



KUDUMANE MANGANESE RESOURCES (PTY) LTD

– ENVIRONMENTAL EMERGENCY PROCEDURES –

Emergency procedures apply to incidents that are unexpected and that may be sudden, and which lead to serious danger to the public and/or potentially serious pollution of, or detriment to the environment (immediate and delayed). Emergency environmental situations that have been identified for the Kudumane Mine are shown in Table 1.

1. GENERAL EMERGENCY PROCEDURE

The general procedure that should be followed in the event of all emergency situations is as follows.

- Applicable operational managers must be notified of an incident upon discovery;
- Area to be cordoned off to prevent unauthorised access and tampering of evidence;
- If residue facilities/dams, storm water diversions, etc., are partially or totally failing and this cannot be prevented, the emergency siren is to be sounded (nearest one available). After hours the Plant Manager on shift must be notified;
- Take photographs and samples as necessary to assist in investigation;
- Report the incident to the responsible person of the Safety, Health Environment and Quality (SHEQ) department (or equivalent);
- The SHEQ department must comply with Section 30 of the National Environmental Management Act (107 of 1998) such that:
 - The SHEQ department must immediately notify the Director-General (DEAT, DME and Inspectorate of Mines as appropriate), the South African Police Services, the relevant fire prevention service, the provincial head of DALA, the head of the local municipality, the head of the regional DWAF office and any persons whose health may be affected of;
 - The nature of the incident;
 - Any risks posed to public health, safety and property;
 - The toxicity of the substances or by-products released by the incident;
 - and



- Any steps taken to avoid or minimise the effects of the incident on public health and the environment.
- The SHEQ department must as soon as is practical after the incident:
 - Take all reasonable measures to contain and minimise the effects of the incident including its effects on the environment and any risks posed by the incident to the health, safety and property of persons;
 - Undertake clean up procedures;
 - Remedy the effects of the incident; and
 - Assess the immediate and long term effects of the incident (environment and public health);
- Within 14 days the SHEQ department must report to the Director-General DEAT, the provincial head of DALA, the head of the local municipality, the head of the regional DWAF office such information as is available to enable an initial evaluation of the incident, including:
 - The nature of the incident;
 - The substances involved and an estimation of the quantity released;
 - The possible acute effects of the substances on the persons and the environment (including the data needed to assess these effects);
 - Initial measures taken to minimise the impacts;
 - Causes of the incident, whether direct or indirect, including equipment, technology, system or management failure; and
 - Measures taken to avoid a recurrence of the incident.

2. IDENTIFICATION OF EMERGENCY SITUATIONS

The site wide emergency situations that have been identified together with specific emergency response procedures are shown in Table 1.



TABLE 1: EMERGENCY SITUATIONS AND RESPONSE

ITEM	EMERGENCY SITUATION	RESPONSE IN ADDITION TO GENERAL PROCEDURES
1	Spillage of chemicals, engineering substances and waste	<p>Where there is a risk that contamination will contaminate the land (leading to a loss of resource), surface water and/or groundwater, Kudumane will:</p> <ol style="list-style-type: none"> 1. Notify residents/users downstream of the pollution incident. 2. Identify and provide alternative resources should contamination impact adversely on the existing environment; 3. Cut off the source if the spill is originating from a pump, pipeline or valve (e.g. sewage pipeline, refuelling tanker) and the infrastructure 'made safe'. 4. Contain the spill (e.g. construct temporary earth bund around source such as road tanker). 5. Pump excess hazardous liquids on the surface to temporary containers (e.g. 210 litre drums, mobile tanker, etc.) for appropriate disposal. 6. Remove hazardous substances from damaged infrastructure to an appropriate storage area before it is removed/repaired.
2	Discharge of dirty water to the environment	<ol style="list-style-type: none"> 1. Apply the principals listed for Item 1 above. 2. To stop spillage from the dirty water system the mine will: <ol style="list-style-type: none"> a. Redirect excess water to other dirty water facilities where possible; b. Pump dirty water to available containment in the clean water system, where there is no capacity in the dirty water system; and c. Carry out an emergency discharge of clean water and redirect the spillage to the emptied facility. 3. Apply for emergency discharge as a last resort.
3	Pollution of surface water	<ol style="list-style-type: none"> 1. Personnel discovering the incident must inform the SHEQ department of the location and contaminant source. 2. Apply the principals listed for Item 1 above.



