

GIPPSLAND CRITICAL MINERALS PTY LTD

FINGERBOARDS PROJECT

PROJECT PROCESSING SUMMARY

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1. INTRODUCTION

The proposed Fingerboards Project is a mineral sands mining operation in Gippsland, Victoria, that aims to extract sand (**ore**) from a shallow formation and separate out small quantities of valuable minerals such as zircon, rutile, ilmenite and rareearth minerals. These valuable minerals are combined into a single saleable product known as Heavy Mineral Concentrate (**HMC**).

The project handles relatively large volumes of material as part of the mining process, with up to 900 tonnes of ore per hour that is extracted and processed. From this, approximately 50 tonnes per hour of HMC become final product. The remaining material, which is largely quartz sand, is safely returned to minedout voids as backfill material. The operation is designed to run continuously and uses waterbased processing and gravity separation rather than blasting or chemical treatment.

2. BACKGROUND

The following provides a summary of the Fingerboards Project processing relevant to radiological levels. This is because the ore contains small percentage of naturally occurring Thorium and Uranium associated with the Zircon and Rare Earth Minerals, and there will be a level of concentration of radiological levels as part of the processing that forms part of the project.

The various stages of ore processing are shown in *Figure 1* below.

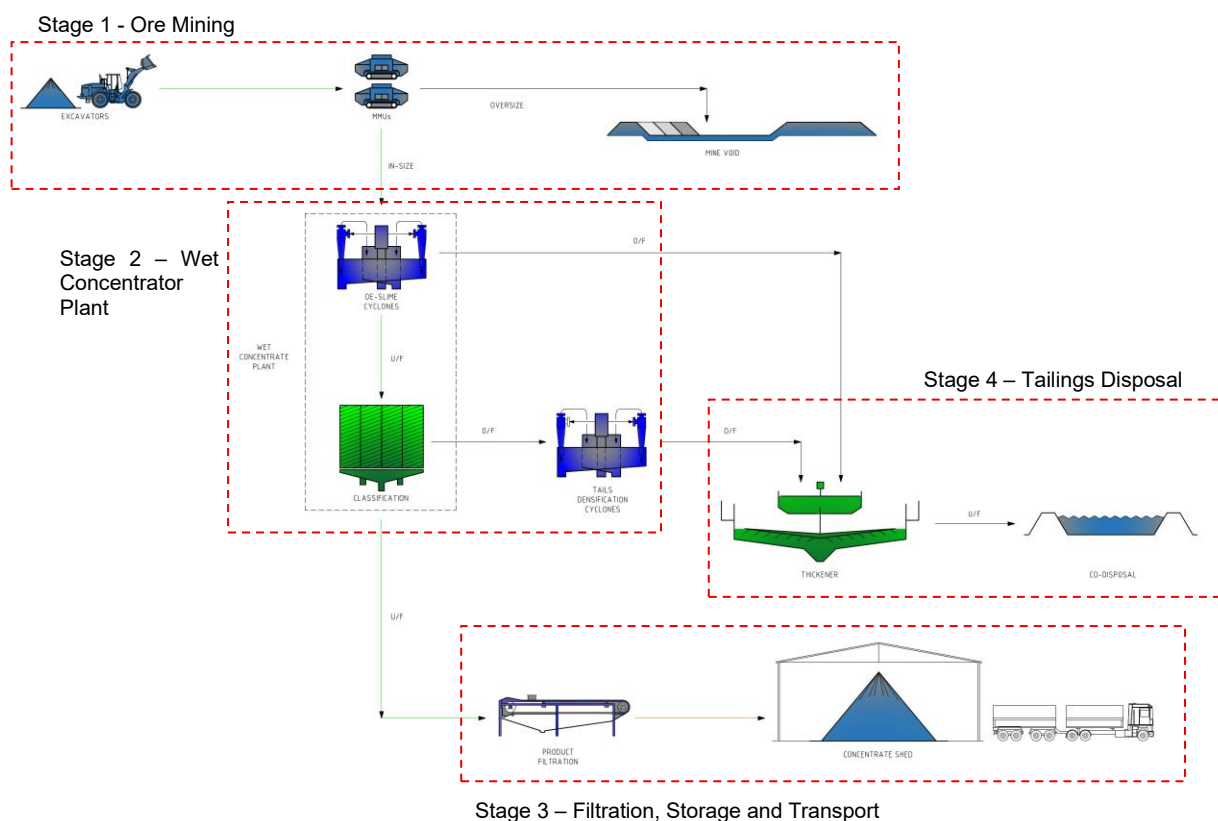


Figure 1 - Processing Stages

Stage 3 – Filtration, Storage and Transport

3. STAGE 1 – ORE MINING: EXTRACTING AND SLURRYING THE SAND

3.1 WHAT IS MINED

The ore consists of loose sand within 20 to 40m of surface. The nature of the geology targeted means that the ore and overlying material can be excavated through conventional excavation equipment, with:

- No blasting is required.
- No crushing or grinding is needed.
- The valuable minerals exist as fine grains within the sand.

3.2 MOBILE MINING UNITS (MMUS)

Mining includes the use of two Mobile Mining Units (**MMUs**) operating directly at the mining face, with each MMU:

- Is fed by standard earthmoving equipment such as bulldozers and loaders.
- Removes very large rocks using a screen.
- Mixes the sand with water to form a slurry.
- Pumps the slurry to the processing plant via pipelines.

