Directive 091

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Rock-Hosted Mineral Resource Development

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Abbreviations

ACO	Aboriginal Consultation Office
AEPA	Alberta Environment and Protected Areas
AER	Alberta Energy Regulator
BA	business associate
EIA	environmental impact assessment
EPEA	*Environmental Protection and Enhancement Act*
FNC	file number for consultation
HLF	heap leach facilities
HLP	heap leach pads
MIMER	*Metallic and Industrial Minerals Exploration Regulation*
MMA	*Mines and Minerals Act*
MRDA	*Mineral Resource Development Act*
PLA	*Public Lands Act*
PLAR	*Public Lands Administration Regulation*
REDA	*Responsible Energy Development Act*
RMR	*Rock-Hosted Mineral Resource Development Rules*

1 Introduction

1.1 Purpose of This Directive

This directive sets out the Alberta Energy Regulator (AER) requirements for developing **rock-hosted mineral resources**. The requirements apply to the entire life cycle of rock-hosted mineral resource development: initiation, construction, operation, and closure. This directive is made under the *Mineral Resource Development Act* (*MRDA*) and forms part of the *Rock-Hosted Mineral Resource Development Rules* (*RMR*).

Unless otherwise indicated, the word "mineral" (singular or plural) in this directive refers to rock-hosted mineral resources, and mineral resource development refers to a rock-hosted mineral resource development. The word "project" in this directive is used interchangeably with "mineral resource development."

In this directive, defined terms are set in boldface at first use, and the definitions are provided in appendix 1.

1.2 AER Requirements

In this directive, the term "must" indicates a requirement, while terms such as "should," "recommends," and "expects" indicate a recommended practice.

If a requirement applies at both the application stage and later in a development's life cycle, the requirement may refer to both the applicant and the permittee, licensee, or approval holder.

Each AER requirement unique to this directive is numbered in this directive.

1.3 Legislative Overview

When an application is filed with the AER, it must adhere to the appropriate requirements for developments as described in the *Responsible Energy Development Act* (*REDA*), the *MRDA*, the *Environmental Protection and Enhancement Act* (*EPEA*), the *Public Lands Act* (*PLA*), the *Water Act*, and the *Mines and Minerals Act* (*MMA*).

Applicants are also responsible for the requirements administered by federal, other provincial, or municipal agencies and are encouraged to contact them early in the planning process. Provincial and federal coordination is often necessary, not only during the permitting phase but also for regulatory oversight of the operations phase. For example, the following enactments and policies may also apply:

- (Alberta) *Occupational Health and Safety Act*
- Alberta's First Nations and Métis Settlements consultation and policies and guidelines on land

and natural resource management

- *Canadian Navigable Waters Act*
- *Fisheries Act*
- *Impact Assessment Act*
- *Metal and Diamond Mining Effluent Regulations*
- *Migratory Birds Convention Act*
- National Instrument 43-101, Standards of Disclosure for Mineral Projects (Alberta Securities Commission)
- *Nuclear Safety and Control Act*
- *Species at Risk Act*

Figure 1 shows the relationship of the various agencies that could potentially be involved in a mineral resource development approval.

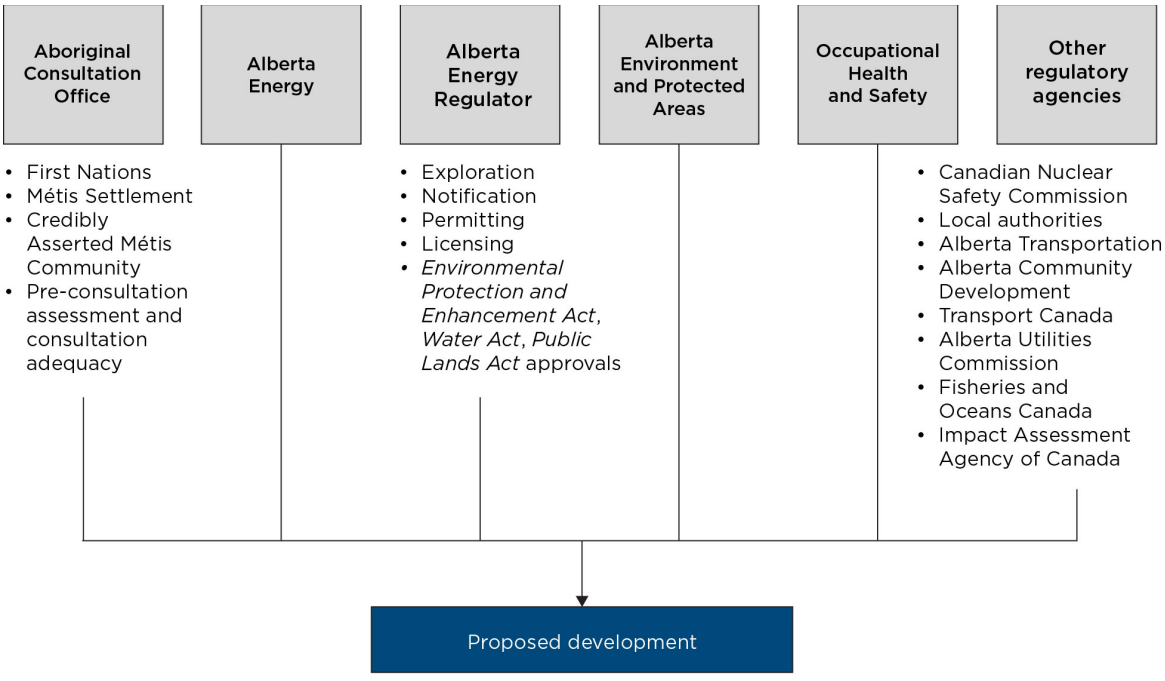

Figure 1. Agencies potentially involved in rock-hosted mineral development approval

1.3.1 *Responsible Energy Development Act*

The AER was established under *REDA*; *REDA* and its associated rules and regulations define the AER's mandate, how we operate with other government agencies, and how we are expected to do our work. Basic requirements are defined in these enactments. For example, Part 1 of the *Alberta Energy Regulator Rules of Practice* sets requirements for public notice of application, statements of concern, and decisions on whether to hold a hearing for an application, among others. In addition, section 3 of the *Responsible Energy Development Act General Regulation* prescribes the factors the AER must consider when reviewing applications.

REDA and the *Specified Enactments (Jurisdiction) Regulation* give the AER authority to administer parts of the specified enactments: *EPEA*, *PLA*, *Water Act*, and Part 8 of the *MMA*.

1.3.2 *Mineral Resource Development Act*

The *MRDA* provides for the economic, orderly, efficient, and responsible development of Alberta's mineral resources in the public interest. The *MRDA* applies to all mineral resources recovered in Alberta and related wells, well sites, facilities, facility sites, **mines**, **mine sites**, **external mine discard dumps**, and **processing plants** throughout their life cycles.

The *RMR* details the AER's licensing and operating requirements, including requirements for recording, collecting, and reporting data for rock-hosted mineral resource development.

1.3.3 *Mines and Minerals Act*

The *MMA* provides the Government of Alberta with the authority to administer, allocate, and enter into agreements with respect to minerals. It applies to all mines and minerals and related natural resources belonging to the Crown. The Department of Energy and Minerals administers the *MMA* except for Part 8, which the AER administers along with the *Metallic and Industrial Minerals Exploration Regulation* (*MIMER*) in respect of mineral resources. The AER approves mineral resource exploration under *MIMER*.

1.3.4 *Environmental Protection and Enhancement Act*

EPEA is the primary act in Alberta through which regulatory requirements for air, water, land, and biodiversity are managed. *EPEA* supports and promotes the protection, enhancement, and wise use of the environment. *EPEA* refers to rock-hosted mineral developments as quarries.

The AER issues *EPEA* approvals for activities designated in the *Activities Designation Regulation* as activities requiring approval. An approval issued under *EPEA* identifies the approval holder's obligations and responsibilities for the design, construction, operation, and reclamation of a mineral resource development relative to air, water, land, and biodiversity.

Under *EPEA*, the AER conducts environmental assessment processes and issues approvals.

The environmental impact assessment process allows the AER to examine the effects a proposed project may have on the environment and determine if the project is in the public interest (see section 4.2).

An *EPEA* approval identifies the approval holder's obligations and responsibilities for effects on the environment resulting from the construction, operation, conservation, and reclamation of a project.

The AER also issues reclamation certificates for reclaimed specified land as defined in the *Conservation and Reclamation Regulation*. An *EPEA* reclamation certificate asserts that all reclamation requirements have been met. Only once an operator obtains a reclamation certificate can they end their surface lease or right of entry order. Partial reclamation certificates can be issued for portions of a rock-hosted mineral mine or rock-hosted mineral processing plant to support progressive, timely reclamation.

1.3.5 *Public Lands Act*

The *PLA* and the *Public Lands Administration Regulation* are provincial legislation that govern the use and allocation of public land. Under the *PLA*, the AER issues dispositions authorizing the use of public land.

The following dispositions are associated with mineral resource developments:

- metallic mineral exploration (MME) for exploration activities on public land
- mineral surface lease (MSL) for the mine site or a mine corridor (i.e., haul access road, conveyor, powerline, etc.)
- licence of occupation (LOC) for access roads, diversion structures, outfalls, intakes, and ponds
- miscellaneous lease (MLL) for storage sites

Purposes and activity types dictate the disposition type required. See the *Public Lands Administration Regulation (PLAR) Table A2 Alberta Energy Regulator (AER) PLAR Dispositions* and *PLAR Approvals and Authorizations Administrative Procedures*, Table C: Approvals and Authorizations.

1.3.6 *Water Act*

The *Water Act* is provincial legislation that supports and promotes the conservation and management of water in Alberta. Under the *Water Act*, the AER reviews applications and submissions for mineral resource development and associated water use. The AER ensures that companies use and manage water safely by

- reviewing and approving activities that occur in or near water bodies, including wetlands;
- issuing water licences and temporary diversion licences for operations that require water;
- requiring companies to have a licence before using surface water and groundwater; and
- allocating the amount of water companies can use.

Some activities present a lower level of environmental risk and impact. Consequently, standard requirements and operating practices are set out in codes of practice. The codes require approval holders to submit a notification instead of a *Water Act* application.

1.3.7 Dam Safety

The AER's dam safety program regulates energy resource-related dams under Part 6 (Dam and Canal Safety) of the *Water (Ministerial) Regulation*. In December 2018, Alberta Environment and Protected Areas (AEPA; formerly Alberta Environment and Parks) updated the regulation to include an *Alberta Dam and Canal Safety Directive*, which forms part of the regulation and provides details and requirements for the following:

- the use of qualified professionals and qualified individuals
- dam consequence classifications
- the use of risk assessments
- design, construction, and operation
- dam submissions for approval/authorization
- dam safety reporting
- dam safety and emergency management
- decommissioning, closure, and abandonment

The regulation and directive apply to all dams in Alberta—dams for energy resource activity or mineral resource development regulated by the AER and dams for other purposes regulated by the AEPA.

1.4 Compliance

Manual 013: Compliance and Enforcement Program outlines the AER's compliance assurance program. For more information, see Regulating Development > Compliance > Compliance Assurance Program on the AER's website.

1.5 Incidents and Required Reporting

The *RMR*, *EPEA*, *PLA*, and the *Water Act* all contain provisions for incident reporting.

1) The permittee, licensee, or approval holder must report all incidents, contraventions of an approval, and circumstances specified by enactment, permit, licence, or approval as reportable to the AER through the Energy and Environmental Emergency 24-Hour Response Line (1-800-222-6514).

   Permittees, licensees, and approval holders are expected be aware of the requirements to report incidents and other circumstances, as identified within their disposition conditions and any required reporting provisions in the applicable enactments.

2) The permittee, licensee, or approval holder must provide the AER a written follow-up report within seven days of a release to the appropriate field centre (see *Release Reporting Requirements* brochure under Regulating Development > Compliance > Release Reporting on the AER's website).

2 Liability Management

Security collection will be under *EPEA* through the *Conservation and Reclamation Regulation*.

The AER requirements for rock-hosted mineral mine liability management will ensure that at the end of a mining project's life, all infrastructure is removed from the landscape, and land is restored to an equivalent land capability.

3 Participant Involvement

3.1 What is Participant Involvement

Participant involvement is an umbrella term encompassing all interactions and communications with landowners, lessees, industry, regulators, Indigenous groups, and other groups or individuals with an interest or a stake in mineral or energy development. Effective participant involvement programs are critical to ensure an efficient regulatory process and promote long-term relationships between project proponents and participants, leading to more influence on mitigating development effects.

Common participant interests associated with surface and underground mining include effects on public safety, the environment, terrestrial and aquatic habitats, the burden on infrastructure and services, regional employment, and the economy.

The participant involvement requirements in this directive are in addition to the consultation requirements set out by the Aboriginal Consultation Office (see section 3.2).

3.1.1 Planning the Participant Involvement Program

The extent of the participant involvement program depends on the nature, size, and scope of the proposed project (i.e., project development footprint) and participant concerns.

3) A proponent must implement and document a participant involvement program to inform parties about the proposed mineral resource development project and address the concerns raised by the participants about the proposed project to the satisfaction of the participants.

4) The area in which the proponent must conduct the participant involvement program for the proposed project must include the project development footprint (as defined by the applicant) and the area within 1.5 kilometres (km) of the proposed permit boundary (collectively, the **participant involvement area**).

   The 1.5-kilometre radius surrounding the proposed permit boundary is the minimum radius. The proponent is responsible for determining whether the participant involvement area needs to be expanded.

