

**GUIDE TO PREPARING MINE PERMIT APPLICATIONS FOR
AGGREGATE PITS AND QUARRIES
IN BRITISH COLUMBIA**

MINING AND MINERALS DIVISION

MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES



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1.0 PURPOSE

This guide is intended to provide proponents with a recommended approach to the preparation, content and format of mine permit applications for aggregate pits and quarries under the Mines Act (RSBC 1996) of British Columbia.

Project proponents will find these guidelines helpful in preparing permit applications for all types of gravel pits and quarries, on private and public land, which are not reviewable under the British Columbia Environmental Assessment Act (BCEAA).

This guide does not take the place of expert mining knowledge or the specific legislated requirements of the Mines Act and the Health, Safety and Reclamation Code for Mines in British Columbia 2008 (HRSC).

1.1 Disclaimer

Although this guidance document is intended to be as comprehensive as possible, information presented here must not be interpreted as authorizing or prescribing any particular practice or course of action.

This guide does not replace or affect the actual legislative requirements. Owners, agents and mine managers are ultimately responsible for ensuring they understand and meet all requirements of the Mines Act and individual permits.

If there are any conflicts between this document and the Mines Act or its regulations, the Act and the regulations take precedence.

1.2 Definitions

Borrow excavation is defined as a surface excavation made solely for the purpose of removing borrow material for

- the construction of the sub-base for a specific roadway project; or
- the construction of a dam, canal, dike, structure or erosion-protection works associated with a Provincial water-management infrastructure project.

Infrastructure is defined as any works, building, structure, facility, equipment, apparatus, mechanism, instrument or machinery belonging to or used in connection with a pit or quarry, including any storage site or facility, access road, haul road, railway or telecommunication line.

A **Mines Act permit** is the permit required under the Mines Act before any work can be started in, on or about a mine. In British Columbia, sand, gravel and quarry operators are required to hold a valid Mines Act permit.

A **Notice of Work and Reclamation Program (NoW)** is the application form and supporting materials proponents are required to submit prior to receiving a Mines Act permit. Information provided via this form is used to administer and enforce the Mines Act and HRSC.

A **Provincial water-management infrastructure project** is any project that will be licenced upon completion to the Province of British Columbia. Dams and other water-management structures developed by the private sector are not considered Provincial water-management infrastructure projects. Excavation projects supplying materials for those projects are classified as pits rather than borrow structures, and are subject to the Mines Act.

1.3 Regulatory Requirements for Mines in British Columbia

The Ministry of Energy, Mines and Petroleum Resources (MEMPR) regulates the approval, development and reclamation of all mines in B.C. under the authority of the Mines Act and its associated regulations, and all other applicable federal and provincial laws.

Before any aggregate operation can commence, a Mines Act permit must be obtained from MEMPR, and appropriate reclamation security must be paid in full.

1.4 Responsibility for Pits and Quarries

Only one person or company is designated as the registered holder of a Mines Act permit. The permit holder may allow other people to use the pit or quarry, but the permit holder is responsible for ensuring compliance with the Mines Act and HSRC.

The registered holder of a permit must appoint a mine manager who will be responsible for pit or quarry operations and the requirements of the Mines Act and HSRC. This person should, in turn, ensure that all persons carrying out activities in the pit or quarry are aware of the regulatory requirements, the company's environmental operating guidelines, and the operation's Mine Emergency Response Plan.

If ownership of an operation changes, the permit is only transferable when MEMPR approves an amendment to the permit and new financial security is in place.

1.5 Inspections and Enforcement

Provincially appointed inspectors of mines will conduct random, unannounced inspections, as well as planned inspections and audits, to ensure that operators are

following their permit conditions and that operations are in compliance with the Mines Act and HSRC.

Failure to follow specific permit conditions or HSRC requirements may result in enforcement action. Enforcement options are varied and depend on the circumstances of non-compliance.

1.6 Continuous Improvement

The Mining and Minerals Division expects permit holders, and industry, to continuously review operating practices and equipment with the objective of improving health, safety and environmental performance.

2.0 RELATIONSHIP TO THE B.C. ENVIRONMENTAL ASSESSMENT PROCESS

In British Columbia, any proposed new mine and most major expansions or modifications to existing mines that meet or exceed the thresholds described in the Reviewable Projects Regulation of the British Columbia Environmental Assessment Act (BCEAA) must undergo a formal review, and the proponent must obtain an environmental assessment (EA) certificate before being issued a Mines Act permit.

A mine under the thresholds could still enter the EA process at the discretion of the Minister of Environment. Possible reasons for such a decision could include the following:

- There is a potential for significant adverse environmental impacts.
- The Canadian Environmental Assessment Act has been triggered.
- A proponent “opts in” to the EA process. This is generally done to demonstrate the environmental sustainability of a project more clearly for the global marketplace.

A Mines Act permit is required whether or not a proposed new mine is reviewable under the BCEAA.

For projects that undergo a formal EA review, there are three options for submitting mine permit applications:

1. Mine proponents may request that applications for Mines Act permits and other statutory authorizations be processed concurrently with the EA process. All permit applications for which concurrent processing is requested must be submitted simultaneously with the EA application. In this case, there are time limits following EA certificate issuance in which agencies must provide a decision for concurrent permits; however, proponents must be prepared to invest in detailed permit-level mine planning and design prior to the issuance of an EA certificate.
2. Applications for mine permits and other statutory authorizations may be submitted during the course of an EA review. When this occurs, permit applications are normally submitted near the end of the EA review process to enable consideration of any comments and issue resolutions. Agencies may begin processing permit applications submitted while the EA review is in progress but cannot issue permits until after the EA certificate has been issued.
3. Applications for mine permits and other statutory authorizations may be submitted following issuance of the EA certificate.

