



087 780 5800

info@tprmining-resources.co.za

29J Woltemade street  
Witbank, 1035

## REHABILITATION PLAN REPORT

**SUBMITTED FOR ENVIRONMENTAL AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT 1998 (NEMA), AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT 2008 (NEMWA) IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATION IN TERMS OF THE MINERAL AND PETROLEUM RESOURCE DEVELOPMENT ACT 2002 (MPRDA) AS AMENDED.**

**NAME OF APPLICANT:** M Chrome Iron Steel (Pty) Ltd

**FARM NAME:** Portion of the remaining extent of farm 131

**COMMODITY:** Copper Ore, Iron Ore, Manganese Ore and Nickel Ore

**MAGISTERIAL DISTRICT:** Barkley West

**DATE:** August 2023

**DMR REFERENCE NUMBER:** NC 30/5/1/3/2/ 11054 MP

## EXECUTIVE SUMMARY

M Chrome Iron Steel (Pty) Ltd has requested TPR Mining Resources (Pty) Ltd to compile a rehabilitation plan for the new proposed mining operation in support of the mining permit application. This document is compiled in accordance with the relevant legislation governing mine rehabilitation as described in the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA)

M Chrome Iron Steel (Pty) Ltd however proposes to mine Copper Ore, Iron Ore, Manganese Ore and Nickel Ore covering an extent of not more than 5 ha on Portion of the remaining extent of farm 131 in the magisterial district of Barkley West. It is assumed that approximately 5 Ha of land will be disturbed during the mining operation.

The rehabilitation objectives for M Chrome Iron Steel (Pty) Ltd Mine include: rehabilitated areas are safe, stable, non-polluting and sustainable; restore ecosystem function, including maintaining or establishing self-sustaining eco-systems comprised of local native plant species and a landform consistent with the surrounding environment; rehabilitated areas are integrated with grazing and pasture land areas that lie with the Integra leases but will not be disturbed by future mining activities; downstream water quality is preserved. Rehabilitation is progressive throughout the life of the mine and is commenced in each area as soon as practicable after it is no longer required for operational purposes; and minimise the adverse socio-economic effects associated with mine closure.

## INTRODUCTION

This Rehabilitation Management Plan (RMP) forms part of a series of Environmental Management Plans for the company. The plans address environmental issues requiring management as determined through those prescribed by relevant authorities and internal risk management processes. This Rehabilitation Management Plan outlines the actions required and personnel responsible in order for the company to effectively manage rehabilitation as well as through the implementation of audits and reviews, establish of a process for continual improvement of rehabilitation perform

## SCOPE

The purpose of this RMP is to consolidate, list and reference the relevant approved documents to demonstrate progressive and effective rehabilitation for the Integra Mine Complex. It has been developed to:

- facilitate the management of rehabilitation issues;
- ensure compliance with regulatory requirements;
- improve environmental performance;
- and meet stakeholder and community expectations

## OBJECTIVES AND OUTCOMES

The rehabilitation objectives for the company include:

- rehabilitated areas are safe, stable, non-polluting and sustainable;
- restore ecosystem function, including maintaining or establishing self-sustaining eco-systems comprised of local native plant species and a landform consistent with the surrounding environment;
- downstream water quality is preserved.
- rehabilitation is progressive throughout the life of the mine and is commenced in each area as soon as practicable after it is no longer required for operational purposes; and
- minimise the adverse socio-economic effects associated with mine closure.

*The outcomes are:*

- the end land use is safe, stable, non-polluting and sustainable;
- the rehabilitated land is self-sustaining or maintenance requirements are consistent with the agreed post mining land use(s);
- achievement of an acceptable post disturbance land use capability/suitability; downstream water quality is preserved.

## ENVIRONMENTAL POLICY

The company has and is committed to an Environmental Policy which states:

- We are committed to the development of a positive culture where we are responsible and accountable for our actions at all levels of our business.
- We are committed to operating in an environmentally responsible and safe manner through the application of Operating Philosophy and Environmental Management System for;
- Complying with applicable environmental laws, regulations and statutory obligations; Communicating regularly with stakeholders; and Making environmental considerations an integral part of our activities.
- Copies of the policy are displayed in prominent positions across the site and further communicated through inductions and training. Copies of the policy are also included in public documentation such as the Annual Environmental Management Report (AEMR).

## LEGAL AND OTHER REQUIREMENTS

### LEGAL REQUIREMENTS

Relevant legislation governing mine rehabilitation, closure cost assessment (closure provision) and closure planning is described in the Mineral and Petroleum Resources

REHABILITATION PLAN FOR A MINING PERMIT APPLICATION ON PORTION OF THE REMAINING EXTENT OF  
FARM 131

Development Act (Act No. 28 of 2002) (MPRDA) Section 24P of NEMA, as amended by the National Environmental Management Laws Amendment Act, 2014 (Act No 25 of 2014) (NEMLA).