5) The proponent must include all parties with a direct interest in the land and other parties who have a right to conduct an activity on the land.

6) The proponent must also include in the participant involvement program persons it is aware of who have concerns, regardless of whether they are inside or outside the participant involvement area identified in requirement 4.

   The proponent is expected to communicate with local **residents** and other operators and develop an effective participant involvement program engaging parties at an early stage of planning. The applicant is also encouraged to contact any synergy groups identified in the participant involvement area.

7) The proponent must attempt to address questions and concerns from interested parties raised throughout the project lifespan.

8) The proponent must document its efforts to address and resolve concerns and be prepared to provide detailed information about those efforts to the AER on request.

9) The proponent must develop and complete its participant involvement program before filing an application for a mineral resource development.

10) The proponent must prepare a project-specific information package about the proposed mineral resource development.

    Plan to distribute the information package well before submitting the application to provide recipients adequate time to review the package and address any issues. See section 3.1.2 for more information.

11) The proponent must **engage** with or notify other parties that express an interest in the proposed development, whether located inside or outside the participant involvement area identified in requirement 4 and allow them the opportunity to obtain information specific to the proposed mineral resource development and to understand its possible effects.

12) The proponent must document commitments made and have a process in place to monitor and follow up on commitments.

13) The proponent must consider timing constraints on the public (e.g., planting, harvesting, calving seasons, and statutory holidays).

14) The proponent must minimize the cumulative effects of mineral resource development and to show that they have applied good planning practices with respect to the public and the environment.

15) If the proposed development is part of a larger project, the proponent must discuss the entire project and explain how it complements other mineral and energy resource developments in the area.

16) During the planning of its participant involvement program, the proponent will have assessed its need to reach the broader public and may determine that an information session or public open-house meeting is required. When holding public meetings or open houses, the proponent must disclose the same project-specific information as it would to those involved in personal engagement and notification. However, information sessions or public open houses may not be a substitute for meeting engagement requirements. Contact the AER for advice on how best to proceed.

17) The proponent must assess the need to update its participant involvement program during the application process with consideration of providing an accurate project scope.

3.1.2 Distribution of the Information Package

18) The proponent must distribute the project-specific information package to persons with a known interest in the proposed project and the following parties within the participant involvement area:

    a) residents

    b) Indigenous groups

    c) municipal authorities

    d) Crown disposition holders within the project development footprint

    e) landowners and **occupants**

19) The proponent must make the information package available to persons who request it no later than ten days after receiving the request.

20) The proponent must allow participants at least 30 calendar days to receive, consider, and respond to notification of the proposed development and content of the information package.

    The proponent may not submit the application to the AER until the 30-day calendar period ends unless confirmation is obtained that there are no objections to the proposed application from any participant of the participant involvement program.

21) If the proponent is unable to engage with a particular party following reasonable efforts over the 30 days before submission of the application, the proponent

    a) may proceed with submitting its application to the AER and

    b) attempt to inform that party that further engagement will not be pursued before the application is submitted.

If a First Nations community, Métis Settlement, or credibly asserted Métis community is within the public involvement area, distribution of the information package to the Chief and Council or delegates of a First Nation community, Métis Settlement, or credibly asserted Métis community satisfies the need to provide an information package to the members of the First Nation, Métis Settlement, or credibly asserted Métis community.

3.1.3 Contents of the Information Package

22) The proponent must prepare a project-specific information package about the proposed mineral resource development that includes the following information:

    a) the applicant's name and contact information, including a phone number and at least one other means by which members of the public can contact the applicant

    b) an emergency contact phone number for the applicant

    c) a summary of the proposed mineral resource development, including a description of the following:

        i) the nature and purpose of the mineral resource development

        ii) the mineral resource activities and specified enactment activities constituting the development main components or infrastructure within the mineral resource development footprint

        iii) how the mineral resource development will be decommissioned and reclaimed

    d) maps that

i) clearly illustrate the expected size and location of the mineral resource development footprint and

ii) are at a scale and format sufficient to allow recipients of the information package to understand how they may be affected by approval of the proposed mineral resource development

e) a summary of the proposed mineral resource development, including the following:

i) the enactment under which the application will be made

ii) the relationship between the proposed application and the overall extent of the mineral resource development

iii) a summary of any potential effects (e.g., environmental, socioeconomic, noise, etc.) that may be expected resulting from approval of the proposed mineral resource development

f) an anticipated schedule, including the following:

i) submission of applications

ii) timing of construction

iii) duration of operations

iv) timing of decommissioning, closure, and abandonment

g) any other information as the AER directs in writing

The information package must provide sufficient detail to enable the recipient to reasonably assess whether they may be affected by approval of the proposed mineral resource development.

3.1.4 Statement of Concern

Filing a statement of concern is an opportunity for anyone who believes they may be directly and adversely affected by an application to share their concerns with the AER. A proactive and comprehensive participant involvement program allows project proponents to understand and potentially address concerns with their applications.

3.2 Indigenous Consultation in Alberta

23) The proponent must submit a preconsultation assessment request (assessment request) to the Aboriginal Consultation Office (ACO) early in the application process.

The ACO will review the assessment request and determine whether consultation is required. The ACO will provide the proponent with a file for consultation number (FNC). The ACO will review the information provided by the proponent and complete a preconsultation assessment. If it is

determined that consultation is required, the ACO will direct the level of consultation and identify which First Nations, Métis Settlements and credibly asserted Métis communities should be consulted.

Once the consultation has concluded, the proponent will submit their record of consultation to the ACO requesting an adequacy assessment. The ACO will review the record of consultation, and if consultation is adequate, the ACO will provide an ACO report. The proponent will need to include the FNC and ACO report when filing its application (see section 4.3).

For more information, see the Government of Alberta's Indigenous Consultation in Alberta website and Protecting What Matters > Giving Albertans a Voice > Indigenous Engagement > Aboriginal Consultations on the AER's website.

4 General Application Requirements

4.1 Overview

Applications for mineral resource developments are processed and reviewed according to statutory requirements and AER procedures. This section provides key information on these requirements and procedures, as well as recommended best practices. The AER's review of applications is most efficient when applicants understand and follow the requirements, procedures, and best practices.

An applicant is responsible for all aspects of application development (including addressing concerns raised through the participant involvement program and Aboriginal consultation as required) and document retention (e.g., consent or approval from other parties). An applicant is also responsible for portions of the application workflow (see section 4.5), including responding to supplemental information requests and addressing statements of concern. An applicant is responsible for work conducted on its behalf by contracted personnel.

An applicant must be eligible to acquire and hold energy licences and approvals for minerals-related activities. These requirements are in *Directive 067: Eligibility Requirements for Acquiring and Holding Energy Licences and Approvals*.

4.2 Preapplication Requirements

4.2.1 Activities Within an Approved Regional Land Use Plan Boundary

The AER is legally obligated to comply with any approved regional plans under the *Alberta Land Stewardship Act*. To ensure compliance, the AER requires any applicant seeking approval for an activity within the boundary of an approved regional plan to meet the requirements below.

24) Applicants seeking approval from the AER for an activity within the boundary of an approved regional plan as set out under the *Alberta Land Stewardship Act* must assess

a) whether the activity would be within the boundaries of a designated conservation area, a provincial park, a provincial recreation area, or a public land area used for recreation and tourism and, if so, whether the mineral rights associated with the activity are subject to cancellation;

b) whether the activity is consistent with the land uses established in the applicable regional plan or with any of the outcomes, objectives, and strategies in that same plan; and

c) how the activity is consistent and complies with any regional trigger or limit established under the management frameworks detailed under the applicable regional plan or any notices issued in response to the exceedance of a regional trigger or limit.

25) The applicant must retain sufficient information concerning requirement 24 and provide it to the AER on request unless otherwise indicated below.

26) The applicant must submit the information from requirement 24 to the AER if the proposed activity will be within the boundary of an approved regional plan and

a) is also within the boundaries of a designated conservation area, a provincial park, a provincial recreation area, or a public land area used for recreation and tourism;

b) is inconsistent with the land uses established in the applicable regional plan or any of the outcomes, objectives, and strategies in the plan; or

c) may result in the exceedance of a trigger or limit or contravene a notice issued in response to an exceedance of a trigger or limit.

27) If the applicant believes its proposed activity is permitted under the applicable regional plan because it is incidental to previously approved and existing activities, the applicant must submit to the AER information to support its position.

The AER has no authority to waive compliance with or vary any restriction, limitation, or requirement regarding a land area or land use under a regional plan. Applicants seeking such relief must apply directly to Alberta's Land Use Secretariat. The stewardship minister may, on application and by order, vary the requirements of a regional plan.

4.2.2 Environmental Impact Assessment

Activities that are designated as "mandatory" under the *Environmental Assessment (Mandatory and Exempted Activities) Regulation* or activities deemed to require further consideration under the environmental assessment process will require an environmental impact assessment (EIA) report. Environmental assessment is required where the complexity and scale of a proposed project, technology, resource allocation, or siting considerations create uncertainty about the exact nature of environmental effects or result in a potential for significant adverse environmental effects.

For more information on the EIA process, see Alberta's Environmental Assessment Process on the Government of Alberta's website.

28) Proponents planning a mineral resource development project must complete a project summary table and project location map to confirm whether the proposed project requires an EIA report. Submit the summary table (see Project Summary Table - Alberta Energy Regulator) and the map to environmental.assessment@aer.ca.

If an EIA report is required, information requirements are determined using the Environmental assessment program: standardized terms of reference.

29) The proponent must use the applicable standardized terms of reference as a template for the development of their project-specific terms of reference.

4.2.3 Other Preapplication Requirements

Applicants should contact the AER before submitting their application to discuss it with AER staff. Applicants can ask the AER at inquiries@aer.ca for direction on who to contact to arrange a preapplication meeting. The meeting can include such topics as

- permittee, licensee, or approval holder eligibility,
- acquisition of a **business associate (BA) code**,
- mineral rights,
- application type,
- project details,
- avoiding major deficiencies in applications,
- the participant involvement program,
- other agency consultation and approval requirements,
- issues around land titles and occupancy rights, and
- other issues of concern to the applicant.

30) Before filing a mineral resource development application with the AER, the applicant must

    a) obtain a business associate (BA) code and a licensee eligibility attribute from AER Corporate Compliance (see *Directive 067*);

    b) retain documentation to support the applicant's participant involvement program, including documentation of contact with or approval from other parties; and

    c) retain copies of all design work and other supporting documentation for the application.

4.3 File Number for Consultation Application Supplement

The FNC application supplement is a document that forms part of any application submitted to the AER under the specified enactments, except applications for those activities listed in appendix C of the consultation guidelines.

31) The applicant must include an FNC application supplement, where applicable, with the application.

    The file name of the supplement document should contain "FNC" and the date (e.g., FNC-Application-Supplement-YYYY-MM-DD).

32) If the proponent has either a decision by the ACO that no consultation is required or a preconsultation assessment and an ACO report (combined to form one document) indicating that consultation has been adequate, the proponent must submit the supplement with the application.

4.4 Application Submission

Applicants are encouraged, where possible, to submit a single, integrated application containing the applications for all activities regulated by the AER that are required over the life cycle of a mineral resource development project. By bundling all applications for a project into a single application, the AER can complete a single review of all proposed activities at the same time. For more information, see Home > Regulating Development > Project Application > Integrated Decision Approach > Integrated Applications for Major Projects on the AER's website.

33) All applications for mineral resource development are considered professional work products and must be authenticated by a qualified professional licensed to practise in Alberta, such as a member of the Association of Professional Engineers and Geoscientists of Alberta.

By following the application document submission requirements, the applicant will facilitate an efficient review of the application. The AER will not consider an application administratively complete until the documents submitted meet the submission requirements. Administratively incomplete applications will not be registered nor eligible for technical review.

34) The application must include the following:

    a) the name and address of the applicant

    b) the location, capacity, and size of the activity to which the application relates

    c) the nature of the activity or, in the case of an amendment, the change to the activity (e.g., addition or deletion)

d) disclosure of any other approvals from a regulator or agency (see the legislative overview in section in 1.3) concerning the application and the date on which the approval was issued

e) unlocked (i.e., no security) PDF versions of application documents (the AER must be able to search, copy, paste, and print the PDF)

35) Maps and figures must be of sufficient resolution to be legible and include the following:

a) legal subdivision (LSD; i.e., section, township, range, and meridian), where scale allows

b) a north arrow, annotated NAD83 10TM/UTM coordinate systems, annotated contour lines, a legend, and scalable

c) the Alberta township survey legal land description for figures showing proposed approval boundaries or reclamation certificate boundaries

d) lands extending a minimum of 500 m beyond the proposed disturbance area for plan view and representative cross-section figures

e) cross-sections must include an accompanying plan view that shows the cross-section locations and must include the following:

i) representations of original ground, approved design, proposed design, reclaimed surface, and as-built surfaces

ii) vertical and horizontal scales

iii) dimensions of all displayed infrastructure

iv) all underground mine layout figures must include annotated contour lines showing

- the complete depth of cover, including representation of the 50 m depth of cover
- the 100 m horizontal buffer off the mineralization outcrop or subcrop (surface contact)

36) The applicant must provide shapefiles for maps and figures, as applicable, supported by the Environmental Systems Research Institute (ESRI) ArcView products.

37) Applicants must submit mineral resource development applications (including applications related to the *MRDA*, *EPEA*, the *PLA*, and the *Water Act*, including for temporary diversion licences) under one applicant company name to MRDAMine.Application@aer.ca. *PLA* and *Water Act* applications must also be submitted through OneStop.