Each MMU processes about 450 tonnes per hour on average, giving a total average mining rate of up to 900 tonnes per hour for both combined. Oversized material removed at this stage is set aside and reused later if required.

3.3 URANIUM AND THORIUM CONCENTRATION: ORE

The extensive sampling and testing of the ore shows that it contains between 7 and 25 ppm uranium and 36 to 120ppm thorium with an activity concentration between 0.2 and 0.8 Bq/g. This means the ore that is extracted is below the trigger value for a nuclear action. The ore is not stockpiled and is continuously fed to MMU for processing at the Wet Concentrator Plant (**WCP**) as a wet slurry.

4. STAGE 2 – WET CONCENTRATOR PLANT: CONCENTRATING THE VALUABLE MINERALS

The WCP is where the ore is separated into valuable product and waste material. This happens in several controlled steps:

4.1 STEP 1 – PRIMARY SCREENING AND DESLIMING

When the ore slurry from the MMU is pumped to the WCP:

- It first passes through screens that remove remaining coarse material.
- The slurry then enters primary cyclones, which separate very fine clay particles from the ore sand and sends the coarser sand forward for further processing.

This step improves gravity separation and reduces water handling issues.

4.2 STEP 2 – SECONDARY DESLIMING AND DENSITY CONTROL

After primary desliming:

- The sand is further diluted with water to control solids concentration.
- It passes through secondary cyclones that remove additional fine clay.

This ensures that the remaining slurry contains mostly clean sand grains and heavy minerals, which improves separation efficiency in later stages.

4.3 STEP 3 – CONSTANT DENSITY TANK

The cleaned slurry flows into a Constant Density (**CD**) Tank, which:

- Acts as a buffer between processing stages.
- Maintains a steady feed rate and density.
- Allows remaining ultrafine particles to rise and be removed.
- Provides stable conditions for the main separation equipment.

The CD tank ensures that the plant runs smoothly even if upstream conditions fluctuate.

4.4 STEP 4 – GRAVITY SEPARATION

From the CD Tank, slurry is pumped to spirals, which are the primary separation units.

The spirals:

- Separate particles based on density using gravity to produce the HMC.
- Allow light quartz sand to flow out as tailings.

From the original 900 tonnes per hour of ore:

- About 50 tonnes per hour become HMC.
- Around 850 tonnes per hour become tailings.

