- a. General
 - i. All materials with the potential to generate ML/ARD must be placed in a manner that minimizes the production and release of metals and contaminants to levels that assure protection of environmental quality.

- ii. Unless otherwise approved, all plans for the prediction, and if necessary, the prevention, mitigation and management of metal leaching and acid rock drainage must be prepared in accordance with the Guidelines for Metal Leaching and Acid Rock Drainage at Minesites in British Columbia (1998).

b. ML/ARD Operational Monitoring

- i. A ML/ARD Operational Monitoring Plan must be implemented on the mine site and made available to an inspector upon request.
- ii. Concurrent with excavation, the Permittee must implement a monitoring program to confirm the geochemical characteristics of excavated materials produced and mine surfaces exposed, to determine the potential for ML/ARD and the need for mitigation measures to ensure protection of environmental quality.
 - 1. At a minimum, the monitoring program must include the characterization of excavated materials at frequency of one sample for every 7,500 tonnes. Each sample must be submitted to an accredited lab and analyzed for sufficient parameters to determine the AP, NP, and total dissolved metals.
- iii. A report, authored by a qualified professional, summarizing the results of the operational monitoring must be submitted to mmd-PrinceGeorge@gov.bc.ca prior to March 31 annually. The report must include a description of the geology encountered, interpretation of all ML/ARD monitoring results, a description of any mitigation strategies undertaken during the program, and an assessment of whether additional mitigation is required.

5. Erosion and Sediment Control

- a. Erosion and sediment must be effectively controlled on the mine site. Sediment laden water must be suitably contained on the mine site and not be allowed access to any watercourse.
- b. Water which flows from disturbed areas must be collected and diverted into settling ponds, unless water is effectively exfiltrating.
- c. Inspections must be conducted at stream crossings, contact and non-contact water management structures, snow dumps, and the tailings rock storage facility during rain events and the snowmelt period on the mine site. Where excessive sediment laden runoff is observed, remedial action must be immediately implemented.
- d. Any significant releases of sediment-laden water, defined as an unauthorized discharge to the receiving environment, must be appropriately characterized with respect to extent and loading, and reported to the Chief Inspector at mmd-PrinceGeorge@gov.bc.ca within 21 days of discovery.
 - i. Characterization of unauthorized discharges of sediment-laden run-off must include, at a minimum, flow, total suspended solids, turbidity, pH, conductivity, temperature, dissolved oxygen, and total and dissolved metals, of both the effluent and the receiving water.

6. Condition of the Land

- a. When the site is not active, disturbed areas are to be left in a condition that is neat, clean and safe.

E. Reclamation and Closure Program

1. Reclamation Security

- a. Reclamation liability shall remain the responsibility of British Columbia Hydro and Power Authority during and to the end of life of mine. Reclamation security for this permit is not required.

2. Obligation to Reclaim

- a. Reclamation of the surface of the land affected by the operations must be conducted in accordance with the approved work program. The surface of the land and watercourses must be reclaimed to the following end land use: Wildlife

3. Reclamation

- a. All available topsoil, overburden, and organic material including large woody debris in the disturbance footprint must be salvaged and stockpiled for use in reclamation.
- b. All stockpiled topsoil, overburden, and organic material including large woody debris must:
 - i. be protected from erosion, degradation, and contamination.
 - ii. be clearly marked to ensure that they are protected during construction and mine operations.
 - iii. not be used as fill.
 - iv. not be removed from the mine site unless authorized in writing by an Inspector.
- c. Progressive reclamation must be conducted and must include:
 - i. Compacted surfaces must be de-compacted to allow water infiltration and achieve self-staining vegetation.
 - ii. Salvaged soil material must:
 1. be replaced on disturbed areas to pre-disturbance depth;
 2. be treated with a rough and loose site preparation where practicable;
 3. be keyed into the underlying materials such that they do not slump off or become unstable;
 4. incorporate roots, stumps and other woody debris to reduce erosion and create greater biological diversity; and
 5. be re-vegetated promptly to a self-sustaining state using appropriate and/or native plant species that support approved end land use.

