Appendix D

Background Information Document
ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN FOR ORANGE RIVER MINES LIFE OF MINE EXTENSION PROJECT

BACKGROUND INFORMATION DOCUMENT

CSIR  
Enviro Dynamics  
NAMDEB
1. INTRODUCTION

The Orange River Mining Licence (ML42) is located along the north bank of the Orange River (Figure 1). Mining commenced in this area at the Aucbas deposit where production ceased in 1999; at present, mining is limited to Daberas. Sendelingsdrif, about 20 km south of Rosh Pinah and 12 km north-east of Daberas, represents the second largest deposit after Daberas.

Figure 1: Location of the Orange River Mining Licence (ML42) indicating the location of Sendelingsdrif
The Orange River Valley is recognized as an area of high environmental sensitivity and conservation importance because of the many irreplaceable biological communities and high vulnerability found here. ML42 forms part of the succulent Karoo biome, with floral and faunal assemblages that are found in the Richtersveld areas (Figure 2). The river helps to sustain life in the midst of this hyperarid environment. The area is also located within the proclaimed Sperrgebiet National Park (SNP). This means that the rehabilitation standard is higher at Sendelingsdrif compared to previous mines in the licence area, requiring active restoration of the disturbed areas and removal of all wastes.

Figure 2: Important flora, fauna, a historic building and archaeological sites are present in the Sendelingsdrif area, in the Sperrgebiet National Park
2. PROJECT OVERVIEW

2.1 The need for the project

In order to achieve the objective of maximum sustainability when the ML42 mining licence expires in 2020, Namdeb is considering adding the Sendelingsdrif (location shown in Figure 3) deposit to the current mine plan to extend the life of mine along the Orange River. This will enable Namdeb to fulfil its strategic goal of sustaining carat production from Orange River mines beyond 2012, i.e., the life of the mines (hence “Life of Mines Extension”).

![Figure 3: Location of Sendelingsdrif in relation to other deposits along the Orange River](image)

The ore deposit consists of ancient Orange River gravels. The intention is that these are to be treated from the surface of bedrock at selected sites, and for the treatable material to be transported to Daberas for further processing and recovery.
2.2 Previous environmental studies

Several environmental studies exist for ML42.

An Environmental Management Programme Report (EMPR) was developed for the Orange River Mining Licence Area (ML42) in 1997. This EMPR contains general guidelines for mining operations along the Orange River. A detailed Environmental Impact Assessment (EIA) was developed, subsequent to this, for the Daberas mine in 1998. A review of the EIA was conducted in 2002, in order to include the development of a mega fine tailings disposal dam at Daberas. In 1998 an EIA for the sampling programme at Sendelingsdrif could not deliver detailed guidelines for mining. However, it recommended a more detailed EIA, including a rehabilitation and closure plan before the deposit is mined.

A detailed Rehabilitation Plan for Namdeb’s land operations received governmental approval in 2008. It identified nature based tourism for Sendelingsdrif and mining-based tourism for Daberas, as future end-land uses. It is intended that rehabilitation will be integrated with the mine plan to ensure that the area does not compromise any future nature-based tourism.

2.3 Project alternatives and trade-off studies

Various project alternatives were evaluated and trade-off studies were conducted during the feasibility study and the project described in this document was established to be the optimal techno-economic solution. Included in the trade-off studies were product transfer options and energy supply options.

2.3.1 Product transfer

Alternatives for the transport of the screened product from the Sendelingsdrif resource to the Daberas treatment plants were evaluated. Trade-off studies included a road versus conveyor versus aerial ropeway, and tar versus gravel. The alternatives that were evaluated included:

- Overland conveyor system.
- Railway system.
- Barging using the Orange River.
- Pumping.
- Tramming using on-highway trucks. It was established that the current road will need to be upgraded to a 20 km bitumen road between Sendelingsdrif and Daberas. It is envisaged that there will be ten trucks per hour on the road; a truck will be operational 22 hours per day.
- Aerial ropeway system. Although not used by Namdeb at the moment, the aerial ropeway is a proven technology. With this option material will be transported to Daberas at 270 tonnes per hour (tph) capacity. The aerial ropeway will have a total length of 14.3 km (2.8km, 7.8km and 3.7km). There will be a loading station at Sendelingsdrif and an off-loading station at Daberas. The system will have a total number of 48 towers with an average span of 276m, with a
minimum height of 10 metres and a maximum height of 20 m. The system will have 2 transfer stations. The system will be operated with 3 drives (200kW, 600kW, 300kW). There will be a conveyor-interfacing with the scalping and screening plant at Sendelingsdrif and the Direct Treatment Plant (DTP) at Daberas respectively. A preliminary route for the aerial rope way is depicted in the Figure 4. This route will still need to get buy in from the relevant stakeholders (e.g. Ministry of Environment and Tourism).