Information and consultation requirements for a Mines Act permit are generally similar and addressed concurrently for projects that undergo an EA review.

2.1 Provincial and Federal Regulations and Statutes

Acquiring a Mines Act permit for an aggregate pit or quarry may require additional approvals from regulators. A list of acts and regulations that may be relevant to the operation of gravel pits and quarries in British Columbia is included in APPENDIX 2. It is the responsibility of proponents to consult with and obtain advice from the Province's various regulatory authorities to determine if projects fall within the scope of their regulations.

3.0 PROCESS CONSIDERATIONS FOR PROPONENTS

Aggregate, more commonly known as sand, gravel and crushed rock, is crucial to the development and economy of British Columbia. Every home, school, hospital, sidewalk and roadway is built using aggregate products. This important commodity provides the basis for our transportation network and important infrastructure such as water and sewer systems, and is used directly or indirectly by British Columbians every day.

Aggregate is produced in or near almost every city and town in the province. Aggregate is a relatively abundant resource in B.C., but transportation costs can be high and constitute a major part of commodity prices. Aggregate operations generally need to be located close to their markets to be viable, or near major water routes where transportation can be more cost effective.

The aggregate industry is a significant employer in B.C. and provides revenue to the Province that benefits all British Columbians. After mining is finished, reclaimed areas provide opportunities for new or different land uses, from reforestation and parks to subdivisions and other community facilities.

A Notice of Work and Reclamation Program (NoW) is the application form and supporting materials that proponents are required to submit to obtain a Mines Act permit. NoW applications submitted by proponents should include a full project description which identifies all of the issues and technical requirements of a proposed operation, with particular attention to potential environmental, health and safety, social and economic impacts.

Proponents are encouraged to undertake preliminary site investigations and relevant environmental studies at proposed mine sites and surroundings, and potentially affected areas, to provide “baseline” information about conditions prior to developing a draft application.

Proponents are also strongly encouraged to undertake early consultations with local, provincial and federal agencies, local First Nations and local communities to assist in the identification of issues, and to help define the content of the permit application. Early outreach by the proponent during pre-application consultation and planning can reduce the risk of new issues emerging during the review of an application that could delay the review process.

For projects on Crown land, proponents should engage potentially affected First Nations communities in meaningful dialogue and relationship building to gain an understanding of their expectations for participation in the project. A useful reference is “AME BC Aboriginal Engagement Toolkit” produced by the Association for Mineral Exploration British Columbia (AMEBC).

3.1 Regional Mine Development Review Committees

Regional Mine Development Review Committees (RMDRCs) facilitate a multi-agency review process and make permitting recommendations to the Chief Inspector of Mines for gravel pit or quarry operations of a sufficient complexity.

The committees are normally chaired by Mining and Minerals Division regional directors or another MEMPR designate, depending on the circumstances. RMDRCs include membership from provincial and federal government agencies, as well as local government and First Nations representatives who are invited to participate on a project-specific basis.

Applications of a sufficient complexity will be referred to the appropriate RMDRC by MEMPR staff.

4.0 PERMITTING FRAMEWORK

4.1 Securing Land Title and Tenure

The first step in starting a new mine is securing title to the property. For aggregate extraction on Crown land, the applicant must have the appropriate tenure (e.g. Licence of Occupation). Surface tenure for an aggregate mine is required even when the applicant holds the subsurface mineral or placer rights. A mine on private land requires fee-simple ownership or authorization from the title holder.

4.2 Referrals

Applications for aggregate pits and quarries on Crown and private land must be referred to agencies and holders of exclusive land tenure rights that have jurisdiction or a vested interest in some aspect of the development, operations, and/or reclamation of the pit or quarry. Agencies and tenure holders with a potential interest in aggregate pits and quarries may include the following:

- Department of Fisheries and Oceans Canada
- B.C. Ministry of Agriculture and Lands
- B.C. Ministry of Environment
- B.C. Ministry of Transportation and Infrastructure
- B.C. Ministry of Forests and Range
- B.C. Environmental Assessment Office
- local government
- Environment Canada
- other

As part of the application review process, MEMPR sends referrals to agencies and tenure holders with a potential interest in the proposed project. A period of 30 days is provided for review.

4.3 First Nations Engagement

As part of the mine project review process, proponents should consider an effective approach to engage with local First Nations. The Government of British Columbia has a legal duty to consult with First Nations regarding proposed mines that may impact on Aboriginal rights or title. Aggregate pit and quarry applications are referred to First Nations for input.

Communicating with First Nations early in the application process can be helpful for proponents. Important information to consider incorporating into a permit application may include the following:

- identification of First Nations potentially affected by the proposed project, and their asserted traditional territories;
- non-confidential overview of traditional use of the project area lands and resources;
- other considerations, such as culturally modified trees, rock paintings, trails, legendary land features, and wildlife and vegetation species of special significance to First Nations;
- identification of any First Nations land-use plans or planning objectives proposed for areas in the vicinity of the project; and
- non-confidential summary of identified archaeological resources in the project area.

