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**PROPOSED EXPANSION OF AN EXISTING  
LANDFILL SITE AT EXXARO NAMAKWA SANDS  
MINERAL SEPERATION PLANT, WESTERN CAPE  
PROVINCE**

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**ENVIRONMENTAL  
MANAGEMENT PROGRAMME (EMP):**

**ADDENDUM TO THE ENVIRONMENTAL MANAGEMENT  
PROGRAMME (EMP) FOR NAMAKWA SANDS  
(Report No:10417-5659-1-E DATED JANUARY 2008)**

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## PROJECT DETAILS

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## DEFINITIONS AND TERMINOLOGY

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**Cumulative impacts:** Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

**Direct impacts:** Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

**Endangered species:** Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers of individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

**Endemic:** An "endemic" is a species that grows in a particular area (is endemic to that region) and has a restricted distribution. It is only found in a particular place. Whether something is endemic or not depends on the geographical boundaries of the area in question and the area can be defined at different scales.

**Environmental management:** Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

**Indirect impacts:** Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

**Interested and Affected Party:** Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public.

**Red data species:** Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of

the South African Red Data list. In terms of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).

**Significant impact:** An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.

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## **OVERVIEW OF THE PROJECT**

## **CHAPTER 1**

### **1.1. Description of the Proposed Project**

It is anticipated that the existing general waste landfill site at the Namakwa Sands Mineral Separation Plant (MSP) near Koekenaap in the Western Cape Province will reach its maximum capacity within the next 12 months. In order to be pro-active, Exxaro Namakwa Sands proposes the expansion of this existing landfill site at their Mineral Separation Plant timeously to ensure on-going good waste management practices. The proposed project therefore entails the expansion of an existing general waste landfill facility at the Mineral Separation Plant of Exxaro Namakwa Sands in Koekenaap. The area that is proposed for the expansion of the landfill site is adjacent to the existing landfill site and has been previously disturbed with little natural vegetation remaining. The landfill site will be fenced and access to the site will be controlled, as is currently the case at the existing landfill site. The site will be managed in terms of the waste management protocol currently in place at the MSP facility.

An existing approved Environmental Management Programme (EMP) exists for the MSP in support of the existing Mining Right (Report No:10417-5659-1-E Dated January 2008). This EMP considers all activities at the MSP. This Environmental Management Programme (EMP) has been compiled as an addendum to this existing EMP and will focus only on activities that are associated with the expansion of the existing landfill facility at the MSP of Namakwa Sands. The study area is situated on Portion 629 of the Olifants River Settlement, district of Van Rhynsdorp which extends approximately 602 ha in size. The area proposed for the expansion of the existing landfill facility is located within the authorised mining area of Exxaro Namakwa Sands and extends approximately 1.3 ha in a northerly direction from the existing landfill site. The proposed expansion area has been disturbed by activities in the past and therefore little natural vegetation remains on-site. The Mineral Separation Plant (MSP) of Exxaro Namakwa Sands is situated approximately 1km west of the proposed expansion area next to the R363. The town of Lutzville is situated approximately 10km south east of the Mineral Separation Plant, while Koekenaap is located approximately 6km south of the study area.

### **1.2. Potential Environmental Impacts associated with the Expansion of the Landfill**

Based on the findings of the studies undertaken, in terms of environmental constraints identified through the Basic Assessment process, no environmental fatal flaws have been identified as a result of the proposed expansion of the existing landfill facility.

It is important to note that no sensitive receptors are located in close proximity to the proposed expansion area and therefore potential impacts in terms of air quality and noise are of no significance.

Current water quality monitoring indicates no impact from the current general waste landfill. Therefore, no additional impacts are expected as a result of the proposed expansion.

No significant impacts to heritage resources will occur as a result of the proposed landfill expansion. The archaeological material present on the site is similar to that which is commonly encountered throughout much of southern Namaqualand. It is of little research value, and considered to be of low local significance.

- » The only issue which has been identified as requiring management and mitigation include the direct loss of vegetation in development footprint during establishment of the project, and the appropriate management of the landfill facility during operation.

Impacts identified are anticipated to have impacts of low significance. Potential impacts identified can be minimised through the implementation of practical and appropriate mitigation measures detailed in the Namakwa Sands EMP (Report No: 10417-5659-1-E Dated January 2008) as well as this addendum to the approved EMP.