Under the *Water Act*, the AER can issue multiyear water licences and temporary diversion licences for mineral resource developments.

38) *Water Act* applications must be in PDF format and include the following:

a) the location of the activity

b) the diversion volume or activity storage capacity and size

c) type of diversion or activity

d) the requested water amount based on present and reasonable need

e) an account of any public consultation carried out or proposed by the applicant

Applicants should place electronic versions of their applications on their websites.

Applicants may withdraw an application at anytime.

Applicants can review the status of their submitted *MRDA* applications or applications bundled with an *MRDA* application using the Integrated Application Registry query tool available on the AER's website under Systems and Tools > Digital Data Submission (DDS). For all other application types, please contact the AER.

4.5 Application Workflow

Upon receipt of an application, the AER checks it for administrative completeness against the application requirements presented in this directive. Administratively incomplete applications are returned to the applicant and are not registered. Administratively complete applications are registered by the AER and will follow the application workflow shown in figure 2.

Administratively complete applications are forwarded to the appropriate subject matter experts for technical review.

4.6 Technically Incomplete Applications

Applications that do not include the required technical information (i.e., have significant technical deficiencies) will be closed. The AER will notify the applicant in writing that the application is closed and the reason for the closure. Closed applications are not returned to the applicant.

Applications with minor technical deficiencies will proceed through technical review. The AER will issue supplemental information requests and a response deadline to the applicant. An application may be deemed technically incomplete if the applicant does not provide the requested information by the deadline and may be closed.

If an application is closed, the applicant may reapply by submitting a new, complete, and accurate development application.

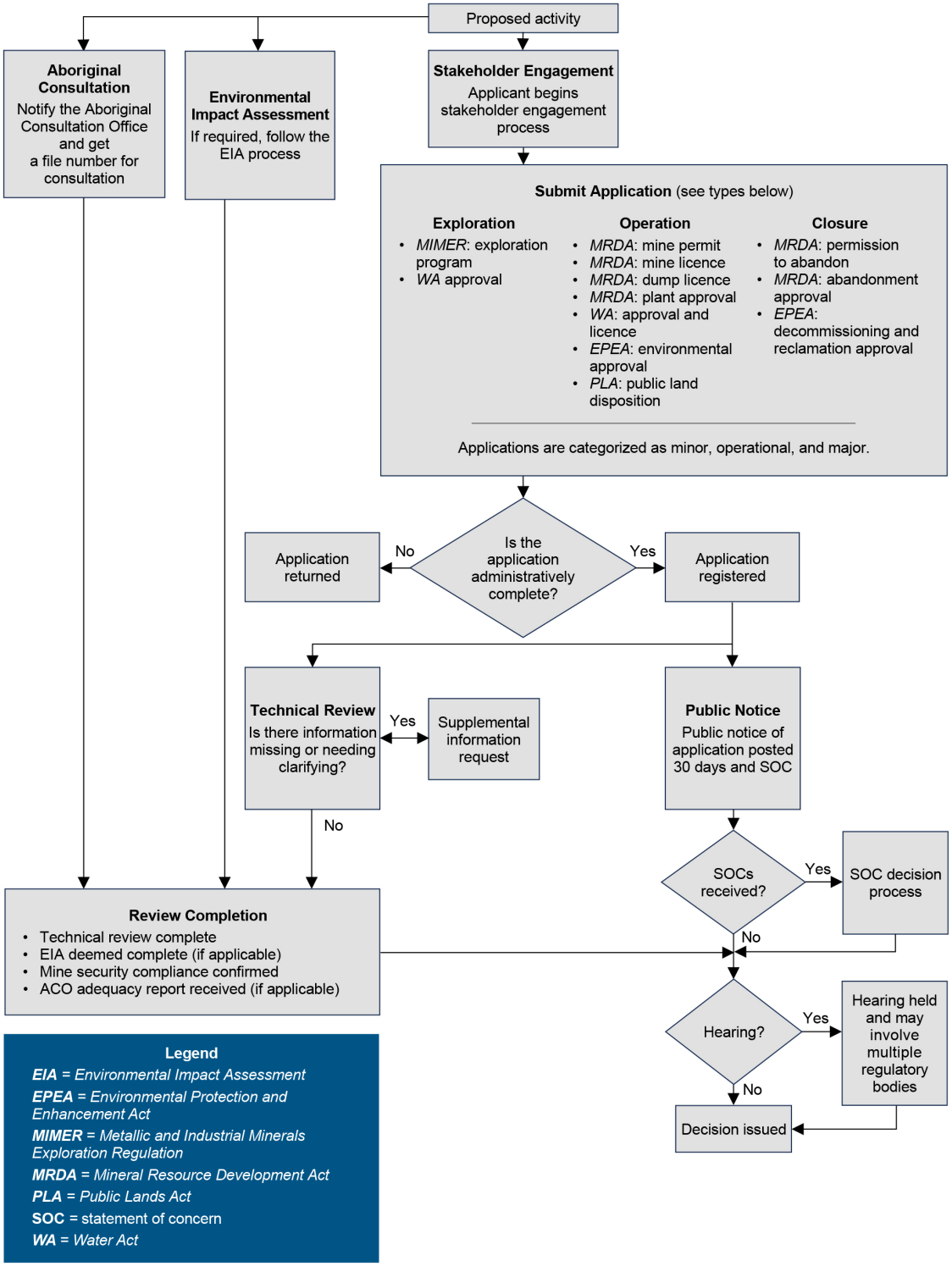

Figure 2. Rock-hosted mineral application workflow

5 Exploration Disposition Requirements

An exploration disposition under the *Metallic and Industrial Minerals Exploration Regulation* (*MIMER*) is required to carry out

- any investigation, work, or act to determine the presence of a mineral resource that, in the AER's opinion, results in a surface disturbance and
- any operations that are preparatory to or otherwise connected with such operations that, in the AER's opinion, have the potential to cause a surface disturbance, but not operations exempted from Part 8 of the *MMA* by the *Exploration Regulation* or by section 2 of *MIMER*.

39) Applicants must meet the requirements in *MIMER* and provide the AER with the information required under section 3(1) of the *Alberta Energy Regulator Rules of Practice*.

40) Under *EPEA*, an operator of a mineral resource exploration operation must conserve, reclaim, and obtain a reclamation certificate for the land that is being or has been used or held for or in connection with the conduct or reclamation of a mineral resource exploration operation.

41) Applications must be in a format acceptable to the AER.

6 *MRDA* Application Classification

The AER will categorize all applications submitted under the *MRDA* for new mining projects or amendments to existing permits, licences, and approvals, including for the resumption of operations at a suspended site or closure of the site. The AER recognizes that *MRDA* applications will vary in complexity, resulting in application-specific processing timelines. An application is categorized based on the uncertainty associated with the proposed technology and the risks to safety, resource conservation, environmental conditions, and stakeholder interests. These factors will determine the processing timeline:

- **Major**: Applications for new activities or amendments to approved activities that are expected to have material and adverse effects on safety, resource conservation, environmental conditions, socioeconomic conditions, and stakeholder interests are categorized as major.
- **Operational**: Applications for changes to approved activities that may affect resource conservation or involve significant modifications but are not expected to affect stakeholders or alter the environment and socioeconomic conditions assessed in the original application are categorized as operational.
- **Minor**: Applications for amendments to approved activities that are not expected to have material and adverse effects on safety, resource conservation, the environment, socioeconomic conditions, and stakeholder interests assessed in the original application are categorized as minor.

7 Mine Site Permit Applications

7.1 Overview

A permit is required to develop a mine site and is used to approve the design and construction of supporting infrastructure, such as roads, power lines, and site structures. The permit application includes details on the mineralized zone or ore deposit (to demonstrate sufficient resources to sustain economic mining), processing facilities, and associated infrastructure, such as heap leach pads and tailings management facilities. The permit allows the development of a mine site up to the point of readiness to start commercial production of rock-hosted minerals.

Under sections 8 and 9 of the *RMR*, a permit application made in accordance with this directive is required to develop a mine site or reopen an abandoned mine site. An application to amend a permit is required to resume operations at a suspended mine site or to extend or materially alter the program of operations for which a permit was granted. Section 13 of the *RMR* requires an application for permission to suspend all or part of a mine site for more than three consecutive months.

There are no exemptions for mine site permits.

The following subsections describe the requirements for preliminary mine infrastructure development.

7.2 Mine Site Permit General Technical Requirements

7.2.1 Mineral Resources, Mining Methods, and Processes

42) Provide the following information:

a) a statement of the applicant's rights to the resource and use of the land surface and a legal description of the lands to which those rights apply

b) estimates of the mineral resources and mineral reserves to be developed and the data on which the estimates are based

c) the analyses of the rock-hosted mineral resources and mineral reserves

d) a description of the proposed mining methods and equipment to be used, supported by representative plans and cross-sections

e) a statement regarding the proposed annual rate of extraction, the proposed output quantities of run-of-mine product, and waste streams

f) a statement regarding the proposed processing methodologies, including a plant process description showing inputs, products, and waste streams

7.2.2 Infrastructure

43) Describe the proposed mine access and mine haul roads and provide the following:

   a) plans and cross-sections showing road design and alignments

   b) cut and fill slope angles, road widths, drainage measures, berm heights, and runaway lanes

   c) construction methodology and specifications

   d) anticipated road foundation conditions

   e) geotechnical assessments for stability of cuts and fills over 6 metres (m) high

   f) construction material selection criteria

   g) a description of the potential risks to roads posed by geohazards and the proposed mitigation measures

44) Provide the quantities of borrow materials required for construction activities and include material specifications with accompanying data demonstrating suitable geotechnical and geochemical characteristics.

45) Describe the power supply and distribution system, including the following:

   a) any power lines to the mine site

   b) utility corridors

   c) any on-site electrical substation (i.e., type and capacity of existing and proposed power generation)

   d) the on-site power distribution system

46) Provide plans and drawings for each aspect of the power supply and distribution system.

47) Describe any on-site operational explosives storage facilities or manufacturing facilities and provide information on the types and quantities of explosives proposed for use during mine construction and mine operation.

48) Describe each ancillary facility and support infrastructure (e.g., shops, warehouses, outdoor storage areas, laboratories, fuel stations, camps, offices, lunchrooms, sanitary conveniences, waste storage areas, water treatment facilities, etc.) and include the following:

   i) a description of the location of each facility

   ii) appropriately scaled, detailed design plans and type of structures (e.g., movable modular units or permanent structures)

   iii) a discussion of the anticipated foundation conditions and geotechnical assessments

iv) a description of the potential risks posed by geohazards and the proposed mitigation measures

7.2.3 Geology

49) Provide geological maps and associated cross-sections showing the regional and local geology, stratigraphy, and major structural features of the deposit and associated overlying and underlying strata.

50) Provide a three-dimensional representation of the mine's geology and geologic structure.

7.2.4 Environmental Controls and Mitigation

51) Describe the measures the applicant intends to take to mitigate the effects of the proposed operation on the environment and stakeholders and to control pollution.

52) Describe the measures the applicant intends to take to mitigate the effects of work or industrial camps on Indigenous communities.

53) Describe the proposed mine site water management plan, including monitoring, handling, and treatment.

7.2.5 Mine Closure

54) Describe the proposed abandonment and reclamation program and the proposed closure plan for the development, supported by representative plans and cross-sections. Include a description of the proposed method and scheduling of all surface abandonment and reclamation.

7.2.6 Maps

55) Provide one or more regional and local topographic maps of the area in which the proposed development will be situated that show the following:

a) the boundaries of the area to be included in the permit defined by LSD (i.e., section, township, range, and meridian)

b) the locations of urban centres (regional map only)

c) the locations of other industrial operations and associated lease boundaries (regional map only)

d) the locations of roads, rail lines, pipelines, power lines, utility corridors, and other public or private works

e) the locations of all known aquifers, watercourses, wetlands, and water bodies within the proposed permit area

f) the locations of all existing and proposed major access roads (i.e., primary access to the site from municipal or provincial road networks), haulage roads, drainage ditches, canals, dams, and other stream diversions

g) the locations, inclinations, and depths of completed drill holes, trenches, test pits, adits, and other underground workings

h) the proposed locations of facilities for explosives storage

i) the locations of existing and proposed power generation and transmission and distribution facilities related to the proposed program, including on-site power distribution systems (e.g., transformers, motor control centres)

j) the locations of proposed, operating, suspended, or abandoned mines and all proposed and existing underground workings

k) the locations of proposed and existing external mine discard dumps

l) the locations of proposed and existing borrow pits

m) the locations of proposed and existing energy resource or mineral resource wells

n) the locations of the ancillary facility and support infrastructure identified in requirement 48

7.2.7 Other Requirements

56) Provide a general statement concerning marketing plans for all products.

57) Provide any additional information the AER may require.

7.3 Underground Mine Technical Requirements

Permit applications for mineral resource developments that involve developing an underground mine have technical requirements in addition to those in section 7.2.

58) Provide a plan showing the following:

a) the extent of the underground mine considered in the application

b) the relation of the underground mine to any external discard dumps, associated processing plant and facilities, storage areas, and handling and loading facilities

c) the relation of the underground mine to all existing surface and underground workings, including all openings to the surface

59) Provide cross-sections showing the following:

    a) the dimensions of development openings

    b) the proposed methods of strata support

    c) the underground workings and their relation to the surface

60) Describe any anticipated ground stability and support issues and the proposed mitigation methods.

