



ECC
ENVIRONMENTAL
COMPLIANCE CONSULTANCY



ECC-36-202-REP-07-D

ENVIRONMENTAL SCOPING REPORT

EXPLORATION ACTIVITIES ON EPL 6949 FOR BASE AND RARE METALS,
INDUSTRIAL MINERALS, AND PRECIOUS METALS IN THE KHOMAS
& OTJOZONDJUPA REGIONS

PREPARED FOR



TITLE AND APPROVAL PAGE

Project Name:	Exploration activities on EPL 6949 for Base and Rare Metals, Industrial Minerals, and Precious Metals in the Khomas and Otjozondjupa Regions.
Project Number	ECC-36-202-REP-07-D
Client Name:	B2Gold Namibia (Pty) Ltd
Ministry Reference:	N/A
Status of Report:	Final submitted to Government
Date of issue:	July 2019
Review Period	NA

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EXECUTIVESUMMARY

Khomas Exploration (Pty) Ltd a wholly owned subsidiary of B2Gold Namibia, propose to undertake exploration activities on Exclusive Prospecting Licence (EPL) 6949 for Base and Rare Metals, Industrial Minerals, and Precious Metals in the Khomas and Otjozondjupa Regions. EPL 6949 stretches across the two regions, approximately 90% of EPL 6949 is located in Otjozondjupa Region, and the remaining 10% is located within the Khomas Region.

The proposed project triggers listed activities in terms of the Environmental Management Act 7 of 2007, therefore, an environmental clearance certificate is required. As part of the environmental clearance certificate application, an environmental impact assessment has been undertaken to satisfy the requirements of the Environmental Management Act 7 of 2007. This environmental scoping report and environmental impact assessment (EIA) and, environmental management plan (EMP) will be submitted as part of the application for the environmental clearance certificate.

The proposed project will entail various types of exploration within EPL 6949, which may involve drilling, aerial or remote sensing, geophysical surveys, and mineral sampling. The extended lifespan of the exploration activities on the EPL could take up to seven years, with work lasting between one (1) to three (3) months with breaks of up to twelve (12) months. If exploration is successful, and a mineral resource can be defined, with commercially viable mineral concentrations, exploration operations can potentially transcend into mining operations that would be assessed at a detailed level and are therefore not included in the scope of this assessment.

EPL 6949 is located in the thornbush savannah biome and the vegetation cover alternates between relatively dense grass and herbaceous vegetation, with small patches of woody vegetation and some areas of higher shrub coverage. The woody vegetation becomes dominate along the riverbeds of the area, while the plains and foothills of the mountains tend to be more open. The weather is characterized by semi-arid conditions. The minimum temperature during summer is on average at 18°C and 5°C during winter with maximums of 38°C and 26°C for these seasons respectively. Rainfall is highly erratic and unpredictable over the entire area, occurring mostly in the summer months, with average rainfall between 314mm to 370mm per year. EPL 6949 covers 23 farm boundaries where 'land use' is predominantly for agricultural activities.

This environmental impact assessment was undertaken using a methodology developed by Environmental Compliance Consultancy (ECC) which is based on the International Finance Corporation (IFC) standard for impact assessments. Through the scoping process, the surrounding environmental assessment was completed by undertaking a desktop review.

Some vegetation may be cleared to create access tracks, working areas, and to allow for the installation and development of exploration boreholes. A vegetation management plan is included in the EMP to minimise damage.

The impacts of exploration activities with respect to airborne dust are expected to be limited to vehicular traffic. There will be some release of exhaust fumes from machinery that will impact the immediate vicinity, but will be of short duration. Additionally, there will be associated drilling and machinery noise, which could be a disturbance to immediate neighbours, but this will be of short duration.

Water is a scarce commodity in Namibia and, as such, must always be treated with caution. The hydrology of the area is limited to ephemeral streams and groundwater and the potential for contamination from the proposed activities is regarded as minimal. Protection of water quality is addressed in the EMP.