## PURPOSE & OBJECTIVES OF THE EMP ADDENDUM

## CHAPTER 2

An Environmental Management Programme (EMP) provides a link between the impacts predicted and mitigation measures recommended within the Basic Assessment report, and the implementation activities of a project to ensure that these activities are managed and mitigated so that unnecessary or preventable environmental impacts do not result.

Exxaro Namakwa Sands have an approved EMP in place for the activities associated with the mine as well as the MSP (refer to the EMP (Report No: 10417-5659-1-E Dated January 2008)). This EMP is currently successfully implemented and will continue to be applied to all activities associated with the MSP. Regular compliance audits to the EMP requirements are undertaken by the Environmental Manager. As such, it is not deemed necessary to reiterate all the specifications of this approved EMP which is currently being applied at the MSP, and therefore this *addendum to the approved EMP* has been prepared to specifically address the potential impacts resulting from the proposed expansion of the existing landfill facility at the MSP only.

### 2.1. Purpose of the EMP and associated Addendum

The purpose of the Namakwa Sands EMP (Report No: 10417-5659-1-E Dated January 2008) as well as this addendum to the approved EMP is to help ensure continuous improvement of environmental performance, reducing negative impacts and enhancing positive effects during the construction and operation of the project. An effective EMP is concerned with both the immediate outcome as well as the long-term impacts of the project.

The draft EMP has the following objectives:

- » To outline mitigation measures and environmental specifications which are required to be implemented for the construction phase of the project in order to minimise and to manage the extent of environmental impacts associated with the project.
- » To ensure that the project establishment phase does not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced.
- » To ensure that all environmental management conditions and requirements as stipulated in the Environmental Authorisation (once issued) are implemented throughout the project life-cycle.
- » To ensure that all relevant legislation (including national, provincial and local) is complied with throughout the project life-cycle.
- » To propose mechanisms for monitoring compliance, and preventing long-term or permanent environmental degradation.

- » To facilitate appropriate and proactive response to unforeseen events or changes in project implementation that were not considered in the EIA process.

The appointed Environmental Manager will be responsible to oversee that the measures which are prescribed in this addendum as well as the existing approved EMP for Namakwa Sands MSP are implemented in order to minimise the potential impact on the environment.

This addendum to the approved EMP has been developed as a set of environmental specifications (i.e. principles of environmental management) for the establishment and management of the landfill expansion which are appropriately contextualised to provide clear guidance in terms of the implementation of these specifications for the localised project.

Several procedures are necessary for Exxaro Namakwa Sands to achieve environmental compliance for the proposed expansion of the existing landfill facility at the MSP. These include:

- » Application for a Waste License in terms of the National Environmental Management: Waste Act (Act No 59 of 2008)
- » Application for Environmental Authorisation for relevant listed activities in terms of the EIA Regulations (GN543 and GN544) published in terms of the National Environmental Management Act (Act No 107 of 1998)
- » Application for amendment to the existing EMP for the Namakwa Sands MSP in terms of the Minerals and Petroleum Resources Development Act (Act No 28 of 2002)

A Basic Assessment has been prepared in support of these applications in order to identify and assess all potential environmental impacts associated with the proposed landfill expansion project. This addendum to the EMP is part of the Basic Assessment process undertaken for the proposed expansion of the existing landfill facility at the MSP, it is important that this document be read in conjunction with the Basic Assessment Report (March 2011) and the Environmental Authorisation (once issued). This will contextualise the EMP addendum. This addendum to the approved EMP must be read in conjunction with the relevant sections and appendices of the Namakwa Sands EMP (Report No: 10417-5659-1-E Dated January 2008).

## 2.2. Structure of the Addendum to the EMP

In order to ensure site-specific compliance, this EMP addendum includes the statement of an over-arching environmental **goal**, as well as lists a number of **objectives** in order to meet this goal. The management plan has been structured in table format in order to show the links between the goals for each phase and their associated objectives, activities/risk sources, mitigation actions monitoring requirements and performance indicators. A specific Environmental Management Programme table has been

established for each environmental objective. The information provided within the EMP table for each objective is illustrated below:

**OBJECTIVE:** Description of the objective, which is necessary in order to meet the overall goals; these take into account the findings of the environmental impact assessment specialist studies

Project component/s	List of project components affecting the objective
Potential Impact	Brief description of potential environmental impact if objective is not met
Activity/risk source	Description of activities which could impact on achieving the objective
Mitigation: Target/Objective	Description of the target; include quantitative measures and/or dates of completion

Mitigation: Action/control	Responsibility	Timeframe
List specific action(s) required to meet the mitigation target/objective described above.	Who is responsible for the measures	Time periods for implementation of measures

