

Appendix B

Previous environmental studies

Namdeb has commissioned a range of scientific studies in its various mining licence areas, and in the Orange River licence area in particular. These studies include the following:

- Environmental impact assessments and management plans;
- Rehabilitation and biodiversity plans;
- Baseline studies;
- Rehabilitation requirements.

These studies that precede the current environmental impact assessment are described below.

1 Environmental impact assessments and management plans

In 1994, a Mineral Agreement was signed between the Government and De Beers. This required Namdeb to submit an EMPR for its activities in DA1. A number of specialists collaborated on different aspects of the Sperrgebiet and Orange River licence area. Previous assessments that Namdeb has commissioned for this mining licence area are described below.

- **1997. EMPR: Orange River Mining Licence Area.**

This EMPR contains general guidelines for mining operations along the Orange River. Its scope included:

- Large scale open-cast mining and processing at Auchas mine
- Infield screening operations at Auchas mine and Sendelingsdrif
- Prospecting at Sendelingsdrif, Obib, Daberas and Auchas

Specialist studies included: Archaeology, palaeontology, vegetation, animal life, the Orange River, history, legal issues and a socio-economic study of Namdeb's operations.

- **1998. Open Cast Diamond Mining of Proto Orange River deposits at Daberas, Namibia Final Environmental Impact Assessment.**

This supplemented the 1997 EMPR, and was aligned with Namdeb's Environmental Policy that required preparation of a baseline study of flora and sensitive habitats.

- **1998. Open Cast Diamond Mining of Proto Orange River deposits at Sendelingsdrif, Namibia Environmental Impact Assessment for Sampling and Preliminary Environmental Impact Assessment for Mining.**

This was undertaken parallel to the feasibility study, to facilitate its contribution to the planning phase. It could not deliver detailed guidelines for mining, but recommended a more detailed EIA, including a rehabilitation and closure plan before the deposit is mined.

- **2002. Environmental Review for Daberas Mine. Environmental Impact Assessment and Environmental Management Plan.**

This review of the 1998 EIA was conducted in 2002, in order to include the development of a mega fine tailings disposal dam at Daberas.

- **2002. Multi-media Communications Backbone Oranjemund to Daberas Environmental Impact Assessment and Environmental Management Plan.**

This formed part of a larger project to provide security surveillance at Daberas and Luderitz. Upgrading the communications infrastructure between Oranjemund and Daberas entailed the installation of an overhead fibre optic communications cable.

- **2007. Sendelingsdrif Exploration Camp Sendelingsdrif Environmental Impact Assessment on a new temporary consumer fuel storage facility.**

This EIA was commissioned by Shell Namibia for its new temporary fuel facility for generators.

2 Rehabilitation and biodiversity plans

- **Biodiversity Strategy and Action Plan**
 - A detailed Rehabilitation Plan, with monitoring and preservation plans for Namdeb's land operations, was completed in 2007 and 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.
 - Since mining operations are in a globally recognised biodiversity hotspot and in a National Park, Namdeb prepared a Biodiversity Strategy and Action Plan in October 2008. Its purpose was to:
 - Identify information gaps and opportunities to improve biodiversity management;
 - Provide an umbrella for biodiversity-related environmental management;
 - Achieve a management objective of improving Namdeb's knowledge on restoration of vulnerable habitats, ecosystems and species.

3 Baseline studies

- **Botany and Insects**

Specialist reports for insects were undertaken in 1986, and in 1993 and 1995 for vegetation.

Namdeb commissioned additional baseline studies for the Sendelingsdrif area in 2002, which comprised a botanical baseline and insect survey, namely, "**Sendelingsdrif Additional Environmental Baseline.**" This study covered only 25%-30% of the 109 insect species, and found that the main environmental threat is habitat destruction. No single insect is known to be confined exclusively to the proposed mining area. The study was intended to:

- Assist with the assessment of the population status of *Juttadinteria albata*;
- Facilitate a comprehensive pre-mining insect reference collection by the National Museum of Namibia.

Its recommendations included:

- Leave adequate portion of the gravel terrace habitat undisturbed;
- Recreate pre-mining landforms and incorporate ongoing rehabilitation during the mining process;
- Maintain a seed collection of *Cephalophyllum* and test transplanting of *Pelagoneum* and *Euphorbia garupina*
- Provide yellow outside lights to reduce attraction for insects at night.

This study was followed by the study “***Juttadinteria albata* - global red list assessment**” that the company supported in 2004. It changed the status of the plant from critically endangered to vulnerable. It recommended that rehabilitation plans incorporate the relocation and replanting of *Juttadinteria albata*, and provided minimum targets for maintaining the current red list status.

The Sendelingsdrif vegetation study is meant to guide the development of a conservation programme. It found that *Juttadinteria albata* occurs on the gravel terraces at Sendelingsdrif, and will be affected by future mining operations. In collaboration with MSBP and NBRI, propagation techniques are being tested.

- **Invertebrates, riparian vegetation and river water quality**

Namdeb commissioned a “**Lower Orange River Baseline Study**” in 1994 of the fish, invertebrates, riparian plants and water quality of the lower Orange River from Sendelingsdrif to Arrisdrijf in the Sperrgebiet. In addition to this, the Inland Fisheries Institute does annual monitoring of fish species abundance and distribution.

The findings include:

- Fish: 16 species occur naturally in the Orange River. *Barbus hopes* is endemic and listed as rare in the IUCN Red list, while *Barbus kimberleycusis* is catalogued as vulnerable.
- Invertebrates: High numbers of endemic insects are likely to occur at Sendelingsdrif. The licence area – Skilpadberg – harbours a rich insect fauna in a confined area that has conservation potential. Arachnids and many other fauna are poorly known.
- Water quality: This is generally good, and suitable for all uses. Any effects from mining are unlikely to be severe or far-reaching, except possible at low- or no-flow conditions. Measurements of dissolved oxygen and salinity were done at Auchas.

Water quality monitoring is done, both upstream and downstream of Daberas. Tests indicate the presence of *E Coli* in the river water, although the operations water was clear; samples are being taken during low flow conditions. Samples are also taken at the plant; chemical analyses are available, but limited. The conclusion is that Namdeb operations have no effects on the river, except during no/low flow.

- **Palaeontology and archaeology**

The National Heritage Act protects caves and middens. ESA and MSA sites consist of a scattering of tools, hand axes, flakes, cores and discoids, graves and stone circles. These are directly on mine deposits. LSA sites consist of graves and agglomerations of artefacts.

Specialist reports for palaeontology were undertaken in 1993, and in 1995 for archaeology. The most recent study for 2010 has co-ordinates for each of the 11 archaeological sites it found. These included:

- Historic police station at Sendelingsdrif, with stock enclosures and shelters;
- Grave sites and a stone circle on the sandy terrace near the river off the deposit;
- ESA site within about 100 m of the deposit, with scattering of tools, flakes and discoids;
- Proto-Orange deposits.

4 Rehabilitation requirements

The “**Rehabilitation plan for Namdeb’s licence areas**” was completed in 2008. It dealt with:

- End land use: Nature based tourism;
- Biodiversity restoration.

De Beers Group requirements for rehabilitation include:

- No net biodiversity loss
- Biodiversity Offsets
- Topsoil preservation
- Manage alien invasive plants
- Determine recovery rate of ecosystem
- Soil analysis