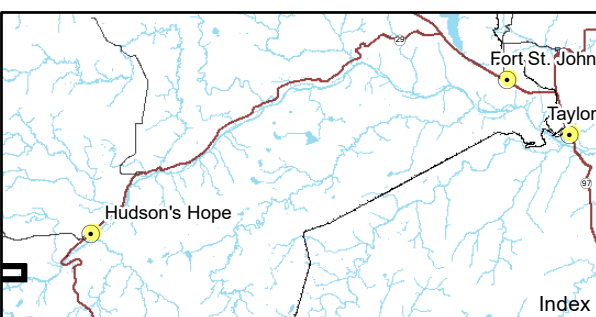
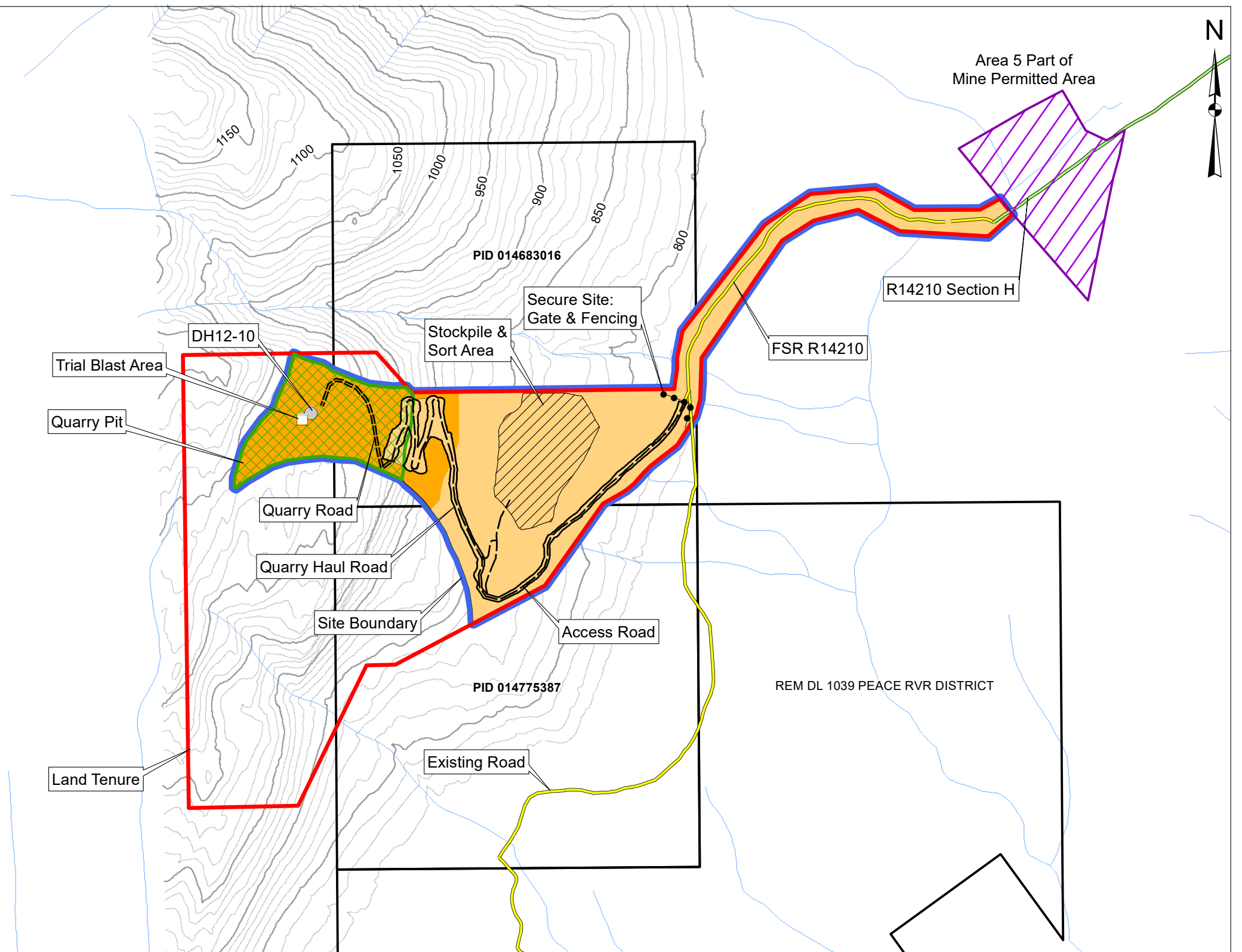
4. Roads and Trails

- a. Individual roads and trails will be exempted from the requirement for total reclamation if either:
 - i. The Permittee can demonstrate that an agency of the Crown has accepted responsibility in writing for the operation, maintenance and reclamation of the road or trail; or



- ii. The Permittee can demonstrate that another party has a valid authorization from a relevant provincial authority to assume liability for the road.

- Notes:**
1. Clearing & grubbing to be completed by BC Hydro Forces by May 2016
 2. All works confined to the site boundary
 3. Site shall be secured by fences and gates



- Map Notes:**
1. Datum: NAD83
 2. Projection: UTM Zone 10N
 3. Base Data: Province of B.C.
 4. Imagery: ESRI Online Basemapping.
 5. Property boundary locations are best available but should be considered approximate. Property information is a combination of surveyed data representing BC Hydro's current ownership records and ICIS data.

- Legend**
- Portgae Mountain Quarry - Area 5
 - Portgae Mountain Quarry Approved Licence of Occupation Area
 - Site Boundary
 - Existing Access to Site
 - R14210 Section D
 - R14210 Section H
 - FSR 14210
 - Clearing Area by BC Hydro
 - Future Quarry Development Area
 - Future Stockpile & Sort Area
 - Future Quarry Haul Road
 - Future In Quarry Access Road
 - Security Fencing
 - DH12-10
 - Trial Blast Area
 - Surveyed Crown Land
 - 10m Contour Interval
 - 50m Contour Interval

1:10,000 0 500 m

BC Hydro

Exhibit 1
Portgae Mountain
General Arrangement

Date	Jan. 13, 2021	DWG NO	1016-C14-07227	R 3
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August 21, 2020

File: 1641424

Karen von Muehldorfer
Regulatory Manager, Site C Clean Energy Project
British Columbia Hydro and Power Authority
333 Dunsmuir Street
Vancouver BC V6B 5R3