Note: Proponents are not required to provide information that, by arrangement with First Nations, is to be treated as confidential.

4.4 Local Government Requirements

Regional districts and municipalities may require approvals for rezoning land and issuing special development permits if applicable bylaws exist. The municipality or regional district in which the proposed pit or quarry is located should be contacted to determine specific local requirements.

Municipalities with approved soil removal and deposit bylaws may have additional requirements, including soil removal and disposal permits, security and fees. Proponents should check with local planning or engineering services to determine the specific requirements of a soil removal and deposit bylaw.

4.5 Public Consultation Process Overview

As part of the mine project review process, proponents should consider an effective approach to distributing project information and consulting with the public. Public consultation should take a variety of forms and can include public meetings and open houses, one-on-one meetings with interested parties, publication of articles on a particular project, and/or notices in community newspapers.

4.6 Notification Requirements

Proactive consultation with the agencies listed above, and with First Nations and locally affected communities or landowners, will assist in identifying and addressing potential concerns related to a proposed mine.

Permitting delays can be avoided if foreseeable concerns and requirements are identified and addressed up front during initial mine planning. Permit applicants are therefore strongly advised to undertake proactive consultation as early as possible.

The following public notification measures are generally required:

- A 30-day advertisement of an approved application in a local newspaper and the British Columbia Gazette. Proponents should contact the appropriate Regional Office (see APPENDIX 3) for guidance on advertising requirements.
- A completed application package should be available during the 30-day review period in a locally accessible facility, such as a library, where the public can access the documentation.
- A public meeting or meetings to communicate the intent of the application, and to provide information on issues (e.g., environmental concerns) pertinent to the project. The format for public meetings is often an “open house” with opportunities for attendees to pose questions to proponents, agents and experts. MEMPR staff attend public meetings to provide information on the Mines Act process, but not to answer specific questions about projects. Notification of public meetings should be co-ordinated through the appropriate Regional Office.
- A public notice posted on the property advertising that the property is the subject of a Mines Act permit application.

Proponents are required to review input received through the public notification process in order to develop a response and mitigation strategy. Matters outside of MEMPR’s jurisdiction may require discussions with other ministries and agencies.

Some projects may be located significant distances away from communities; in these situations, the inspector of mines may waive certain advertising or public meeting requirements.

4.7 Values to Manage and Protect

Health and Safety

The health and safety of workers and the public is paramount in any mining activity that takes place in British Columbia. Exemplary safety performance is essential for staying in business. The following considerations must guide any mining operation:

- Safety overrules all other considerations.
- Health and safety regulations must be complied with at all times.
- Workers and the public must not be exposed to unsafe conditions.
- Safe and stable pit slopes/faces must be in place at all times.
- Activities must be inspected and monitored.
- Safety performance must be continuously improved.

Environmental Values

A healthy environment is key to quality of life in British Columbia. Protecting the environment and minimizing impacts are essential requirements for both regulatory approval and maintaining a strong social license to mine in this province.

Using current technology, best management practices and prevention measures, a mine should

- minimize sediment and pollutants reaching natural and man-made surface water, groundwater and aquatic environments;
- prevent impacts to fish and wildlife and their habitats;
- minimize the establishment and spread of invasive plants; and
- minimize impacts to air and water quality.

Note: No work can commence on a mine until the reclamation security is paid in full.

Community Values

To be viable, aggregate operations generally need to be located close to their markets and where transportation can be cost effective. Successful aggregate operations minimize conflicts with neighbours and have the support of nearby communities. This support is built on an understanding of and respect for community values, which should be incorporated into business operating procedures. Public perception of one operation will reflect on the entire industry. A good industry reputation can make the business of mining more readily acceptable to communities across the province.

The following considerations are recommended to assist in developing positive community relationships:

- Consult with neighbors in a sincere manner.
- Protect drinking water and all water sources.
- Ensure industrial traffic does not degrade public roads or jeopardize public safety.
- Be innovative in minimizing noise, dust and vibration.
- Minimize visual impacts to the landscape.

- Minimize disruption to local footpaths and public areas.
- Participate in community events and projects.

5.0 CONTENT REQUIREMENTS FOR A MINE PERMIT APPLICATION

The Sand & Gravel/Quarry Operation Notice of Work and Reclamation Program (NoW application) is the application form proponents are required to submit in order for a project to be considered for a Mines Act permit. Proponents cannot begin any work or cause any disturbance to a site before they receive a permit.

The NoW application can be found on the Application Forms page of the Mineral Exploration and Mining portion of the MEMPR website (<http://www.empr.gov.bc.ca/Mining/>).

In addition to the information requirements contained in this guide, permit applications must reflect the statutory permitting requirements of other agencies to the extent possible. Proponents are encouraged to consult with regulatory agencies early in the exploration and project feasibility stages to identify their requirements for permits, approvals or other statutory authorizations.

The following section of this guide provides a detailed summary of key information requirements for a mine permit application, but is flexible and intended to be proportional to the complexity of the proposed aggregate operation.

5.1 Introduction

The introduction indicates in general terms why the permit application is being prepared and how it has been developed, and should include the following:

- An indication that the application is for a B.C. Mines Act permit, for a project
 - a. that is not subject to review under the BCEAA;
 - b. that is subject to the BCEEA but has already been granted an Environmental Assessment Certificate or is currently being reviewed by the B.C. Environmental Assessment office; or
 - c. for which the proponent is requesting that the application be reviewed concurrently with a BCEAA review.
- Identification of the agencies, First Nations and other parties involved in the development of the application.