Performance Indicator	Description of key indicator(s) that track progress/indicate the effectiveness of the management plan.
Monitoring	Mechanisms for monitoring compliance; the key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods and reporting

### 2.3. Project Team

This draft EMP was compiled by:

<b>EMP Compiler:</b>	Gerhard Cronje Jo-Anne Thomas	Savannah Environmental
<b>Specialists:</b>	Jayson Orton Nick Helme	Archaeology Contracts Office Nick Helme Botanical Surveys

The Savannah Environmental team members have extensive knowledge and experience in environmental impact assessment and environmental management, having been involved in EIA processes over the past twelve (12) years. They have managed and drafted Environmental Management Plans/Programmes for a number of projects throughout South Africa.

## MANAGEMENT PLAN: SITE ESTABLISHMENT

## CHAPTER 3

From the findings of the Basic Assessment process it was concluded that the activities associated with the establishment of the proposed landfill expansion may cause a low to medium impact on a local scale for a very short duration. These impacts would relate to site establishment activities and potentially include removal and loss of vegetation, erosion and increased sediment transport into nearby drainage lines, ground water quality deterioration, and increased surface water flows. It was concluded that the landfill expansion activities of the proposed expansion of the existing landfill facility can be adequately mitigated by the appropriate procedures as outlined below, and as per the specifications of the approved Environmental Management Programme (and amendments) for Namakwa Sands.

### 3.1. Overall Goal for Expansion Activities

**Overall Goal for Expansion:** Undertake the establishment of the landfill expansion in a way that:

- » Ensures that landfill expansion activities are properly managed in respect of environmental aspects and impacts.
- » Minimises the impact on the vegetation and habitats within the area.

In addition to the objectives below, relevant specifications within the Namakwa Sands approved EMP (Report No: 10417-5659-1-E Dated January 2008) must be considered and implemented within this phase of the project.

### 3.2. Objectives for Expansion

In order to meet the goals, the following objectives have been identified, together with necessary actions and monitoring requirements.

**OBJECTIVE: Minimise the extent of surface disturbance**

<b>Project component</b>	Site establishment for the expansion of the existing landfill facility
<b>Potential impact</b>	Construction activities will result in the removal of vegetation, where this is present.
<b>Activity / risk source</b>	<ul style="list-style-type: none"> <li>» Injudicious clearing of vegetation;</li> <li>» extending activities outside the proposed expansion</li> </ul>

	area
<b>Mitigation: Target / Objective</b>	All surface disturbances should be limited to the area proposed for the expansion of the existing landfill facility. No disturbance of any kind associated with the construction activities may take place outside this area.

<b>Mitigation: Action / Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
The full extent of the authorised development area should be clearly demarcated and fenced off prior to any development taking place and prior to the commencement of any construction activities on site and the arrival of construction machinery.	Exxaro Namakwa Sands	Pre-Site establishment Phase
No dumping or temporary storage of any materials may take place outside designated and demarcated laydown areas, which should be located within the development footprint.	Exxaro Namakwa Sands	Site establishment Phase
The demarcations should stay in place for the entire construction phase and no personnel, construction machinery or construction material should move or be placed outside the demarcated construction area.	Exxaro Namakwa Sands	Full duration of project.
Following completion of construction activities, a clean-up operation of the construction area should be undertaken to remove all litter and construction related waste.	Exxaro Namakwa Sands	Site establishment Phase

<b>Performance Indicator</b>	No disturbance outside of the clearly demarcated construction areas.
<b>Monitoring</b>	This should be monitored daily by the relevant Line Manager and SHE team.

**OBJECTIVE: Prevent soil erosion**

Removal of vegetation and excavation of the area under development could increase the possibility of soil erosion unless appropriate management measures are implemented.

<b>Project component</b>	Construction phase of the expansion of the existing landfill facility.
<b>Potential impact</b>	Construction activities will result in disturbances to the soil as well as removal of vegetation, rendering the soils susceptible to erosion. Surface run-off due to rainfall events during the construction process could result in increased sediment transport into nearby drainage lines.
<b>Activity / risk source</b>	<ul style="list-style-type: none"> <li>» Rainfall - water erosion of disturbed areas</li> <li>» Wind erosion of disturbed areas</li> <li>» Construction during periods of rainfall;</li> <li>» lack of adequate rehabilitation; and</li> <li>» lack of installation of mitigation measures</li> </ul>
<b>Mitigation: Target / Objective</b>	No visible erosion scars should form during the construction process, and no erosion damage should be visible 1 year after completion of construction.