61) Describe the proposed methods for ensuring the stability of any external discard dumps that may be affected by the underground workings.

62) Provide any additional information the AER may require.

7.4 Surface Mine Technical Requirements

Permit applications for mineral resource developments that involve developing a surface mine have technical requirements in addition to those in section 7.2.

63) Provide a plan showing the ultimate dimensions of the pits and dimensions of related external discard dumps.

64) Provide a plan showing the following:

    a) the relation of the surface mine to any discard dumps, associated processing plant and facilities, storage areas, and handling and loading facilities

    b) the relation of the surface mine to all existing surface and underground workings

65) Provide cross-sections showing the following:

    a) the dimensions of the ultimate pits

    b) the proposed methods of pit wall stability

66) Describe any anticipated ground stability issues.

67) Describe the proposed methods for ensuring the stability of any external discard dumps.

68) Provide any additional information the AER may require.

7.5 Processing Plant Technical Requirements

Permit applications for mineral resource developments that involve developing a processing plant have technical requirements in addition to those in section 7.2.

69) Provide a plan view map showing the general location of the processing plant, plant infrastructure, heap leach facilities (HLFs), related stockpiles, load-out facilities, and the proposed tailings management facility.

70) Describe the proposed mineral processing streams and general processing equipment.

71) Provide a description of the process water requirements and the sources.

72) Provide any additional information the AER may require.

8 Mine Permit Amendments

A permit amendment is required to

- extend or materially alter the program of operations for which the permit was granted,
- suspend or abandon all or part of the mine site,
- resume operations at a suspended mine site, or
- change the named permittee.

73) The permittee must submit the permit amendment application via email to MRDAMine.Application@aer.ca.

If complete, the amendment application will be registered and processed in the Integrated Application Registry.

8.1 Extension or Material Alteration

74) Provide the following information in the application to amend a permit to authorize an extension or material alteration of the program of operations for which the permit was granted:

a) the reasons for the proposed extension or material alteration

b) a description of the proposed extension or material alteration

c) the applicable information in section 7 relating to the extended or materially altered project

d) any additional information the AER may require

8.2 Suspend or Abandon Operations

75) Provide the following information in the application for permission to suspend or abandon all or part of a mine site for which the permit was granted:

a) the reasons for the proposed suspension or abandonment

b) a description of the proposed suspension or abandonment

c) the applicable information in section 7 relating to the suspension or abandonment

d) any additional information the AER may require

8.3 Resumption of Operations

76) Provide the following information in the application to amend a permit to resume operations at a suspended mine site:

a) the reasons for the resumption of operations

b) a geotechnical assessment of any affected mine site infrastructure

c) any mitigation or design changes recommended by the geotechnical assessment

d) any additional information the AER may require

8.4 Permittee Name Change

77) Provide the following information in the application to amend a permit to change the named permittee:

a) the reasons for the proposed amendment

b) details regarding the change in name (e.g., documentation and evidence supporting the name change)

c) information about the current permittee and the proposed permittee relevant to their eligibility to hold approvals under *Directive 067* and meet the liability management requirements for rock-hosted mineral resource development

d) any additional information the AER may require

9 Mine Licence Applications

9.1 Overview

A licence is required to develop and operate surface mine pits or underground mine workings and construct and operate external mine discard dumps. Licences are used to approve the design and construction of these features and the supporting infrastructure, such as roads, power, and remote facilities, as necessary.

A licence is required before the operator can start mining operations. An applicant may apply for the licence simultaneously with the application for a permit.

Section 10 of the *RMR* requires a licence application made in accordance with this directive to develop or operate a mine or external mine discard dump. Sections 11 and 12 of the *RMR* require

an application to amend a licence to resume operations at a suspended mine or to extend or materially alter a mine or external mine discard dump. Section 13 of the *RMR* requires an application for permission to suspend all or part of a mine for more than three consecutive months or to abandon all or part of a mine or external mine discard dump.

Applicants should be aware that additional dispositions may be required from other regulatory agencies before the AER issues a licence.

9.2 General Technical Requirements

This section identifies the technical information required in the applicant's licence application.

9.2.1 Previous Work and Changes

78) Provide the following information:

   a) plans and representative cross-sections showing any previous exploration or experimental work in the area applied for

   b) a description of any deletions, alterations, or additions resulting from the development program to any plan, cross-section, statement, or description submitted with the permit application

   c) revised plans, cross-sections, and descriptions for any extensive deletions, alterations, or additions indicated

9.2.2 Geology

79) Provide geological maps and associated cross-sections showing the mine geology, stratigraphy, and major structural features of the deposit and associated overlying and underlying strata.

9.2.3 Mine Design

80) Provide the following information:

   a) technical details of the proposed mine design and method of development

   b) the proposed mine design, including the following:

      i) the selection criteria and justification for the mine design

      ii) the mining methods

      iii) selection criteria for the load and haul fleet and auxiliary equipment and the anticipated emissions from the fleet and equipment

iv) a three-dimensional representation of the ultimate mine design incorporating mine geology and geologic structure

v) plans and cross-sections at suitable intervals and azimuths of the mine

9.2.4 Mineral Resources, Mining Methods, and Processes

81) Provide the following information:

a) estimates of the mineral resources and mineral reserves to be developed and the data on which the estimates are based

b) the analyses of the rock-hosted mineral resources and mineral reserves

c) a statement regarding the proposed annual rate of extraction, the proposed output quantities of run-of-mine product, and waste streams

9.2.5 Infrastructure

82) Describe each ancillary facility and support infrastructure (e.g., shops, warehouses, outdoor storage areas, laboratories, fuel stations, camps, offices, lunchrooms, sanitary conveniences, waste storage areas, water treatment facilities, etc.), and include the following:

a) a description of the location of each facility

b) appropriately scaled, detailed design plans and the type of structures (e.g., movable modular units or permanent structures)

c) a discussion of the anticipated foundation conditions and geotechnical assessments

d) a description of the potential risks posed by biological, geological, and chemical hazards and the proposed mitigation measures

83) Describe the type and capacity of existing and proposed power generation, transmission, and distribution facilities connected with the proposed program.

9.2.6 Environmental Controls

84) Describe the measures the licensee intends to take to remedy or mitigate the effects of the proposed operation on the environment and stakeholders and to control pollution.

85) Describe the proposed mine site water management plan, including monitoring, handling, and treatment.

9.2.7 Mine Closure

86) Provide technical details and the proposed designs for the abandonment and reclamation program, supported by representative plans and cross-sections.

9.2.8 Maps

87) Provide one or more regional and local topographic maps of the area in which the proposed development will be situated that show the following:

a) the boundaries of the area to be included in the licence defined by LSD (i.e., section, township, range, and meridian)

b) the locations of roads, rail lines, pipelines, power lines, utility corridors, and other public or private works

c) the locations of all known aquifers, watercourses, wetlands, and water bodies within the proposed licence area

d) the locations of all existing and proposed access roads (site road infrastructure), haulage roads, drainage ditches, canals, dams, and other stream diversions

e) the locations, inclinations, and depths of completed drill holes, trenches, test pits, adits, and other underground workings

f) the proposed location of facilities for explosives storage

g) the locations of existing and proposed power generation transmission and distribution facilities connected with the proposed program

h) the locations of operating, suspended, or abandoned mines and all existing underground workings

i) the locations of operating, suspended, or abandoned processing facilities and associated infrastructure

j) the locations of existing external mine discard dumps

k) the locations of existing borrow pits

l) the locations of energy resource wells and mineral resource wells

m) the locations of the ancillary facility and support infrastructure identified in requirement 82

9.2.9 Other Requirements

88) Provide any additional information the AER may require.

9.3 Technical Requirements for an Underground Mine

Licence applications for mineral resource developments that involve developing an underground mine have technical requirements in addition to those in section 9.2.

9.3.1 Design of Underground Workings

89) Provide a detailed design for the proposed underground workings that includes the following:

a) technical details with supporting justification of the proposed mine design and method of underground mine development

b) plans and cross-sections showing all existing surface and underground workings, including locations of all existing portals, shafts, raises, stopes, surface openings, and areas of potential subsidence

c) plans and cross-sections showing the projected ultimate outline of the mine workings and the projected mine workings in five-year increments throughout the proposed mine life

d) a description of the mineral resources known to occur, details of the mineral reserves to be mined, and details of the overlying and underlying strata

e) plans and cross-sections showing proposed underground workings in relation to the surface, including mineralized contacts, geological strata, geological structure, portals and shafts, crown pillars, boundary pillars, stopes, surface openings, extent of surface subsidence, and areas of enhanced hydraulic connectivity between the surface and underground

f) an assessment of the potential risks posed by biological, geological, and chemical hazards and any planned mitigation

g) locations and designs for any bulkheads, tunnel plugs, dams storing water, and saturated material, including those required for closure

h) locations and description of any underground ancillary infrastructure, including shops, conveyance systems, communication systems, refuge stations, lunchrooms, toilet facilities, fuel bays, etc.

i) a list of mobile underground equipment with a description for each type

j) an outline of the hazards associated with operating equipment in gassy environments (if required)

k) technical details and designs of the ventilation system, including mine ventilation design criteria, ventilation design factors, ventilation circuit designs, mine air conditioning design, mine dust control, and ventilation plans for all underground workings

9.3.2 Mine Stability

90) Describe the methods and associated assessments proposed for ensuring mine stability, including the following components, as applicable:

a) design details specific to the method of underground development

b) details of the ground control program, including the following:

   i) a description of the mining methods and sequencing to be used to ensure mine stability

   ii) proposed ground support systems, including criteria used in the selection, dimensioning, and spacing

   iii) a description of anticipated ground stability and support issues

   iv) a schedule for program review and updates

c) the mining methods to be used, with associated design criteria showing the dimensioned geometry of the mine workings

d) details of any anticipated surface subsidence and hydraulic connectivity between the surface and underground and any proposed mitigation strategies

e) the mine design criteria and assumptions used to develop the mine design and the ground support program, including the following:

   i) a geological model for the mine

   ii) a structural model for the mine

   iii) a hydrogeological model for the mine

   iv) a geotechnical (rock mechanics) model for the mine, including stress, structure, and rock mass

f) fluid controls proposed with attention to water bodies, water-bearing structures, overburden, tailings, etc., that may inundate the mine workings

g) a ground support monitoring program to detect signs of instability and confirm the design assumptions and the performance of the applied ground support systems

h) the predicted extent and magnitude of groundwater drawdown surrounding the mine workings

9.3.3 Backfilling

91) Describe the backfilling methods proposed to ensure the geotechnical stability of the mine workings.

92) Describe any potential chemical or biological hazards associated with the proposed backfill materials and any planned mitigation.

9.3.4 Other Requirements

93) Provide any additional information the AER may require.

9.4 Technical Requirements – Operate a Surface Mine

Licence applications for mineral resource developments that involve developing a surface mine have technical requirements in addition to those in section 9.2.

9.4.1 Design of Surface Mine

94) Provide plans and cross-sections showing all existing surface and underground workings, including locations of all existing portals, shafts, raises, stopes, surface openings, and areas of potential subsidence.

95) Provide plans and cross-sections showing the projected ultimate and final pit outlines, the mineral resources as known to occur, the mineral reserves to be mined, the overlying and underlying strata, and the geological structure.

96) Describe the mineral resource known to occur, the details of the mineral reserves to be mined, and details of the overlying and underlying strata.

97) Provide plans and cross-sections showing the final and five-year intermediate incremental pit walls, including toe and crest positions, planned face angles, average overall wall angles, berm widths, and berm intervals.

98) Provide technical details and design assumptions of the final and five-year incremental intermediate pit walls, including toe and crest positions, planned face angles, average overall wall angles, berm widths, and berm intervals.

99) Provide the geotechnical properties of the rock and soil forming the pit walls and the areas surrounding the pit walls.

100) Provide technical details of the mining equipment selection criteria, including the truck-shovel match factors, the proposed fleet size, and other proposed equipment, including auxiliary and support equipment.

101) Provide technical details of the assessment of the potential risks posed by biological, geological, and chemical hazards and any planned mitigation.

9.4.2 Mine Stability

102) Provide the design, position, nature of construction, and stability analysis of any support structures incorporated in the walls.

103) Provide the pit wall stability analysis, including a discussion of any design assumptions.

104) Describe any anticipated problems of pit wall stability and the factors used to determine such parameters as bench height, bench width, face slope, and overall pit wall slope.

105) Provide details of any testing and instrumentation proposed to monitor wall or strata movement and groundwater conditions to verify the design assumptions and performance.

106) Describe the method and rate of excavation proposed to ensure pit wall stability throughout the life of the mine, including the final pit walls.

107) Provide details for any wall-control blasting procedures.

108) Provide technical details of the proposed in-pit dumping strategies and in-pit backfilling.

109) Describe the potential risks posed by geological and chemical hazards and the proposed mitigation measures.

9.4.3 Road Design

110) Provide technical details of the haul road design, including the following:

a) descriptions of mine access and haulage roads

b) drawings and cross-sections showing road designs, including cut and fill slope angles, road widths, drainage measures, berm heights, and runaway lanes

c) construction methodology and specifications

d) anticipated foundation conditions

e) geotechnical assessments and stability analyses

f) construction material selection criteria

9.4.4 Water Management

111) Describe how pit water will be managed, including surface water diversions, groundwater dewatering, and slope depressurization methods and include the following:

a) surface water diversion design criteria

b) the number, location, spacing, and design of dewatering wells

c) the construction, operation, and closure of dewatering wells

d) the predicted drawdown zone, including the lateral and vertical extents

e) slope depressurization requirements and recommendations

f) the estimated dewatering volumes from wells and in-pit sumps

g) the predicted quality of pumped water

h) the proposed mitigation measures for the discharge of pumped water

112) Describe the water management system, including a map showing the location of various components and the proposed discharge locations.