5.2 Table of Contents

A table of contents is recommended for larger applications to outline all components of the document.

5.3 Notice of Work and Reclamation Program (NoW) Application

A NoW with accompanying maps or reports may be all that is required for relatively small projects. For more complex projects or projects that could potentially have substantial impacts, a more detailed application package and supporting studies is recommended as laid out in this section.

5.4 Location of Project and Mapping

All NoW applications must contain maps of a sufficient quality that show the location of the project, proposed access routes and site details. Applications must also include a land title map identifying property ownership in the surrounding area.

- **Location Map** – 1:50,000 scale showing access and location with respect to local communities and drainages
- **Access Map** – 1:20,000 scale TRIM map showing existing and/or proposed access routes, proposed mine site with primary features (excavation area, stockpile area, processing area), proximity to water courses, and important topographical features of the proposed mine and surrounding area
- **Site Map** – 1:5,000 or greater scale showing details of all pertinent features of the proposed mine
- **Land Title Map** – Proponents must include a land title map of adequate scale for legal identification of subject property and surrounding parcels

5.5 Consultation and Community Engagement Documentation

This section summarizes the proponent's past and proposed public consultation initiatives. First Nations engagement is also included in this section, as well as documentation of consultations with federal, provincial and local government agencies. Consultation and community engagement documentation might include the following:

- A brief description of the outreach and consultation efforts undertaken with the public, First Nations and government agencies prior to submitting the application
- A description of any consultation or business agreements reached with First Nations potentially affected by the project (excluding confidential information)
- An indication of the degree to which issues are considered resolved or addressed by the proponent and other parties
- A description of the public and First Nations engagement and consultation programs proposed for the application review stage (i.e., the stage which follows acceptance of a permit application)
- Documentation of the proposed process for attempting to resolve outstanding issues

5.6 Mine Plan

The mine plan will form the basis of the mine permit application. A thorough, well-prepared mine plan will result in a more timely approval of the permit application. A mine plan should include the following key components:

a) Site Plan Requirements (General)

Include documentation of the following:

- property boundaries
- access roads
- location of all structures and wells on neighboring properties within 300 metres of the property line
- watercourses
- current land uses adjacent to property (e.g., forestry, residential, farms, etc.)
- elevation contours at five metres or less

b) Mine Plan (Specific)

Include documentation of the following:

- final boundaries of excavation
- buffer zones and setbacks
- area of initial excavation and progression of mining
- plan of progressive reclamation
- final configuration after reclamation

c) Locations

Describe the onsite locations of the following:

- topsoil, subsoil and overburden storage areas
- oversize and product stockpiles
- processing site
- waste and process water management facilities (e.g., settling ponds)
- weigh scale
- fuel and lubricant storage
- sanitary facilities
- any buildings
- stormwater, wastewater, and erosion control, storage and treatment systems

- permanent water-control structures require professional design.
- dry or intermittent water courses must be located and taken into account in the mine plan.
- noise berms (including a description of design particulars, proximity to noise source, height and construction materials)
- vegetated buffers
- water source(s)

d) Cross Sections

- Provide at least one longitudinal cross section and one (or more if directed) lateral cross section at 1:5,000 or greater scale showing the original land surface, typical configuration during mining with slope angles and benches, and final configuration on completion of reclamation.
- The maximum excavation extents, sequence and method of mining, and the final reclaimed configuration must be shown on the sections.
- Information from test pits or drilling on soil horizons such as clay, till fines sands and perched water tables shall be shown. The mine plan shall take problematic soils into account.

e) Property Description

- Provide the following information about the mine property:
 - address (if applicable)
 - property owner's name
 - legal description
 - size (in hectares)
- If directed, a legal survey of the mine property may be required.

f) Material Quality and Quantity

- Describe the type and volume of material to be excavated, and how volume estimates were arrived upon.

g) Mining Method

Include documentation of the following:

- A development schedule which shows how and what method will be used to remove overburden (i.e., type of equipment, such as loader or excavator, to be used)
- Configuration of the pit (e.g., pit slope angle, mining face height and angle, bench spacing and width, etc.)
 - Should be shown in the mine plan and sections

- Haul roads
 - Provide the methods to be followed in the construction of haulage roads. Design parameters of the pit haul roads in terms of gradient, stabilized running surface, height of shoulder barrier
- Traffic plan
 - Provide a traffic control plan showing the maximum allowable speeds for the vehicles in use, rules for passing, “stop” and “yield” locations, priority rules for various vehicles, rules for night operation, maximum operating grades, emergency run-off protection, shoulder barriers, and any other information required by MEMPR.
- Open pit design
 - Preliminary pit slope designs are required for initial permitting based on available information obtained from boreholes, test pits, and nearby rock cuts or natural outcrops.
 - Pit slopes are required for phased pit expansions using the detailed geology and geotechnical information obtained from exposed pit slopes, additional geotechnical boreholes, and experience with the interim walls.