Dear Karen von Muehldorfer:

Re: Amendment of Mines Act Permit: Q-9-050
Permittee: BC Hydro and Power Authority
Approval Number: 20-1641424-0821
Notice of Work: 1641424-202002
Property: Portage Mountain Quarry

Mines Act permit Q-9-050 is hereby amended authorizing quarry activities as described in the email from Karen von Muehldorfer and BC Hydro dated August 20, 2020 (Notice of Work 1641424-202002). All other conditions of your permit previously issued continue to apply

This authorization and amendment is issued for the period **beginning August 21, 2020 and ending prior to December 31, 2023**. The Notice of Work and Reclamation Program forms part of your permit and you are reminded that you may not depart from the permitted program without written authorization.

Attach this letter to your permit as it forms an integral part of the permit

Read your permit and ensure that you and all persons who are carrying out activities under this permit comply with all terms and conditions and are familiar with the approved work program. Maintain a legible copy of this permit at the mining property, and ensure it is available to authorized inspectors and other authorized government officials.

This permit applies only to the requirements under the *Mines Act* and Health, Safety and Reclamation Code for Mines in British Columbia (Code). Be advised part 10 of the Health, Safety and Reclamation Code for Mines in British Columbia has been revised as of July 2016. It is your responsibility to be aware of and to comply with the revised part 10 of the Code (including section 10.4.1) as well as all other applicable parts of the Code. Other legislation may be applicable to the operation and you (the Permittee) are responsible for obtaining all required approvals or permits under that legislation. Work requiring approval or permit(s) from other agencies shall not commence until those approvals or permits are obtained.

Ensure compliance with all parts of the Mines Act and the Health, Safety and Reclamation Code for Mines in British Columbia including 2.8.1, 2.8.2, 3.7.5, 4.9.4(2)c, 4.9.5 and 4.9.9. It is also your responsibility to ensure the mine emergency response plan and traffic control plan are updated accordingly to include 24 hour operations (night shift). It is your responsibility to comply with the terms and conditions of all permits and authorizations that you may have been issued and other applicable legislation.

Reclamation security requirements for this permit amendment have been waived. As a condition of this permit, you are required to continually and progressively reclaim the surface of the land affected by the mining

Ministry of Energy, Mines and
Petroleum Resources

Mailing Address:
Suite 350 - 1011 4th Avenue
Prince George BC V2L 3H9
Phone: 250-565-4240
Fax: 250-565-4328

Location:
Suite 350
Plaza 400 Bldg
Prince George BC

operation. The amount of your security deposit may be adjusted on the basis of reclamation performance, field inspections by this Ministry, and on reports which may be requested.

For reclamation purposes, ensure that photos are taken of the work areas prior to commencing work, during operations and following completed reclamation. These photos are to be submitted to this office with your completed Annual Summary of Activities form. **It is a requirement that you submit a completed form and detailed map of your mining operation annually, by March 31, to this office. Failure to comply with the Code may impact your ability to obtain future permits and work authorizations.**

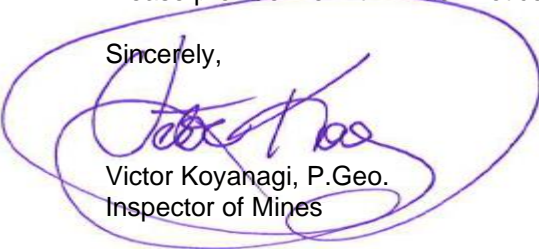
Contaminated or silt laden water shall be suitably contained on site and shall not be allowed to enter any watercourse or stream. Erosion shall be minimized and controlled at the source eliminating negative impacts to the environment.

Health and Safety inspections fall under the jurisdiction of this Ministry. A Mine Inspection Fee is collected for this service. The fee structure is based on tonnes of materials extracted for the period January 1st through December 31st. You will receive a Return Reminder for the Mine Inspection Fee in December of each year, with payment due by January 31st of the following year. For further information regarding the Mine Inspection Fee please contact your regional office or Cindy Head at Mineral, Oil and Gas Revenue Branch in Victoria at 250-356-1366.

All activities on the mine site shall comply with the terms and conditions listed in the Health, Safety and Reclamation Code for Mines in British Columbia, the *Mines Act*, and shall conform with the Metal Leaching and Acid Rock Drainage Guidelines for Mines in British Columbia.

Please provide me with written notice at least 7 days prior to ceasing work on the program.

Sincerely,



Victor Koyanagi, P.Geo.
Inspector of Mines

encl Approved NoW/Approved Letter
Annual Summary of Activities Form

Cc: Eva Armstrong, Reclamation Section, MEM Victoria
Ken Dobb, Senior Project Manager, Regional Initiatives, Northeast Region MFLNRO Fort St John



July 7, 2020

File: 1641424

Meaghan Candy
Sr. Environmental Coordinator, Site C Clean Energy Project
British Columbia Hydro and Power Authority
333 Dunsmuir Street
Vancouver BC V6B 5R3

Dear Meaghan Candy:

Re: Amendment of Mines Act Permit: Q-9-050
Permittee: BC Hydro and Power Authority
Approval Number: 20-1641424-0707
Notice of Work: 1641424-202001
Property: Portage Mountain Quarry

Mines Act permit Q-9-050 is hereby amended authorizing quarry activities as described in:

- 1) the Notice of Work and Reclamation Program (1641424-202001) received July 6, 2020, and
- 2) the Letter – BCH – MEMPR Portage-Mountain-NOW-Volumes-20200608 (003).pdf dated June 8, 2020 and received June 17, 2020.