<b>Mitigation: Action / Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Topsoil from the two Medium sensitivity areas (Refer to Figure 1.1) should be removed (minimum of 400mm deep) prior to development and set aside for later use during rehabilitation at the decommissioning phase. This topsoil must be stored separately from the subsoil removed and protected from wind erosion (covered with shade cloth weighted down at all edges).	Exxaro Namakwa Sands	Site establishment Phase
Control stormwater and runoff water by means of establishing a comprehensive stormwater management plan for compacted surfaces	Exxaro Namakwa Sands	Site establishment Phase

<b>Performance Indicator</b>	No visible erosion scars should form during the construction process, and no erosion damage should be
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	visible 1 year after completion of construction.
<b>Monitoring</b>	This should be monitored daily by the relevant Line Manager and SHE team, as well as after completion of construction.



**Figure 1.1:** Botanical Sensitivity map of the site

**Environmental Awareness and Monitoring**

Please refer to section 6.4 and 6.5 in the existing Namakwa Sands EMP (Report No: 10417-5659-1-E Dated January 2008) for the Environmental Monitoring and Environmental Awareness plans respectively.

## MANAGEMENT PLAN: OPERATION

## CHAPTER 4

The site that is proposed for the expansion of the existing landfill facility is located within the existing mine authorised area, adjacent to the existing general waste landfill site at the MSP. The existing landfill site is well managed in terms of the relevant waste management procedures that are currently implemented by Exxaro Namakwa Sands at their Mineral Separation Plant (MSP). It is imperative that the new landfill site be operated in accordance with the current management procedures.

The responsibility of waste care, such as waste minimisation, pollution prevention and correct disposal, is applicable to all Namakwa Sands personnel, contractors, consultants and visitors. Alternative products and waste disposal methods will continuously be considered and investigated as well as ways of avoiding, reducing, re-using and recycling of waste at the Mineral Separation Plant. The telecon containers containing domestic waste are emptied on a regular basis and the waste is disposed of at the Solid waste disposal site. It is also ensured that the smaller waste bins and other waste containers that are labelled "domestic waste" are emptied in the domestic waste telecom bins on a regular basis.

### 4.1. Overall Goals for Operation

To ensure that the operation of the landfill facility does not have unforeseen impacts on the environment and to ensure that all impacts are monitored and the necessary corrective action taken in all cases. In order to address this goal, it is necessary to:

- » Ensure that operation activities are properly managed in respect of environmental aspects and impacts.
- » Enable the landfill facility's operational activities to be undertaken without significant disruption to other land uses in the area.

### 4.2. Objectives for Operation

In order to meet the goals, the following objectives have been identified, together with necessary actions and monitoring requirements.

**OBJECTIVE: Prevent the spread and distribution of exotic and/or alien invader plant species**

Disturbance of the area through the establishment of the new landfill could provide an opportunity for the establishment of alien and invader plant species, unless adequate monitoring and management measures are implemented.

<b>Project component</b>	Operational phase of the landfill facility.
<b>Potential impact</b>	Exotic and/or alien invader plant species can spread across the site during the operational phase.
<b>Activity / risk source</b>	<ul style="list-style-type: none"> <li>» Use of invasive plant species for rehabilitation during the operational phase;</li> <li>» Lack of installation of mitigation measures.</li> </ul>
<b>Mitigation: Target / Objective</b>	No exotic or alien invasive plant species should be present on the landfill site.

<b>Mitigation: Action / Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
No exotic or invasive plant species should be used for rehabilitation during the operational phase.	Exxaro Namakwa Sands	Operational Phase
All exotic or invasive plant species should be removed from the landfill facility.	Exxaro Namakwa Sands	Operational Phase
Develop and implement an alien eradication plan for the landfill site and surrounding areas	Exxaro Namakwa Sands	Operational Phase

<b>Performance Indicator</b>	No exotic or invasive plant species present on the landfill facility.
<b>Monitoring</b>	This should be monitored on a weekly basis by the relevant Line Manager and SHE team.

### OBJECTIVE: Prevent ground water pollution

Ambient groundwater quality is such that groundwater in the vicinity of the study site is not fit for domestic or agricultural use. As a result, no groundwater users occur within at least 3 km of the proposed landfill facility.

