Baken Diamond Mine

STORAGE AND TREATMENT OF CONTAMINATED SOIL USING A BIOPILE FACILITY
FINAL SCOPING REPORT

DEA Reference No.: 12/9/11/L1278/8

SLR Project No.: 723.05018.00002
Report No.: 1

April 2014

Trans Hex Operations (Pty) Ltd
Baken Diamond Mine

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This report has been prepared by an SLR Group company with all reasonable skill, care and diligence, taking into account the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.
EXECUTIVE SUMMARY

Introduction
Trans Hex Operations (Pty) Ltd (Trans Hex), a diamond mining company, is proposing to establish a treatment facility for the remediation of contaminated soil at its Baken Diamond Mine in the Northern Cape Province. The proposed treatment technology is referred to as biopiling.

SLR Consulting (South Africa) (Pty) Ltd (SLR) has been appointed by Trans Hex to undertake the EIA process. EnviroServ Waste Management (Pty) Ltd (EnviroServ), a specialist waste management company, will be appointed contractor to undertake the activity on behalf of Trans Hex.

Location
The mine is located on the lower Orange River, approximately 40km north east of Alexander in the Richtersveld municipal area. The proposed biopiling site is located in an area currently used as a salvage yard by the mine, within the mine footprint and central to its mining operations.

Project overview and motivation
The aim of the project is to remediate hydrocarbon contaminated soil found at the mine such that it can be used in the rehabilitation of areas disturbed by mining operations. The proposed remediation methodology is biopiling. The proposed biopile facility will be located centrally within the mine footprint. Initially the facility will treat a total of 1,000m³ of contaminated soil. Any future treatment capacity is expected to be significantly less than this. Each treatment cycle could take between 3 and 12 months to complete depending on the extent of contamination. Gobakanya, an inert, organic absorbent material will be used as the treatment medium.

The project will comprise:
- clearing any existing infrastructure or material not relevant to the project;
- demarcating each biopile area – the size of each biopile will depend on the volume of material to be remediated and the design constraints of the liner;
- excavating a trench down-gradient of the biopile to collect runoff and leachate (if present) and establishing a berm up-gradient of the biopile to divert clean runoff;
- placing a plastic liner in the trench, across the biopile footprint and over the berm;
- placing a 20cm thick compacted soil layer on top of the liner;
- establishing site-specific fencing and access control measures;
- preparing the soil for bioremediation;
- placing the soil on the prepared biopile area and cover with a tarpaulin;
- monitoring and sampling of the biopile to determine the level of bioremediation;
once remediation is complete, sampling of the soil to determine its fertility and suitability for use in rehabilitation;
removal of the remediated soil for use by the mine; and
decommissioning of each biopile through removing the lining and levelling and ripping the area.

The facility will be established and operated by a contractor. No new employment opportunities are expected.

The estimated cost to set up the facility is in the region of R30,000.

Although there is an initial immediate need to treat contaminated soil stockpiled on site, it is expected that this facility will remain for the life of mine and used by the mine as and when needed. The scoping report and EIA report therefore covers the remaining life of mine of six years.

It is expected that the closure of the facility will be done at the end of the life of mine, once rehabilitation of the mine has taken place.

The remediation project will have a positive effect on the environment minimizing the ongoing pollution and/or damage of natural resources such as soil, water and biodiversity. The establishment of an on-site remediation facility also negates the need to transport and dispose of the contaminated soil as hazardous waste at a landfill site. The project ties in with the national waste management strategy of South Africa which calls upon treatment prior to disposal.

Legal framework
The remediation of contaminated soil and the establishment and operation of the biopile facility triggers a number of activities listed in terms Government Notice Regulations 921 (29 November 2013) of the National Environmental Management: Waste Act, 59 of 2008 (NEM:WA). A scoping and environmental impact assessment (EIA) process, as stipulated in the EIA Regulations (GN R543, 18 June 2010) of the National Environmental Management Act, 107 of 1998 (NEMA), is required to support the waste management license application.

Waste management activities of relevance to the project are detailed in the table below. The table highlights activities that were included in the application submitted to DEA and the amended activities as per the November 2013 changes.
TABLE 1: WASTE MANAGEMENT ACTIVITIES APPLICABLE TO THE PROJECT (GNR 718 VS 921)

<table>
<thead>
<tr>
<th>Activity No.</th>
<th>Activity description</th>
<th>Activity No.</th>
<th>Activity description</th>
<th>Applicability to project</th>
</tr>
</thead>
<tbody>
<tr>
<td>A(2)</td>
<td>The storage including the temporary storage of hazardous waste at a facility that has capacity to store in excess of 35m³ of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons</td>
<td>C</td>
<td>The storage of hazardous waste at a facility that has capacity to store in excess of 80m³ of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons and temporary storage of such waste.</td>
<td>Approximately 1000m³ of hydrocarbon contaminated soil is stockpiled on site. No authorisation needed but activity does require compliance with the Norms and Standards for Waste Storage, 2013.</td>
</tr>
<tr>
<td>A(12)</td>
<td>The remediation of contaminated land</td>
<td>A(8)</td>
<td>The remediation of contaminated land</td>
<td>Applicability to be confirmed with the DEA.</td>
</tr>
<tr>
<td>A(18)</td>
<td>The construction of facilities for activities listed in Category A of this schedule (not in isolation to associated activity)</td>
<td>A(12)</td>
<td>The construction of facilities for activities listed in Category A of this schedule (not in isolation to associated activity)</td>
<td>Applicability of this activity depends on the applicability of Activity A(8).</td>
</tr>
<tr>
<td>B(4)</td>
<td>The biological, physical or physico-chemical treatment of hazardous waste at a facility that has the capacity to receive in excess of 500kg of hazardous waste per day.</td>
<td>-</td>
<td>-</td>
<td>Activity no longer exists in terms of revised activities and therefore the activity falls away.</td>
</tr>
<tr>
<td>B(5)</td>
<td>The treatment of hazardous waste using any form of treatment regardless of the size or capacity of such a facility to treat waste</td>
<td>B(4)</td>
<td>The treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average, using any form of treatment excluding the treatment of effluent, wastewater or sewage.</td>
<td>The biopiling facility will have a design capacity to treat 1000m³ of contaminated soil at any one time.</td>
</tr>
<tr>
<td>B(11)</td>
<td>The construction of facilities for activities listed in Category B of this schedule (not in isolation to associated activity)</td>
<td>B(10)</td>
<td>The construction of facilities for activities listed in Category B of this schedule (not in isolation to associated activity)</td>
<td>Still applicable.</td>
</tr>
</tbody>
</table>

Approach and Methodology
The methodology used to identify key issues included:
- developing an understanding of the project and its environmental setting;
- considering legislative and regulatory requirements;
- review of available data including the mine’s environmental management programme (EMP);
- consultations with identified interested and/or affected parties (IAPs);
- consideration of alternatives; and
- identifying all impacts and issues associated with the project including an indication of how these impacts and issues will be addressed in the next phase of the EIA process.
Alternatives considered

Limited alternatives exist for the project. Alternatives considered during the scoping process include:

- site selection – alternatives included sites outside or within the mine boundary. In this regard, an already disturbed area within the mine footprint was chosen as the preferred option;
- waste handling options – alternatives included disposal of contaminated soil as hazardous waste at a landfill site or the on-site remediation of contaminated soil using a biopiling facility. The biopiling treatment facility was considered the most feasible option for the project and will be assessed in the EIA phase. No further assessment of alternatives will be undertaken; and
- land uses for the site – given the project’s location within a disturbed area of the mine, no alternative land uses exist for the site.

Alternatives that will be considered further in the EIA include:

- site layout options – the treatment facility layout will be optimised to ensure efficiency in the process and take into consideration technical aspects of the project and site. Given the small size of the facility and location of the project within a disturbed area within the footprint of the mine limited environmental or social considerations exist; and
- the “no-project” option – a comparison between the options of proceeding with the project with that of not proceeding with the project.

Environmental setting

The project site is located centrally within the mine boundary, within an area currently used as a salvage yard. It has been identified by the mine that there are no diamond bearing reserves within the project footprint. The natural soil and biodiversity characteristics of the project site have been altered by the current mining and related activities. There are no surface water resources within close proximity of the site (the nearest is a non-perennial drainage channel approximately 500m north of the site). The nearest potentially sensitive receptor sites include the Baken town (mine village) (almost 4km north of the site), Sanddrift town (located 5km north of the project site) and local ecology including the young terraces along the Orange River and the Orange River itself (the nearest of which is approximately 1.5km from the project site).

Key issues and conclusion

Given the small scaled nature of the project, the design criteria being proposed, the project site’s location centrally within the mine footprint and the project site’s distance from sensitive biodiversity or third party related receptors, limited impacts are expected to occur. The more significant impacts both positive and negative are associated with soil resources. No specialist investigations are deemed necessary and the detailed assessment and management plan will be provided by SLR in the next phase of the EIA process.
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1 INTRODUCTION

1.1 INTRODUCTION TO THE PROJECT AND ENVIRONMENTAL ASSESSMENT

Trans Hex Operations (Pty) Ltd (Trans Hex), a diamond mining company, is proposing to establish a treatment facility for the remediation of contaminated soil at its Baken Diamond Mine in the Northern Cape Province. The proposed treatment technology is referred to as biopiling.

The mine is located on the lower Orange River, approximately 40km north east of Alexander Bay (Figure 1-1 and Figure 1-2, respectively), in the Richtersveld municipal area.

The remediation of contaminated soil using a biopile facility triggers a number of activities listed in terms of the National Environmental Management: Waste Act, 59 of 2008 (NEM:WA). Such listed activities cannot be undertaken without a decision from the respective competent authorities. A scoping and environmental impact assessment (EIA) process, as stipulated in the EIA Regulations (GN R543, 18 June 2010) of the National Environmental Management Act, 107 of 1998 (NEMA), is required to support the waste management license application. An overview of the legal framework and applicable guidelines is provided in Section 2.

The environmental assessment process comprises three phases: an application phase, scoping phase and environmental impact assessment (EIA) phase. This report describes the scoping phase for the project. The main purpose of this scoping report is to set out project-related environmental issues; to identify any additional work required to address the issues; and to detail how this additional work will be performed. The terms of reference generated for the EIA will enable the meaningful assessment of all relevant environmental and social issues.

SLR Consulting (South Africa) (Pty) Ltd (SLR) has been appointed by Trans Hex to undertake the EIA process. EnviroServ Waste Management (Pty) Ltd (EnviroServ), a specialist waste management company, will be appointed contractor to undertake the activity on behalf of Trans Hex.
FIGURE 1-1: REGIONAL SETTING
FIGURE 1-2: LOCAL SETTING
1.2 PROJECT SETTING

The regional and local setting of the mine and project site is outlined Table 1-1 below and illustrated in Figure 1-1 and Figure 1-2, respectively.