9.4.5 Other Requirements

113) Provide any additional information the AER may require.

9.5 Technical Requirements – Construct and Operate an External Mine Discard Dump

Licence applications for external mine discard dumps have technical requirements in addition to those in section 9.2.

9.5.1 Dump Design

114) Provide plans and cross-sections showing dump configurations projected over the life of the operation, including lift heights, maximum dump heights, storage capacity, slope angles, and foundation angles.

115) Provide an analysis of the foundation, including data from geotechnical site investigations and laboratory testing.

116) Provide an assessment of geohazards that could affect the dumps and the proposed mitigation measures.

117) Provide a risk assessment for dumps and identification of high-risk dumps.

118) Provide a detailed closure plan and objectives for the dump, including the configuration of each dump at closure.

9.5.2 Dump Construction

119) Provide a detailed construction methodology for each proposed dump, including the following:

a) proposed design criteria

b) construction specifications

c) monitoring requirements for each dump, including instrumentation, movement thresholds, and response

9.5.3 Stripping

120) Provide the stripping requirements for organics, soil, and overburden to enhance the stability of each proposed dump and accommodate reclamation efforts.

If the designs do not require stripping, provide the rationale for the design decisions and the stability analysis of the proposed foundation conditions.

9.5.4 Dump Stability

121) Provide a stability analysis, including factors of safety for both interim and final configurations, including the following:

   a) a justification for all input parameters and identify the groundwater table conditions

   b) an assessment of potential run-out zones for all dumps

   c) results of the sensitivity analysis of critical assumptions

   d) figures showing the analysis model and critical slip surfaces

122) Provide an assessment of the potential for static and seismic liquefaction for dump foundations and waste materials.

9.5.5 Water Management

123) Provide a water balance that considers the inputs and outputs of precipitation, surface water, and groundwater.

124) Provide an assessment of the effect on surface water drainage, with detailed designs for water management structures associated with the dump (e.g., rock drains, diversion channels, sediment ponds, discharge channels).

9.5.6 Environmental Controls

125) Describe the operating practices, including any special handling related to mine leaching and acid mine drainage.

126) Provide an assessment of the potential for groundwater contamination and, if applicable, plans to monitor and mitigate groundwater contamination.

127) Provide details of testing and instrumentation required to monitor groundwater, settlement or lateral movement in the vicinity of the dump and verify the design parameters and construction specifications, rate of construction and description of safeguards to accommodate seasonal runoff and flash storms.

9.5.7 Other Requirements

128) Provide any additional information the AER may require.

10 Mine Licence Amendments

A licence amendment is required to

- extend or materially alter the program of operations for which the licence was granted,
- suspend all or part of a mine for more than three months,
- resume operations at a suspended mine,
- abandon all or part of a mine or external mine discard dump, or
- change the named licensee.

129) The licensee must submit the licence amendment application via email to MRDAMine.Application@aer.ca.

A complete amendment application will be registered and processed in the Integrated Application Registry.

10.1 Extension or Material Alteration

130) Provide the following information in the application to amend a licence for a mine or external mine discard dump to authorize an extension or material alteration of the program of operations for which the licence was granted:

a) the reasons for the proposed extension or material alteration

b) a description of the proposed extension or material alteration

c) the applicable information in sections 9.2, 9.3, 9.4, and 9.5 concerning the extended or materially altered project

d) any additional information the AER may require

10.2 Suspend Operations

131) Provide the following information in the application for permission to suspend all or part of a mine for more than three months:

a) the reasons for the proposed suspension of operations

b) a geotechnical assessment of any affected mine

c) any mitigation, monitoring, or design changes as recommended by the geotechnical assessment

d) a summary of the proposed methods for maintaining site security during the suspension period

e) any additional information the AER may require

10.3 Resumption of Operations

132) Provide the following information in the application to amend a licence to resume operations at a suspended mine:

a) the reasons for the resumption of operations

b) a geotechnical assessment of any affected mine

c) any mitigation or design changes recommended by the geotechnical assessment

d) any additional information the AER may require

10.4 Abandon Mine or External Mine Discard Dump

This section lists the requirements for an application to abandon a mine or external mine discard dump.

10.4.1 General

133) Provide the reasons for the proposed abandonment.

10.4.2 Geology

134) Provide geological maps and associated cross-sections representing the mine's geology, stratigraphy, and the major structural features of the mineral deposit and associated overlying and underlying strata.

10.4.3 Geotechnical and Risk Assessment

135) Provide geotechnical assessments that assess the long-term slope stability of all slopes proposed for abandonment, including analyses of

a) stability,

b) seismicity, and

c) rockfall and rockslide hazards.

These analyses should consider the worst-case scenarios for groundwater conditions at steady-state seepage and include the factors of safety for the as-built slope configuration identification and a justification of all input parameters and groundwater conditions, a sensitivity analysis, and figures showing the analysis model and critical failure surfaces.

When evaluating rockfall and rockslide risks concerning mine slope abandonment design, consider only the effects on public safety.

136) Provide a quantitative risk-based assessment addressing the potential risks posed by biological, geological, and chemical hazards and the proposed mitigation measures, including the following:

   a) hazard identification

   b) risk analysis

   c) risk evaluation and criteria incorporating the "as low as reasonably practicable" principle to determine a final abandonment slope stability factor of safety, considering the end land use classification for the mine site

137) Provide an assessment of the external mine discard dump foundation conditions, including waste materials and their associated properties.

138) Provide an assessment of the in-pit tailings disposal areas and related structure conditions, including tailings materials and the associated properties.

10.4.4 Water

139) Describe the hydrogeological and hydrological conditions for the project area.

140) Provide an assessment of the surface water drainage and detailed designs for water management structures associated with the external mine discard dump (e.g., rock drains, diversion channels, sediment ponds, discharge channels).

141) Provide a water balance that considers the inputs and outputs of precipitation, surface water, and groundwater.

142) Provide strategies to mitigate the effects of materials or mine conditions that produce or may produce radioactivity, acid rock drainage, or metal leaching and an inventory of these materials or conditions.

10.4.5 Slopes (Mitigation and Monitoring)

143) Provide the slope stability mitigation and reporting strategies for all slopes following the "as low as reasonably practicable" principle.

144) Provide the long-term slope monitoring and reporting strategies for all mine slopes within the abandonment area covering the five years after implementing the mitigation works.

10.4.6 Infrastructure

145) Provide figures showing plan and representative cross-sectional views of all as-built infrastructure proposed for abandonment.

10.4.7 Land Use

146) Describe the proposed end land use and any deviations from the approved end land use, including the following:

a) recreational (camping, fishing, hunting, hiking, skiing, off-road vehicles, etc.)

b) forestry

c) other industrial opportunities

d) other land development potential (golf course, residential, commercial, retail)

Proposed end land uses should align with AEPA's requirements and requirements outlined in *Alberta's Land-Use Framework* and any applicable regional plans, which may be discussed in the preapplication meeting.

10.4.8 Maps

147) Provide one or more regional and local topographic maps of the area in which the proposed abandonment operations are situated that show the information requested in section 9.2.8.

10.4.9 Other Requirements

148) Provide any additional information the AER may require.

10.5 Abandon Underground Mine Workings

This section lists the requirements for an application to obtain permission to abandon underground mine workings.

149) Provide the information in section 10.4 that would apply to abandoning an underground mine working.

10.5.1 As-Built Conditions

150) Provide the following mine as-built information:

a) plans on a horizontal plane, with separate drawings for each mining level, showing all underground workings, including shafts, tunnels, dams, and bulkheads

b) plans on a vertical plane of all mine sections at suitable intervals and azimuths, showing all shafts, tunnels, drifts, stopes, and other mine workings in relation to the surface, including the location of the top of the bedrock and the surface of any known water body

c) a three-dimensional representation of the entire underground mine workings in a scalable electronic format acceptable to the AER

10.5.2 Technical Details

151) Provide technical details for the following:

a) the methodologies proposed to secure all openings to the surface (i.e., shafts, raises, stopes, portals, adits, declines) to restrict inadvertent access

b) how access for all other mine openings to the surface will be stabilized and secured

c) a geotechnical assessment of all underground mine workings to determine their geotechnical stability and any surface areas disturbed or likely to be disturbed by such workings

d) all existing and proposed underground impoundment structures concerning their stability against expected static and dynamic loadings to ensure the materials remain contained

e) the proposed underground water management system and the connections to all remaining on-site surface watercourses or drainage channels such that the watercourses and channels do not require maintenance

f) the proposed post-abandonment monitoring program for openings stability, mine water flow, and surface subsidence

g) the proposed abandonment strategies for the mine openings to the surface and how they conform with the following:

i) shafts, raises, and stopes abandonment must incorporate backfilling, concrete caps, or reinforced concrete caps

ii) before installing a concrete cap to abandon shafts, raises, and stopes, provide a geotechnical assessment detailing the competency of the rock that is to support the concrete cap

iii) the removal of all loose rock from the rock anchorages leaving only competent rock

iv) concrete work meets the minimum standards set out in *CAN/CSA-A23.1-M90: Concrete Materials and Methods of Concrete Construction* (latest edition)

152) Provide technical details of the formwork for the concrete, shoring, and temporary support.

153) Provide the final surface configuration of the concrete cap installation, considering site drainage to prevent water from pooling on the surface.

10.5.3 Decommissioning and Removal

154) Provide details for the following:

a) the decommissioning of all services, machinery, equipment, storage tanks, and other structures to be removed from the underground workings

b) the removal of all steel and concrete structures, foundations, and slabs

c) a strategy for removing all petroleum products, chemicals, and waste from the underground workings, including an inventory and disposal details

d) a strategy for removing all explosives within the underground workings, including an inventory and disposal details

e) strategies to mitigate the effects of materials or mine conditions that produce or may produce radioactivity, acid rock drainage, or metal leaching and an inventory of these materials or conditions

10.5.4 Other Requirements

155) Provide any additional information the AER may require.

Section 11 provides the requirements and specifications for any works proposed in the licence amendment for abandonment.

10.6 Licensee Name Change

156) Provide the following information in the application to amend a licence for a mine or external mine discard dump to change the named licensee:

a) the reasons for the proposed amendment

b) details regarding the change in name (e.g., documentation and evidence supporting the name change)

c) information about the current licensee and the proposed licensee relevant to their eligibility to hold approvals under *Directive 067* and meet the liability management requirements for rock-hosted mineral resource development

d) any additional information the AER may require

11 Abandonment Requirements for Underground Workings

11.1 General Requirements

157) The licensee must ensure the following requirements are met when conducting abandonment of underground workings:

i) shafts, raises, and stopes must incorporate backfilling, concrete caps, or reinforced concrete caps

ii) before installing a concrete cap to abandon shafts, raises, and stopes, provide a geotechnical assessment detailing the competency of the rock to support the concrete cap

iii) remove all loose rock from rock anchorages leaving only competent rock

iv) conduct all concrete work in accordance with *CAN/CSA-A23.1-M90* (latest edition)

11.2 Reinforced Concrete Cap Requirements

158) The licensee must ensure all reinforced concrete caps meet the following requirements:

a) Reinforced concrete caps must meet the following minimum design live loads:

i) 1.4 m cover of saturated soil uniformly distributed with a unit weight of 19 kilonewtons (kN) per cubic metre

ii) the greater effect of either

- 18 kilopascals (kPa) of uniformly distributed load or
- an 81 kN concentrated load applied over an area 300 millimetres (mm) by 300 mm anywhere on the cap, and the weight of the cap as the dead load

b) The 28-day concrete strength must be at least 30 megapascals (MPa).

c) The yield strength of reinforcing bars must be at least 400 MPa.

d) The concrete cap minimum thickness must be 450 mm or 300 mm if an alternative design with all calculations is provided.

e) All supports must be founded on sound rock having a minimum bearing capacity of 600 kPa.

f) All concrete design must be in accordance with *CAN3-A23.3-M84: Design of Concrete Structures for Buildings* (latest edition).

g) The reinforced concrete cap must be vented with a stainless-steel pipe that is at least 75 mm in diameter and extends above the cap or soil cover to permit airflow.

h) The reinforced concrete cap must be securely attached to the bedrock or to any existing concrete collar.

i) Appropriate reinforcing steel bars and concrete must be used in areas where corrosive conditions may exist.

11.3 Reinforced Concrete Specifications

159) The licensee must ensure the concrete design meets the following specifications:

a) The 28-day concrete strength must be at least 30 MPa.

b) The maximum slump must not exceed 75 mm. ±25 mm.

c) The maximum size of aggregate must not exceed 20 mm.

d) Air entrained in concrete must not exceed 6% ±1%.

e) The maximum water-cement ratio by weight must not exceed 0.50.

f) The aggregates used in the concrete mix must be a nonalkali-silica reactive type.

g) The concrete cover must be

   i) 75 mm thick on the top of the reinforcing bars,

   ii) 50 mm thick on the bottom of the reinforcing bars, and

   iii) 40 mm thick on the stirrups.

h) Concrete must be cured in accordance with *CAN/CSA-A23.1-M90* (latest edition). Curing compounds must be clear liquid conforming to the Canadian General Standards Board Standard 90-GP-1a, type 1 and applied as directed by the manufacturer.