- The definition for environmental management plan as stated in the MPRDA is 'means a plan to manage and rehabilitate the environmental impact as a result of prospecting, reconnaissance, exploration or mining operations conducted under the authority of a reconnaissance permission, prospecting right, reconnaissance permit, exploration right or mining permit, as the case may be.' Reference is also made to the MPRDA Regulations 53 – 57 and 60 – 62.

## COMPILATIONS

The rehabilitation plan compiled for the proposed project has followed the above methodology and details the following:

- Statutory requirements, both at a national and international level;
- Soil and overburden management;
- Vegetation and fertilizer management;
- Alien invasive control plan; and
- Monitoring criteria and guidelines.

## LAND PREPARATION

The aim of land preparation is to ensure that the area impacted is kept to an absolute minimum. The mining activities need to be designed with closure in mind. Top soil stockpile areas must be demarcated as no-go areas

## VEGETATION CONSERVATION

Vegetation must be removed and stockpiled together with the topsoil so as to preserve the organic content in the soil as well as the seed bank for the replacement of soil and re-vegetation. The occurrence of protected plant species will need to be determined before vegetation is removed and the required permits will be obtained for either destruction or relocation.

## SOIL STRIPPING

To reach the Iron Ore, Lithium Ore, Manganese Ore, Nickel Ore and Rare Earths reserves, the mining process may need to remove the topsoil, sub-soil soft overburden and hard overburden. This section explains the correct measures that should be followed during the stripping of soil. This is a key rehabilitation activity as lost soils cannot be regenerated in the lifetime of the mining activities. Correct stripping of soils will firstly ensure that enough soils are available for rehabilitation and secondly, that the

soils are of adequate quality to support vegetation growth and thus ensure successful rehabilitation.

### SOIL STRIPPING DEPTHS

The topsoil of the soil profile can be stripped to a total depth of 0.3m and stockpiled separately from the sub soil as this is where the seed bank is. The subsoil approximately 0.7 – 0.9 m thick will then be stripped and stockpiled separately. The maximum estimated volume of topsoil that will be stripped over 5ha is 15,000m<sup>3</sup>.

### SOIL STRIPPING METHOD

Soils should be stripped and replaced using the truck and shovel method as far as possible. This method will limit the compaction of soils. If bowl scrapers are used, then the soils must be dry during stripping to minimise compaction. The best time for stripping of soils is when soil moisture content is lowest which will be during the dry season.

### SOIL STRIPPING SUPERVISION

Supervision by an environmentalist (or trained supervisor) must be done to ensure that the soils are being stripped from the correct areas and to the correct depths, and placed on the correct stockpiles with a minimum of compaction. Soils are most susceptible to compaction when the moisture content is high. The dry winter months (April - August) are thus more suitable for the stripping and replacement of soils. If soils have to be moved during wet months, then special care should be taken to adopt methods that cause minimum compaction.

### SOIL STOCKPILING

This section explains the correct measures to be followed during the stockpiling of soil. Stockpiling should be minimised as far as possible as it increases compaction and decreases the viability of the seed bank.

### STOCKPILE LOCATIONS

- **Compaction Avoidance**

Soils should be stockpiled loosely. Achieving this will depend on the equipment being used during the stripping and stockpiling process. Soils should be dumped in a single lift if truck and shovel methods are used. If the dumps are too low, then the height could be increased by using a dozer blade or backwater bucket to raise the materials. Generally, no higher than 4m is the prescribed stockpile height (Tanner et. al., 2007).

#### **Topsoil Stockpile Vegetation.**

The stockpiles are potentially going to be in place for the life of the project and will be used to rehabilitate the disturbed area. Vegetation should be allowed to establish itself in

situ on the topsoil stockpiles to avoid soil loss due to erosion and weed colonisation as well as fertility loss. Should vegetation not establish itself, then fertilisers will need to be applied into the stockpile to vegetate. A similar seed mixture to the final one recommended for rehabilitation should be used.

## TOPSOIL AND SUBSOILS STOCKPILE MAINTENANCE AND MONITORING

Once established, stockpiles should be managed to ensure that losses from the piles are minimised and that additional damage the physical, chemical or biotic component is minimised. It must be ensured that the stockpiled soil is only used for its intended purpose. The topsoil stockpiles must be clearly demarcated as “No Go” zones and monitored frequently. Employee awareness programmes are to be carried out to reduce the risk of stockpile “robbery” / unauthorized use or contamination. The topsoil stockpile must remain vegetated at all times. The vegetation must be monitored and managed accordingly to avoid erosion losses.