h) Processing

- Include a description of the products expected to be produced, the proposed method of processing (e.g., crushing, screening, washing, etc), and proposed types of equipment that are to be used.
- Indicate if processing will be continuous with respect to excavation or in batches from time to time.
- If batch processing, indicate if processing equipment will be left on site between batches.
- Note that all machinery must comply with the HSRC, but trucks used only to haul product from the site are not considered to be mining equipment and are not subject to the equipment standards provisions of the Mines Act and HSRC.

i) Soil Salvage and Stockpiles

- Identify any soil storage locations, configurations, and anticipated volumes.
- Soil salvage, storage and replacement should be based on information collected, including descriptions of soils, depth to be salvaged, erosion and sediment control, and anticipated volumes of each soil type.
- Soil compaction and other activities that destroy soil structure should be avoided.

j) Additional Mine Site Infrastructure

- Any additional mine site structures, including on-site accommodations and offices, must be described in terms of location and construction. Items of particular relevance to the reclamation plan are locations, foundations, and nature of construction (e.g., movable modular units or “permanent” structures).

k) Noise Impacts

- Describe the potential noise impacts of the operation and what measures are proposed to minimize these impacts.
- For quarries, describe the type of drills, blast pattern and frequency, and measures to mitigate blast effects.
- A notification plan for neighbours living within a specific radius from the quarry may be required.

l) Dust Impacts

- Describe the potential impacts of dust generated on the sites, especially potential impacts on adjacent properties, and describe what measures are proposed to minimize dust impacts.

m) Geotechnical Considerations

- British Columbia’s predominantly mountainous terrain has historically resulted in pit and quarry operators tending to work from the most easily accessible portion of the deposit, usually the toe of a slope. This practice can sometimes lead to future negative events, including geotechnical failure, with considerable future mitigation and expenses required.
- APPENDIX 3 provides guidance on the development of mine plans for different types of terrain.

n) Groundwater Impacts

- Information will be required to demonstrate the proximity of the proposed excavation to the water table.
- The operator must be aware of the possibility of perched water tables bounded by hard till or clay/silt layers.
- The inspector may require a professional estimate of the winter high water table if the excavation is likely to approach that level.
- Excavations below the water table will require special approval.

o) Groundwater Mitigation and Control

- Describe potential impacts of the proposed operation on groundwater quantity and quality.
- If there are nearby wells or down slope water users, a hydrogeological study to assess potential impacts and recommend mitigative measures will be required.
- Depending on known soil types and/or terrain, a slope stability analysis, which will be used in the mine plan to mitigate groundwater and surface water effects on slope stability, may be required.

p) Surface Water Management

- List the number of settling ponds and provide description of the water source, proposed dimensions and construction methods for each pond.
- If constructing a dam or dyke, indicate what the height of the dam or dyke wall will be, and what materials will be used for construction.
- Indicate whether or not water will exfiltrate into the ground or will be decanted to a watercourse. Describe the decant structure if one is required.
- Describe how extreme rainfall events will be managed.

q) Erosion Control and Sediment Retention Plan

- Describe how erosion will be prevented/minimized during construction and throughout the mine life, and how any detached sediment release will be contained within the mine site.
- A potential for erosion will result from surface disturbance and exposure during development activities. The proponent should be adequately prepared to respond both with knowledge and materials (e.g., seed, fertilizer, silt fences, settling ponds, flocculants).
- Erosion control/sediment removal plans are required for disturbed surfaces and soil stockpiles.
 - List the equipment that will be used for pond cleaning.
 - The ground must be stable enough for the proposed works.
 - A report on the structural stability of an existing pond may be required.
 - New impoundment structures may require a design from an appropriate qualified professional.

r) Metal Leaching and Acid Rock Drainage (ML/ARD)

- Hard-rock quarry applications must include a ML/ARD geochemical prediction of all materials exposed, disturbed or created during mining, in

accordance with the “Policy for Metal Leaching and Acid Rock Drainage at British Columbia Mine Sites” (BCMEMP and BCMELP, 1998) and the “Guidelines for Metal Leaching and Acid Rock Drainage at Mine sites in British Columbia” (Price and Errington, 1998).

s) Reclamation Cost Estimates and End Land Use

- Describe the intended land use of the mine site upon completion of mining. Proponents should be aware of the local land use zoning for the area and whether or not the intended end land use is consistent with the zoning.
- A reclamation cost estimate is required for all phases of mine development and closure. These cost estimates form the basis of the timing and size of securities required as a condition of the Mines Act Permit.
- Reclamation cost projections must normally include, but are not necessarily limited to, the following:
 - site preparation
 - revegetation and fertilization
 - disposal of structures and equipment
 - construction of spillways, diversions and other water management structures
 - removal of culverts
 - disposal of fuel, contaminated soils, and toxic materials
 - long-term maintenance and monitoring programs
 - mobilization and demobilization
 - engineering re-design costs

6.0 WORKER SAFETY

The Health, Safety and Reclamation Code for Mines in British Columbia specifies all health and safety requirements for mines in this province. Mine managers, supervisors and workers must know and meet these requirements at all times on all mine sites.