TABLE 1-1: REGIONAL SETTING

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Province</td>
<td>Northern Cape</td>
</tr>
<tr>
<td>Magisterial district</td>
<td>Namakwa District Municipality (DC6)</td>
</tr>
<tr>
<td>Local authority</td>
<td>Richtersveld Local Municipality (NC061)</td>
</tr>
<tr>
<td>Municipal ward</td>
<td>Ward 2</td>
</tr>
<tr>
<td>Properties on which project will take place</td>
<td>Portion of Farm Richtersveld 11 (within the mine footprint)</td>
</tr>
<tr>
<td>Nearest towns</td>
<td>Alexander Bay (approx. 30km south west of the site); Port Nolloth (approx. 85km south of the site); Baken Mine Village (almost 4km north of the site)</td>
</tr>
<tr>
<td>Presence of servitudes</td>
<td>Power lines and internal mine gravel roads are located in the vicinity of the site.</td>
</tr>
<tr>
<td>Water catchment and management area</td>
<td>Within the lower reaches of the Orange River (Water Management Area 14, Quaternary Drainage Region D82L)</td>
</tr>
<tr>
<td>Co-ordinates of project area</td>
<td>With reference to Figure 1-2, the centre of the project site is approximately: 28° 28’ 15” (S) and 16° 46’ 37.22” (E)</td>
</tr>
</tbody>
</table>

1.3 PROJECT MOTIVATION (NEED AND DESIRABILITY)

The project’s aim is to provide an on-site option for the remediation of hydrocarbon contaminated soil at the mine. This will have a positive effect on the environment minimizing the ongoing pollution and/or damage of natural resources such as soil, water and biodiversity. The establishment of an on-site remediation facility also negates the need to transport and dispose of the contaminated soil as hazardous waste at a landfill site. The project ties in with the national waste management strategy of South Africa which calls upon treatment prior to disposal.

1.4 DETAILS OF THE APPLICANT

Trans Hex is a diamond exploration, mining and marketing company and has been in the diamond industry for almost 50 years. The company has a number of established mining operations along the bank of the Orange River in South Africa. Baken Mine, its southern most operation, is its flagship operation. Contact details for the applicant are provided below.

| Applicant         | TransHex Operations (Pty) Ltd                                      |
| Contact person    | Vincent Madlela                                                    |
| Physical address  | Head Office: 405 Vootrekker Road, Parow, Cape Town                 |
| Postal address    | Head Office: PO Box 723, Parow 7499, Cape Town                    |
| Telephone         | 021 937 2000                                                       |
| Fax               | 086 224 8310                                                       |
| Email             | vincentma@transhex.co.za                                           |
1.5 COMPETENT AUTHORITY

The Directorate: Authorisation and Waste Disposal at the Department of Environmental Affairs (DEA) is the competent authority. The assigned case officer is:
Ms Zinhle Mbili or Mr Lucas Mahlangu
Tel: 012 310 3870
Fax: 012 310 3142
Email: zmbili@environment.gov.za

1.6 STRUCTURE OF THIS REPORT

This document has been structured to comply with the requirements of the National Environmental Management Act, 107 of 1998 (NEMA) and the EIA regulations made there-under (Regulation 543 of 18/06/2010). Table 1-2 provides a summary of the requirements of GNR 543, with cross references to the report sections where these requirements have been addressed. Further detail on the legal framework for scoping is provided in Section 2 below.

### TABLE 1-2: STRUCTURING OF THE SCOPING REPORT IN TERMS OF GNR 543 REQUIREMENTS

<table>
<thead>
<tr>
<th>NEMA Regulation 28(1) of Regulation 543 of 18 June 2010</th>
<th>Reference in scoping report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Details of the EAP who prepared the report; and the expertise of the EAP to carry out Scoping procedures</td>
<td>Section 3.1</td>
</tr>
<tr>
<td>A description of the proposed activities, a description of the property on which the activity is to be undertaken, and the location of the activity on the property</td>
<td>Section 4</td>
</tr>
<tr>
<td>A description of any feasible and reasonable alternatives that have been identified</td>
<td>Section 5</td>
</tr>
<tr>
<td>A description of the environment that may be affected by the activity and the manner in which the activity may be affected by the environment</td>
<td>Section 6</td>
</tr>
<tr>
<td>Identify all legislation and guidelines that have been considered in preparing the Scoping report.</td>
<td>Section 2</td>
</tr>
<tr>
<td>A description of environmental issues and potential impacts, including cumulative impacts that have been identified</td>
<td>Section 7</td>
</tr>
<tr>
<td>Details of the public participation process conducted in terms of Regulation 27(a), including:</td>
<td>Section 3.4</td>
</tr>
<tr>
<td>- steps that were taken to notify potentially interested and affected parties of the application;</td>
<td></td>
</tr>
<tr>
<td>- proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the application have been displayed, placed or given;</td>
<td></td>
</tr>
<tr>
<td>- a list of all persons or organisations that were identified and registered in terms of Regulation 55 as interested and affected parties in relation to the application; and</td>
<td></td>
</tr>
<tr>
<td>- a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues.</td>
<td></td>
</tr>
<tr>
<td>A description of the need and desirability of the proposed activity</td>
<td>Section 1.3</td>
</tr>
<tr>
<td>A description of the identified potential alternatives to the proposed activity, including</td>
<td>Section 5</td>
</tr>
<tr>
<td>NEMA Regulation 28(1) of Regulation 543 of 18 June 2010</td>
<td>Reference in scoping report</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity.</td>
<td></td>
</tr>
<tr>
<td>Copies of any representations, and comments received in connection with the application or the scoping report from interested and affected parties. Copies of the minutes of any meetings held by the EAP with interested and affected parties and other role players which record the views of the participants</td>
<td>Appendix C</td>
</tr>
<tr>
<td>Any responses by the EAP to those representations and comments and views.</td>
<td>Appendix D</td>
</tr>
<tr>
<td>A plan of study for EIA which sets out the proposed approach to the EIA of the application, which must include:</td>
<td>Section 9</td>
</tr>
<tr>
<td>• tasks to be undertaken and the manner in which such tasks will be undertaken, specialist reports and processes,</td>
<td></td>
</tr>
<tr>
<td>• indication of the stages at which the competent authority will be consulted,</td>
<td></td>
</tr>
<tr>
<td>• a description of the proposed method of assessing environmental issues and alternatives, including the option of not proceeding with the activity,</td>
<td></td>
</tr>
<tr>
<td>• particulars of the public participation process.</td>
<td></td>
</tr>
<tr>
<td>Any specific information required by the competent authority.</td>
<td>Not applicable at this stage</td>
</tr>
</tbody>
</table>
2 LEGAL FRAMEWORK AND GUIDELINES

In accordance with EIA sub regulation 28(1f) of GN R 543, all legislation and guidelines that have been considered in the preparation of the scoping report are documented in this section. This section lists environmental legislation that has been identified as being pertinent to the project as well as guideline documents aimed to inform the assessment process.

2.1 PRIMARY ENVIRONMENTAL AUTHORISATIONS

This section lists the specific activities for which an authorisation/licence is being applied for.

2.1.1 WASTE MANAGEMENT LICENCE IN TERMS OF NEM:WA

The requirements of the National Environmental Management: Waste Act, 59 of 2008 (NEM:WA) came into effect on 1 July 2009. The Act makes provision for the identification of various waste management activities which may have a detrimental effect on the environment. A waste management activity identified in terms of the Act may not commence, be undertaken or conducted except in accordance with published standards or a Waste Management Licence.

On 3 July 2009 the list of waste management activities requiring a waste management licence from a competent authority were published (GN R 718). The list was amended on 29 November 2013 (GN R 921). Listed waste management activities are divided into Category A, B and C in the schedule. Activities identified in Category A require a basic environmental assessment process while activities identified in Category B require a scoping and environmental impact assessment (EIA) process. Category C activities do not require a license but do need to comply with the relevant standards if undertaken. For Category A and B activities, these environmental processes need to be undertaken in line with the EIA Regulations (GN R543) of the National Environmental Management Act, 107 of 1998 (NEMA), in order to inform an application for a waste management licence. Given that both Category A and Category B activities may be triggered, a scoping and EIA process is being followed for this project.

Waste management activities of relevance to the project are detailed in the table below. The table highlights activities that were included in the application submitted to DEA and the amended activities as per the November 2013 changes.
TABLE 2-1: WASTE MANAGEMENT ACTIVITIES APPLICABLE TO THE PROJECT (GNR 718 VS 921)

<table>
<thead>
<tr>
<th>Government Notice 718</th>
<th>Activity No.</th>
<th>Activity description</th>
<th>Government Notice 921</th>
<th>Activity No.</th>
<th>Activity description</th>
<th>Applicability to project</th>
</tr>
</thead>
<tbody>
<tr>
<td>A(2)</td>
<td>The storage including the temporary storage of hazardous waste at a facility that has capacity to store in excess of 35m$^3$ of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons</td>
<td>C</td>
<td>The storage of hazardous waste at a facility that has capacity to store in excess of 80m$^3$ of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons and temporary storage of such waste.</td>
<td>Approximately 1000m$^3$ of hydrocarbon contaminated soil is stockpiled on site. No authorisation needed but activity does require compliance with the Norms and Standards for Waste Storage, 2013.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A(12)</td>
<td>The remediation of contaminated land</td>
<td>A(8)</td>
<td>The remediation of contaminated land</td>
<td>Applicability to be confirmed with the DEA.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A(18)</td>
<td>The construction of facilities for activities listed in Category A of this schedule (not in isolation to associated activity)</td>
<td>A(12)</td>
<td>The construction of facilities for activities listed in Category A of this schedule (not in isolation to associated activity)</td>
<td>Applicability of this activity depends on the applicability of Activity A(8).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B(4)</td>
<td>The biological, physical or physico-chemical treatment of hazardous waste at a facility that has the capacity to receive in excess of 500kg of hazardous waste per day.</td>
<td>-</td>
<td>-</td>
<td>Activity no longer exists in terms of revised activities and therefore the activity falls away.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B(5)</td>
<td>The treatment of hazardous waste using any form of treatment regardless of the size or capacity of such a facility to treat waste</td>
<td>B(4)</td>
<td>The treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average, using any form of treatment excluding the treatment of effluent, wastewater or sewage.</td>
<td>The biopiling facility will have a design capacity to treat 1000m$^3$ of contaminated soil at any one time.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B(11)</td>
<td>The construction of facilities for activities listed in Category B of this schedule (not in isolation to associated activity)</td>
<td>B(10)</td>
<td>The construction of facilities for activities listed in Category B of this schedule (not in isolation to associated activity)</td>
<td>Still applicable.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Various policies, regulations and guidelines relating to the management of waste have been published. Those which are relevant to the project are described below.