4.5 URANIUM AND THORIUM CONCENTRATION: HMC

The HMC material that is generated from the WCP contains between 200-250 ppm uranium and 1,500-1,600 ppm thorium with an activity concentration between 8.5-9.5 Bq/g and is therefore above the trigger value for a nuclear action. The HMC is however still a wet slurry contained in hoppers and pipes before it is pumped for filtration sand storage.

The processing will limit the Zircon grade of the HMC to a target of 19.0 and 19.5% ZrO₂ which consequently limits the activity concentration of the HMC product to below 9.5 Bq/g.

5. STAGE 3 – PRODUCT FILTRATION, STORAGE AND TRANSPORT

5.1 DEWATERING THE HMC PRODUCT

The HMC still contains water at the completion of process at the site and is dewatered before transport. This is done in two stages:

1. Small cyclones remove most of the free water.
2. Belt filters further reduce moisture to below 9%, which is the target moisture content for transport.

5.2 STORAGE AND TRANSPORT

The filtered HMC product is conveyed into a covered storage shed that can hold up to two weeks of production. During daytime hours, the product is proposed to be loaded into enclosed half height containers, trucked via an internal haul road to a rail siding, and transported by rail to the destination port.

5.3 SHIPLOADING

At the port the HMC remains in the containers until a vessel arrives for loading. The containers are discharged into the ships hold as bulk cargo using “rotainer” type unloading, where the half height containers are rotated to empty the contents while in the ships hold.

6. STAGE 4 – TAILINGS DISPOSAL AND WATER RECOVERY

6.1 WHAT ARE TAILINGS?

Tailings include:

- Natural sand, silt and clay material above and surrounding the ore that does not contain valuable minerals.
- Fine clays removed from ore during desliming stage.
- Process water used to slurry and transport tailings to in-pit tailings cells.

6.2 CODISPOSAL SYSTEM

The Fingerboards Project proposes to use a codisposal method for in-pit tailings deposition, where:

- Coarse sand and fine clay material left after processing are mixed/homogenised prior to deposition.
- A relatively small amount of flocculant is added to slurried tailings to help solids bind/clump which enhances water recovery once deposited in-pit.

6.3 WATER REUSE

Water recovered from thickeners, filters and in-pit decant ponds is stored in process water dams and reused throughout mining and processing. This minimises the need for fresh water and improves overall sustainability.

6.4 URANIUM AND THORIUM CONCENTRATION: TAILINGS

After separation of the HMC, the remaining combined coarse sand (tailings) contains on average 6-11ppm uranium and 11-95ppm thorium with activity concentration of 0.1-0.5 Bq/g and is therefore below the trigger value for a nuclear action.

The tailings remain as a wet slurry until discharged into the in-pit cells and covered as soon as practical with overburden material.

7. OVERALL SCALE OF THE PROPOSED OPERATION

- **Mining rate:** ~900 tonnes per hour
- **Final HMC product:** ~50 tonnes per hour
- **Material returned to mine:** ~850 tonnes per hour
- **Operating life:** ~22 years
- **Operating hours:** Continuous, 24 hours per day

8. SUMMARY

In summary, while the Fingerboards Project processes relatively large volumes of material which is naturally elevated in radiological levels, the majority (~96%) of that material remains well below the nuclear action trigger, with activity concentrations comfortably under 1 Bq/g throughout mining, processing and tailings disposal.

Only a small, clearly defined portion of the operation namely the Heavy Mineral Concentrate exceeds this threshold, and in this case the material is managed as a wet slurry within fully enclosed pipes, hoppers, filters and covered storage, with engineered controls to avoid emissions to the surrounding environment.

Finally, the proposal includes controls to limit concentrate grade to ensure activity levels within those stated.

Overall, the mining, processing, tailings management and product storage/transport controls will aim to ensure that it either avoids or minimises emissions so far as reasonably practicable and demonstrate that the project's scale does not translate to an unacceptable environmental risk.