Figure 4: Preliminary route for the aerial rope way between Sendelingsdrif and Daberas.

2.3.2 Energy supply

Power will be needed for the scalping and screening plant with its associated infrastructure, the aerial ropeway system and the treatment plants at Daberas. During the feasibility phase available power sources that will be considered for the supply of electrical power to the Sendelingsdrif operation are the following:

- **NamPower from Rosh Pinah town.** Two options exist to supply the NamPower grid power to Sendelingsdrif: either via the existing redundant 66kV line or via a newly constructed 33 kV power line. The route for a new power line will have to be determined and will also depend on the final power supply solution agreed between NamPower and Namdeb. Most likely however, it will run from the NamPower Lorelei substation north east of Rosh Pinah along the shortest route to Sendelingsdrif. A new section of power line will be required to connect the current distribution network at Daberas with the aerial ropeway.
• **Diesel generators.** The current base case assumed for the study is a diesel power station consisting of five (5) 725kVA diesel generators, 4 running and 1 on rotational standby, with automatic synchronisation, to supply bulk power at Sendelingsdrif. For start-up 4 generators will be required to run. Only 3 generators will be required for normal running conditions. Power from the generators will be supplied at 525 V. A 50kVA 525/400V transformer has been provided to supply small power and lighting for the plant whilst a 150kVA 525/400V transformer will supply small power and lighting for all infrastructure loads. A 1.6 MVA 525V/22kV transformer has been provided to supply the aerial ropeway.

2.3 **Mining methods**

The Sendelingsdrif deposit occurs as a near-surface deposit and can be exploited with conventional open pit mining methods. The diamond bearing material will be mined with heavy earthmoving machinery comprising hydraulic excavators, off-highway trucks, dozers, front end loaders and graders. Mined ore material will be delivered to a scalping and screening plant on the site where the undesired fraction will be removed, and the product transferred to Daberas for further treatment via a new aerial ropeway system. Hard cemented portions of the deposit will require drilling and blasting. The footwall (bedrock) will be thoroughly cleaned using industrial vacuum units to ensure the recovery of all diamonds. All fines and coarse residues from the scalping and screening plant will be trammed back into the mined-out areas to facilitate the envisaged end-state of nature based tourism for the area.

Only two of the mining zones contain scours that are known to contain water close to bedrock. Dewatering of the pits will be required during mining of the basals and it has been assumed that the water will be utilised for either treatment at the sampling plant or for road maintenance.

2.4 **Treatment process**

Treatment of the Sendelingsdrif resource will be done at two localities:

- Initial volume reduction of 68% on average will be effected by a dry, fixed infield screening plant close to the resource.
- Product from this plant will be transferred via a new aerial ropeway system to be installed by the project, to the existing Daberas Treatment Plant (DTP) for further treatment.

Treatment at Daberas remains virtually unchanged from the current process apart from the possible addition of a live Dense Media Separation (DMS) feed stockpile to serve as buffer. Final concentration through DTP DMS and Recovery Plant will remain as per the existing operation.
It is envisaged that a small portion of the material will be treated on site at Sendelingsdrif utilising the existing sampling plant and associated infrastructure (water, power, fines residue disposal site, etc.) for a period of ±3 months.

2.5 Infrastructure Requirements

The remoteness of the Sendelingsdrif resource in relation to existing infrastructure makes the establishment of a stand-alone operation very expensive due to the cost of providing the required infrastructure on site. Its environmental classification as a future nature-based tourist area further adds complexities to the solution and requires as little as possible disturbance of the area.

It was established that the addition of water to any process located at Sendelingsdrif added significant infrastructural and OPEX costs as well as environmental complexities. All processes at Sendelingsdrif are therefore designed to operate without water (Figure 5); the only allowance is water for maintenance purposes (roads, cleaning, etc.) and for domestic use. A new borehole might have to be drilled to supply the water required. Only the portion of material envisaged to be treated through the sampling plant will require a wet process. The current river water abstraction point and fine tailings residue disposal paddocks applicable for the sampling program will be utilised for this purpose and no additional fine tailings disposal dam will be constructed at Sendelingsdrif.