**Waste Classification**

On 29 November 2013, the Minister of Water and Environmental Affairs published documents as part of the Standards and Regulations provided for in terms of the NEM:WA. The Standards and Regulations replace the ‘Minimum Requirements’ series published by the DWAF in 1998. The Minimum Requirements were guidelines endorsed by the DEA. The storage of hazardous waste at the project site will need to comply with the Norms and Standards for Storage of Waste, 2013.
National Waste Management Strategy
The purpose of the National Waste Management Strategy (GN344 of 4 May 2012) (NWMS) is to ensure that the objectives of the NEM:WA are achieved. The NWMS identifies some of the major waste challenges in South Africa and provides a plan to address these. Two of the goals in the NWMS are particularly relevant to the project, namely: "Goal 1: Promote waste minimisation, reuse, recycling and recovery of waste", and "Goal 7: Provide measures to remediate contaminated land".

2.1.2 ENVIRONMENTAL AUTHORISATION IN TERMS OF THE MPRDA
The project will take place on a mine property. Any changes to mine infrastructure require an amendment of the mine’s EMP in terms of the Mineral and Petroleum Resources Development Act, 28 of 2002 (MPRDA). It is envisaged that the need and scope of this process will be determined by the mine in consultation with the Department of Mineral Resources (DMR).

2.2 OTHER ENVIRONMENTAL AND CULTURAL LEGISLATION CONSIDERED
The legislation listed in Table 2-2 below has been considered for the project. Although no authorisation/licences are required in terms of these laws, the list has been included for completeness.

In addition, the municipal strategy documents relevant to the project and considered in this report include:
- Integrated Development Plan (IDP) for the Richtersveld Local Municipality (2012-2013);
- Local Economic Development (LED) Strategy for the Richtersveld Local Municipality (2012 – 2016);
### TABLE 2-2: OTHER ENVIRONMENTAL LEGISLATION CONSIDERED

<table>
<thead>
<tr>
<th>Legislation</th>
<th>Objective of legislation</th>
<th>Reason why not applicable to project</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Environmental Management: Air Quality Act, 39 of 2004 (NEM:AQA)</td>
<td>The NEM:AQA aims to reform the law regulating air quality in order to protect the environment. It also aims to comply with general environmental policies and to bring legislation in line with local and international good air quality management practices. A schedule of Listed Activities and Minimum National Emission Standards was published on the 31st of March 2010 (GN R248, March 2010). Listed activities may only be undertaken after an atmospheric emissions licence (AEL) has been obtained and must comply with the prescribed emissions standards set for that activity.</td>
<td>The project does not trigger any activities listed in GN R248, and therefore no AEL is required.</td>
</tr>
<tr>
<td>National Water Act, 36 of 1998 (NWA)</td>
<td>The NWA lists water uses for which a water use licence must be obtained.</td>
<td>Currently there are no water uses in terms of the NWA which are applicable to the project.</td>
</tr>
<tr>
<td>National Heritage Resources Act, 25 of 1999 (NHRA)</td>
<td>The NHRA provides for the protection of all archaeological and palaeontological sites and meteorites. Section 38 of the Act defines the categories of development for which the responsible heritage resources authority must be notified. Under Section 38 (c) ‘any development or other activity which will change the character of a site’ (i) exceeding 5000 m² the responsible heritage authority must be informed of a development larger than 0.5 ha.</td>
<td>The footprint of the project is larger than the listed threshold however most of the footprint area has been disturbed through existing activities on site. No heritage sites or artefacts have been recorded on the site. A Phase 1 heritage study was completed for the mine as part of the mine’s EMP (Baken, 2009).</td>
</tr>
<tr>
<td>National Environmental Management: Biodiversity Act, 10 of 2004 (NEM:BA)</td>
<td>The NEM:BA provides for the Minister or MEC to list species and ecosystems which are threatened and in need of protection as well as to identify threatening processes within these ecosystems. A list of threatened and protected species and regulations pertaining thereto has been published (GN R 150, 151 &amp; 152, February 2007).</td>
<td>The project is located in an area that has been disturbed through existing activities on site.</td>
</tr>
<tr>
<td>Conservation of Agricultural Resources, 43 of 1983 (CAR)</td>
<td>The CAR defines a list of registered weeds and invader plants, categorises them into different classes and introduces restrictions where these plants may occur. The act prohibits the spread of weeds and requires that listed weeds be controlled.</td>
<td>No registered weeds or invader plants will be planted as part of the project. In addition, the alien and invasive plant control programme currently implemented at the site will be applied to the project area.</td>
</tr>
</tbody>
</table>
### Provincial, District and Other Policies, Guidelines, Frameworks and Municipal by-laws

<table>
<thead>
<tr>
<th>Policy/By-law</th>
<th>Description</th>
<th>Relevance to Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Refuse Removal by-law (6 May 2005)</strong></td>
<td>This by-law governs the removal of refuse by the local municipality. This is the only municipal by-law related to the environment and/or waste management available for the Richtersveld Local Municipality (pers. comm. Heinrich Cloete, Infrastructure Manager for the Municipality)</td>
<td>Given that the project entails the treatment of contaminated soil on-site and the re-use thereof in rehabilitation of disturbed areas this by-law does not apply to the project.</td>
</tr>
<tr>
<td><strong>Mining and Biodiversity Guidelines (May 2013)</strong></td>
<td>The Mining and Biodiversity Guideline promotes cross-sectoral interaction and cooperation, aimed at improving biodiversity conservation and management in the mining industry</td>
<td>The project falls within an area that has been categorised as having ‘highest biodiversity conservation significance’ in terms of the Guideline. In addition, the site is located within the mine footprint which is adjacent to the Orange River. The Orange River has been identified as a National Freshwater Ecosystem Priority Area (NFEPA).</td>
</tr>
</tbody>
</table>
3 SCOPING METHODOLOGY

This section presents the approach and methodology used to identify potential environmental and social impacts and alternatives associated with the project.

3.1 SCOPING TEAM

SLR is an independent firm of consultants that has been appointed to undertake the environmental assessment. Alex Pheiffer and Victoria Tucker comprise the SLR team whom are the responsible SLR environmental assessment practitioners (EAPs) for managing the project and compiling the final report. Alex Pheiffer (project reviewer) has approximately 11 years of relevant experience and is registered with the South African Council for Natural Scientific Professions (SACNSP) as a professional natural scientist (PrSciNat) (Environmental Science). Victoria Tucker (Project manager) has three years of relevant experience.

Neither Alex, Victoria nor SLR has any interest in the project other than fair payment for consulting services rendered as part of the environmental assessment process.

<table>
<thead>
<tr>
<th>Team</th>
<th>Name</th>
<th>Designation</th>
<th>Tasks and roles</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project management</td>
<td>Alex Pheiffer</td>
<td>Project reviewer</td>
<td>Process management, stakeholder engagement, and report compilation.</td>
<td>SLR Consulting (South Africa) (Pty) Ltd (SLR)</td>
</tr>
<tr>
<td></td>
<td>Victoria Tucker</td>
<td>Project manager</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Christiaan Malherbe</td>
<td>Project assistant</td>
<td>Assistance with public participation process</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Olwethu Kolisi</td>
<td>Project assistant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical project team</td>
<td>Samantha Bennett-Haslam</td>
<td>EnviroServ project manager</td>
<td>Technical input</td>
<td>EnviroServ</td>
</tr>
<tr>
<td>Specialist team</td>
<td>Richard Daneel</td>
<td>Treatment technology expert</td>
<td>Soil specialist</td>
<td>Soil and Pollution Remediation Services</td>
</tr>
<tr>
<td></td>
<td>Stephen Weber</td>
<td>Land quality and remediation specialist</td>
<td>Technical input on land remediation aspects</td>
<td>SLR</td>
</tr>
</tbody>
</table>

3.2 SCOPING PHASE OBJECTIVES

The key objectives of the scoping phase are:

- to understand the project;
- to identify and describe potential environmental and social impacts in consultation with interested and/or affected parties (IAPs); and
- to set out any related terms of reference for further investigations (if required) that will enable the meaningful assessment of all relevant environmental and social issues.
3.3 **SCOPING PROCESS**

The scoping process is being followed in accordance with the requirements of the legal framework outlined in Section 2 above and involves the following steps:

- key team members conducted a site visit of the project area – the purpose of the site visit was to familiarise the environmental assessment team with the site characteristics and conditions;
- available literature, documents and databases were reviewed;
- interested and/or affected parties (IAP), including the relevant authorities, were identified and notified of the project and consulted (the consultation process is outlined in Section 3.4 of this report);
- potential positive and negative impacts were identified by considering the project description, the site conditions and IAP input;
- further work required was identified by the SLR environmental team and terms of reference required to assess the positive and negative impacts drafted (the terms of reference for further investigations are included in Section 9); and
- a draft scoping report was compiled.

The main sources of information used to develop this report included:

- technical input provided by EnviroServ and the soil specialist (Soil and Pollution Remediation Services);
- the mine’s existing environmental management programme (EMP) (dated April 2009);
- the site visits conducted by the SLR team during the initial scoping phase; and
- maps including regional geological maps, topographical maps (1:250 000 and 1:50 000 scales) and satellite imagery (Google Earth).

Stages of the environmental process being followed and corresponding activities up to and including scoping are outlined in the table below. Details on the proposed EIA phase are included in Section 9 of this scoping report.

<table>
<thead>
<tr>
<th>TABLE 3-2: ENVIRONMENTAL PROCESS BEING FOLLOWED UP TO AND INCLUDING SCOPING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objectives</strong></td>
</tr>
<tr>
<td>Project initiation and application phase (May – July 2013)</td>
</tr>
<tr>
<td>Notify the decision making authorities of the project.</td>
</tr>
<tr>
<td>Scoping phase (August 2013 – March 2014)</td>
</tr>
<tr>
<td>Identify interested and/or affected parties (IAPs) and involve them in the Scoping process through information sharing.</td>
</tr>
<tr>
<td>Identify potential</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Objectives | Corresponding activities
---|---
environmental issues associated with the project. • Identify any fatal flaws. • Determine the terms of reference for the EIA. | • Distribute draft scoping report and/or summary to IAPs and other regulatory authorities for review (February 2014). Forward copy of draft scoping report to DEA for record keeping • Record comments (in writing) and update scoping report where required (February - March 2014). • Forward final scoping report including IAP comments to DEA (April 2014). At the same time, notify IAPs of availability of final scoping report.

3.4 STAKEHOLDER ENGAGEMENT

The public participation process followed thus far, including the identification of potentially interested and/or affected parties is detailed below.

3.4.1 INTERESTED AND/OR AFFECTED PARTIES (IAPs)

The stakeholder engagement process commenced with a stakeholder analysis that was aimed at identifying parties to be involved during the environmental assessment process and associated communication structures. This was done through information provided by Trans Hex on landowners at the mine; site visits in the surrounding area; networking and direct discussions with IAPs. Key stakeholders identified for the project include:

- **IAPs:**
  - landowner at the mine and on the project site (Richtersveld Sidal Hub Community Property Association);
  - landowners, land occupiers and communities on and surrounding the mine.