## REHABILITATION ACTIONS

The actions contained within this section are to be implemented at closure. The report and its associated costing have been based upon DMR guidelines set out by the Department of Minerals Resources (2005) in the “Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine”. The guidelines outline the methods for rehabilitation required for closure, and the actions which are described below follow these guideline.

## OPENCAST AREA REHABILITATION

It is assumed that approximately 5ha of land will be disturbed during the mining operation. The purpose of pit closure is to ensure the pits become safe for humans and animals and for the purpose of the liability assessment it has been assumed that the shaping of the pit area slopes will be undertaken during the operational phase of the mine to reduce closure costs. After the mining activities are completed, up to 300mm thick of topsoil will be spread on the disturbed areas. Once placed, the “soil” should then be ripped, fertilised, and re-vegetated.

## TAILINGS DAM

The tailings dam will be removed at closure. The plastic lining must be removed and can be recycled. The earth walls will be flattened and the area profiled. The pipes associated with the dam must be removed and if possible sold.

## STOCKPILE AREA

It is assumed that all the material from the stockpile area will be taken for processing and cost has been allocated to rip the footprint, reshape the surface and vegetate

## ACCESS ROADS

Access roads around the site should be ripped for all areas except those needed to access the facilities for inspection after closure. Roads that can and will be used by other users post closure should, however, be left provided this is agreed upon by all parties concerned. For the rehabilitation of roads, a cost has been allocated to rip the area, add 300 mm topsoil and vegetate.

## BIOPHYSICAL CLOSURE AND REHABILITATION

### FINAL LANDFORM AND ECOLOGICAL FUNCTIONALITY

The open cut area will be re-shaped to create a gently sloping, free-draining topography during the operational phase. The topsoil and sub soil that was removed during the construction phase should be returned/replaced (as the final top layer), fertilised and ripped. After these tasks have been completed the open cut site can be included in the rehabilitation process for re-vegetation, monitoring and maintenance.

### SOIL REPLACEMENT

Once the final land-form has been created, soil replacement can begin. All the stripped soil types are to be replaced into the original locations of the soils.

### COMPACTION AVOIDANCE

Compaction limits the effectiveness of replaced soils. The equipment used during the replacement of the soils has a major impact on the compaction levels. Ideally heavy machinery should not be used to spread and level soils during replacement. The truck and shovel method should be used since it causes less compaction than, for example, a bowl scraper. When using trucks to deposit soils, the full thickness of the soil required can be placed in one lift. This does, however, require careful management to ensure that the correct volumes of soil are replaced. The soil piles deposited by the trucks will have to be smoothed before re-vegetating the area.

### SOIL AMELIORATION

Replaced soils require both physical and chemical amelioration as the actions of soil removal, stockpiling and replacement result in high levels of soil compaction and a dilution of the fertility of the soil originally present and concentrated in the surface layers. The actions that should be taken during the amelioration of soils are as follows:

- The deposited soils must be ripped to ensure reduced compaction;
- An acceptable seed bed should be produced by surface tillage;
- Restore soil fertility;
- Incorporate the immobile fertilisers in to the plant rooting zone before ripping; and

- Apply maintenance dressing of fertilisers on an annual basis until the soil fertility cycle has been restored.

## RE-VEGETATION AND BIODIVERSITY ESTABLISHMENT

### AIMS AND OBJECTIVES

The main aim of re-vegetation for the study area is to restore the area to the indigenous vegetation. It is advised to restore the study area as far as possible to a stable and sustainable ecosystem. The overall objectives for the re-vegetation of reshaped and top-soiled land are to:

- Prevent erosion;
- Restore the land to the agreed land capability;
- Re-establish eco-system processes to ensure that a sustainable land use can be established without requiring fertilizer additions; and
- Restore the biodiversity of the area as far as possible

### REHABILITATION SPECIES

The rehabilitation “seed cocktails” generally consist of grasses as they rapidly establish and provide excellent protection against surface erosion. The following grass seed mix is recommended for rehabilitation re-vegetation:

- Eragrostis tef;
- Digitaria eriantha;
- Cynodon dactylon
- Cenchrus ciliaris; and
- Chloris gayana;

### RE-VEGETATION

The rehabilitated areas need to be stabilised with vegetation, mainly grasses at first. Long-term post-closure rehabilitation will allow the re-vegetation of the grasses, bushes and trees.

The recommended approach, for which the costing has been derived, is as follows: Lime and superphosphate must be applied to the surface

- These ameliorants are then incorporated by deep ripping, which penetrated 100mm through the soil into the underlying overburden material
- Compound (NPK + Zn) fertilizer must be applied, and diced in as part of seedbed Preparation

### AIR QUALITY



Re-vegetation is critical for acceptable closure of the area and to achieve sustainable and good air quality. It is recommended to minimise the erosion to reduce the potential for fugitive dust generation.