6.1 Key Requirements for Worker Safety

Each mine must have a comprehensive safety program that addresses key requirements, including the following:

- first aid and emergency response plans
- personal protective equipment
- training programs that ensure all workers are properly trained for their jobs, including being trained in all emergency response procedures
- training in the Workplace Hazardous Materials Information System (WHMIS) for workers exposed to or handling hazardous substances
- fall-arresting devices and guardrails on elevated work structures
- guards and protective structures on moving parts, including conveyors
- protection on moving equipment such as rollover protective structures and back up warning systems
- fire protection for buildings, equipment and machinery, including fire extinguishers
- ventilation and monitoring requirements for exhaust and other gases
- British Columbia Building Code and Canadian Electrical Code requirements for all buildings, equipment and machinery
- signage requirements at mine access points
- gates, fences, signs or other barriers to ensure the mine site is secure against unauthorized and/or accidental entry
- marking and maintaining the legal mine property boundary
- maintaining the pit face height not more than 2 metres above the reach of loading equipment
- removing trees and vegetation within 2 metres of the face rim
- eliminating vegetation and aggregate material that overhangs the face
- ensuring that all haul roads conform to mine road specifications
- ensuring all slopes and materials are left in a stable state during any temporary shutdown or closure
- ensuring the mine site is not used for any purpose other than mining

APPENDIX 1: MINE PROJECT THRESHOLDS FOR BCEAA REVIEW

Project Category	New Project	Modification of Existing Project
<p>Coal Mines SIC code 063</p>	<p>Criteria:</p> <p>A new mine facility that, during operation, will have a production capacity of $\geq 250,000$ tonnes/year of clean coal or raw coal or a combination of both clean coal and raw coal.</p>	<p>Criteria:</p> <p>Modification of an existing mine facility that meets new project criteria, with either a 50% or more increase in area of mining disturbance, or 750 ha or more new disturbance.</p>
<p>Mineral Mines</p>	<p>Criteria:</p> <p>A new mine facility that, during operations, will have a production capacity of $\geq 75,000$ tonnes/year of mineral ore.</p>	<p>Criteria:</p> <p>Modification of an existing mine facility that meets new project criteria, with either a 50% or more increase in area of mining disturbance, or 750 ha or more new disturbance.</p>
<p>Sand and Gravel Pits SIC code 082</p>	<p>Criteria:</p> <p>A new pit facility that will have a production capacity of</p> <ol style="list-style-type: none"> 1. $\geq 500,000$ tonnes/year of excavated sand or gravel or both sand and gravel during at least one year or its operation; or 2. over a period of ≤ 4 years of operation, $\geq 1,000,000$ tonnes of excavated sand or gravel or both sand and gravel. 	<p>Criteria:</p> <p>Modification of an existing mine facility that meets new project criteria, with a 35% or more increase in area of mining disturbance than was previously permitted.</p>

Project Category	New Project	Modification of Existing Project
<p>Placer Mineral Mines</p>	<p>Criteria:</p> <p>A new mine facility that, during operations, will have a production capacity of $\geq 500,000$ tonnes/year of paydirt.</p>	<p>Criteria:</p> <p>Modification of an existing mine facility that meets new project criteria, with a 35% or more increase in area of mining disturbance than was previously permitted.</p>
<p>Construction Stone and Industrial Mineral Quarries</p>	<p>Criteria:</p> <p>A new quarry facility or other operation that</p> <ol style="list-style-type: none"> 1. involves the removal of construction stone or industrial minerals or both; 2. is regulated as a mine under the Mines Act; and 3. during operations, will have a production capacity of $\geq 250,000$ tonnes/year of quarried product. 	<p>Criteria:</p> <p>Modification of an existing mine facility that meets new project criteria and will result in either of the following amount or disturbance to land not previously permitted:</p> <ul style="list-style-type: none"> • an area of at least 750 hectares; or • an area that represents at least 50% of the land previously permitted.

APPENDIX 2: REGULATIONS AND IMPORTANT STATUTES

The following list of acts, regulations, and statutes may be relevant to the operation of gravel pits and quarries in British Columbia. Some key sections of legislation affecting pits and quarries are briefly summarized.

Provincial Acts and Regulations

To view applicable British Columbia legislation, please see the BC Laws website, which provides free public access to B.C. Statutes and Regulations:

Agricultural Land Commission Act

This act, which is administered by the Agricultural Land Commission, Ministry of Agriculture and Lands, applies to the use and protection of agricultural land in B.C.

Environmental Assessment Act

This act is administered by the Ministry of Environment (MoE) and applies to major projects in the province of B.C. which may have an environmental impact. These projects must undergo an environmental assessment review process.

- Sections 5 and 6 of Part 2 state that projects may be designated as requiring review under the Act according to certain criteria; this may include gravel pits.
- Section 8 of Part 2 requires the proponent of a reviewable project to apply for a project approval certificate.

Environmental Management Act

This act, administered by MoE, applies to all sites where chemical storage, hydrocarbon storage or usage, herbicides, pesticides, salt or other contaminants are or were contained within the pit boundaries. This act also contains the Contaminated Sites Regulation, Special Waste Regulation, and the Asphalt Plant Regulation.

Forest Act

This act, administered by the Ministry of Forests and Range (MoFR), applies to land and forest use in B.C.

- Section 45 sets out the use of forest land for mineral claim.
- Sections 115, 119, and 121 deal with the use and construction of roads and rights of way for access and removal of timber.

Forest Practices Code of British Columbia Act

This code, administered by MoFR, governs the planning and management of B.C.'s forest resource so that commercial use is fairly balanced with requirements for silviculture and recreation, and the preservation of biodiversity and cultural heritage.

Heritage Conservation Act (and Bill 21 Amendments)

- Section 1 defines heritage sites, objects, and artifacts.
- Section 13 prohibits the excavation, alteration, or damage of a heritage site except with a permit issued under Sections 12 or 14.