- **Regulatory authorities:**
  - National Department of Environment Affairs (DEA);
  - Northern Cape Department of Nature Conservation (DENC);
  - Northern Cape Department of Mineral Resources (DMR);
  - Northern Cape Department of Water Affairs (DWA);
  - Northern Cape Department of Agriculture, Forestry and Fisheries (DAFF);
  - South Africa Heritage Resource Agency (SAHRA);
  - Northern Cape Department of Rural Development and Land Reform (DRDLR) (Land Affairs); and
  - Northern Cape Department of Economic Development and Tourism.

- **Local authorities:**
  - Namakwa District Municipality;
  - Richtersveld Local Municipality; and
  - Relevant ward councillors.
A public involvement database has been developed for the project and is provided in Appendix B. The database is updated on an ongoing basis throughout the environmental process.

### 3.4.2 Steps in the Scoping Phase of the Public Participation Process

Steps in the public participation process that have been conducted to date are set out in Table 3-3 below.

#### TABLE 3-3: PARTICIPATION PROCESS TO DATE WITH IAPS AND AUTHORITIES

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notification of IAPs</td>
<td>Laminated A2 site notices in English and Afrikaans were placed at the Baken Mine entrance (as the majority of IAPs in the area work at the mine) and Baken Mine Head Office. Copies of the site notices are included in Appendix C together with photos of where the site notices were placed.</td>
<td>October 2013</td>
</tr>
<tr>
<td>Newspaper advertisements</td>
<td>Block advertisements were placed in one local newspaper. In this regard, advertisements were placed in Die Plattelander (8 November 2013). A copy of the advertisement is included in Appendix C.</td>
<td>November 2013</td>
</tr>
<tr>
<td>Scoping stage comments received</td>
<td>No written comments were received by SLR during the scoping process. One telephonic comment was received and proof of the conversation is included in Appendix C and Appendix D.</td>
<td>August 2013 to January 2014</td>
</tr>
</tbody>
</table>

#### 3.4.3 Summary of Issues Raised

A summary of issues that have been raised to date by authorities and IAPs is given below. The full list is included in Appendix D. Issues raised pertain to:

- Project scope clarification;
- Employment and business opportunities.

#### 3.5 Assumptions and Limitations

The following assumptions and limitations underpin the approach to this EIA study:

- The information including specialist information as provided in the mine’s EMP (dated April 2009) is an accurate reflection of the environmental conditions of the site and in the surrounding area. No project-specific specialist work has been conducted for the project.
- The public participation strategy took into consideration that the mine is located in a remote area of the country where the two main residential areas are the mine village and Sanddrif community. It is understood by SLR that the majority of the Sanddrif community work at the mine.
- The scoping report will provide preliminary estimations on sizes and proposed infrastructure and or components. All technical specifications will be finalised during the EIA phase of the project.
- Health and safety issues relating to project staff and contractors are viewed as an occupational health and safety concern and should be addressed by the project developer. Accordingly, the EIA will only assess potential health and safety concerns related to external, third parties as a result of potential environmental impacts.
4 DESCRIPTION OF THE PROJECT

A description of the project is given in the section below.

The aim of the project is to remediate hydrocarbon contaminated soil found at the mine such that it can be used in the rehabilitation of areas disturbed by mining operations. The proposed remediation methodology is biopiling. The proposed biopile facility will be located centrally within the mine footprint. Alternatives considered are discussed in Section 5 of the scoping report. Further detail on the preferred treatment option and support services are provided below.

Although there is an initial immediate need to treat contaminated soil stockpiled on site, it is expected that this facility will remain for the life of mine and used by the mine as and when needed. The scoping report and EIA report therefore covers the remaining life of mine of six years.

4.1 PROJECT DESIGN CRITERIA

Information that provides perspective on the scale of the project is presented in the table below. It should however be noted that this information is preliminary and may be refined in the EIA phase.

<table>
<thead>
<tr>
<th>TABLE 4-1: PROJECT DATA THAT PROVIDES PERSPECTIVE ON THE SCALE OF THE PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Features</strong></td>
</tr>
<tr>
<td><strong>Group</strong></td>
</tr>
<tr>
<td>Storage prior to treatment</td>
</tr>
<tr>
<td>Method of identifying waste</td>
</tr>
<tr>
<td>Source of waste</td>
</tr>
<tr>
<td>Transport method</td>
</tr>
<tr>
<td>Storage capacity</td>
</tr>
<tr>
<td>Biopile facility</td>
</tr>
<tr>
<td>Life of facility</td>
</tr>
<tr>
<td>Number of piles</td>
</tr>
<tr>
<td>Features</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td><strong>Group</strong></td>
</tr>
<tr>
<td>Treatment medium</td>
</tr>
<tr>
<td>Output</td>
</tr>
<tr>
<td>Resource use</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Power demand</td>
</tr>
<tr>
<td>Employment and operating times</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Ongoing monitoring</td>
</tr>
<tr>
<td>Revenue generation</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
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<tr>
<td></td>
</tr>
</tbody>
</table>

### 4.2 Layout of Surface Infrastructure

The project will comprise the following (Figure 4-1):
- fencing with access control;
- contaminated soil receiving and storage area;
- biopile remediation facility including clean and dirty stormwater / leachate controls.

### 4.3 Construction Phase

The construction phase will involve the preparation of the biopiles. This will include:
- clearing any existing infrastructure or material not relevant to the project;
- demarcating each biopile area – the size of each biopile will depend on the volume of material to be remediated and the design constraints of the liner;
- excavating a trench down-gradient of the biopile to collect runoff and leachate (if present) and establishing a berm up-gradient of the biopile to divert clean runoff;
- placing a plastic liner in the trench, across the biopile footprint and over the berm;
- placing a 20cm thick compacted soil layer on top of the liner; and
- establishing site-specific fencing and access control measures.
Figure 4-1: Conceptual site layout

Legend

- Biopiles
- Project Site Area
- Fence & Entrance Gate

Clean and Dirty Water Management

- Clean Stormwater Diversion Berm
- Dirtywater Collection Trench

Scale: 1:915
Projection: WGS17

TRANS HEX
Baken Diamond Mine

Conceptual Site Layout
4.4 PROPOSED TREATMENT TECHNOLOGY

Biopiles are used to reduce concentrations of petroleum constituents in excavated soils through the use of biodegradation/bioremediation. The technology involves stimulating aerobic microbial activity within the soils through the addition of a treatment medium containing enzymes, nutrients and microbes. The enhanced microbial activity results in degradation of adsorbed petroleum-product constituents through microbial respiration.

Prior to placing the soils on the prepared biopile area (as outlined in Section 4.3 above), the treatment medium will be added to the soil and mixed in using a front end loader. Water will then be added to the soil and the soil placed in a heap on top of the compacted soil layer. The pile will be covered with a tarpaulin sheet. An illustration of the facility is provided in Figure 4-2.

Environmental parameters key to the bioremediation process include soil moisture, nutrient levels, pH and temperature. Soil moisture will be adjusted during pile construction. Bulking agents may be added to increase soil moisture content (e.g. wood chippings) or soil permeability (e.g. sand). Generally, soil moisture should be maintained between 40 and 85% of field capacity during treatment. Temperature also has a significant effect upon the rate of biodegradation. During summer time, higher temperatures will occur within the soil piles, whilst during winter slower degradation rates may be achieved when temperatures drop. Organic contaminants and natural organic compounds in soils typically provide an adequate supply of carbon to promote biological degradation, but the availability of other essential nutrients such as nitrogen, phosphorus or potassium may be insufficient for optimum treatment. Requirements for additional nutrients will be evaluated at the start of each treatment cycle through site specific treatability studies. Typically one or more of the following approaches would be used to amend soils with additional nutrients:

- addition of animal manure or other composting materials;
- slow release nutrients added to soil when constructing soil piles; or
- nutrient solutions sprayed onto soil pile prior to, or after, construction.

Every three months the piles will be inspected to determine the level of bioremediation. A sample will be taken and analysed. Depending on the results, the following will take place:

- additional treatment medium will be added;
- piles will be turned using a front end loader; or
- the piles will be left as is.

Once the bioremediation is complete, the tarpaulin cover will be removed and the soils sampled to determine their fertility and suitability for use in rehabilitation. At this point, fertilisers will be added if required. The soils will then be removed from the biopile and transported to relevant areas of the mine.
FIGURE 4-2: ILLUSTRATION OF BIOPILING TECHNOLOGY

Note: Drawing is not to scale and is for illustration purposes only.
4.5 SUPPORT FACILITIES AND SERVICES

Support facilities and services that will be required for the project are outlined below. This information will be verified and refined in the EIA phase.

4.5.1 ACCESS AND TRANSPORT MECHANISMS

With reference to Figure 1-1 (regional setting) and Figure 1-2 (local setting), there is an existing network of roads in the area providing access to the mine. In the vicinity of the mine these roads are all gravel roads. Within the mine boundary, there is a network of haul roads providing access to the project site. These existing access routes will be used for the project. No changes or upgrades to these transport routes will be required.

The project will require a maximum of two 4x4 trips at the start of each treatment cycle followed by one 4x4 trip every three months. The trips will cater for both contractor and consumable transport. This is considered a negligible increase in traffic.

4.5.2 WATER USE AND SUPPLY

Water will be required to mix the treatment medium with the soil. Initially, a total of 70,000 litres (70 m$^3$) of water will be required to treat the 1,000 m$^3$ of stockpiled contaminated soil. This water will be sourced from the mine’s existing allocation from the Orange River.

4.5.3 STORM-WATER MANAGEMENT

Built into the design of each biopile will be clean and dirty water controls (Figure 4-1 and Figure 4-2):

- a trench down-gradient of the biopile to collect runoff and leachate (if present) – this trench will be suitably sized to contain any potential leachate; and
- a berm up-gradient of the biopile to divert clean runoff.

Any collected leachate will be allowed to evaporate. Due to the dry environmental conditions of the site it is expected that limited to no leachate will be produced.

4.6 DECOMMISSIONING AND CLOSURE

Decommissioning of each biopile will take place at the end of each treatment cycle. The following decommissioning activities are expected:

- removal of the plastic liner and disposal at a permitted facility;
- removal of the berm and backfilling of the trench; and
• ripping of compacted soils to allow for rehabilitation.

It is expected that the closure of the facility will be done at the end of the life of mine, once rehabilitation of the mine has taken place.
5 PROJECT ALTERNATIVES

5.1 SITE SELECTION

Alternative options considered for the proposed facility included sites outside and within the mine boundary. In this regard, an already disturbed area within the mine footprint was chosen as the preferred option. The chosen site within the mine boundary occupies an area that is currently used as a salvage yard. The site has already been disturbed by mine related activities and is in close proximity to the contaminated soil stockpiles that require treatment by the facility.

