McArthur River Mine

Overburden Management Project

AG

Appendix AG
Borrow Pit Design Process Guidelines

Draft Environmental Impact Statement

McArthur River Mining Pty Ltd

Borrow Pit Design Process

Guidelines

McArthur River Mining

A GLENCORE COMPANY

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1.0 PURPOSE

This document forms a guideline for the life cycle of benign borrow sources for the MRM site, including the TSF and NOEF domains. It aims to cover the process of site selection, determination of design criteria and design details, operation, and closure so that the borrow pits may be developed in keeping with MRM's operational and closure environmental objectives.

This document has been developed as part of the Overburden Management Project EIS (OMP EIS).

2.0 DEFINITIONS

The term 'borrow pit' refers to any borrow pit or extractive quarry for benign materials outside of the main MRM open cut, including associated access tracks, haul roads, stockpiles, and other works directly associated with the borrow pit itself.

3.0 MRM ENVIRONMENTAL OBJECTIVES

A summary of MRM's Closure Objectives is included here, as extracted from the Mine Closure Plan. Refer to Chapter 4 (Closure, Decommissioning and Rehabilitation).

Safe to Humans and Wildlife

- Post-mining landscape will be left in a condition safe and secure for humans and animals.

Stable

- Construction of stable landforms that are compatible with post-mining land use.

Non-Polluting

- Manage surface water and groundwater such that environmental values and ecosystems are maintained downstream of the lease boundary in the short term (0-100 years), and within the McArthur River in the long term (100-1,000 years).
- Metal levels for fauna comparable to background levels.

Able to Sustain an Agreed Post-Mining Land Use

- Landform will host suitable vegetation for post-mining land use.
- Rehabilitated areas will provide appropriate habitat for fauna utilization - abundance and diversity will be appropriate.
- No infrastructure left on site unless a beneficial gain is identified with stakeholders.
- Manage soil to meet post mining land use.
- Maintain Traditional Owners access to areas of cultural significance.
- Foster economic opportunities for Traditional Owners and local communities.

4.0 GUIDELINES

Planning, development and closure of borrow pits shall follow the process described in this guideline. Sections, chapters and appendices within the OMP EIS document will be referenced throughout this document.

4.1 Process and Assessments

1) Broad locations

a. All borrow locations will be within the mining leases
b. All borrow locations will be covered by appropriate Aboriginal Areas Protection Authority certificates (including conditions and permitted activities) at the time of development. Sufficient time must be allowed for new or amended certificates.

2) Matters of National Environmental Significance (MNES)
   a. Sites will be located so to preserve habitat for MNES relevant species where practicable
   b. Refer to Chapter 9 (Biodiversity) and Chapter 10 (Matters of National Environmental Significance) for details on commitments and management strategies.
3) Geochemical classification
   a. Material within the borrow pit will be sampled for geochemical properties and classification against the MRM/KCB 2016 classification table. Target materials are specifically alluvials and LS-NAF(HC).
      i. In oxidised materials, chromium reducible sulphur (CRS) will replace total sulphur
      ii. Topsoil and alluvials are not considered as MS-NAF's due to the oxidised mineralogy, and are suitable for replacement in the borrow pit as part of rehabilitation.
   b. The density of sampling will be determined by the MRM overburden sampling procedure, which considers international standards and MRM local geology.
   c. Laboratory testing will be conducted by a NATA registered facility as per the MRM procedure.
   d. Refer to Chapter 6 (Material Characterisation) for details on commitments and management strategies.
4) An assessment of potential groundwater impacts shall be made using available data or additional data gained before development:
   a. Preference will be given to designs that remain above the groundwater table for the range of expected seasons that the borrow pit would remain operational or until closure
   b. Where this is not possible, a groundwater management plan will be required addressing, but not limited to, the following:
      i. A review of un-impacted groundwater quality and expected inflows to determine if intercepted groundwater could be released as surface water, and under what conditions;
      ii. Potential for impacted groundwater/seepage from adjacent facilities to enter the borrow;
   c. Refer to Chapter 8 (Water Resources) for details on commitments and management strategies.
5) An assessment of potential surface water impacts shall be undertaken, which addresses, but is not limited to, the following:
   a. Identify clean water diversions/drains and separations required.
   b. Assess the potential for surface water quality impacts from the borrow pit, roads, stockpiles and other associated changes proposed
   c. Refer to Chapter 8 (Water Resources) for details on commitments and management strategies.
6) Develop a water management plan for the development and operational period of the borrow, which addresses, but is not limited to, the following:

   a. Levees or windrows required
   b. Drains
   c. Sumps, pumps and piping infrastructure, and their associated energy sources
   d. Sediment traps or basins or other erosion management structures
   e. Sampling and testing requirements
   f. Refer to Chapter 8 (Water Resources) for details on commitments and management strategies.

7) A geotechnical analysis of the proposed borrow shall be undertaken using available data or additional testing as required to ensure it is appropriate for its intended use in construction of rehabilitation. This shall address, but not necessarily be limited to, the following:
   a. Analysis of the stability of the borrow
   b. Analysis of the potential impact on adjacent structures (such as TSF or NOEF) where applicable. Factors of Safety for the adjacent facilities shall not be reduced below their minimum criteria by the proposed borrow.
   c. Refer to Chapter 3 (Project Description) for details on commitments and management strategies.
8) A dust management plan will be developed in accordance with MRM's site air quality management plan. Refer to Chapter 13 (Air Quality) for details on commitments and management strategies.
9) A rehabilitation plan will be developed addressing at least the following:
   a. Backfilling options will be assessed, with a preference for backfilling with benign materials to at least above the groundwater table, where relevant;
      i. Where a void is to remain, the excavation shall be left in a condition likely to be stable in the long term, in keeping with MRM's closure objectives
   b. An assessment of the requirement, and the specifications of, any capping layers plus sources for the required materials
   c. Long term water management requirements
   d. Refer to Chapter 4 (Decommissioning, Rehabilitation and Closure) for details on commitments and management strategies.
10) Plans for topsoil replacement and revegetation. Refer to Refer to Chapter 4 (Decommissioning, Rehabilitation and Closure) for details on commitments and management strategies.

4.2 Documentation

The assessments undertaken for the borrow pit shall be compiled into a report for each borrow pit (or complex, if comprised of several small adjacent borrows). A file is recommended for each source, to be updated over time as the facility moves from planning through operations and into the closure phases. The structure of the report is to contain the sections described below:

Section 1 – Assessments

- This contains the assessments described above

Section 2 – Design Criteria

- Based on the assessments, final design criteria are to be developed for the borrow pit/s and associated constructions.

Section 3 – Execution Plan

- Permits and approvals process
- Any baseline data collection required before development
- Development plan and schedules
- Monitoring requirements

This plan should be completed to a standard suitable for submission as part of an MMP or Amendment.

Section 4 – Detailed Design

- Detailed design drawings, specifications, and methods as required

Section 5 – As-built Data

- Survey data
- Monitoring and sampling results
- QA/QC data
- Closure criteria assessments