ITEM	EMERGENCY SITUATION	RESPONSE IN ADDITION TO GENERAL PROCEDURES
3.		Absorbent booms will be used to absorb surface plumes of hydrocarbon contaminants.
4.		Contamination entering the surface water drainage system should be redirected into the dirty water system.
5.		The SHEQ department will collect in-stream water samples downstream of the incident to assess the immediate risk posed by contamination.
4	Groundwater contamination	1. Use the groundwater monitoring boreholes as scavenger wells to pump out the polluted groundwater for re-use in the process water circuit (hence containing the contamination and preventing further migration).
5	Burst water pipes (loss of resource and erosion)	2. Investigate the source of contamination and implement control/mitigation measures.
6	Flooding from failure of surface water control infrastructure	1. Notify authority responsible for the pipeline (if not mine responsibility).
7	Risk of drowning from falling into water dams	2. Shut off the water flowing through the damaged area and repair the damage (if Kudumane pipeline).
8	Veld fire	3. Apply the principals listed for Item 1 above if spill is from the dirty/process water circuit.
9		1. Evacuate the area downstream of the failure (e.g. opencast pits).
10		2. Using the emergency response team, rescue/recover and medically treat any injured personnel.
11		3. Temporarily reinstate/repair storm water diversions during the storm event (e.g. emergency supply of sandbags).
12		4. Close the roads affected by localised flooding or where a storm water surge has destroyed crossings/bridges.
13		1. Attempt rescue of individuals from land by throwing lifeline/life saving ring.
14		2. Get assistance of emergency response team whilst attempting rescue or to carry out rescue of animals.
15		3. Ensure medical assistance is available to recovered individual.
16		1. Evacuate mine employees from areas at risk.
17		2. Notify down wind residents and industries of the danger.
18		3. Assist those in imminent danger/less able individuals to evacuate until danger has passed.



ITEM	EMERGENCY SITUATION	RESPONSE IN ADDITION TO GENERAL PROCEDURES
9	Injury from fly rock	<ol style="list-style-type: none"> 4. Provide emergency fire fighting assistance with available trained mine personnel and equipment. 1. The person discovering the incident will contact the mine emergency response personnel to recover the injured party and provide medical assistance. 2. Whilst awaiting arrival of the emergency response personnel, first aid should be administered to the injured party by a qualified first aider if it is safe to do so. 3. Should third party livestock be injured or killed by flyrock, suitable compensation will be provided.
10	Falling into hazardous excavations	<ol style="list-style-type: none"> 1. Personnel discovering the fallen individual or animal must mobilise the emergency response team to the location of the incident and provide a general appraisal of the situation (e.g. human or animal, conscious or unconscious, etc). 2. The injured party should be recovered by trained professionals such as the mine emergency response team. 3. A doctor (or appropriate medical practitioner)/ambulance should be present at the scene to provide first aid and transport individual to hospital.
11	Property damage from blasting	<ol style="list-style-type: none"> 4. Should third party livestock be injured or killed by due to hazardous excavations, suitable compensation will be provided. 1. Should third party property be damaged by blasting, suitable compensation will be provided.
12	Road traffic accidents (on site)	<ol style="list-style-type: none"> 1. The individual discovering the accident (be it bystander or able casualty) must raise the alarm giving the location of the incident. Able personnel at the scene should shut down vehicles where it is safe to do so. 2. Access to the area should be restricted and access roads cleared for the emergency response team. 3. Vehicles must be made safe first by trained professionals (e.g. crushed or overturned vehicles). 4. Casualties will be moved to safety by trained professionals and provided with medical assistance. 5. Medical centres in the vicinity with appropriate medical capabilities will be notified if multiple seriously injured casualties are expected.



ITEM EMERGENCY SITUATION

RESPONSE IN ADDITION TO GENERAL PROCEDURES

- 13 Uncovering of sites and graves
- Should additional heritage resources be discovered the mine will follow a chance find emergency procedure, which includes the following:
 - Work at the find will be stopped to prevent damage
 - An appropriate heritage specialist will be appointed to assess the find and related impacts
 - Applications will be made to SAHRA as required
 - Prior to damaging or destroying any of the identified graves, permission for the exhumation and relocation of graves must be obtained from the relevant descendants (if known), the National Department of Health, the Provincial Department of Health, the Premier of the Province and the local Police.
 - The exhumation process must comply with the requirements of the relevant Ordinance on Exhumations, and the Human Tissues Act, 65 of 1983.
- 14 Development of informal settlements
- The mine will inform the local authorities (municipality and police) that people are illegally occupying the land and ensure that action is taken within 24hrs.