11.4 Inspection and Testing

160) The licensee must inspect and test all concrete as follows:

a) A qualified professional engineer must inspect and approve any reinforcing steel bars installed before concrete is placed.

b) The concrete must be tested for air content and slump in the field.

c) At least one set of four concrete cylinders must be cast and tested for compressive strength.

d) The concrete cylinders must be cured under the same field conditions as the shaft cap and seat support (if applicable).

e) The testing must be done in accordance with *CAN/CSA-A23.1-M90* (latest edition), and the test results and the certified results must be submitted as required by the *MRDA* abandonment approval application.

11.5 Adits

161) Provide the technical design details for the abandonment strategies to permanently prevent access to adits, ramps, declines, or portals.

11.6 Backfilling

162) Provide the technical design details for the abandonment strategies for a shaft, raise, or stope to be backfilled rather than capped, including the material properties of the backfill that demonstrate the long-term biological, geological, and or chemical stability of the backfilled opening.

11.7 Stability of Crown Pillar and Room and Pillar Operations

In this section

- "NGI-Q" means the Norwegian Geotechnical Institute Q value as given by Hoek, Kaiser, and Bawden 1995[1], and
- "Rock mass rating" means the Council for Scientific and Industrial Research (CSIR) rock mass rating as given by Hoek, Kaiser, and Bawden 1995.

163) Provide a geotechnical assessment of the crown pillar or pillars to demonstrate their long-term stability, including the following:

   a) a stability mitigation strategy for the crown pillars with consideration of the end land use
   b) any history of rock mass instability in the stope walls or crown pillar
   c) whether backfilling of stopes should be considered and, if so, the type of suitable backfill
   d) the location of backfilled stopes and the type of backfill material used
   e) any at-risk infrastructure, including roads, power lines, pipelines, gas lines, and buildings
   f) a description of the potential for future mining or alternative uses of the abandoned mine site
   g) a description of any potential environmental effects caused by a failure
   h) the location of urban areas, residences, and infrastructure near the abandoned mine site
   i) the population density of the area surrounding the mine site
   j) the likelihood that the public will access the mine site after abandonment
   k) the current and future end land use designations

164) Provide an assessment of the risk and consequences of a crown pillar failure.

165) For sites determined as low risk and consequence in the risk assessment (requirement 164), provide an assessment of the risks and consequences of a crown pillar failure where the following is the minimum information that must be evaluated:

   a) general surface topography, including lakes, rivers, roads, buildings, and benchmarks and survey details
   b) cross-sections showing the overburden profile

[1] Hoek, E., P.K. Kaiser, and W.F. Bawden. 1995. *Support of Underground Excavations in Hard Rock*. Rotterdam: A.A. Balkema.

c) cross-sections showing plans of all mine levels to a depth at least 200 m below the base of the crown pillar

d) the basic crown pillar, abutment, or stope configuration, including length, span, thickness, basic geology, and structural features

e) the nature and composition of the backfill, where applicable

f) rock mass rating and NGI-Q values for each of the controlling rock mass zones

g) historical information on rock mass instability, where available

166) For sites determined as having risks and consequences greater than low in the risk assessment (see requirement 164), provide an assessment of the risks and consequences of crown pillar failure where the following minimum information must be evaluated:

a) surface conditions, including the following:

i) surface topography near the crown pillar

ii) the presence or absence of a water body

iii) a surface projection of the underground working to a depth at least 200 m below the base of the crown pillar

iv) general surface topography (including lakes, rivers, roads, buildings, and benchmarks and survey details)

v) all rights-of-way, utility corridors, and easements

vi) the surface area that would be affected by a crown pillar failure

b) overburden characterization, including the following:

i) the bedrock-overburden interface topography

ii) the groundwater regime

iii) soil types and thicknesses (including bulk density, in situ bulk density, grain size distribution, friction angle, cohesion, moisture content, and groundwater levels)

c) a rock mass characterization, including the following:

i) geology of the site

ii) strike and dip of the ore body and host rocks

iii) the presence of structural features such as joints, faulting, or cleavage

iv) the geotechnical classification of the hanging wall, footwall, and crown pillar using both the rock mass rating and NGI-Q classification systems and using the following:

- underground mapping or drill core data evaluation
- laboratory strength determination or published ranges, where available, with justification for using the data specified and its origin
- discontinuity characterization

167) Provide the mine workings geometry, including the geometry and location of the crown pillar, upper mine openings, and stopes, including the following:

a) the mining width and depth, if mine unfilled

b) the crown pillar thickness

c) the stope span

d) the nature and composition of backfill

e) the support method used

f) all drifts, shafts, and raises

g) historical information on rock mass instability, where available

h) other factors, including the presence of any of the following:

i) elevated horizontal stress fields

ii) multiple openings

iii) complex geometries

iv) numerical modelling of the crown pillar and stope geometry using industry-recognized software to assist in assessing potential failure mechanism and the likelihood of crown pillar failure

168) All testing of rock and soil properties must conform to American Society for Testing and Materials (ASTM) Standards.

169) Provide the rehabilitation measures for the crown pillars derived from the results of the risk assessments in requirements 165 and 166 above.

170) Provide a geotechnical assessment for room and pillar operations to determine long-term stability, including information in requirements 163, 165, and 166 above.

171) Provide the appropriate rehabilitation measures for the room and pillar operations derived from the results of the risk assessments in requirements 165 and 166 above.

12 Processing Plant Approval Applications

12.1 Overview

An approval is required to construct and operate a processing plant and associated infrastructure, including ore stockpiles, HLFs (including solution processing), tailings management facilities, load-out facilities, and other infrastructure, such as roads and site buildings.

Section 14 of the *RMR* requires an approval application made in accordance with this directive to construct or operate a processing plant. Sections 15 and 16 of the *RMR* require an application to amend an approval to resume operations at a suspended processing plant or to extend or materially alter the program of operations for which the approval was granted. Section 17 of the *RMR* requires an application for permission to suspend a processing plant for more than three consecutive months or abandon a processing plant.

Applicants should be aware that additional dispositions may be required from other regulatory agencies before the AER issues an approval.

12.2 General Requirements

172) The applicant must provide the following information:

a) a statement of its right to use the land surface associated with the proposed processing plant site

b) the legal description of the lands to which those rights apply

c) the site selection criteria and rationale for the processing plant

d) a general statement concerning marketing plans for all products

12.3 Approval Application Technical Requirements

This section identifies the technical information required in the applicant's approval application to construct or operate a processing plant and associated infrastructure.

12.3.1 Processing Plants

173) Provide a topographic map and associated cross-sections of the processing plant site locations showing the following:

a) all sources of water to be used for processing minerals

b) the location of all proposed impoundments, ponds, and dams

c) the location of all mineral storage, handling and loading facilities, and other ancillary structures and operations associated with the proposed processing plant

174) Provide a geotechnical assessment of the processing plant and associated infrastructure, including the following:

a) an assessment of the soil bearing capacity, expected settlement, and a comparison with allowable settlements for the structures involved

b) a description of the potential risks posed by geohazards and the mitigation measures

c) a geotechnical assessment of the safety and stability of all construction slopes over 6 m high

175) Provide a detailed description of any processing plant-specific ancillary facilities (i.e., fine or coarse ore storage pads, HLFs, temporary tailings storage areas, refined metal storage, and concentrate load-out area).

If ore or waste rock facilities will be present at the processing plant, include a description of these facilities. If the facilities are temporary, provide an estimate of how long these facilities will be required and when they will be decommissioned.

176) Provide details of the methods proposed for controlling dust from mineral storage and handling and loading facilities.

177) Provide the required parameters and designs for the ventilation systems, including heating, ventilation, and air conditioning systems and local exhaust ventilation.

178) Describe the construction of impoundments, ponds, and dams, including representative drawings and physical data.

179) Provide a water management plan for the processing plant site, including the technical details on any proposed impoundments, channels, ponds, or dams and, to the extent applicable,

a) satellite imagery, showing the location of the impoundments or dams, the physical features of the downstream area that might be affected by a dam failure, the watershed upstream from the dam structures, and the dimensions of the dam banks;

b) a topographic map showing the site layout and representative cross-sections of all embankments, including any anticipated future extensions, the location of diversionary drainage systems, and the design of any spillways to be installed; and

c) the technical details and results of any geotechnical analysis and site investigations of impoundments, ponds and dams, including the following:

i) logs of sampled drill holes

ii) field permeability tests and groundwater levels

iii) a description of the pertinent engineering properties of the foundation materials and dam construction materials

iv) an overall stability analysis of the impoundment and foundation, including an outline of any assumptions that were made

180) Provide details of the processing plant circuits for all proposed mineral streams, the associated capacities for each stream, and the potential for expansion.

181) Provide details on measuring process streams entering and leaving the processing plant site.

182) Provide general arrangement plans and cross-sections for the processing plant, including mechanical and electrical equipment lists.

183) Provide a life-of-mine mineral (ore) processing and production schedule by mineral (ore) type.

184) Provide a flow diagram and material balance for the processing plant operating at design throughput capacity.

185) Provide an analysis of the composition of the processing plant feed, products, waste streams, and tailings.

186) Provide the technical details and schematics of the concentrate circuits and associated handling systems, including storage capacity, solution concentration, and overflow collection and recycling.

187) Provide the technical details and schematics of the refining circuits and associated handling systems, including storage capacity, solution concentration, and overflow collection and recycling.

188) Provide an inventory of all process reagents and the accompanying process flow charts for the reagent systems.

189) Provide details of hazardous products and address their safe handling and storage.

190) Provide any additional information the AER may require.

12.3.2 Heap Leach Facility

The HLF and its associated infrastructure includes heap leach pads (HLPs), process facilities, solution containment, conveyance facilities, water treatment facilities, and water management facilities.

191) Provide the stability analyses for the

a) foundation materials underlying the HLF,

b) interfaces between the foundation material and the liner systems,

c) liner system interfaces,

d) the interface between the upper liner and the overlying stacked mineral ore, and

e) for the HLF at full capacity of leached ore and any intermediate stacked configurations that may result in a less stable configuration than the final stacked height.

These analyses must include static and seismic loading conditions and clearly indicate moisture conditions and the groundwater surface, both in the ore and rinsed residue.

192) Provide analyses of foundation settlement and differential settlement for HLPs at full capacity and any intermediate stacked configurations that may result in differential settlement greater than the final stacked configuration.

193) Provide the stripping requirements for organics, soil, and overburden to enhance the stability of each HLP and accommodate reclamation efforts; if the designs do not require stripping, provide the rationale for the design decisions and stability analysis of the proposed foundation conditions.

194) Describe the construction schedule for the HLP, addressing proposed construction phases and seasonal scheduling.

195) Provide design details for all proposed liner systems, including permeabilities and leakage rates.

196) Provide the overall solution storage capacity design criteria and design, incorporating a water balance, prediction of extreme climatic inputs, and site-specific test work used to predict emergency drain-down volumes.

197) Describe the heap leach solution management system, incorporating details during operation, rinsing and detoxification phases, use of storage and treatment facilities, flow diagrams, quantities and qualities in various operational scenarios, emergencies, and address management of solutions from the leak detection system, including identification of leakage thresholds and responses.

198) Describe the solution and leakage collection systems for the HLP, including pipe layout and sizing, material permeabilities, segregation of leaching and leak collection cells, solution recovery risers or wells and solution recovery pumping systems.

199) Provide a site water management plan for the HLF that includes the following:

a) water balance calculations demonstrating requirements for make-up water supplies, excess water discharge, and pond storage volumes for various stages of the HLF, including any proposed separate residue disposal facilities

b) designs for surface water management facilities and infrastructure, including layout, sizing, material specification, construction specifications, and erosion control

c) hydrologic calculations that assess the design flood volumes and flood peaks to be conveyed in the diversions around the HLF and the solution channels and other conveyances within the HLF or temporarily stored in the solution collection and emergency overflow ponds

200) Provide material balances for the life of the HLF, demonstrating sufficient materials are available for the construction, operation, and closure of the HLF.

201) Provide material properties of the ore placed on the heap and the proposed sizing processes for the ores.

202) Provide details on the proposed loading methodology for depositing the ore onto the ore pad, including loading sequencing, bench and slope designs, and a stability analysis during loading and full build-out.

203) Provide analyses demonstrating the HLF design will accommodate the closure grading requirements.

204) Provide the process flows for the recovery of minerals from the pregnant leach solution through all steps from barren solution chemistry to the production of the final product.

205) Provide the emergency management plan, the adaptive management plan, HLF shutdown procedures, and the operations, maintenance, and surveillance program.

206) Identify the borrow sources and quantities of borrow materials required for construction activities, including material specifications, with accompanying data demonstrating suitable geotechnical and geochemical characteristics.

207) Provide any additional information the AER may require.

12.3.3 Tailings Management Facilities

208) Describe the tailings treatment technologies, if applicable.

209) Provide the overall tonnage, volume of tailings and the daily and annual deposition rates.

210) Provide the tailings specifications, including tailings mineralogy, particle size distributions, water quality, densities, consolidation rates, permeability, etc.

211) Provide details for the disposal and mitigation of off-spec tailings.

212) Provide details of process water recycling, including any facilities for water recycling and any constraints for water recycling.

213) Describe how the proposed tailings operations and facilities are expected to affect air quality, including potential dust transmission.

214) Provide seismic design events, factors of safety, slope angles, material strengths, and seepage rates.

215) Provide flood design events, inflow hydrographs, erosion control, sediment removal, freeboard, flood routing capacity, and emergency water storage capacity.