## MAINTENANCE AND AFTERCARE

Maintenance and aftercare must be planned for 2-3 years after the land preparation and replanting of vegetation has been completed. Maintenance will specifically focus on annual fertilising the rehabilitated area, control of all other alien plants and general maintenance, including rehabilitation of cracks, subsidence and erosion gullies. Continuous erosion monitoring of rehabilitated areas and slopes should be undertaken and zones with excessive erosion should be identified. The cause of the erosion should be identified, and rectified. Zones with erosion will need to be repaired with topsoil and re-vegetated.

## LONG TERM WATER ISSUES

Each mining operation has an effect on the ground and surface water regimes. These effects vary greatly according to the mining operation and the geological setting of the operation. This report did not attempt to quantify the groundwater impacts or the mitigation thereof. These impacts and their mitigation cannot be accurately predicted without the availability of a detailed hydrogeological study of the area, resulting in this omission. Post-Closure Monitoring and Management. The purpose of monitoring is to ensure that the objectives of the rehabilitation programme are met and that the rehabilitation process is followed.

## GROUNDWATER AND SURFACE WATER

The post-closure monitoring should take place for five years or until a long term acceptable trend can be determined.

The following recommendations have been suggested for post mining rehabilitation and monitoring of the proposed development area. Biodiversity assessments mid wet season should be undertaken by a qualified ecologist / botanist to monitor the rehabilitation progress with regards to flora.

## CONCLUSION AND RECOMMENDATION

The Rehabilitation Plan and Closure Cost Calculation was based on an estimate was made based on previous experience.

The recommendations, based on the compilation of the liability assessment are as follows:

- Hydrogeological studies should be conducted for the mining area to define the post-closure influence of the mining on the groundwater quality on the farm, and its likely impact on the surrounding areas;

- Concurrent rehabilitation must be conducted where possible so as to reduce the liability burden when the mine ceases to operate; and
- The liability figures need to be updated on an annual basis as required by the DMR.
- This will ensure that all costs become more accurate over time and will reflect current market conditions.

## STAKEHOLDERS

Regular consultation has been held and will continue to be held with the relevant Government, community and surrounding stakeholders in regard to all aspects of both the Open Cut operations. In addition and in accordance with relevant legislation.

Relevant stakeholders include:

DMR:

SAHRA:

DEA:

Mine Site Neighbours:

Local Community:

## ENVIRONMENTAL MANAGEMENT CONTROLS

The description of environmental management controls as required by Guidelines to the Mining, Rehabilitation and Environmental Management Process are described in the following Plans (EMP). These Plans provide the necessary detail for the management and mitigation measures to be adopted for the Mine to ensure overall environmental management is undertaken in accordance with the relevant approvals.

## ENVIRONMENTAL MANAGEMENT CONTROL

References Issue	Document
Air Quality	Air Quality and Greenhouse Management Plan
Water Management	Water Management Plan
Ecology	Biodiversity Management Plan
Weed Control and Management	Biodiversity Management Plan
Noise	Noise Management Plan

Blasting	Blast Management Plan
Heritage	Heritage Management Plan
Hydrocarbon Contamination	Spill Response Plan

## COMPETENCE, TRAINING AND AWARENESS

All personnel shall undergo rehabilitation management awareness training. Rehabilitation Management shall be a component of the competency based site induction program. The following areas shall be covered in induction:

- Importance of rehabilitation; and
- Requirements for rehabilitation

The Environmental Advisor shall be responsible for ensuring the appropriate rehabilitation management training is included in the induction.

## ROLES AND RESPONSIBILITIES

<b>Role</b>	<b>Responsibilities</b>
<b>Operations Manager</b>	Must ensure adequate resources are available to enable implementation of this rehabilitation management plan
<b>Operations Manager (or equivalent)</b>	The Manager of Mining Engineering is accountable for the overall environmental performance of the Integra Copper Ore, Iron Ore, Manganese Ore and Nickel Ore including the outcomes of this rehabilitation management plan.
<b>Superintendents</b>	Accountable for ensuring all employees in the respective areas are committed to and implement the requirements of rehabilitation management at Integra as defined in this procedure.
<b>Environmental Advisor</b>	Responsible for providing consultative advice and facilitating training where

	<p>required for rehabilitation management at Integra.</p> <p>Ensure rehabilitation management training is included in the induction.</p>
<b>All personnel</b>	<p>Responsible for ensuring the Rehabilitation Management Plan is complied with in all respects.</p>

## REVIEW

The review of this document will be in line with the sites Environmental Management Strategy. A review will be conducted yearly after the Independent Environmental Audit and/or as required by relevant consent conditions. The purpose of the review is to ensure that the RMP remains suitable, adequate and effective. In addition if changes to the relevant documented Plans relevant to rehabilitation are amended, this Plan will also be reviewed and updated.

Reporting for rehabilitation will be included in the Annual Review.