KUDUMANE MANGANESE RESOURCES (PTY) LTD

– ENVIRONMENTAL AWARENESS PLAN –

1. THE PURPOSE OF THE ENVIRONMENTAL AWARENESS PLAN

This document describes the environmental awareness plan for Kudumane Manganese Resources (Pty) Ltd (Kudumane). The purpose of the environmental awareness plan is to ensure that all personnel and management understand the general environmental requirements of the site. In addition, greater environmental awareness must be communicated to personnel involved in specific activities which can have a significant impact on the environment and ensure that they are competent to carry out their tasks on the basis of appropriate education, training and/or experience. The environmental awareness plan should enable Kudumane to achieve the objectives of the environmental policy.

2. ENVIRONMENTAL POLICY

Kudumane will display the environmental policy prominently at the mine entrance and key notice boards at the mine's business units. Kudumane's environmental policy is described below:

1. To minimise the impact of Kudumane's mining operations on the environment wherever possible;
2. To comply with all applicable environmental legislation and the commitments contained in Kudumane's Environmental Management Programme (EMP) Report;
3. To ensure that all Kudumane's employees, contractors and sub-contractors:
 - o Are aware of the impact of their activities on the environment;
 - o Are informed about the measures required to prevent, mitigate and manage environmental impacts; and
 - o Apply these principles whilst carrying out their work.
4. To establish and maintain a good relationship with surrounding communities, industries and other interested and affected parties, with regard to Kudumane's activities;
5. To develop a localised environmental strategy with the local authority and nearby mines and industries; and
6. To provide relevant and constructive consultation/public participation on the management of the potential environmental impacts posed by the mine in the future.



2.1. STEPS TO ACHIEVE THE ENVIRONMENTAL POLICY OBJECTIVES

Kudumane's environmental policy will be realised by setting specific and measurable objectives. It is proposed that new objectives are set throughout the life of mine, but initial objectives are as follows:

1. Management of environmental responsibilities:

- a. Kudumane will establish and appoint an Environmental Manager at senior mine management level, who will be provided with all necessary resources to carry out the management of all environmental aspects of the site as a primary function, for example:
 - i. Compliance with environmental legislation and EMP commitments;
 - ii. Implementing and maintaining an environmental management system;
 - iii. Developing environmental emergency response procedures and coordinating personnel during incidents;
 - iv. Manage routine environmental monitoring and data interpretation;
 - v. Environmental trouble shooting and implementation of remediation strategies; and
 - vi. Closure planning.

2. Communication of environmental issues and information:

- a. Meetings, consultations and progress reviews will be carried out, and specifically Kudumane will:
 - i. Set the discussion of environmental issues and feedback on environmental projects as an agenda item at all company board meetings;
 - ii. Provide progress reports on the achievement of policy objectives and level of compliance with the approved EMP to the Department of Minerals and Energy;
 - iii. Ensure environmental issues are raised at monthly mine management executive committee meetings and all relevant mine wide meetings at all levels; and



- iv. Ensure environmental issues are discussed at all general liaison meetings with local communities and other interested and affected parties.

3. Environmental awareness training:

- a. Kudumane will provide environmental awareness training to individuals at a level of detail specific to the requirements of their job, but will generally comprise:
 - i. Basic awareness training for all prior to granting access to site (e.g. short video presentation requiring registration once completed). Employees and contractors who have not attended the training will not be allowed on site.
 - ii. General environmental awareness training will be given to all employees and contractors as part of the Safety, Health and Environment induction programme. All non Kudumane personnel who will be on site for more than five days must undergo the SHE induction training.
 - iii. Specific environmental awareness training will be provided to personnel whose work activities can have a significant impact on the environment (e.g. workshops, waste handling and disposal, sanitation, etc).