Your authorization is issued for the period **beginning July 7, 2020 and ending prior to December 31, 2023**. The Notice of Work and Reclamation Program forms part of your permit and you are reminded that you may not depart from the permitted program without written authorization.

Attach this letter to your permit as it forms an integral part of the permit

Read your permit and ensure that you and all persons who are carrying out activities under this permit comply with all terms and conditions and are familiar with the approved work program. Maintain a legible copy of this permit at the mining property, and ensure it is available to authorized inspectors and other authorized government officials.

This permit applies only to the requirements under the *Mines Act* and Health, Safety and Reclamation Code for Mines in British Columbia (Code). Be advised part 10 of the Health, Safety and Reclamation Code for Mines in British Columbia has been revised as of July 2016. It is your responsibility to be aware of and to comply with the revised part 10 of the Code (including section 10.4.1) as well as all other applicable parts of the Code. Other legislation may be applicable to the operation and you (the Permittee) are responsible for obtaining all required approvals or permits under that legislation. Work requiring approval or permit(s) from other agencies shall not commence until those approvals or permits are obtained.

Cutting of timber and use of roads is not authorized under this permit. It is your responsibility to apply for and receive cutting authority prior to felling timber on crown land and road use permits wherever necessary. It is also your responsibility to comply with the terms and conditions of all permits and authorizations that you may have been issued and other applicable legislation.

Pursuant to section 21, 22, 23, and 24 of the *Mines Act*, a Mine Manager shall be appointed for your mine site. Prior to commencing mining activities, please provide, to this mines inspector, the name and contact information for the appointed Mine Manager. This Mine Manager shall be adequately qualified and well informed of the responsibilities regarding the *Mines Act* and the Health, Safety and Reclamation Code.

Pursuant to section 1.7.1 and 1.7.3 of the Health, Safety and Reclamation Code the Manager shall report all significant accidents and dangerous occurrences to the regional Health and Safety Inspector of Mines.

Reclamation security requirements for this permit amendment have been waived. As a condition of this permit, you are required to continually and progressively reclaim the surface of the land affected by the mining operation. The amount of your security deposit may be adjusted on the basis of reclamation performance, field inspections by this Ministry, and on reports which may be requested.

For reclamation purposes, ensure that photos are taken of the work areas prior to commencing work, during operations and following completed reclamation. These photos are to be submitted to this office with your completed Annual Summary of Activities form. **It is a requirement that you submit a completed form and detailed map of your mining operation annually, by March 31, to this office. Failure to comply with the Code may impact your ability to obtain future permits and work authorizations.**

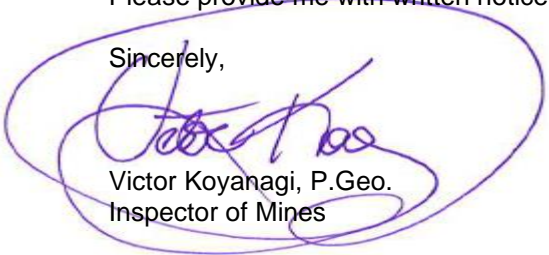
Contaminated or silt laden water shall be suitably contained on site and shall not be allowed to enter any watercourse or stream. Erosion shall be minimized and controlled at the source eliminating negative impacts to the environment.

Health and Safety inspections fall under the jurisdiction of this Ministry. A Mine Inspection Fee is collected for this service. The fee structure is based on tonnes of materials extracted for the period January 1st through December 31st. You will receive a Return Reminder for the Mine Inspection Fee in December of each year, with payment due by January 31st of the following year. For further information regarding the Mine Inspection Fee please contact your regional office or Cindy Head at Mineral, Oil and Gas Revenue Branch in Victoria at 250-356-1366.

All activities on the mine site shall comply with the terms and conditions listed in the Health, Safety and Reclamation Code for Mines in British Columbia, the *Mines Act*, and shall conform with the Metal Leaching and Acid Rock Drainage Guidelines for Mines in British Columbia.

Please provide me with written notice at least 7 days prior to ceasing work on the program.

Sincerely,



Victor Koyanagi, P.Geo.
Inspector of Mines

encl Approved NoW/Approved Letter
Annual Summary of Activities Form

Cc: Eva Armstrong, Reclamation Section, MEM Victoria
Karen von Muehldorfer, BC Hydro and Power Authority, Site C Clean Energy Project
Ken Dobb, Senior Project Manager, Regional Initiatives, Northeast Region MFLNRO Fort St John



August 08, 2019

File: 1641424

Alexandra Gray
Snr Envi Coorindator
British Columbia Hydro and Power Authority
9th Floor - 1111 West Georgia Street
Vancouver BC V6B 4G2

Dear Alexandra Gray:

Re: Amendment of Mines Act Permit: Q-9-050
Permittee: BC Hydro and Power Authority
Approval Number: 19-1641424-0808
Notice of Work: 1641424-201901
Property: Portage Mountain Quarry

Mines Act permit Q-9-050 is hereby amended authorizing quarry activities as described in the Notice of Work and Reclamation Program (1641424-201901) submitted June 4, 2019. Your authorization is issued for the period **beginning August 8, 2019 and ending prior to December 31, 2023**. The Notice of Work and Reclamation Program forms part of your permit and you are reminded that you may not depart from the permitted program without written authorization.