5.2 ALTERNATIVE LAND USES

Given that the project site is located within a disturbed area within the footprint of the mine, no alternative land uses exist for the site. No ore reserves are located within this area and therefore this area would not be required for mining.

5.3 SITE LAYOUT ALTERNATIVES

The final facility layout will be optimised to ensure efficiency in the process and take into consideration technical aspects of the project and site such as construction conditions, local topographical conditions and the aspect of the site in relation to the sun’s daily movements. Given the small size of the facility and location of the project within a disturbed area within the footprint of the mine limited environmental or social considerations exist.

5.4 WASTE HANDLING ALTERNATIVES

Two options were considered by the mine and EnviroServ for the handling of contaminated soil on site. These included the disposal of contaminated soil as hazardous waste at a landfill site or the on-site remediation of contaminated soil. For the on-site option a biopiling technology was considered. A comparison of these two options as well as the advantages of using biopiling are provided in Table 5-1 below.

<table>
<thead>
<tr>
<th>Landfill Disposal</th>
<th>Biopiling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Significant cost implications associated with the transport of waste to a landfill site</td>
<td>Relatively simple to design and implement.</td>
</tr>
<tr>
<td>Associated risks in terms of transportation of hazardous material.</td>
<td>Short treatment times: usually 6 months to 2 years under optimal conditions.</td>
</tr>
<tr>
<td>Compliance to new waste legislations (i.e. Impact on the airspace at the landfill and</td>
<td>Cost competitive: R 100 - 300/ton of contaminated soil.</td>
</tr>
<tr>
<td></td>
<td>Effective on organic constituents with slow biodegradation rates.</td>
</tr>
</tbody>
</table>
Based on the comparison above, it was determined that the biopiling treatment facility is the most feasible option for the project.

### 5.5 NO-GO ALTERNATIVE

The assessment of this option requires a comparison between the options of proceeding with the project with that of not proceeding with the project. The assessment of this option therefore requires input from the additional work described in Section 8 so that the full extent of environmental, social and economic considerations can be taken into account. A detailed assessment will be provided in the EIA.
6 ENVIRONMENTAL BASELINE DESCRIPTION

In order to assess the potential impacts of the project, it is important to understand the baseline environmental features of the site and surrounding area. In this regard it is important to note that the project site is located within an already disturbed area within the footprint of the mine. The site is currently used as a waste salvage yard and is surrounded by overburden stockpiles.

The baseline environmental information provided in this section is sourced from the mine’s environmental management programme (EMP) (dated April 2009) (which included a number of mine-specific specialist studies) and site visits conducted by the SLR project team.

6.1 GEOLOGY

The geology, geological processes and associated structural features and stratigraphy in and surrounding an area influence soil forms (discussed further in Section 6.26.4), groundwater resources (discussed further in Section 6.7), palaeontological resources (discussed further in Section 6.12) and the presence of economical reserves. As a baseline, this section provides an understanding of the geology relevant to the project site.

The geology at the mine site forms part of the Gariep Supergroup (Council for Geoscience website, 2013). This supergroup is represented by a group of volcanic and sedimentary rocks that have accumulated in a geosynclinal trough on the west coast of Africa. Superficial deposits of sand represent the top strata of the area.

The diamond deposits are alluvial occurrences, which are limited to a young system of remnant palaeo-channel deposits of unconsolidated gravels deposited in two deposition cycles referred to as the “proto” (older) and “meso” (younger) deposits. These are classified as the Arrisdrift Gravel Formation (Baken, 2009). Diamond gravels occur at various depths with some areas occurring as little as 1 to 11 m below natural ground level to deposits below 20 to 60 metres of sand, grit and gravel deposits.

At the project site it has been identified by the mine that there are no diamond bearing reserves and therefore sterilisation of ore reserves is not considered an issue for the project.

Structural features such as dolerite dykes and faults do occur within the broader mine lease area however it is reported in the mine’s EMP that none of these affect the mining process given their dormance (age tectonically) and their similar insignificance in terms of groundwater source or possible contamination conduit (Baken 2009).
6.2 **TOPOGRAPHY**

The topography of an area influences surface water behaviour, safety of third parties, the behaviour of soils, the type of land use and the visual character of a landscape. Topography can also influence climatic factors such as wind speeds and direction. As a baseline, this section provides an understanding of the topographical features relevant to the project site and surrounding area from which to measure potential change.

The natural topography of the area is relatively flat and slopes gently towards the Orange River (Figure 1-2). The natural topography surrounding the project site has been altered through mining activities and various overburden stockpiles are present. The topography on the site resembles that of the natural topography, lying at an elevation of approximately 55 meters above mean sea level.

6.3 **CLIMATE**

Climate can influence the potential for environmental impacts and related project design. As a baseline, this section provides a brief overview of climatic conditions relevant to the site.

The mine is located in the Arid West Coast Climatic Region of Southern Africa (Transitional Desert of the Orange River Trough; Köppen Code) (Baken, 2009). The climatic conditions are similar to those found in the southern Namib Desert of Namibia. This unique climate of the lower Orange River is characterised by:

- very low rainfall <50mm/year;
- very high evaporation of approximately 3500mm/year;
- only occasional penetration of coastal fog this far inland;
- frost free winters given low altitude;
- strong south-westerly winds; and
- very high temperatures.

6.4 **SOIL AND LAND CAPABILITY**

Soils are a significant component of most ecosystems. They support a variety of life forms and plants. Furthermore, soil characteristics determine the natural capability of land. As a baseline, this information identifies soil types relevant to the project site and will be used to inform handling of soil and rehabilitation of disturbed land.

As identified in the mine’s EMP the soils in the broader lease area are scarce (other than the deeper soils of the weathered granite in the south) and mostly shallow and stoney with a low clay content. The main soils include river terrace gravels, flood silts or Aeolian (windblown) sands. The associated land
capability ranges between grazing and wilderness, however given the low carrying capacities the grazing areas are considered as wilderness (Baken, 2009).

The pre-mining soils at the project site comprised alluvial gravels (terrace soils) which are considered typical diamond gravels where the coarse pebble / gravel fraction is 70 – 90% and the clay content is 6 – 15% (Baken, 2009). Given the low rainfall, the soils have no dry-land cropping potential. Given their low clay content, soils are highly erodible when subjected to concentrated run-off (Baken, 2009).

It is expected that due to the project site’s current use as a salvage yard, the natural characteristics of the soils and land capabilities have been altered to some degree.

6.5 BIODIVERSITY

The biodiversity value and conservation importance of any area requires an understanding of the vegetation communities together with the occurrence of fauna species. The presence and extent of fauna is directly linked to the natural vegetation. As a baseline, this section provides an outline of the vegetation communities relevant to the mine and project site, highlights the occurrence of sensitive ecological environments including sensitive/ endangered species (if present) that require protection and/or additional mitigation should they be disturbed, and outlines the conservation importance/sensitivity of the vegetation communities and associated vertebrate and invertebrate species.

6.5.1 VEGETATION

The mine lease area falls within the Succulent Karoo Region or biome. In general the mine’s EMP identified that the mine lease area houses a very rich flora, compared to other regions with similar harsh environments (Baken, 2009). The mining and biodiversity guideline (SANBI, 2013) identifies this area as having the highest biodiversity importance. The Orange River and its riparian zone has also been identified as a national freshwater ecosystem protection area (NFPEA) (WRC, 2011)

The main botanical findings as they relate to Baken Mine are listed below (Baken, 2009).

- The mine lease area includes a sensitive environment with a large flora including locally and regionally endemic species as well as plant communities. Some of these do occur nearly exclusively in the mine lease area, while the area outside the mine lease is small and mainly placed in Namibia. This is due to the fact that the mine lease area covers most of a phytogeographical unit.
- Due to the very arid environment, disturbance in these habitats is of a very long-lasting effect. Rehabilitation of disturbed habitats will either take extremely long or is impossible.
- There exists a number of islands inside the concession area, which are not diamond bearing, but carry a very rare flora and vegetation, such as Koeskop. Some of these are disturbed due to their
proximity, as secondary structures of the near-by mines are placed on the sensitive area (buildings, roads, dumping sites). In future planning, these sites should be declared as no-go-areas for all activities.

- In the Koeskop area the *Brownanthus pubscens*-community (on gypsum soils) includes a rare local endemic: *Euphorbia melanohydrata*. This species occurs on a few square kilometres on the South African side and a similar sized area on the Namibian side. Probably some 50% of the total South African distribution area of this species is lost due to the Koeskop mining area and the large overburden deposits along the Alexander Bay-Kuboes road.

In addition, the more sensitive flora areas relevant to the mine are outlined below (Baken, 2009).

1. *Euphorbia melanohydrata* occur in this area.
2. Close to the Orange River younger terraces are bearing a number of rare species.
3. The rocky parts of the Koeskop should remain untouched.

The main invader species is *Nicotiana glauca* which invades the silt banks of the Orange River and other disturbed areas where water tends to pond.

A full list of species including rare and endangered species will be included in the EIA.

It is expected that due to the project site's current use as a salvage yard, the natural flora has been altered to some degree. No physical evidence of plants was noted during the SLR site visits. It is also important to note that the project site falls outside of the more sensitive flora areas identified above.

6.5.2 **ANIMAL LIFE**

The key findings on fauna as they relate to Baken mine and as identified in the mine's EMP (Baken, 2009) are listed below.

- Two frog and two lizard species are endemic to the Richtersveld, while six frog and eight reptile species are endemic to Namaqualand. There are no endemic birds or mammals in the area.
- Mining activities along the lower Orange River, in the vicinity of Baken Mine, do not pose a direct threat to any vertebrate species. The majority of species occurring in the area, have extensive ranges in southern Africa. Those with more restricted ranges, occur in the more mountainous south-eastern parts of the Richtersveld in the Richtersveld national park, far from the mining areas along the Orange River.
- The riparian zone of the Orange River supports a number of amphibian, lizard, bird and mammal species that are restricted to the riverine vegetation. Although none of these species are endangered, they form part of a very sensitive ecosystem.
It is expected that due to the project site’s current use as a salvage yard and its location centrally within the mining footprint, that naturally occurring animal species will for the most part have moved away from the area.

6.6 **SURFACE-WATER**

Surface water resources include drainage lines and paths of preferential flow of stormwater runoff. As a baseline, this section provides an understanding of the hydrological catchments that could be affected by the project and the status of surface water features in the area.

**6.6.1 CATCHMENTS AND DRAINAGE**

The mine and project site fall within the Department of Water Affairs’ Water Management Area 4 (quaternary catchment D82L) – a sub-catchment of the Orange River.

The drainage in the vicinity of the mine reflects a dendritic pattern in the south on the deep weathered granite slopes in deep soils as far north west as the Koeskop – Wondergat area. Parts of the mine lease area are characterised by well defined run-off channels which are generally soil filled but often eroded to bed rock. The channels are charged during rainfall episodes bringing very fast run-off from bare rock outcrops on the hills and mountain slopes. The catchments and the main channels and their local catchments are defined by the north west trending hill ridges (Baken, 2009).

