

PART 11: IDENTIFICATION OF KNOWLEDGE GAPS

In accordance with Regulation 50 of the MPRDR¹ (2004), under the MPRDA² (2002), the knowledge gaps, adequacy of predictive methods, underlying assumptions and uncertainties encountered in compiling the required information have been identified and discussed in this part of this EMP³ (incl. EIA⁴).

11.1 KNOWLEDGE GAPS

Several gaps in the information available regarding De Beers Kimberley Mines have been identified during the EMP (incl. EIA) process.

Some investigations are currently underway in order to generate the data required, or to supplement outdated or insufficient information are summarised below.

11.1.1 GEOHYDROLOGICAL ASSESSMENT

A Phase I assessment on groundwater impacts was conducted for De Beers Kimberley Mines. The results of the mentioned assessment were documented in the report titled "*Kimberley Mines, Assessment of groundwater impacts from tailings storage facilities and proposed backfilling of open pits – Phase 1 – situation assessment – Rev 1*", dated July 2007, with Report No. 8785/9449/1/G (refer to **Appendix L**).

As part of the above-mentioned study, it was concluded that a Phase II geohydrological investigation needs to be conducted to assess the hydrogeology of the area, as well as the impacts of the mine activities on the groundwater environment. The data collected during the proposed Phase II investigation will provide the data needed for Phase III numerical modelling to be conducted, for an impact assessment to be undertaken, and for suitable remediation and mitigation measures in identified priority areas to be developed.

It is also suggested that additional boreholes be incorporated into the existing monitoring programme to monitor all possible pollution sources such as the tailings resources, the Plants and the pits, as well as to ensure that the direction and rate of movement of the pollution plume(s) can be determined.

Groundwater level and quality monitoring should be instated around the groundwater sinks (open pits) and pollution source areas (wastewater facilities and tailings resources) where no monitoring currently takes place. The placing of the groundwater boreholes should be undertaken by a suitably qualified geohydrologist.

11.1.2 BIODIVERSITY STUDY

It is recommended that the current status of the biodiversity within the De Beers Kimberley Mines mining area be established by a suitably qualified person as part of a

¹ MPRDR: Mineral and Petroleum Resource Development Regulations (R.527), dated 23 April 2004.

² MPRDA: Mineral and Petroleum Resources Development Act, Act No. 28 of 2002.

³ EMP: Environmental Management Programme.

⁴ EIA: Environmental Impact Assessment.

biodiversity study that should include soils, land use, land capability, natural and alien invasive vegetation, and terrestrial and aquatic animal life, amongst others. The establishment of baseline information regarding the *status quo* of the biophysical environment at De Beers Kimberley Mines will ensure that appropriate management and rehabilitation measures can be investigated and applied as far as possible.

11.1.3 ASSESSMENT OF INVADER PLANT SPECIES

Although an assessment on the distribution and extent of invader plant species within the mine boundary of De Beers Kimberley Mines has been undertaken previously (refer to **Appendix H** attached hereto), an additional assessment which includes appropriate measures to be implemented to mitigate the occurrence of invader plant species within the mine boundary of De Beers Kimberley Mines should be conducted by a suitably qualified person. The results of such an assessment will need to be documented.

11.1.4 WATER BALANCE

Volumes and flows of surface water within the De Beers Kimberley Mines mining area were captured in a water balance that was developed for the mine in March 2003, and was included as **Appendix J** of the document titled, "*De Beers, Kimberley Mines, Integrated Water and Waste Management Plan*", dated October 2006, with Reference number DB/KM/04/2006, compiled by Clean Stream Environmental Services, extracts of which are attached hereto as **Appendix E**. However, the mentioned water balance is outdated and does not conform to the requirements of the DWA⁵ as indicated in the most recent relevant Best Practice Guideline.

The water balance (dated March 2003) should therefore be updated to reflect the current situation of water management at the mine, as well as to comply with the requirements of the DWA as indicated in the relevant Best Practice Guidelines. The water balance should be interactive and should allow for flexibility in terms of alterations to the water management system, in order to ensure that the water balance reflects the actual situation at the mine at all times.

⁵ DWA: Department of Water Affairs.