<b>Project component</b>	Operational phase of the landfill facility.
<b>Potential impact</b>	Possible contamination of ground water due to poor waste management practices.
<b>Activity / risk source</b>	<ul style="list-style-type: none"> <li>» Disposal of incorrect/ hazardous waste to general waste landfill facility</li> </ul>
<b>Mitigation: Target / Objective</b>	Prevent the pollution of ground water.

Mitigation: Action / Control	Responsibility	Timeframe
Ensure that separation of waste types are undertaken throughout the operation of the proposed facility	Exxaro Namakwa Sands	Operational Phase
Undertake daily inspections to prevent the disposal of incorrect/hazardous waste types at the general waste landfill site.	Exxaro Namakwa Sands	Operational Phase

<b>Performance Indicator</b>	Ground water quality should not deteriorate when compared against present status.
<b>Monitoring</b>	Ground water quality to be monitored on a regular basis by the relevant Line Manager and SHE team.

**OBJECTIVE: Prevent the spreading of windblown waste/litter**

<b>Project component</b>	Operational phase of the landfill facility.
<b>Potential impact</b>	Possible spread of litter across the site by means of wind.
<b>Activity / risk source</b>	Uncovered litter/waste from the landfill facility being blown across the site
<b>Mitigation: Target / Objective</b>	Prevent wind-blown litter from occurring across the site.

Mitigation: Action / Control	Responsibility	Timeframe
Cover waste/litter with a layer of subsoil/dorbank directly after disposal	Exxaro Namakwa Sands	Operational Phase
Regular clean-up operations to collect windblown waste across the site	Exxaro Namakwa Sands	Operational Phase

<b>Performance Indicator</b>	No traces of litter/waste in and around the area of the landfill facility
<b>Monitoring</b>	The occurrence of windblown waste to be monitored on a daily basis by the relevant Line Manager and SHE team.

## MANAGEMENT PLAN: DECOMMISSIONING

## CHAPTER 5

The decommissioning of the extended landfill facility will be undertaken on an on-going basis. No significant environmental impacts are expected to be associated with this phase of the project.

### 5.1 Overall Goals for Operation

To ensure that the decommissioning of the landfill facility does not have unforeseen impacts on the environment and to ensure that all impacts are monitored and the necessary corrective action taken in all cases. In order to address this goal, it is necessary to:

- » Ensure that decommissioning activities are properly managed in respect of environmental aspects and impacts.
- » Enable the landfill facility's decommissioning activities to be undertaken without significant disruption to other land uses in the area.

### 5.2 Objectives

In order to meet the goals, the following objectives have been identified, together with necessary actions and monitoring requirements.

**OBJECTIVE: Management of the site proposed for the expansion of the landfill facility**

The facility is of such a nature that excavations and backfilling will take place on an on-going basis as required. The area proposed for the expansion of the landfill facility will be divided into various grids. Each of these grids will be excavated, filled with general waste and then backfilled. It is important, in terms of the management of the area proposed for the expansion of the landfill facility, that rehabilitation must be implemented after backfilling of the various grids has taken place.

<b>Project component</b>	Decommissioning phase of the landfill facility.
<b>Potential impact</b>	Possible erosion of soil due to poor management practices.
<b>Activity / risk source</b>	If re-vegetation/rehabilitation of the affected area is not undertaken
<b>Mitigation: Target / Objective</b>	Proper management of the landfill expansion area. No erosion scars should be visible after the decommissioning of the landfill facility.

<b>Mitigation: Action / Control</b>	<b>Responsibility</b>	<b>Timeframe</b>
The landfill pits must be backfilled to a level as close as possible to its original topography	Exxaro Namakwa Sands	Decommissioning Phase
Backfilled pits must be finally capped with at least 500mm of subsoil/dorbank.	Exxaro Namakwa Sands	Decommissioning Phase
Topsoil/growth medium may only be applied after 12 months if there are no further signs of active subsidence. The topsoil/growth medium layer must be at least 200mm thick.	Exxaro Namakwa Sands	Decommissioning Phase
The disturbed area must be protected against wind erosion by placing shade nets as windbreaks across the site.	Exxaro Namakwa Sands	Decommissioning Phase
A re-vegetation programme will be introduced if natural restoration is not successful.	Exxaro Namakwa Sands	Decommissioning Phase

<b>Performance Indicator</b>	<ul style="list-style-type: none"> <li>» Zero disturbance outside of designated work areas</li> <li>» Rehabilitation of backfilled areas</li> </ul>
<b>Monitoring</b>	An incident reporting system will be used to record non-conformances to the EMP.