Two main drainage channels occur at Baken mine (Baken, 2009):
- the Springklip channel which rises in western Ploegberg and flows between the Terrace 1 and 2 satellite mining areas; and
- the “Kaais River” which rises behind Koeskop and runs along the main internal Baken mine road before flowing past the Baken town entrance between the recreation club and the residential area.

In addition, local smaller episodic drainage channels cross the mining area (Baken, 2009). The project site is located approximately 500m south of the nearest drainage channel. Surface water drainage on the project site is influenced by existing mining facilities such as internal haul roads and overburden stockpiles.

**6.6.2 SURFACE-WATER QUALITY**

The surface water quality of the Orange River is expected to be good (Baken, 2009).
6.6.3 **SURFACE WATER USE**

Trans Hex sources its water from the Orange River in line with an abstraction permit from DWA. The total Trans Hex allocation is 6.3 million m³/year. Not all of this is used by Trans Hex. This water is pumped into a reservoir at Baken, about 3km from the abstraction point. From the Baken reservoir, water is then pumped to a reservoir in Sanddrift which feeds the reticulation network. While mining constitutes 50% of the gross domestic product (GDP) in the Northern Cape, water consumption by mining in comparison to agriculture and urban use is minimal (Baken, 2009).

6.6.4 **WETLANDS**

Important wetlands in relation to the mine include the riparian zone along the Orange River (identified as a national freshwater ecosystem probity area (NFEPA) (WRC, 2011) and the Orange River Estuary located approximately 30km downstream of the mine) which is vulnerable to the following impacts of all upstream land uses in the Orange River catchment:

- siltation and especially suspended solids under low flow conditions;
- chemical pollution especially under low flow conditions; and
- reduced flow (Baken Mine).

The project site is located more than 1.5km from the banks of the Orange River.

6.7 **GROUNDWATER**

Groundwater is a valuable resource and is defined as water which is located beneath the ground surface in rock pore spaces and in the fractures of lithologic formations. As a baseline, this section provides an understanding of the current groundwater conditions (quality, quantity and use) and the potential for pollution plumes to occur as a result of project-related activities.

6.7.1 **PRESENCE OF BOREHOLES AND DEPTH OF WATER TABLE**

The groundwater table relevant to the mine is that of a locally perched water table on the palaeo bedrock surface as observed in certain mining areas of depths varying from ±10m to 70m below natural ground level. These palaeo channels do not always connect to the Orange River channel nor drain into it and consequently often represent separate localised groundwater basins (Baken, 2009).

6.7.2 **WATER QUALITY**

Water chemistry in these basins has been found to be extremely variable (between fresh and highly saline) (Baken, 2009).
6.7.3 GROUNDWATER USE

No groundwater is used by the mine. The mine lease area falls within the Groundwater zone “A” which does not permit abstraction of groundwater (Baken, 2009).

6.8 AIR QUALITY

Identification of existing sources of emissions in the region and the characterisation of existing ambient pollution concentrations is important to the assessment of air impacts. A change in ambient air quality can result in a range of impacts which in turn may cause a disturbance to nearby receptors. Potential receptor sites include the Baken town (mine village), Sanddrift town (see Section 6.11) and local ecology including the young terraces along the Orange River and the Orange River itself. As a baseline, this section aims to identify existing ambient air sources.

The main contributions to ambient air quality in the region are expected to be:

- Fugitive dust from mining and agricultural type sources and dust entrainment by vehicles on unpaved roads.
- Typical sources of gaseous emissions associated with intensive human activities and industries are absent from the area. Gaseous emissions are produced by mine vehicles and equipment and the limited population in the area however these are expected to be negligible.
- As no chemicals are used and no combustion processes are used, there is no smoke nor chemical discharge into the atmosphere other than smoke generated from the burning of domestic waste at the domestic waste disposal sites of Baken (approved by the Department of Environmental, Cultural Affairs and Sport (Baken, 2009)).

6.9 NOISE

In the normal course, noise generating activities may cause an increase in ambient noise levels in and around the site. This may cause a disturbance to nearby receptors. Potential receptor sites include the Baken town (mine village), Sanddrift town (see Section 6.11) and local ecology. As a baseline, this section provides an understanding of existing conditions in the area from which to measure changes as a result of project-related noise.

The only noise in the area is mine generated noise with minimal noise created by community and agricultural activities (Baken, 2009). As the production areas are isolated from any surrounding uses, public roads and mine residents and as such noise levels from on site observations do not exceed normal residential noise levels of 55dB in the mining towns and are not audible on surrounding public roads (Baken, 2009).
6.10 VISUAL

As a baseline, this section provides an understanding of the visibility of the project site against which to measure potential change as a result of project infrastructure and activities.

As identified in the mine’s EMP, most of the mining areas lie low down in the western extremities of the catchment basins, isolated from any views from public roads (Baken, 2009). The location of the project site within the mining footprint will screen the project from sensitive views.

6.11 LAND USE

Projects of this nature have the potential to influence current land uses both on the site (through direct loss) and in the surrounding areas (through direct or secondary positive and/or negative impacts). As a baseline, this section outlines existing land tenure, describes the land uses on site and in the surrounding area, and identifies third party service infrastructure. This section provides the context within which potential impacts on land uses and existing economic activity will be felt.

6.11.1 LAND OWNERSHIP

The land on which the mine is located is owned by the Richtersveld Sidal Hub Community Property Association (CPA) through a successful land claim process. Landownership adjacent to the mine comprises the CPA as well as one private owner of a small holding south of the mine (Baken, 2009).

6.11.2 LAND USES

Trans Hex controls approximately 40,000 hectares of land stretching for 52km along the banks of the Orange River. Within this area, Trans Hex has several mining operations with Baken Mine being the most southerly.

Pre-mining use of the land was nomadic grazing of a wilderness area (Baken, 2009).

Land uses within the Baken/Sanddrif mine area consist of (Baken, 2009):

- Orange River and riparian zones (located over 1.5 km from the project site)
- Sanddrif town with 136 houses, soccer field, community centre, shops and administrative office, cemetery and primary school (located 5km from the project site)
- Airfield at the Sanddrif town (located adjacent to Sanddrif town)
- Baken town with ±130 houses, Trans Hex main offices, recreational club, sports fields and clubs, guest and visitor accommodation, contract accommodation, clinic, security personnel base, fire
fighting services, security personnel accommodation, retail store, filling station (located almost 4km from the project site)
- Mining related infrastructure with mining blocks, plants and slimes dams.

Other residential areas include:
- Kuboes – A small community located approximately 20 km east of the project site;
- Private farms and a bed and breakfast – located on the banks of the Orange River approximately 25 km south west of the project site; and
- Alexander Bay (South Africa) and Orangemund (Namibia) – mining towns located approximately 40 km south west of the site.

The project site falls within the footprint of the mine and is currently used as a salvage yard. Immediately adjacent land comprises internal haul roads and overburden stockpiles. An internal mine overhead powerline borders the site.

6.11.3 Third Party Service Infrastructure

Apart from mining related infrastructure, there is no third party service infrastructure within or near to the project site.

6.12 Heritage and Cultural (Including Paleontological)

Various natural and cultural assets collectively form the heritage. As a baseline, this section identifies the presence of heritage resources and their conservation significance.

Heritage resources have been found within the vicinity of Baken Mine (Baken, 2009). None of these resources occur at the project site.

6.13 Socio-Economic

Projects of any nature have the potential to influence various aspects of the socio-economic profile of a community. This baseline section describes the socio-economic status of the region and project area thereby providing the context within which the operations’ potential impacts will occur.

The project site falls within the Richtersveld Local Municipality (LLM) in the Namakwa District Municipality. The office of Richtersveld Municipality is situated in Port Nolloth. The information below is taken from the mine’s approved EIA and EMP report (Baken, 2009), the Namakwa District Municipality Integrated Development Plans (2011-2012 and 2013-2014 [draft]) and the Richtersveld Local Municipality Integrated Development Plan (2013).
Namakwa District Municipality

- Population: The total population during 2011 was estimated to be 115,842.
- Economic activity: Mining, fishing and tourism are the dominant sectors that contribute to the economy. Approximately 25.8% of the population is under the age of 15, while 66.1% of the population is between the ages of 15 and 64, and 8.1% is over the age of 65. Thus the economically active population are the most dominant age group in the District.
- Unemployment: The unemployment rate was estimated to be 20.1% in 2011.
- Basic services: It is estimated that a total of 12,495 households have access to basic water provision, while approximately 17,199 households do not. With regards to sanitation, it is estimated that 10,056 households have access to this service, while 13,877 do not.

Richtersveld Local Municipality

- Population: The total population during 2011 was estimated to be 11,982.
- Economic activity: Mining, fishing and tourism are the dominant sectors that contribute to the economy. Approximately 23.8% of the population is under the age of 15, while 70.2% of the population is between the ages of 15 and 64, and 6% is over the age of 65. Thus the economically active population are the most dominant age group in the District.
- Unemployment: The unemployment rate was estimated to be 18.6% in 2011, which is slightly less than the District unemployment rate.
- Basic services: It is estimated that a total of 1,073 households have access to basic water provision, while approximately 3,937 households do not. With regards to sanitation, it is estimated that 1,073 households have access to this service, while 3,937 households do not.
7 POTENTIAL ENVIRONMENTAL IMPACTS

This section provides a list and description of potential impacts on the biophysical and socio-economic environment identified during the scoping phase of the EIA process. The potential impacts detailed below have been compiled based on the project team's experience in environmental impact assessments for similar projects as well as from comments and issues raised by IAPs during the public participation process.

7.1 GEOLOGY

Mineral resources can be sterilised and/or lost through the placement of infrastructure and activities in close proximity to mineral resources, by preventing access to potential mining areas. It has been identified by Baken that there are no diamond bearing reserves at the project site and therefore sterilisation of ore reserves is not considered an issue for the project and will not be assessed further.

7.2 TOPOGRAPHY

Project-related activities have the potential to alter the topography of the site through the establishment of infrastructure. This in turn could result in changes to drainage patterns (discussed in Section 7.5), landforms which could prove hazardous to people and animals (discussed below), changes in land uses (discussed in Section 7.10) as well as changes to the visual character (discussed in Section 7.9).

Given the small size of the biopiles, these do not pose a significant hazard to third parties. In addition given that the project is located within the footprint of the mine where access and security control measures are in place, it is highly unlikely that unaccompanied third parties or animals would have access to the site. As a result, the presence of the project and hazardous landforms creating a safety risk for third parties or animals is not considered an issue for the project and will not be assessed further.