Figure 5. No wet processes will be used for mining at Sendelingsdrif
The main infrastructural requirement is for the support of the mining fleet, e.g. earth moving vehicle (EMV) workshop, wash bay, lube facility, bulk fuel depot, etc. Power requirements at the site will be addressed through diesel generators although alternatives will still be investigated such as a bulk power line. To facilitate easier rehabilitation of the area to the nature-based requirement, all offices, ablution installations, etc. will be mobile units.

3. APPROACH TO THE EIA AND EMP

The EIA process is used as a planning, design and decision-making tool in order to identify the biophysical, social and economic impacts (positive and negative) of a proposed project upfront. It provides recommendations for management actions that mitigate and minimise potential negative impacts, and maximise any benefits associated with the project.

Namdeb has appointed CSIR and Enviro Dynamics to conduct this EIA for the proposed activities associated with the ORM LOM Extension project. The approach to the EIA process is based on current EIA legislation in Namibia and its Environmental Policy. A summary of the key elements of the EIA process for this project is described below:

- **Scoping phase**
  - Identify the Interested and Affected Parties (I&APs) including authorities
  - Announce the EIA process and identify key issues
  - Prepare Draft Scoping Report
  - Public review of Draft Scoping Report
  - Prepare Final Scoping Report and submit it to authorities

- **EIA phase**
  - Conduct specialist studies to address the issues identified in Scoping
  - Prepare Draft EIA Report and Environmental Management Plan (EMP)
  - Public review of Draft EIA Report and EMP
  - Prepare Final EIA and EMP and submit it to authorities
  - Decision by authorities is communicated to I&APs
  - Opportunity for appeal.

Key environmental issues that have been identified at this stage of the EIA process are:

- Impact on archaeology and palaeontology.
- Impact on vegetation.
- Impact on insects, small mammals and reptiles.
- Impact on the functions of the Orange River.
- Socio-economic impacts in the local area.
All factors that may influence project implementation, including environmental and socio-economic aspects, shall be identified. The EIA/EMP will enable Namdeb to identify high priorities for environmental decision making and integration of the EMP that cover all aspects related to the ORM LOM project into their Environmental Management System (EMS). The EMP will include environmental monitoring plans, and rehabilitation and closure plans for integration into Namdeb’s ISO 14001 EMS for mining operations.

4. PUBLIC PARTICIPATION IN THE EIA PROCESS

Engagement with Interested and Affected Parties (I&APs) is an important component of the EIA process. The public and key stakeholders will be informed via newspaper adverts, letters and a public meeting about the proposed project. They shall register as I&APs and - during the Scoping Phase - identify issues and concerns to be addressed. The draft Scoping and EIA reports shall be presented to I&APs for comment prior to submission of the final reports to the authorities for decision-making. Comment Response reports shall be included in the reports submitted to the authorities.

What is your role as an Interested and Affected Party (I&AP)?

The EIA process provides you with the opportunity to:

- Attend meetings and obtain information, such as this Background Information Document (BID), to find out more about the proposed project and the EIA process;
- Raise any issues or concerns which you may have regarding the proposed project;
- Provide us with additional information which should be taken into account in the project design, assessment of impacts and the decision making process;
- Review and comment on the reports and findings from the EIA process; and
- Appeal the environmental authorization that may be issued by the authorities.

How can you be involved?

Your involvement shall include some or all of the activities:

- Respond to our invitation for your involvement, which will be advertised in local newspaper(s), and by registering as an Interested and Affected Party (I&AP);
- Mailing or fax a comment form to the EIA contact person (details below);
- Attend public meetings that will be held during the EIA process;
- Contact the EIA contact person if you have a query, comment, or require further project information; and
- Reviewing the draft reports within the timeframes provided.
We encourage you to register on the project database by providing your contact details to the EIA contact person indicated below. Registration will ensure that you are kept informed of developments relating to the EIA process, that you are invited to attend meetings and are informed of the availability of draft reports for review.

Where can I find Information on the project?

Relevant EIA information will be included on the CSIR website at: http://www.csir.co.za/EIA/

Whom should you contact to register as an I&AP?

Please complete the attached *Registration & Comments Form* and send it to:

Carla Saayman  
P O Box 20837  
Windhoek  
Tel:  264 61 223336  
Fax:  264 61 307437  
E-mail: carla@envirod.com
Please register me as an Interested and Affected Party to receive ongoing communication about the Environmental Impact Assessment (EIA) process and the proposed project:

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Any comments or issues of concern:

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Please submit this *Registration & Comments Form* to:

Carla Saayman  
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