Read your permit and ensure that you and all persons who are carrying out activities under this permit comply with all terms and conditions and are familiar with the approved work program. Maintain a legible copy of this permit at the mining property, and ensure it is available to authorized inspectors and other authorized government officials.

This permit applies only to the requirements under the *Mines Act* and Health, Safety and Reclamation Code for Mines in British Columbia (Code). Be advised part 10 of the Health, Safety and Reclamation Code for Mines in British Columbia has been revised as of July 2016. It is your responsibility to be aware of and to comply with the revised part 10 of the Code (including section 10.4.1) as well as all other applicable parts of the Code. Other legislation may be applicable to the operation and you (the Permittee) are responsible for obtaining all required approvals or permits under that legislation. Work requiring approval or permit(s) from other agencies shall not commence until those approvals or permits are obtained.

Cutting of timber and use of roads is not authorized under this permit. It is your responsibility to apply for and receive cutting authority prior to felling timber on crown land and road use permits wherever necessary. It is also your responsibility to comply with the terms and conditions of all permits and authorizations that you may have been issued and other applicable legislation.

Pursuant to section 21, 22, 23, and 24 of the *Mines Act*, a Mine Manager shall be appointed for your mine site. Prior to commencing mining activities, please provide, to this mines inspector, the name and contact information for the appointed Mine Manager. This Mine Manager shall be adequately qualified and well informed of the responsibilities regarding the *Mines Act* and the Health, Safety and Reclamation Code.

Pursuant to section 1.7.1 and 1.7.3 of the Health, Safety and Reclamation Code the Manager shall report all significant accidents and dangerous occurrences to the regional Health and Safety Inspector of Mines.

Reclamation security requirements for this permit amendment have been waived. As a condition of this permit, you are required to continually and progressively reclaim the surface of the land affected by the

mining operation. The amount of your security deposit may be adjusted on the basis of reclamation performance, field inspections by this Ministry, and on reports which may be requested.

For reclamation purposes, ensure that photos are taken of the work areas prior to commencing work, during operations and following completed reclamation. These photos are to be submitted to this office with your completed Annual Summary of Activities form. **It is a requirement that you submit a completed form and detailed map of your mining operation annually, by March 31, to this office. Failure to comply with the Code may impact your ability to obtain future permits and work authorizations.**

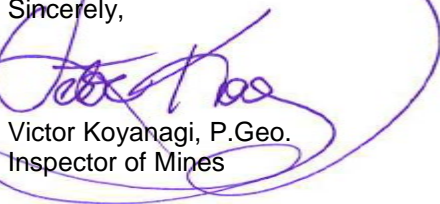
Contaminated or silt laden water shall be suitably contained on site and shall not be allowed to enter any watercourse or stream. Erosion shall be minimized and controlled at the source eliminating negative impacts to the environment.

Health and Safety inspections fall under the jurisdiction of this Ministry. A Mine Inspection Fee is collected for this service. The fee structure is based on tonnes of materials extracted for the period January 1st through December 31st. You will receive a Return Reminder for the Mine Inspection Fee in December of each year, with payment due by January 31st of the following year. For further information regarding the Mine Inspection Fee please contact your regional office or Cindy Head at Mineral, Oil and Gas Revenue Branch in Victoria at 250-356-1366.

All activities on the mine site shall comply with the terms and conditions listed in the Health, Safety and Reclamation Code for Mines in British Columbia, the *Mines Act*, and shall conform with the Metal Leaching and Acid Rock Drainage Guidelines for Mines in British Columbia.

Please provide me with written notice at least 7 days prior to ceasing work on the program.

Sincerely,



Victor Koyanagi, P.Geo.
Inspector of Mines

encl Permit / Approved NoW
Annual Summary of Activities Form

Cc: Eva Armstrong, Reclamation Section, MEM Victoria
Jennifer Eichelberger, Project Manager, Major Projects, MFLNRO
Alanna Schroeter, First Nations Consultation, MFLNRO

**PROVINCE OF BRITISH COLUMBIA
MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES**

**QUARRY PERMIT
APPROVING MINE PLAN AND RECLAMATION PROGRAM
(Issued pursuant to Section 10 of the **Mines Act** R.S.B.C. 1996, C.293)**

Permit Number: **Q-9-050** Mine Number: **1641424**
Approval Number: **19-1641424-0806**

Permittee: **British Columbia Hydro and Power Authority
9th Floor - 1111 West Georgia Street
Vancouver BC V6B 4G2**

Business Phone: **(604) 699 5178**

For work located at the following property:

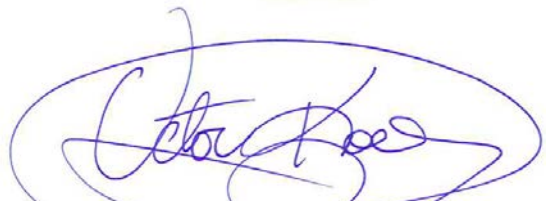
Portage Mountain Quarry
Lat: 55.97500N Long: -122.11500W

This approval and permit is subject to the appended conditions and mine plan as described in Notice of Work and Reclamation Program 1641424-201901 for the period:

August 08, 2019 to December 31, 2023

Date of Issuance: **May 12, 2017**

Date of Amendment: **August 08, 2019**



Victor Koyanagi, P.Geol.
Senior Inspector of Mines

PREAMBLE

A Notice of Work and Reclamation Program **1641424-201901** submitted June 04, 2019 was received by the Chief Inspector of Mines (Chief Inspector) on June 10, 2019 in accordance with Part 10.1.1 of the Health, Safety and Reclamation Code for Mines in British Columbia (Code).

The Notice of Work and Reclamation Program (Application) consists of the following documents:

- a. Site Investigation for Rip Rap Quarry Potential, Portage Mountain BC, AMEC Environment and Infrastructure, August 8, 2013
- b. Site C Clean Energy Project, Portage Mountain Quarry – Mining and Reclamation Plan, Duz Cho Construction, May 4, 2019
- c. Site C Clean Energy Project: Construction Environmental Management Plan Revision 2 dated February 4, 2016 prepared by BC Hydro
- d. Site C Clean Energy Project, Construction Activity Plan – Portage Mountain Quarry, For Provincial Permits required for Construction and Operations, March 6, 2015
- e. BC Hydro Portage Mountain Quarry Quality and Operational Blasting Controls; Project No. 97289 Document Number 1016.N.04.001DUZ04.CMO.00004.PLAN; Revision 2, June 16,2017

Pursuant to s.10 of the *Mines Act*, the Application hereby forms part of the permit, and defines what mining and reclamation activities are approved under this authorization.

All activities on the mine site shall comply with:

- a. the *Mines Act*, and
- b. the Health, Safety and Reclamation Code for Mines in British Columbia (Code)

and shall adhere to the terms and conditions listed in:

- a. the Metal Leaching and Acid Rock Drainage Guidelines for Mines in British Columbia, and
- b. the Handbook for Mineral and Coal Exploration in British Columbia

CONDITIONS

The Chief Inspector of Mines hereby approves the Notice of Work and Reclamation Program (Application) subject to compliance with the following conditions:

RECLAMATION

1. Reclamation Security

Reclamation liability shall remain the responsibility of British Columbia Hydro and Power Authority during and to the end of life of mine. Reclamation security for this permit is not required.

2. Reclamation

- (a) A detailed progressive reclamation plan developed by a qualified professional shall be provided to the regional Inspector of Mines within 60 days of the issuance of this permit amendment.
- (b) All disturbed areas on the mine site shall be re-vegetated progressively where appropriate to control erosion, sediment and weeds using appropriate/native plant species including culturally important native species
- (c) All available topsoil, overburden, and organic material including large woody debris in the disturbance footprint shall be salvaged and stockpiled for use in reclamation.
- (d) All stockpiled topsoil, overburden, and organic material including large woody debris shall be protected stockpiles from erosion, degradation, and contamination through re-vegetation and/or other practices.
- (e) Stockpiles shall be clearly marked to ensure that they are protected; the locations, origins and quantities of material shall be documented and reported in the Annual Reclamation Report
- (f) Stripped and stockpiled soil suitable for use in reclamation shall not be used as fill.
- (g) Progressive reclamation shall be conducted whenever practicable. Reclamation activities shall include:
 - i. Re-contouring of disturbed areas to achieve surfaces similar to pre-disturbance shapes.
 - ii. All severely compacted areas shall be deeply ripped prior to placement of growth media and/or vegetation. Compacted surfaces shall be de-compacted to allow water infiltration and achieve self-staining vegetation.
 - iii. Soil material salvaged during construction of the mine site shall be replaced and shall:
 - a) be rough and loose with abundant microsites to facilitate the lodging and germination of seeds;
 - b) be keyed into the underlying materials such that they do not slump off;

- c) incorporate roots, stumps and other woody debris to reduce erosion and create greater biological diversity; and
- d) be re-vegetated promptly.

3. Annual Reclamation Report

By March 31st of each year, an Annual Reclamation Report shall be submitted in a form containing the information required by the Chief Inspector. The Annual Reclamation Report shall document the current status of the mine plan, reclamation obligations, and outstanding reclamation liability and shall include all water quality monitoring information.

4. Land Use

The land surface shall be progressively reclaimed with a view generally to re-establishing pre-mining capability and productivity conditions to the following end land use objective: **wildlife.**

5. Removal of Topsoil

No topsoil shall be removed from the mine site without the specific written permission of an Inspector.

6. Use of Excavated Materials

Unless otherwise authorized in writing by an inspector of mines, construction materials excavated from the mine site shall be utilized solely for BC Hydro and Power Authority projects.