7.3 SOILS AND LAND CAPABILITY

Soils are a significant component of most ecosystems. As an ecological driver, soil is the medium in which most vegetation grows and a range of vertebrates and invertebrates exist. In the context of the project, soil is even more significant if one considers that the project is a temporary land use where-after rehabilitation is the key to re-establishing post closure land capability that will support post closure land use objectives. The aim of the project is to remediate contaminated soils. This is seen as a positive impact and is discussed further below. Soil resources have the potential to be lost through physical disturbance, erosion by wind and water, and contamination. These are discussed further below.
7.3.1 ISSUE: REMEDIATION OF CONTAMINATED SOIL

**Project phase/s in which impact could occur**

<table>
<thead>
<tr>
<th>Construction</th>
<th>Operational</th>
<th>Decommissioning</th>
<th>Closure</th>
</tr>
</thead>
</table>

**Discussion**

The main objective of the project is to treat contaminated soil so as to re-use the soil in the rehabilitation of the mine. This is a positive impact as these soil resources would either in-situ have the potential to cause additional pollution of soil and water resources and affect biodiversity or be disposed of as hazardous waste at a landfill site thereby losing the resource in perpetuity. The treatment and re-use of contaminated soil shows the mine’s commitment to waste management as well as in achieving its rehabilitation objectives.

It is proposed that no further specialist investigations are required. The assessment and detailed management measures will be provided by SLR in the EIA and EMP report (Section 9.2).

7.3.2 ISSUE: LOSS OF SOIL RESOURCES AND LAND CAPABILITY THROUGH PHYSICAL DISTURBANCE

**Project phase/s in which impact could occur**

<table>
<thead>
<tr>
<th>Construction</th>
<th>Operational</th>
<th>Decommissioning</th>
<th>Closure</th>
</tr>
</thead>
</table>

**Discussion**

The project site is located within the footprint of the mine and as such it is expected that the natural soil characteristics of the site have been altered to some degree by the existing mining activities. The biopiling activities have the potential to disturb soils and related land capability through compaction and/or erosion by the establishment of the biopiles and use of a front end loader for handling the soils. The significance of the potential impact is expected to be low.

It is proposed that no further specialist investigations are required. The assessment and detailed management measures will be provided by SLR in the EIA and EMP report (Section 9.2).
7.3.3 ISSUE: LOSS OF SOIL RESOURCES AND LAND CAPABILITY THROUGH POLLUTION

Project phase/s in which impact could occur

<table>
<thead>
<tr>
<th>Construction</th>
<th>Operational</th>
<th>Decommissioning</th>
<th>Closure</th>
</tr>
</thead>
</table>

Discussion

The only project-related activity that could pollute soils and reduce land capability is the spillage of leachate produced by the biopiling facility. The inclusion of dirty water controls and presence of a plastic liner minimise the potential for significant impacts. The significance of the potential impact is expected to be low.

It is proposed that no further specialist investigations are required. The assessment and detailed management measures will be provided by SLR in the EIA and EMP report (Section 9.2).

7.4 BIODIVERSITY

In the normal course of a project, the establishment of project infrastructure as well as project related activities have the potential to result in a loss of and disturbance to habitat through the destruction/disturbance of vegetation and/or contamination of soil and/or water resources thereby reducing the occurrence of fauna on site and in the surrounding areas.

Limited natural flora and fauna occur at the project site and the project site is located away from the more sensitive flora and fauna areas of the mine. There are also limited activities associated with the project that could impact negatively on plant and animal life at the project site. Given the site’s current use as a salvage yard for the mine as well as its location centrally within the mine footprint, it is highly unlikely that the project will result in a significant impact. As a result, biodiversity impacts are not considered an issue for the project and will not be assessed further.

7.5 SURFACE WATER

In the normal course, a project has the potential to impact on surface water resources through the potential contamination thereof as well as through potential alterations to surface water drainage patterns. Given the small scaled nature of the project, the project site’s location centrally within the mine footprint and its distance to nearest natural drainage patterns (a non-perennial drainage line more than 500m away), and the use of localised clean and dirty water controls it is highly unlikely that the project will have an impact on surface water qualities and drainage patterns. As a result, surface water impacts are not considered an issue for the project and will not be assessed further.
The positive impact of remediating contaminated soil and thereby minimising the potential for water-related pollution is addressed in Section 7.3.

7.6  GROUNDWATER

The project has the potential to negatively impact on groundwater resources through the potential contamination thereof. This is discussed below. The positive impact of remediating contaminated soil and thereby minimising the potential for water-related pollution is addressed in Section 7.3.

7.6.1 ISSUE: CONTAMINATION OF GROUNDWATER RESOURCES

**Project phase/s in which impact could occur**

<table>
<thead>
<tr>
<th>Construction</th>
<th>Operational</th>
<th>Decommissioning</th>
<th>Closure</th>
</tr>
</thead>
</table>

**Discussion**

The only project-related activity that could pollute groundwater is the seepage of leachate produced by the biopiling facility. The dry climatic conditions of the area, the inclusion of dirty water controls and a plastic liner in the design of the facility minimise the potential for significant impacts. The significance of the potential impact is expected to be low.

It is proposed that no further specialist investigations are required. The assessment and detailed management measures will be provided by SLR in the EIA and EMP report (Section 9.2).

7.7  AIR QUALITY

Air-related impacts on biodiversity have been discussed in Section 7.4 and therefore this discussion focuses on human health impacts.

Given the small scaled nature of the project, limited dust/emission generating activities, the project site’s location centrally within the mine footprint as well as its distance from potentially sensitive receptors (the nearest of which is Baken town located almost 4km from the project site), it is highly unlikely that the project will have an impact on ambient air qualities and third party receptors.

7.8  NOISE

Noise related impacts on biodiversity have been discussed in Section 7.4 and therefore this section focuses on human health impacts.
Given the small scaled nature of the project, limited noise generating activities (material handling using a bulldozer), the project site’s location centrally within the mine footprint as well as its distance from potentially sensitive receptors (the nearest of which is Baken town located almost 4km from the project site), the project will not have an impact on ambient noise levels and third party receptors. As a result, noise-related impacts are not considered an issue for the project and will not be assessed further.

7.9 VISUAL
Projects have the potential to alter the landscape character of the site and surrounding area through the establishment of infrastructure. Given the small scaled nature of the project and the project site’s location centrally within the mine footprint, no visual-related impacts are expected. As a result, visual-related impacts are not considered an issue for the project and will not be assessed further.

7.10 LAND USE
Given the project site’s current use as a salvage yard for the mine as well as its location centrally within the mine footprint, disturbance to land uses both on site and in the area surrounding the mine is not considered an issue and will not be assessed further.

7.11 HERITAGE AND CULTURAL (INCLUDING PALEONTOLOGICAL)
In the normal course, projects that disturb the ground surface (through establishment of infrastructure) have the potential to impact on heritage resources. Given that there are no known heritage resources located at the project site, the loss of heritage resources is not considered an issue for the project and is not assessed further.

7.12 SOCIO-ECONOMIC
Socio-economic impacts are often associated with the establishment of a new project and the expectation of new employment opportunities. This in turn results in indirect economic benefits as well as the potential for social related ills. With the small scaled nature of the project (initial site establishment costs of approximately R30,000) and no employment opportunities (a specialist waste management contractor will be required to undertake the bioremediation activities), there is limited to no potential for either positive or negative socio-economic impacts. As a result, socio-economic impacts are not considered an issue for the project and will not be assessed further.
8 WAY FORWARD FOR SCOPING REPORT

The way forward for the remainder of the scoping phase is as follows:

- Distribute the draft scoping report and/or summary to IAPs and other regulatory authorities for review.
- Forward a copy of the draft scoping report to DEA, as required by R543 of the 2010 EIA Regulations, for record keeping.
- Record comments (in writing) and update scoping report where required.
- Submit the final scoping report (including IAP and other regulatory authorities’ comments) to DEA for review. At the same time notify IAPs of availability of final scoping report via newsletter highlighting any changes to the report.
- Receive comments from DEA and incorporate into the EIA.

8.1 REVIEW OF SCOPING REPORT BY DEA

Five copies of the final scoping report (including IAP comments) will be forwarded by SLR to DEA in line with NEMA. It is then expected that the scoping report will be distributed internally for review and comment.

8.2 REVIEW OF SCOPING REPORT BY IAPs

The draft scoping report will be made available for public review from 11 February 2014 at the following venues:

- Baken Diamond Mine office
- Sanddrift local municipal office
- SLR’s offices in Cape Town

Electronic copies on CD will also be made available to IAPs on request.

Summaries of the report as well as details on the draft scoping report review process will be sent by post or e-mail to all IAPs and regulatory authorities on the project’s public involvement database.

All comments and queries on the draft scoping report can be sent in writing to the contact person listed below as per the timeframes stipulated in the notification of IAP review of this scoping report.

SLR Consulting (South Africa) (Pty) Ltd
Attention: Victoria Tucker
Reference: 12/9/11/L1278/8
Email: vtucker@slrconsulting.com
Tel: 011 467 0945
Fax: 011 467 0978
All comments received during the public and authority review of the scoping report will be recorded and included in the final scoping report for submission to DEA. The Issues and Responses Table will be updated accordingly.

8.3 INFORMATION-SHARING MEETINGS

At this stage in the process there is no plan to conduct information-sharing meetings due to the small scaled nature of the project and the remoteness of the site.
9 FURTHER INVESTIGATIONS AND PLAN OF STUDY FOR EIA

The plan of study for EIA sets out the proposed approach to the EIA phase. The plan of study is set out below.

9.1 EIA PHASE OBJECTIVES

The main objectives of the EIA phase are to:

- assess the preferred option;
- assess the potential environmental (including heritage and socio-economic impacts) of the project;
- identify and describe procedures and measures that will mitigate potential negative impacts and enhance potential positive impacts;
- liaise with IAPs including relevant government departments on issues relating to the project to ensure compliance with existing guidelines and regulations;
- undertake consultations with IAPs and provide them with an opportunity to review and comment on the outcomes of the environmental assessment process and acceptability of mitigation measures;
- develop an environmental management plan (EMP) and a conceptual closure/decommissioning plan; and
- provide measures for on-going monitoring (including environmental audits) to ensure that the project plan and proposed mitigation measures are implemented as outlined in the detailed EIA and EMP report.

9.2 ADDITIONAL INVESTIGATIONS

It is proposed that no further specialist investigations are required. The assessment and detailed management measures will be provided by SLR in the EIA and EMP report. The assessment will cover construction, operation, decommissioning and closure phases where relevant and conceptual closure planning principles (including post-closure management) will be incorporated into the EIA report. The main component of the tasks is assessment work by SLR. The outcome of this set of tasks includes the EIA and EMP report.