216) Describe any constraints on the tailings storage conditions (e.g., saturated, unsaturated, etc.).

217) Provide the permeabilities and leakage rates of the liner.

218) Identify any contaminants of concern and the proposed water treatment, discharge, and receiving water quality criteria.

219) Provide details of the foundation conditions, site preparation, permafrost identification and mitigation, liner placement, compaction, and moisture conditioning.

220) Provide details of the tailings deposition methodology, tailings placement sequencing, and schedule, including the following:

    a) the transport of tailings from the processing plant

    b) the diameter of the transport line and the size of any slurry tanks

    c) the approximate temperature of the tailings

    d) installation of heat tracing, if required

    e) the length and gradient of the line

    f) shutdown procedures to suspend processing plant operations

    g) a figure showing the discharge locations to the tailings storage facilities

    h) the tailings deposition method (e.g., subaqueous, spray, piped)

    i) the process for altering the length and position of the deposition line

    j) the expected beach angle

221) Provide the properties of the expected tailings material, showing changes with time and depth and considering deposition schedule and consolidation.

222) Provide the proposed methodologies and associated timeline to transition the tailings disposal area towards a ready-for-reclamation landform.

223) Provide the anticipated biochemical hazards from the tailings, the associated in-place mitigation strategies of the tailings materials, and the anticipated effectiveness of the strategies.

224) Provide a detailed description of the proposed operations and the maintenance and surveillance program for the tailings management facilities, including tailings treatment, transportation, and disposal areas.

225) Provide design details of the surface water management facilities and infrastructure design, including layout, sizing, material specifications, construction specifications, and erosion control.

226) Provide design details for all proposed liner systems, including permeabilities and leakage rates.

227) Identify the borrow sources and quantities of borrow materials required for construction activities and tailings mitigation, including material specifications, with accompanying data demonstrating suitable geotechnical and geochemical characteristics.

228) For slurry tailings impoundments where all or a portion of the tailings will be retained by constructed dams and where the groundwater surfaces may be within the tailings or the dam, provide the following:

    a) a detailed description of the expected seepage through and around any tailings dam and connectivity with underlying aquifers

    b) a description of how the tailings facilities have been designed to address requirements for water covers, including maintenance of water covers during placement and in the long term and requirements for any co-disposal of tailings and waste rock

    c) storage requirements for the life of the mine, including operational volumes, flood capacity requirements, and the amount of freeboard required

    d) details of the tailings consolidation, including the expected consolidation and draining methodologies of tailings solids and any design measures intended to assist these processes

229) For **subaerial** tailings storage facilities, including facilities where tailings will be stored in a drained state and where the groundwater surface is below the tailings and any retaining embankments, provide the following:

    a) a detailed description of the location, size and orientation of the tailings stack and any retaining embankments

b) details of the material and construction specifications, foundation preparation, drainage control, drainage layers, finger drains, surface water management, and erosion control

c) details of any phasing for embankment or stack construction, including any temporary facilities and infrastructure

d) design requirements for the tailings stack, including material composition, lift thickness, compaction requirements, and per cent solids content and the detailed design drawings of the proposed stack and associated infrastructure

e) a detailed stability analysis for the tailings stack and embankment, including the evaluating factors of safety for static and seismic conditions and the potential for liquefaction of the foundation, embankment, or tailings materials

f) design details of the proposed drainage and seepage facilities through all project phases

g) details of the expected consolidation of tailings solids and design measures proposed to assist consolidation

230) For each in-pit tailings storage facility containing tailings within a mined-out open pit below the natural spill elevation of the pit, provide the pit storage capacity and a diagram of the storage volume to pit elevation.

231) Provide any additional information the AER may require.

13 Processing Plant Approval Amendments

An approval amendment for a processing plant is required to

- extend or materially alter the program of operations for which the approval was granted,
- suspend a processing plant for more than three months,
- resume operations at a suspended processing plant,
- abandon a processing plant, or
- change the named approval holder.

13.1 Extension or Material Alteration

232) Provide the following information in the application to amend an approval for a processing plant to authorize an extension or material alteration of the program of operations for which the approval was granted:

a) the reasons for the proposed extension or material alteration of the program of operations for which the approval was granted

b) the applicable information in sections 12.3.1, 12.3.2, and 12.3.3 concerning the extension or material alteration of the processing plant, HLFs, or tailings management facilities

c) a description of the proposed extension for material alteration of the processing plant, HLFs, or tailings management facilities

d) any additional information the AER may require

13.2 Suspend Operations

233) Provide the following information in the application for permission to suspend operations at a processing plant:

a) the reasons for the suspension of operations

b) a description of the procedures proposed for suspending the plant to eliminate safety hazards and ensure the future operability of the processing plant

c) a geotechnical assessment of any affected processing plant slopes

d) any mitigation or design changes as recommended by the biological, geological, and chemical hazards technical assessment

e) any further information the AER may require

13.3 Resumption of Operations

234) Provide the following information in the application to amend an approval to resume operations at a suspended processing plant:

a) the reasons for the resumption of operations

b) the applicable information in sections 12.3.1, 12.3.2, and 12.3.3

c) a description of the existing plant and related facilities with particular reference to potential safety hazards

d) a description of the procedures to be used for restoring the plant

e) any further information the AER may require

13.4 Abandonment

This section lists the requirements for an application to obtain permission to abandon a processing plant.

13.4.1 General

235) Provide the following information for abandoning a processing plant:

a) the reasons for the proposed abandonment

b) a description of the procedures proposed for abandoning the processing plant, which may include fine or coarse ore storage pads, leaching facilities, tailings storage areas, refined metal storage areas, and concentrate load-out areas, ensuring the elimination of safety hazards

13.4.2 Geology

236) Provide geological maps and associated cross-sections representing the mine geology, stratigraphy and major structural features of the deposit and associated overlying and underlying strata.

13.4.3 Geotechnical and Risk Assessment

237) Provide geotechnical assessments of all slopes proposed for abandonment that assess long-term slope stability, including an analysis of seismicity, and rockfall and rockslide hazards, considering the worst-case scenarios for groundwater conditions at steady-state seepage. Include the factors of safety for the as-built slope configuration identification and a justification of all input parameters and groundwater conditions, a sensitivity analysis, and figures showing the analysis model and critical failure surfaces.

238) Describe the potential risks posed by the biological, geological, and chemical hazards and mitigation measures. Quantitative risk-based assessments must include the following components:

a) hazard identification

b) risk analysis

c) risk evaluation and criteria incorporating the “as low as reasonably practicable” principle to determine a final abandonment slope stability factor of safety, considering the end land use classification for the mine site

When evaluating rockfall and rockslide risks concerning the processing plant or mine slope abandonment design, consider only the effects on public safety.

239) Provide details of the long-term stability of all minerals, waste materials, tailings, and process-affected water associated with the processing plant.

240) Provide an assessment of the foundation conditions of all mineral handling, storage, and handling and loading facilities and other ancillary structures.

241) Provide details of the stability of all mineral handling, storage, and handling and loading facilities, and other structures and operations associated with the processing plant.

13.4.4 Water

242) Describe the hydrogeological and hydrological conditions of the processing plant approval area.

243) Provide an assessment of the surface water drainage and detailed designs for water management structures associated with the processing plant (e.g., rock drains, diversion channels, sediment ponds).

244) Provide a water balance that considers the inputs and outputs of precipitation, surface water, and groundwater.

13.4.5 Slopes

245) Provide the slope stability mitigation and reporting strategies for all slopes following the "as low as reasonably practicable" principle.

246) Provide long-term slope monitoring and reporting strategies for all processing plant slopes within the abandonment area covering the five years following implementation of the mitigation works.

13.4.6 Infrastructure

Provide figures showing plan and representative cross-sectional views of all as-built infrastructure proposed for abandonment.

13.4.7 Land Use

247) Describe the proposed end land use and any deviations from the approved end land use, including the following:

   a) recreational (camping, fishing, hunting, hiking, skiing, off-road vehicles, etc.)

   b) forestry

   c) other industrial opportunities

   d) other land development potential (golf course, residential, commercial, retail)

   Proposed end land uses should align with AEPA's requirements or requirements outlined in *Alberta's Land-Use Framework* and any applicable regional plans, which may be discussed in the preapplication meeting.

13.4.8 Environmental Controls and Reclamation

248) Describe the proposed abandonment and reclamation program and its probable effects on the environment and proposed mitigation measures, including those to control pollution.

249) Identify the borrow sources and quantities of borrow materials required for reclamation and abandonment activities, tailings mitigation, and landform construction, including material specifications, with accompanying data demonstrating suitable geotechnical and geochemical characteristics.

13.4.9 Maps

250) Provide one or more regional and local topographic maps of the area in which the proposed abandonment operations are to occur that show the following:

a) the boundaries of the area to be included in the approval defined by LSD (i.e., section, township, range, and meridian)

b) the location of urban centres (regional map only)

c) the location of other industrial operations and their lease boundaries (regional map only)

d) the location of roads, rail lines, pipelines, power lines, utility corridors, and other public or private works

e) the locations of all known aquifers, watercourses, wetlands, and water bodies

f) the locations of all existing and proposed major access and haulage roads, drainage ditches, canals, dams, and other stream diversions

g) the locations, inclinations, and depths of completed drill holes, trenches, test pits, adits, and other underground workings

h) the proposed location of facilities for explosives storage

i) the locations of existing and proposed power generation and transmission and distribution facilities connected with the processing plant, including the type and capacity

j) the locations of operating, suspended, or abandoned mines and all existing underground workings

k) the locations of operating, suspended, or abandoned processing facilities and associated infrastructure, including tailings contacted areas and final storage areas and stockpile areas

l) the location of existing external mine discard dumps

m) the locations of energy resource and mineral resource wells

13.4.10 Other Requirements

251) Provide any additional information the AER may require.

13.5 Approval Holder Name Change

252) Provide the following information in the application to amend a processing plant approval to change the named approval holder:

a) the reasons for the proposed amendment

b) details regarding the change in name (e.g., documentation and evidence supporting the name change)

c) information about the current approval holder and the proposed approval holder relevant to their eligibility to hold approvals under *Directive 067* and meet the liability management requirements for rock-hosted mineral resource development

d) any further information the AER may require

14 Abandonment Approval Application

An abandonment approval is required to rescind *MRDA* licences and approvals. The abandonment approval application will contain details of the actual mine or the processing plant mitigation activities and the monitoring results demonstrating that mitigation of the site slopes successfully meets the required safety factor for the end land use. Figure 3 shows the two-phased application process for approval to abandon a mine, external mine discard dump, or processing plant.

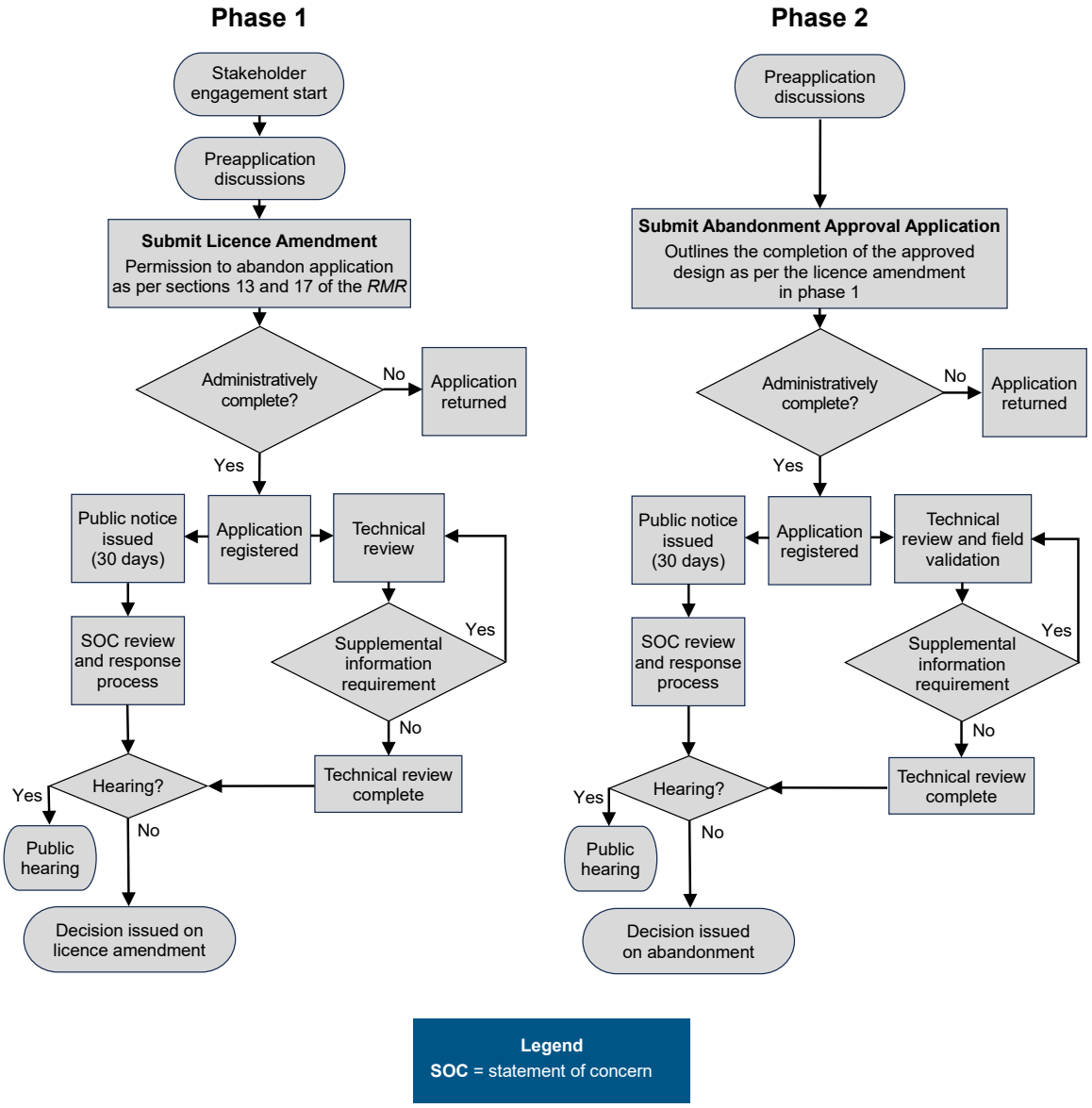

Figure 3. Mine site abandonment application process

253) The licensee or approval holder must submit an application for an abandonment approval for a mine, external mine discard dump, or processing plant that includes the following:

a) a report outlining the completed abandonment works as approved within the applicant's permission to abandon application

b) details of the monitoring results demonstrating the required safety factors and overall slope stability requirements for abandonment have been met

c) any additional information the AER may require

15 Mine Site Closure

Approval holders are expected to prepare for closure throughout the life cycle of the mineral resource development.

