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 <p>ASSMANG MANGANESE BLACK ROCK MINE OPERATIONS</p>	<b>ASSMANG LIMITED</b>	Revision No.: 1.0
	<i>Appendix 11: Topsoil Management Procedure</i>	Next Revision Date: 2016/10/14
	Document No: PRO-SHE-E-Ge-G-2299	Effective Date: 2014/11/14

## Appendix 11: Topsoil Management Procedure

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## 1. Purpose

The purpose of this procedure is to:

- Ensure that topsoil is managed in a manner that its fertility and quality is preserved for future use for the rehabilitation of disturbed areas.

## 2. Scope

This procedure is applicable to all employees doing work for, and on behalf of, Assmang Limited Black Rock Mine Operations.

## 3. References

- 3.1. Black Rock Mine Operations' Occupational Health, Safety & Environmental Policy;
- 3.2. Loading Procedure for Topsoil Dump – Black Rock (PRO-Eng-G-BI-S-791);
- 3.3. Applicable legislation as detailed in the Legal Register; and
- 3.4. Black Rock Mine Operations' Approved Environmental Management Programme.

## 4. Abbreviations & Definitions

### DEFINITIONS

**Environment:** the surroundings in which the mine operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation.

**Environmental aspects:** components of the mine's activities or products or services that can interact with the environment.


**Environmental impact:** any change to the environment, whether adverse or beneficial, wholly or partially resulting from the mines environmental aspects.

**Environmental Management System (EMS):** the part of the overall management system that includes the organisation structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy.

**Topsoil:** that uppermost layer of soil capable of growing and supporting vegetation. Topsoil typically contains the essential micro-organisms, nutrients, organic matter, and physical characteristics necessary to grow and sustain permanent vegetation. Stripping, stockpiling, and reusing topsoil is generally essential for proper reclamation of disturbed areas upon mine closure/rehabilitation

## 5. Responsibilities


- It is the responsibility of all employees and contractors whose work involves the stripping, stockpiling or working of topsoil at Black Rock Mine Operations to manage these activities in accordance with this procedure and report via the prescribed incidents/non-conformance form or Electronic Management System.

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- Where applicable, it is the responsibility of the Supervisor to ensure that remedial steps are taken to rectify non-compliance with this procedure in their area of responsibility and to report back on the Electronic Management System.
- The supervisors responsible in that area must in conjunction with the Environmental Section formulate sustainable solutions to prevent re-occurrences of such incidents.
- It is the responsibility of the Environmental Management Section to audit topsoil management and where necessary to evaluate the success of the remedial action taken and to record the results on the Electronic Management System.

## 6. General

This procedure applies to all areas at Black Rock Mine Operations which are considered to have been disturbed, or are planned to be disturbed, by the mines' activities.

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## 7. Description of Procedure

### 7.1. Stripping

- 7.1.1. The area where topsoil is to be stripped must be demarcated such that the disturbed area is minimised as far as is practical;
- 7.1.2. Surface vegetation must be removed prior to topsoil stripping;
- 7.1.3. No specific recommendations on how deep the topsoil should be excavated to prepare the area are stipulated. In order to minimise the amount of soil removed and to preserve organic content the normal practice must be to excavate no more than 30 cm, unless the specific activity requires deeper excavation;
- 7.1.4. If archaeological sites are exposed during vegetation stripping, these should immediately be reported to the Environmental Specialist. The Environmental Specialist must subsequently report these to the South African Heritage Resources Agency (SAHRA);
- 7.1.5. Under no circumstances shall archaeological artefacts discovered be removed, destroyed or interfered with;
- 7.1.6. Temporary stockpiles at the stripping site must not exceed 3m in height, and must be removed to the official topsoil storage areas within 2 weeks of stripping;
- 7.1.7. Topsoil must be kept separate from subsoil, waste rock and other forms of overburden; and
- 7.1.8. Multiple handling of soil materials increases the risk of damage to soil structure so should be minimised.

### 7.2. Stockpiling

- 7.2.1. Areas devoted to the stockpiling of topsoil must fenced, gated and locked;
- 7.2.2. Access to the topsoil stockpiles must be controlled by the Environmental Specialist or a suitable delegated person;
- 7.2.3. No topsoil may be removed without the prior consent of the Environmental Specialist;
- 7.2.4. A record of all topsoil transfers must be kept by the Environmental Specialist, this must include:
  - 7.2.4.1. The date of transfer;
  - 7.2.4.2. The volume transferred; and
  - 7.2.4.3. The reason for the transfer, and the area to where the topsoil has been approved for use;
- 7.2.5. Topsoil must be stockpiled to a maximum height of 5m;
- 7.2.6. Topsoil stockpiles must be shaped to facilitate shedding of rainwater and prevent ponding and infiltration; and
- 7.2.7. Invasive species must be removed in accordance with the BRMO alien and invasive species management programme.

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### 7.3. Application

#### Site Preparation

- 7.3.1. Before spreading topsoil, establish erosion and sedimentation control structures such as diversions, berms, dikes, waterways and sediment basins;
- 7.3.2. Maintain grades on the areas to be top-soiled according to the approved plan;
- 7.3.3. Adjust grades and elevations for receipt of topsoil;
- 7.3.4. Roughening - Immediately prior to spreading the topsoil, loosen the subgrade by disking or scarifying to a depth of at least 10 centimetres to ensure bonding of the topsoil and subsoil;
- 7.3.5. Ensure that soil horizons are replaced in the same order that they were removed;
- 7.3.6. Uniformly distribute topsoil to pre-mining thickness. If sufficient topsoil is available, a minimum compacted depth of a half metre on 3:1 slopes and one metre on flatter slopes is suggested;
- 7.3.7. Compact the topsoil enough to ensure good contact with the underlying soil, but avoid excessive compaction, as it increases runoff and inhibits seed germination; and
- 7.3.8. The surface may be left rough after spreading topsoil.

### 8. Records

No	Record	Ref.	Resp. Person	Storage	Retention Period	Disposition
1	Topsoil Management Register	FOR-SHE-E-Ge-G-2084	Environmental Specialist	File and Z:Drive	Life of Mine	Shred
2						
3						

### 9. Appendix

None