GEOTECHNICAL

7. General

- (a) All construction shall be completed by or under the supervision of a qualified professional engineer and shall include sufficient field reviews to ensure that all excavations, structures, and facilities are built in general conformance with the designs, accepted engineering practices, and the Code.
- (b) Any written recommendations made by a qualified professional engineer relating to geotechnical stability affecting health and safety or environment shall be followed unless a suitable alternative course of action is provided by a qualified professional engineer.
- (c) A geotechnical incident report shall be submitted to the Chief Inspector for any dangerous occurrence (as defined by the section 1.7.3 of Code) or any other incident as described in the current Ministry of Energy Mines and Petroleum Resources Advice of a Geotechnical Incident.

8. Quarry Pit Walls

- (a) Design
 - (i) The quarry pit wall design is approved subject to an annual review by a qualified Professional Engineer with experience in the design of pit slopes.

- (ii) Further investigation, including geotechnical logging, rock strength testing and structural/hydrogeological modeling shall be undertaken during excavation to provide information for final wall design.

(b) Construction

- (i) The minimum final width of pit slope catchment berms shall be 8 m as required by the Health, Safety and Reclamation Code for Mines in British Columbia.
- (ii) Surface drainage is to be diverted away from the pit slopes in accordance with good engineering practice.
- (iii) Quarry wall dewatering measures shall be implemented in accordance with the recommendations of a qualified professional engineer.

(c) Operation

- (i) Controlled blasting methods (e.g. trim and buffer, pre/post shear) shall be implemented to minimize damage to the crest and bench face of all final walls and on any interim walls that will be in place for a period exceeding 12 months. Controlled blasting may be omitted where a qualified professional engineer assesses conditions and states in writing that worker safety will not be adversely endangered by the proposed excavation.
- (ii) Catchment benches shall be cleaned of accumulated rock fall debris as needed and prior to bench access being lost. .
- (iii) If access cannot be gained to clean a catchment berm and a danger exists to any person working below, a safe work procedure shall be developed and implemented before work proceeds.

(d) Monitoring

Geological, geotechnical, and hydrological conditions encountered during pit development shall be assessed to detect early signs of instability and to confirm design basis information and assumptions. The frequency of assessment shall be annually or as determined by a qualified professional engineer.

(e) Reporting

- (i) Annual inspections of pit slopes shall be undertaken by a qualified professional engineer, and an annual report submitted to the Regional Inspector of Mines by March 31 of the year following the inspection. At a minimum, the report shall include:
 - a) Inspection of all pits other than those fully reclaimed;
 - b) Observations made during the inspections;
 - c) Summary of monitoring and instrumentation data;
 - d) Assessment of design versus actual bench and pit performance;
 - e) Updated pit plans, and
 - f) Conclusions and recommendations.

- (ii) A report shall be submitted to the Chief Inspector in the event of a single bench failure resulting in a dangerous occurrence (as defined by the Code) and in the event of a multi-bench failure regardless of consequence.

9. Stockpiles and Waste Dumps

(a) Design

- (i) Temporary and permanent stockpiles and waste dumps shall be designed by a qualified professional engineer. The designs shall be in accordance with accepted engineering practice and the Code.
- (ii) Factors of safety for waste dump slopes shall satisfy design criteria from the Interim Guidelines of the BC Mine Waste Rock Pile Research Committee.

(b) Construction

- (i) The subgrade shall be approved by the design engineer prior to commencing construction. .
- (ii) Temporary stockpiles and waste dumps shall be constructed and operated in accordance with designs prepared by a qualified professional engineer..

(c) Operation and Monitoring

- (i) A monitoring plan shall be established to detect early evidence of any potentially dangerous slope instability during operation. The monitoring plan shall include the instrument type, spacing, monitoring frequency, and appropriate initial threshold and response criteria for any required instrumentation. The plan shall be updated as needed to reflect the status of stockpile and waste dump development. Monitoring and management shall be conducted in accordance with the recommendations of a qualified professional engineer and good engineering practice. The plan shall be maintained on site and shall be provided to any Mines Inspector upon request.
- (ii) Berms shall be constructed at the toe of all waste dumps where rock rollout could present a safety hazard. The location and size of the berms shall be determined by a qualified professional engineer.
- (iii) Entry into the potential run-out zone of a stockpile or waste dump, whether of short or extended duration, shall comply with Section 6.10.1(7) of the Health, Safety and Reclamation Code for Mines in BC.

(d) Reporting

While active, the stockpile shall be included in the annual review of high risk spoils, which shall be conducted by a qualified professional geotechnical engineer.

10. Mine Roads

(a) Design

All mine roads shall be designed and constructed according to current engineering standards (e.g. Ministry of Forests Forest Road Engineering Guidebook) and in accordance with the Health, Safety and Reclamation Code for Mines in BC.

(b) Construction

(i) Cuts and fills more than 6m height (if any) shall be designed by a qualified professional geotechnical engineer, who shall conduct sufficient field reviews to ensure that the road is constructed in general conformance with the design. Verification of field reviews shall be filed on-site, and shall be provided to any Mines Inspector upon request.

(ii) Where necessary to ensure geotechnical stability, the footprint of fill slopes shall be stripped of organics and topsoil and/or have the fill toe “keyed-in” to original ground. For slopes exceeding a gradient of 15 degrees, the prepared foundation of fill slopes in excess of 10m height shall be inspected by a qualified professional geotechnical engineer prior to fill placement.