Depending on the stage of development, approval holders submit plans and reports to guide progressive reclamation leading to closure as required by the terms and conditions of the *EPEA* approval.

For more information, see Regulating Development > Project Closure > Reclamation > Mine Reclamation Requirements on the AER's website.

Figure 4 shows the mine closure process.

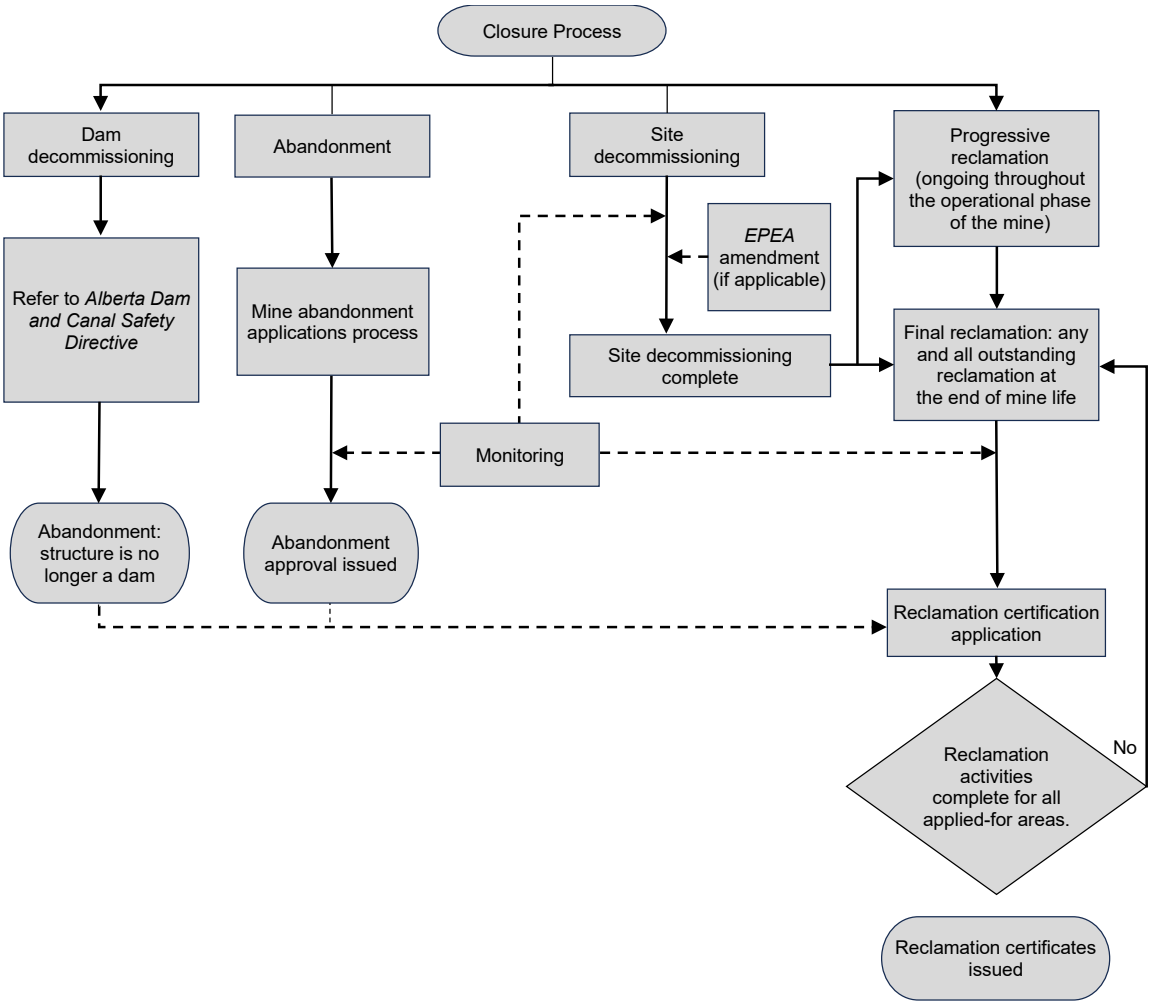

Figure 4. Mineral resource development closure process

16 Records, Reports, and Other Submissions

16.1 Records

254) Unless otherwise authorized by the AER, the permittee or licensee must prepare and keep a mine plan in the office at the mine or mine site that shows

a) the boundaries of each lease or other grant of the mineral resource

i) in which any part of the mine site or mine lies or

ii) that comprise an adjoining area from which the holder of the permit or licence has a right to mine and recover a mineral resource;

b) the legal description of all land from which the mineral resource will be or is being mined;

c) the outer boundaries of the area surveyed in the most recent survey and the survey date;

d) the boundaries of all mine workings and working places;

e) the elevation of all workings and working places relative to sea level and their positions relative to the surface;

f) the location of all mine entrances, exits, ventilation shafts, effluent discharge openings, and the same relative to the surface;

g) the general location, outline, and orientation of each mineral resource deposit;

h) a representative section of each mineral resource deposit, including the immediately adjoining strata; and

i) the position, direction, and dip of all known faults, the throw or displacement of strata affected by the faults, and all known washouts, dikes, or sills in the mine.

255) The permittee or licensee must, at the request of and for the period specified by the AER, submit to the AER a copy of the mine plan and retain duplicate copies of the mine plan as part of the permittee or licensee records.

16.2 Reports

16.2.1 Operations Reports to the AER

256) The permittee or licensee of a mine must submit to the AER no later than the 15th day of each month on forms furnished or approved by the AER a report for the preceding month that includes the following:

a) quantity and average grades of run-of-mine mineral extracted

b) quantity and average grades of run-of-mine mineral disposition

c) quantity and average grades of run-of-mine minerals in storage

d) value of sales

e) quantity of material removed as

i) overburden and

ii) waste rock

257) The permittee or licensee of a mine must submit the following reports to the AER in a format provided by the AER:

a) a forecast of next year's proposed operations submitted in the third quarter of each calendar year

b) a report outlining the previous year's operations submitted in the first quarter of each calendar year

258) The holder of an approval for a processing plant must submit to the AER no later than the 15th day of each month on forms furnished or approved by the AER a report for the preceding month that includes the following:

a) the production and disposition of plant products, including

i) grade and quantity of concentrate and

ii) quantity and purity of refined metals in storage

b) the value of sales

259) The permittee must submit to the AER no later than the 15th day of each month in a format provided by the AER a report of the previous month's general construction and operations that includes the following:

a) site as-built plans with accompanying representative cross-sections

b) production quantities of run-of-mine ore and waste

c) quantities of processed minerals produced

d) construction and operation of HLFs

e) tailings volumes deposited

f) incidents and required reporting

260) The holder of an approval of a processing plant must submit to the AER a waste management report every six months in a format provided by the AER that includes the following:

a) For the tailings management facility,

   i) the site as-built plans with accompanying representative cross-sections;

   ii) tailings site allocations and associated volumes;

   iii) incidents, required reporting, mitigation, and monitoring;

   iv) evaluation of the water balance and contaminant loading outcomes;

   v) operations of water management systems, including any seepage collection, treatment, and discharge systems;

   vi) water quality discharge and receiving water standards and other water management requirements such as required water levels;

   vii) identification of potential risks; and

   viii) status update of tailings treatment.

b) For the HLF,

   i) ore as-built stacking plans, including the status of any concurrent or progressive rinsing, reclamation, or closure;

   ii) development, calibration, and refinement of the water balance model and contaminant load model;

   iii) evaluation of solution inventories and water balance and contaminant loading outcomes;

   iv) leak detection monitoring and response;

   v) evaluation of any contaminant-related effects on aquatic, terrestrial, or atmospheric environments; and

   vi) evaluation of any physical effects on wildlife or wildlife habitat.

261) The permittee must submit to the AER a geotechnical report every six months in a format provided by the AER that includes the following:

a) an analysis of the results from all pit wall and dump slope groundwater and deformation monitoring programs

b) an analysis of the results from all subsidence monitoring programs

c) a summary of all mitigation measures undertaken in response to issues identified in previous monitoring program reporting

16.2.2 *EPEA* Reporting

Reports, plans, proposals, and authorizations must be submitted as required by the *EPEA* approval conditions. For more information, see Regulating Development > Project Application > Application Legislation > *Environmental Protection and Enhancement Act* on the AER's website.

16.2.3 *Public Lands Act* Reporting

Reports must be submitted in accordance with the conditions of the *PLA* disposition.

16.2.4 *Water Act* Reporting

Reports (e.g., annual water use reports) are required by the *Water Act* licence conditions. For more information, see Regulating Development > Project Application > Application Legislation > *Water Act* on the AER's website.

16.3 Exploration Data

16.3.1 Core Segments, Samples and Analyses

262) If requested by the AER, the permittee or licensee of a mine site or mine must submit exploration samples, analyses, or core segments typical and representative of the mine area.

A complete core segment or a portion equal to at least half of the core segment cut axially may be submitted.

263) If **core images** are taken as part of the core analysis, the licensee must submit them as compressed high-quality images to the designated information submission system.

16.3.2 Identification and Transmittal of Core Segments, Samples and Analyses

264) The permittee or licensee of a mine site or mine must submit samples, analyses, and core segments to the Mineral Core Research Facility (MCRF) in a manner acceptable to the MCRF no later than three months after the completion of the field program or any major phase of the field program.

Address sample containers and core boxes to

Mineral Core Research Facility, Alberta Energy Regulator
Capital Industrial Park
4504 Eleniak Road (63 Ave) NW
Edmonton, Alberta T6B 2N1

When storing samples or cores, preserve them to prevent deterioration before transmittal.

16.4 Report Submission Procedures

Permittees, licensees, and approval holders can submit all reports, including those required by the *MRDA*, *EPEA*, *MIMER*, *PLA*, and the *Water Act*, via email to MRDA.Submissions@aer.ca.

17 Emergency Management

The AER has a rigorous regulatory framework aimed at protecting public safety and minimizing effects on the environment through safe and responsible mineral resource development. The AER's regulatory instruments support the phases of the emergency management cycle: prevention and mitigation, preparedness, response, and recovery.

265) The permittee, licensee, or approval holder must develop, implement, and update their emergency response plan in accordance with *Directive 071: Emergency Preparedness and Response*. The plan contents must be appropriate to the risks and hazards at the permittee's, licensee's, or approval holder's mineral resource development and include the following:

   a) Procedures describing how the permittee, licensee, or approval holder will respond to incidents as defined in *Directive 071*.

   b) Information on the level of preparedness of the permittee, licensee, or approval holder to implement its emergency response plan, including sufficient numbers of suitably trained personnel and equipment to respond to an emergency effectively.

Appendix 1 Definitions

business associate (BA) code	*Directive 067* requires that any party that seeks to apply for and hold AER licences or approvals must first apply for and obtain a BA code through Petrinex.
core images	A core image is any photography of a core, including white light, ultraviolet light, hyperspectral image analysis, etc.
engage	To engage means initiating two-way communications with identified participants, providing information, providing opportunities for feedback, and following up on concerns.
external mine discard dump	As defined in the *Mineral Resource Development Act*.
mine	As defined in the *Mineral Resource Development Act*.
mine site	As defined in the *Mineral Resource Development Act*.
occupant	A person other than the owner who is in actual possession of land; a person who is shown on a certificate of title or by contracts as having an interest in the land that confers a right to occupy the land; in the case of Métis land, a person having a right or interest in land recorded on the Métis title register pursuant to the Métis Settlements Land Registry Regulation; the holder of a permit for a coal mine.
participant involvement	Participant involvement encompasses all aspects of public, industry, and regulator interactions and communications. It means that each organization, community, group, and individual with a stake in the discovery, development, and delivery of Alberta's resources may be a participant.
participant involvement area	The area in which the applicant must conduct the participant involvement program, which includes the project development footprint (as defined by the applicant) and the area within 1.5 kilometres of the proposed permit boundary.
processing plant	As defined in the *Mineral Resource Development Act*.
resident	A person occupying a residence on a temporary or permanent basis.
rock-hosted mineral resources	As defined in the *Rock-Hosted Mineral Resource Development Rules*.
subaerial	Tailings that are uncovered and exposed to the atmosphere.