9.3 PROPOSED METHOD OF ASSESSMENT OF ENVIRONMENTAL ISSUES

The proposed method for the assessment of environmental issues is set out in Table 9-1 below. This assessment methodology enables the assessment of environmental issues including: cumulative impacts, the severity of impacts (including the nature of impacts and the degree to which impacts may cause irreplaceable loss of resources), the extent of the impacts, the duration and reversibility of impacts, the probability of the impact occurring, and the degree to which the impacts can be mitigated.
TABLE 9-1: CRITERIA FOR ASSESSING IMPACTS

Note: Part A provides the definition for determining impact consequence (combining severity, spatial scale and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Part B and C. The interpretation of the impact significance is given in Part D.

### PART A: DEFINITION AND CRITERIA*

<table>
<thead>
<tr>
<th>Definition of SIGNIFICANCE</th>
<th>Significance = consequence x probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition of CONSEQUENCE</td>
<td>Consequence is a function of severity, spatial extent and duration</td>
</tr>
<tr>
<td>Criteria for ranking of the SEVERITY of environmental impacts</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.</td>
</tr>
<tr>
<td>M</td>
<td>Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.</td>
</tr>
<tr>
<td>L</td>
<td>Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.</td>
</tr>
<tr>
<td>L+</td>
<td>Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.</td>
</tr>
<tr>
<td>M+</td>
<td>Moderate improvement. Will be within or better than the recommended level. No observed reaction.</td>
</tr>
<tr>
<td>H+</td>
<td>Substantial improvement. Will be within or better than the recommended level. Favourable publicity.</td>
</tr>
<tr>
<td>Criteria for ranking the DURATION of impacts</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Quickly reversible. Less than the project life. Short term</td>
</tr>
<tr>
<td>M</td>
<td>Reversible over time. Life of the project. Medium term</td>
</tr>
<tr>
<td>Criteria for ranking the SPATIAL SCALE of impacts</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Localised - Within the site boundary.</td>
</tr>
<tr>
<td>M</td>
<td>Fairly widespread – Beyond the site boundary. Local</td>
</tr>
<tr>
<td>H</td>
<td>Widespread – Far beyond site boundary. Regional/ national</td>
</tr>
</tbody>
</table>

### PART B: DETERMINING CONSEQUENCE

**SEVERITY = L**

<table>
<thead>
<tr>
<th>DURATION</th>
<th>Long term</th>
<th>Medium</th>
<th>Medium</th>
<th>Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium term</td>
<td>M</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Short term</td>
<td>L</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**SEVERITY = M**

<table>
<thead>
<tr>
<th>DURATION</th>
<th>Long term</th>
<th>Medium</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium term</td>
<td>M</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Short term</td>
<td>L</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**SEVERITY = H**

<table>
<thead>
<tr>
<th>DURATION</th>
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<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium term</td>
<td>M</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Short term</td>
<td>L</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Localised Within site boundary</td>
<td>M</td>
<td>H</td>
<td></td>
</tr>
<tr>
<td>Fairly widespread Beyond site boundary</td>
<td>M</td>
<td>H</td>
<td></td>
</tr>
<tr>
<td>Widespread Far beyond site boundary</td>
<td>Local</td>
<td>Regional/ national</td>
<td></td>
</tr>
</tbody>
</table>

| SPATIAL SCALE |
PART C: DETERMINING SIGNIFICANCE

<table>
<thead>
<tr>
<th>PROBABILITY (of exposure to impacts)</th>
<th>Definite/ Continuous</th>
<th>Medium</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible/ frequent</td>
<td>M</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Unlikely/ seldom</td>
<td>L</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
</tbody>
</table>

*H = high, M= medium and L= low and + denotes a positive impact.

PART D: INTERPRETATION OF SIGNIFICANCE

<table>
<thead>
<tr>
<th>Significance</th>
<th>Decision guideline</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>It would influence the decision regardless of any possible mitigation.</td>
</tr>
<tr>
<td>Medium</td>
<td>It should have an influence on the decision unless it is mitigated.</td>
</tr>
<tr>
<td>Low</td>
<td>It will not have an influence on the decision.</td>
</tr>
</tbody>
</table>

9.4 PROPOSED METHOD OF ASSESSMENT OF ALTERNATIVES

9.4.1 ASSESSMENT OF THE “NO-GO OPTION”

The assessment of the implications of the “No-Go option” will require a high level comparison between the existing situation without the project and the possible future situation with the project, as assessed in the EIA and EMP report. This comparison will take existing and future impacts into account, including both positive and negative impacts.

9.4.2 ASSESSMENT OF PROJECT ALTERNATIVES

The realistic alternatives have been discussed in Section 5 of the scoping report.

9.5 EIA PHASE ACTIVITIES, TIMING AND ASSESSMENT TEAM

An overview of the EIA and EMP phase and corresponding activities are outlined in the table below. The proposed EIA project team is the same as that used for the scoping report (Table 3-1).

TABLE 9-2: EIA PROCESS THAT WILL BE FOLLOWED

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Corresponding activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIA/EMP phase (March 2014-October 2014)</td>
<td></td>
</tr>
<tr>
<td>• Assessment of potential environmental impacts.</td>
<td>• Compile draft EIA and EMP report.</td>
</tr>
<tr>
<td>• Design requirements and management and mitigation measures.</td>
<td>• Distribute draft EIA and EMP report and/or summary to IAPs and other regulatory authorities for review (May 2014).</td>
</tr>
<tr>
<td>• Receive feedback on application</td>
<td>• Forward a copy of the draft EIA and EMP report to DEA, as required by R543 of the 2010 EIA Regulations, for record keeping</td>
</tr>
<tr>
<td></td>
<td>• Record comments (in writing) and update report where required</td>
</tr>
</tbody>
</table>
Objectives | Corresponding activities
---|---
(May 2014 – June 2014).
- Forward final EIA and EMP report including IAP comments to DEA for review (June 2014). At the same time notify IAPs of availability of final scoping report.
- Circulate record of decisions to all registered IAPs registered.

9.6 STAGES OF CONSULTATION WITH THE COMPETENT AUTHORITY IN EIA PHASE

Proposed consultation meetings for the EIA phase include:
- a site visit and meeting with DEA, DWA and other regulatory authorities to present the main findings of the EIA (if requested).

9.7 PUBLIC INVOLVEMENT PROCESS IN EIA PHASE

As with the scoping report, full copies of the EIA and EMP report will be distributed to the agreed venues and summaries will be distributed to registered IAPs. Full copies of the report will also be provided electronically (on a CD) on request.

All comments received from IAPs in the review period will be incorporated into the final EIA and EMP report and forwarded to the DEA.

Once the DEA has issued its decision, the IAPs will be notified by e-mail or post in accordance with the instructions from the DEA.
10 SUMMARY AND CONCLUSIONS

Baken Mine propose to establish an on-site bioremediation facility for the treatment of hydrocarbon contaminated soil located at the mine. This is considered the best feasible option for the project and will be assessed in the next phase of the EIA.

An environmental scoping study has been undertaken by SLR as part of the environmental assessment process for the project’s waste management license application. This report presents the findings of the scoping phase of the process. A public participation process was conducted as part of the scoping phase.

Given the small scaled nature of the project, the design criteria being proposed, the project site’s location centrally within the mine footprint and the project site’s distance from sensitive biodiversity or third party related receptors, limited impacts are expected to occur. The more significant impacts both positive and negative are associated with soil resources. No specialist investigations are deemed necessary and the detailed assessment and management plan will be provided by SLR in the next phase of the EIA process.

Alex Pheiffer
（Author）

Victoria Tucker
（Project Manager）
11 REFERENCES


SANBI, 2013. Mining and Biodiversity Guideline.

APPENDIX A: PROOF OF NEM:WA APPLICATION

- NEM:WA application submitted to DENC (17 May 2013)
- DEA acknowledged receipt of application (15 July 2013)
APPENDIX B: INTERESTED AND AFFECTED PARTY DATABASE
APPENDIX C: DOCUMENTATION AND PROOF OF THE CONSULTATION PROCESS

- Proof of landowner notification (included in application to DEA)
- Site notices
- Photographs of site notices
- Advertisements
- Correspondence to and from IAPs
- Correspondence to and from Regulatory Authorities
APPENDIX D: ISSUES AND RESPONSES TABLE
<table>
<thead>
<tr>
<th>Name</th>
<th>Entity</th>
<th>No. of copies</th>
<th>Date issued</th>
<th>Issuer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms Zinhle Mbili</td>
<td>Department of Environmental Affairs</td>
<td>1</td>
<td>February 2014</td>
<td>V Tucker</td>
</tr>
<tr>
<td>Martha Molokwane</td>
<td>Northern Cape Department of Nature Conservation</td>
<td>1</td>
<td>February 2014</td>
<td>V Tucker</td>
</tr>
<tr>
<td>Diedre Williams</td>
<td>Northern Cape Department of Mineral Resources - Springbok</td>
<td>1</td>
<td>February 2014</td>
<td>V Tucker</td>
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<tr>
<td>Shaun Cloete</td>
<td>Northern Cape Department of Water Affairs - Upington</td>
<td>1</td>
<td>February 2014</td>
<td>V Tucker</td>
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<tr>
<td>Jacoline Mans</td>
<td>Northern Cape Department of Agriculture, Forestry and Fisheries - Upington</td>
<td>1</td>
<td>February 2014</td>
<td>V Tucker</td>
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<tr>
<td>Katie Smuts</td>
<td>South Africa Heritage Resource Agency</td>
<td>Electronic copy</td>
<td>February 2014</td>
<td>V Tucker</td>
</tr>
<tr>
<td>Kenneth Lembowane</td>
<td>Northern Cape Department of Rural Development and Land Reform</td>
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<td>February 2014</td>
<td>V Tucker</td>
</tr>
<tr>
<td>Vanessa Oliver</td>
<td>Northern Cape Department of Economic Development and Tourism</td>
<td>1</td>
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<td>V Tucker</td>
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<tr>
<td>Chris Fortuin</td>
<td>Namakwa District Municipality</td>
<td>1</td>
<td>February 2014</td>
<td>V Tucker</td>
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<tr>
<td>Ethel Cloete</td>
<td>Richtersveld Local Municipality</td>
<td>1</td>
<td>February 2014</td>
<td>V Tucker</td>
</tr>
<tr>
<td>Johannes Saal</td>
<td>Baken Diamond Mine office</td>
<td>1</td>
<td>February 2014</td>
<td>V Tucker</td>
</tr>
<tr>
<td>Arthur Jansen</td>
<td>Sanddrift local municipal office</td>
<td>1</td>
<td>February 2014</td>
<td>V Tucker</td>
</tr>
<tr>
<td>Samantha Haslam-</td>
<td>EnviroServ in Cape Town</td>
<td>1</td>
<td>February 2014</td>
<td>V Tucker</td>
</tr>
<tr>
<td>Bennet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victoria Tucker</td>
<td>SLR’s offices in Cape Town</td>
<td>1</td>
<td>February 2014</td>
<td>V Tucker</td>
</tr>
</tbody>
</table>

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