(c) Maintenance

The rock fall potential from cut slopes shall be assessed annually and scaling shall be conducted as required to safeguard road users.

(d) Reporting

As-Built record drawings for all new roads with duty life of more than 1 year shall be prepared by a qualified professional. These records shall be submitted to the Chief Inspector no later than March 31 following the year of construction.

(e) Closure

Mine site roads that are no longer required for mining purposes shall be deactivated and reclaimed in accordance with the recommendations of a qualified professional engineer. The reclaimed road shall satisfy stability requirements and the end land use.

ENVIRONMENTAL PROTECTION

11. Metal Leaching and Acid Rock Drainage (ML/ARD)

(a) All mining activities on the mine site shall adhere to the terms and conditions listed in the Metal Leaching and Acid Rock Drainage Guidelines for Mines in British Columbia where applicable.

(b) All materials with the potential to generate ML/ARD shall be placed in a manner that minimizes the production and release of metals and contaminants to levels that assure protection of environmental quality.

- (c) Only materials classified as not potentially acid generating (NP/AP < 2) shall be used for road and site construction and repairs.
- (d) Concurrent with excavation, the Permittee shall implement a monitoring program to confirm the geochemical characteristics of excavated materials produced and mine surfaces exposed, to determine the potential for ML/ARD and the need for mitigation measures to ensure protection of environmental quality.
- (e) To characterize excavated materials, geochemical sampling shall be of a **minimum** frequency of one sample every 7,500 tonnes. Analyses shall include ABA (paste pH, fizz rating, total sulphur, acid soluble sulphate sulphur, total carbon, total inorganic carbon and neutralization potential) and total elemental composition (including major and trace elements) after a strong acid digestion.
- (f) A report, authored by a qualified professional, summarizing the results of the operational monitoring shall be submitted annually. The report shall include a description of the geology encountered, interpretation of all ML/ARD, and an account of any mitigation strategies undertaken during the program and an assessment of whether additional mitigation is required.

12. Water Management

- (a) In the event that seepage and other drainages that may arise from the mine or plant site results in an exceedance of the applicable provincial water quality standards in the receiving environment, the Permittee shall collect and treat, or otherwise mitigate drainage for as long as is necessary.
- (b) Routine site inspections shall be conducted during quarry development to evaluate the need for water management infrastructure (i.e. localized collection ditches and sumps, and sediment ponds).
- (c) If water management structures are deemed necessary based on permit condition 12(b), the Permittee shall develop and implement a Water Management Plan to minimize the release of total suspended solids and contaminant loadings from the quarry pit and stockpile areas.

13. Surface Water and Ground Water Quality Monitoring

- (a) Changes to surface water quality from the mine site shall be monitored and recorded. The monitoring program shall be capable of providing early warning about an increase in contaminant loading.
- (b) Monitoring results of water quality and water quantity, including interpretation of the results, shall be kept up to date in a dedicated database available for review by an inspector and reported in the Annual Reclamation Report.

14. Erosion and Sediment Control

- (a) Erosion and sediment shall be effectively controlled on the mine site minimizing or eliminating negative impacts to the environment.
- (b) Progressive reclamation shall be conducted where possible to minimize erosion on the mine site.

- (c) Sediment laden water shall be suitably contained on the mine site and not be allowed access to any watercourse or stream.
15. Vegetation Management
- Weeds that establish on the site and shall be suitably managed and controlled and reasonable efforts shall be taken to ensure that weeds do not move from the site to adjacent areas. The control of weeds shall consider using non-toxic means for weed control when possible.
16. Dust Control
- Dust management and monitoring will take into account at minimum the following:
- (a) All dust on the mine site shall be suitably controlled at the source.
- (b) All roads on the mine site shall be appropriately constructed and top-dressed such that dust is controlled.
- (c) All vehicles exiting the mine site shall be adequately washed to minimize the potential spread of weeds and other contaminants.
17. Fuels and Lubricants
- Fuels and Lubricants, if stored on the mine site, shall conform to the requirements of the *Field Guide to Fuel Handling, Transportation, and Storage*.
- A hydrocarbon management plan that deals with fueling, operational servicing, spill prevention, emergency response, spill contingency, and clean-up for fuels and lubricants stored on the mine site in accordance with the Field Guide to Fuel Handling, Transportation, and Storage shall be developed and implemented. This plan shall be kept on site and made available to the Regional Inspector upon request. All workers on the site shall be made aware of and understand this plan.

OTHER CONDITIONS

18. Mine Emergency Response Plan
- The Mine Emergency Response Plan shall be posted in a conspicuous place accessible to all persons on the mine site while the mine is in operation.
19. Receiving Foreign Materials
- Foreign materials including but not limited to garbage, refuse, concrete, asphalt, asphalt shingles, rebar, wood chips and contaminated soils shall not be accepted or stored on the mine site unless authorized in writing by the an Inspector.
20. Crushing Notification
- Written notification to the regional Inspector of Mines shall be provided seven working days prior to commencement of crushing or screening. The notification shall include the start date and the anticipated end date of the operation.