Land Act

This act is administered by the Ministry of Agriculture and Lands (MAL) and applies to disposition, disposition processes and surveying of Crown land.

- Section 11 authorizes the Minister to dispose of Crown land.
- Section 16 allows the Minister to withdraw Crown land from disposition, as well as amend or cancel the withdrawal.
- Section 19 states that Crown land cannot be disposed of by a Crown grant if it is suitable for mining or quarrying, including the removal of sand, gravel and products for road construction.
- Section 28 states that leases or other dispositions granted for mining and quarrying may require a payment for material removed from the land.
- Section 32 sets out the procedure for applying for a land disposition (e.g., applicants may be required to publish a notice of their application).

Local Government Act

This act, administered by the Ministry of Community and Rural Development, applies to removal of soil, nuisance disturbances, and land use within B.C. municipalities.

- Municipal planning or engineering departments can provide information on applicable Soil Removal and Deposit Bylaws.

Mineral Tenure Act

This Act is administered by MEMPR and applies to exploration, claims, and production of defined materials.

Mines Act

This Act, administered by MEMPR, applies to all mines in BC through all phases from exploration to reclamation and abandonment.

- Section 10 states that a permit is required to operate a mine, and sets out some conditions of such a permit.
- Section 15 states that mines can be inspected at any time by a MEMPR inspector.
- Section 34 sets out the mandate of the health, safety, and reclamation code committee, which enforces the HSRC (2003).

Health, Safety and Reclamation Code for Mines in British Columbia

This Code applies to all mines in B.C. and is issued under the Mines Act.

- Parts 1–3 outline the occupational health, emergency preparedness and other general rules that must be followed and in place for the operation of a mine.
- Part 4 sets out the standards and requirements for buildings, machinery, and equipment on a mine site.
- Part 5 sets out the standards and requirements for electrical systems on a mine site.
- Part 6 outlines mine design specifications and procedural requirements for operating a mine.
- Part 10 deals with reclamation and closure requirements for mine sites. Part 10 also outlines mine plan and mine permit application requirements.

Mining Right of Way Act

This act is also administered by MEMPR and applies to the acquisition and use of right-of-way to access mines in B.C.

Motor Vehicle Act

This act is administered by MoT and applies to the licensing of vehicles for operation on highways and roads within B.C.

Park Act

This act, administered by MoE, applies to the establishment and administration of parkland in B.C.

- Section 16 states that parks cannot be used for any industrial purpose, including mining, without a permit.

- Sections 20 and 21 allow the issuance of park use permits under certain conditions.

Transportation Act

This act administered by MoT, applies to the establishment and use of highway right-of-ways, the taking of gravel, and compensation.

- Section 9 sets out compensation for land used for highways, gravel, sand, stone, and other materials taken from land.
- Section 62 states that it is an offence to excavate in or under highways without a permit from the Minister.

Water Act

This act is administered by the Water Stewardship Division of the Ministry of Environment.

Weed Control Act

This act is administered by MAL and applies to the control of noxious weeds in B.C.

- Section 2 states that land occupiers must control noxious weeds growing on the land.
- Sections 7 and 8 state that inspectors may enter the land to control noxious weeds and bill the land occupier for the costs.

Federal Acts and Regulations

Canada Water Act

This act is administered by Environment Canada for the protection of water quality.

- Section 9 prohibits the deposit of any waste, including overburden, silts, sands, or gravel, into water bodies composing a water quality management area.

Fisheries Act

This act, administered by Fisheries and Oceans Canada, protects fish and fish habitat, and includes measures to protect against the deposit of deleterious substances.

- Section 32 states that no person shall destroy fish by any means other than fishing except as authorized by the Minister.
- Section 34 requires that no deleterious substances that may be harmful to fish, such as sands, gravels, silts or clays, be placed in water.

- Section 35 states that no person shall carry on any work or undertaking that results in the harmful alteration, disruption or destruction of fish habitat.

Navigable Waters Protection Act

This act, also administered by Fisheries and Oceans, applies to navigable waters in Canada.

- Section 5 states that no work can be done in, over, under, through, or across any navigable water without the approval of the Minister and under certain conditions.
- Section 22 prohibits the dumping of gravel, stone, earth, or any other material or rubbish into navigable waters.

Canadian Environmental Assessment Act

Administered by the Canadian Environmental Assessment Office, this act applies to proposed projects through four types of environmental assessment:

- screenings (http://www.ceaa.gc.ca/010/basics_e.htm#screening), including class screenings (http://www.ceaa.gc.ca/010/basics_e.htm#class)
- comprehensive studies (http://www.ceaa.gc.ca/010/basics_e.htm#comp)
- mediations (http://www.ceaa.gc.ca/010/basics_e.htm#mediation)
- review panels (http://www.ceaa.gc.ca/010/basics_e.htm#panel)

Unlike British Columbia, the federal system relies on individual departments, or Responsible Authorities, (e.g., Environment Canada, DFO) to make decisions with respect to scope of projects and/or whether a project is in or out of the CEAA process.