4. Review and update the environmental topics already identified in the EMP which currently includes the following issues:

- a. Geology (sterilisation of mineral resource)
- b. Topography (hazardous excavations and surface subsidence);
- c. Soil management (loss of soil resource);
- d. Land capability (loss of land with agricultural and conservation/ecotourism potential);
- e. Surrounding land use (traffic management, reduction in land available to livestock grazing, and damage from blasting);
- f. Management of biodiversity (impacts on land and water related habitats and species);
- g. Surface water management (alteration of surface drainage and pollution of surface water);



- h. Groundwater management (reduction in groundwater levels/availability and groundwater contamination);
 - i. Management of air quality (dust generation);
 - j. Noise (specifically management of disturbing noise);
 - k. Visual aspects (reduction of negative visual impacts);
 - l. Heritage resources (management of archaeological, palaeontological, cultural and historical sites);
 - m. Socio-economic impacts (management of positive and negative impacts); and
 - n. Interested and affected parties.
5. All mine projects will be designed to minimise impact on the environment and to accomplish closure/rehabilitation objectives.
 6. Kudumane will maintain records of all environmental training, monitoring, incidents, corrective actions and reports.
 7. Contractors and employees will be contractually bound to participate in the achievement of environmental policy objectives and compliance with the EMP.

2.2. TRAINING OBJECTIVES OF THE ENVIRONMENTAL AWARENESS PLAN

The environmental awareness plan ensures that training needs are identified and that appropriate training is provided. The environmental awareness plan should communicate:

1. The importance of conformance with the environmental policy, procedures and other requirements of good environmental management;
2. The significant environmental impacts and risks of individuals work activities and explain the environmental benefits of improved performance;
3. Individuals roles and responsibilities in achieving the aims and objectives of the environmental policy; and
4. The potential consequences of not complying with environmental procedures.



2.2.1. GENERAL CONTENTS OF THE ENVIRONMENTAL AWARENESS PLAN

To achieve the objectives of the environmental awareness plan the general contents of the training plans are as follows:

1. Module 1 – Basic training plan applicable to all personnel entering the site:
 - a. Short (15min) presentation to indicate the site layout and activities at specific business units together with their environmental aspects and potential impacts.
 - b. Individuals to sign off with site security on completion in order to gain access to the site.
2. Module 2 – General training plan applicable to all personnel at the site for longer than 5 days:
 - a. General understanding of the environmental setting of the mine (e.g. local communities and industries and proximity to natural resources such as rivers);
 - b. Understanding the environmental impact of individuals activities on site (e.g. excessive production of waste, poor housekeeping, energy consumption, water use, etc);
 - c. Indicate potential site specific environmental aspects and their impacts;
 - d. Kudumane's environmental management strategy;
 - e. Identifying poor environmental management and stopping work which presents significant risks;
 - f. Reporting incidents;
 - g. Examples of poor environmental management and environmental incidents; and
 - h. Procedures for emergency response and cleaning up minor leaks and spills.
3. Module 3 – Specific training plan:
 - a. Environmental setting of the workplace (e.g. proximity of watercourses, vulnerability of groundwater, proximity of local communities and industries, etc);
 - b. Specific environmental aspects such as:
 - i. Spillage of hydrocarbons at workshops;
 - ii. Spillage of explosive liquids in the open pits;
 - iii. Poor waste management such as mixing hazardous and general wastes, inappropriate storage and stockpiling waste large amounts of waste;
 - iv. Poor housekeeping practices; and



- v. Poor working practices (e.g. not carrying oil changes in designated bunded areas).
- c. Impact of environmental aspects, for example:
 - i. Groundwater contamination resulting in loss of resource due to potential adverse aesthetic, taste and health effects; and
 - ii. Dust impacts on local communities (nuisance and health implications).
- d. Kudumane's duty of care (specifically with respect to waste management); and
- e. Purpose and function of Kudumane's environmental management system.

Individuals required to complete Module 3 (Specific training module) will need to complete Modules 1 and 2 first. On completion of the Module 3, individuals will be subject to a short test (written or verbal) to ensure the level of competence has been achieved. Individuals who fail the test will be allowed to re-sit the test after further training by the training department.

The actual contents of the training modules will be developed based on a training needs analysis.

Key personnel will be required to undergo formal, external environmental management training (e.g. how to operate the environmental management system, waste management and legal compliance).

In addition to the above Kudumane will:

1. Conduct refresher training/presentations on environmental issues for mine employees (permanent and contractors) at regular intervals.
2. Promote environmental awareness using relevant environmental topic posters displayed at strategic locations on the mine. These topics will be changed monthly, and will be reviewed annually by the Environmental Manager to ensure relevance.

Participate and organise events which promote environmental awareness, some of which will be tied to national initiatives e.g. National Arbor Week, World Environment Day and National Water Week.