APPENDIX 3: CONTACT INFORMATION

For more information or direction regarding the requirements for Mines Act Permit applications, please contact the Mining and Minerals Division of the Ministry of Energy, Mines and Petroleum Resources:

Mailing Address: 7th Floor - 1675 Douglas Street, Victoria, BC
PO Box 9320, Sta Prov Govt, Victoria, BC V8W 9N3

Phone: (250) 952-0492

Fax: (250) 952-0491

Website: <http://www.empr.gov.bc.ca/mining/>

Contact List for Regional Offices

<p>Northwest Region</p> <p>Bag 5000 3793 Alfred Avenue Smithers, BC V0J 2N0</p> <p>(250) 847-7383 (250) 847-7603 (Fax)</p> <p>Northwest Mine Development Review Committee</p>	<p>Southeast Region</p> <p>2nd Floor, 42 – 8th Avenue South Cranbrook, BC V1C 2K3</p> <p>(250) 426-1557 (250) 426-1652 (Fax)</p> <p>Fernie Field Office PO Box 1000 401 – 4th Avenue Fernie, BC V0B 1M0</p>
<p>Central/Northeast Region</p> <p>#350 – 1011 Fourth Avenue Prince George, BC V2L 3H9</p> <p>(250) 612-7232 (250) 656-6629 (Fax)</p> <p>Northeast Mine Development Review Committee</p> <p>Omineca Mine Development Review Committee</p>	<p>(250) 423-1709 (250) 423-3194 (Fax)</p> <p>Kootenay Mine Development Review Committee</p>
<p>South Central Region</p> <p>162 Oriole Road Kamloops, BC V2C 4N7</p> <p>(250) 371-6069 (250) 371-6070 (Fax)</p> <p>South Central Mine Development Review Committee</p>	<p>Southwest Region</p> <p>7th Floor - 1675 Douglas Street, PO Box 9320, Sta Prov Govt, Victoria, BC V8W 9N3</p> <p>(250) 952-0473 (250) 952-0481 (Fax)</p> <p>Vancouver Island Mine Development Review Committee</p> <p>Lower Mainland Mine Development Review Committee</p>

APPENDIX 4: TERRAIN FEATURES TO CONSIDER

Terrain Class	Slope Classes	Features	Mine Plan Specifics	Survey Mine Plan Preparation
I	0%–20%	<ul style="list-style-type: none"> Flood plains and wide valley bottoms. Well drained deposits. 	<ul style="list-style-type: none"> Generally the pit or quarry will be a sinking excavation. Staking or marking of boundaries, face heights and acceptable excavation slope angles. 	<ul style="list-style-type: none"> An engineered design will not usually be required. A survey is not usually required unless operations are adjacent to a property line.
II	20%–40%	<ul style="list-style-type: none"> Mostly gently sloping, poorly to well drained landforms. Moderately sloping, well to rapidly drained deposits 	<ul style="list-style-type: none"> Staking or marking of property and excavation bounds; face heights; mining sequence; acceptable excavation slope angles; final reclamation slopes; proximity to adjacent bodies of water, public and private infrastructure 	<ul style="list-style-type: none"> An engineered design may be required, depending on the site specifics. A survey is usually required, along with plan and section drawings based on the survey. A detailed terrain stability assessment will not usually be required.
II to III	40%–60%	<ul style="list-style-type: none"> Level to gently sloping, imperfectly or poorly drained marine clays or lacustrine deposits. Moderately sloping, imperfectly to poorly drained deposits that are not marine or lacustrine. Moderately sloping, deeply gullied surficial deposits that are not lacustrine or marine. 	<ul style="list-style-type: none"> Access to the deposit. Mining methods which sequence the excavation from the top of the deposit or other convenient and stable break in the slope. Staking or marking of property and excavation bounds; face heights; mining sequence; acceptable excavation slope angles; final reclamation 	<ul style="list-style-type: none"> An engineered design based on good topographical and subsurface soil and/or geological structural information is required. A survey is required to provide the detailed topographical information. An exploration program consisting of an organized series of test pits for unconsolidated material, or test drilling for rock

			<p>slopes; proximity to adjacent bodies of water and public and private infrastructure</p> <ul style="list-style-type: none"> • Site drainage and erosion control. • Avoidance of channels or gullies which may carry intermittent flows of water, unless diversion works can be constructed. 	<p>quarries carried out under the supervision of the design engineer, may be required depending on site and program specifics.</p> <ul style="list-style-type: none"> • A detailed geotechnical site assessment by a qualified person may be required.
IV	60%–70%	<ul style="list-style-type: none"> • Steeply sloping, well drained, deeply gullied deposits. • Steeply sloping, poorly drained deposits. • Moderately sloping, deeply gullied or imperfectly to poorly drained lacustrine or marine deposits. 	<p>Same as Class III with the following additions:</p> <ul style="list-style-type: none"> • Only mining methods which sequence the excavation on a lift by lift basis, from the top of the deposit or other convenient and stable break in the slope, will be considered. • Overall long-term slope stability and erosion control will be in the mine plan. 	<p>Same as Class III with additions:</p> <ul style="list-style-type: none"> • A detailed topographical survey is mandatory. • A property/boundary survey may be required. • A detailed geotechnical site assessment by a suitably qualified person is mandatory.
V	>70%	<ul style="list-style-type: none"> • Any area where natural landslide scars are visible on air photographs or in the field. • Very steeply sloping, imperfectly to poorly drained, deeply gullied deposits. 	<ul style="list-style-type: none"> • Proposals for aggregate pits and rock quarries in these areas will not be considered. 	