The only potential environmental risk that may require further investigation was related to the visual impacts to neighbours, tourists, and/or farmers. Through further investigation, it was determined that the visual impact is considered to be of moderate significance, however with additional mitigation, the significance can be reduced to minor. These additional mitigation measures will include;

- Drill equipment will, where possible, be positioned in such a way that it is out of sight from human receptors, and through maintenance and good housekeeping on site
- Barriers or fences shall be used if drilling occurs in locations that may affect residents, to minimise potential impact to livestock.
- Residents shall be provided with at least two weeks' notice of drilling operations within 1km of their property, and
- Continual engagement with residents shall be undertaken by the proponent to identify any concerns or issues, and appropriate mitigation and management measures agreed upon.

The assessment is comprehensive and sufficient to identify impacts, and it is concluded that no further assessment is required. On this basis, it is of the opinion of ECC that an environmental clearance certificate could be issued, on conditions that the management and mitigation measures specified in the EMP are implemented and adhered to.

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DEFINITIONS AND ABBREVIATIONS

ALARP	As Low As Reasonable Practicable
DEA	Directorate of Environmental Affairs
ECC	Environmental Compliance Consultancy
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
I&AP	Interested and Affected Parties
IFC	International Finance Cooperation
MET	Ministry of Environment and Tourism
MME	Ministry of Mine and Energy
MPMRC	Minerals (Prospecting and Mining Rights) Committee
SANS	South African National Standards

1 INTRODUCTION

1.1 PURPOSE OF THIS REPORT

The purpose of this report is to present the findings of the EIA for the proposed project. The proposed project is to undertake mineral exploration activities on Exclusive Prospecting Licence (EPL) 6949 for Base and Rare Metals, Industrial Minerals and Precious Metals, which are described in detail throughout the report. The EIA has been undertaken in terms of the requirements of the Environmental Management Act, 2007 and the Environmental Impact Assessment Regulation, 2007 (No. 30 of 2011) gazetted under the Environmental Management Act, 2007 (referred to herein as the EIA Regulations).

This scoping report plus impact assessment and appendices will be submitted to the Ministry of Mines and Energy (MME) and the Directorate of Environmental Affairs (DEA) at the Ministry of Environment and Tourism (MET) for review as part of the applications for environmental clearance certificate.

This report has been prepared by Environmental Compliance Consultancy (ECC). ECC's terms of reference for the assessment is strictly to address potential effects, whether positive or negative and their relative significance, explore alternatives for technical recommendations and identify appropriate mitigation measures.

This report provides information to the public and stakeholders to aid in the decision-making process for the proposed project. The objectives are to:

- Provide a description of the proposed activity and the site on which the activity is to be undertaken, and the location of the activity on the site;
- Provide a description of the environment that may be affected by the activity;
- Identify the laws and guidelines that have been considered in the assessment and preparation of this report;
- Provide details of the public consultation process;
- Describe the need and desirability of the activity;
- Provide a high level of environmental and social impact assessment on feasible alternatives that were considered; and
- Report the assessment findings, identifying the significance of effects.

In addition to the environmental assessment, an Environmental Management Plan (EMP) (Appendix A) is also required in terms of the Environmental Management Act, 2007. An EMP has been developed to provide a management framework for the planning and implementation of exploration activities. The EMP provides exploration standards and arrangements to ensure that the potential environmental and social impacts are mitigated, prevented and/or minimised as far as reasonably practicable, and that statutory requirements and other legal obligations are fulfilled.

1.2 PROPOSED PROJECT

Khomas Exploration Pty Ltd propose to undertake mineral exploration activities on Exclusive Prospecting Licence (EPL) 6949 for Base and Rare Metals, Industrial Minerals and Precious Metals in the Khomas and Otjozondjupa regions (referred to as the proposed project from here-on). EPL 6949 straddles the boundary between the Khomas and Otjozondjupa regions (FIGURE 1 - LOCALITY MAP OF EPL 6949).

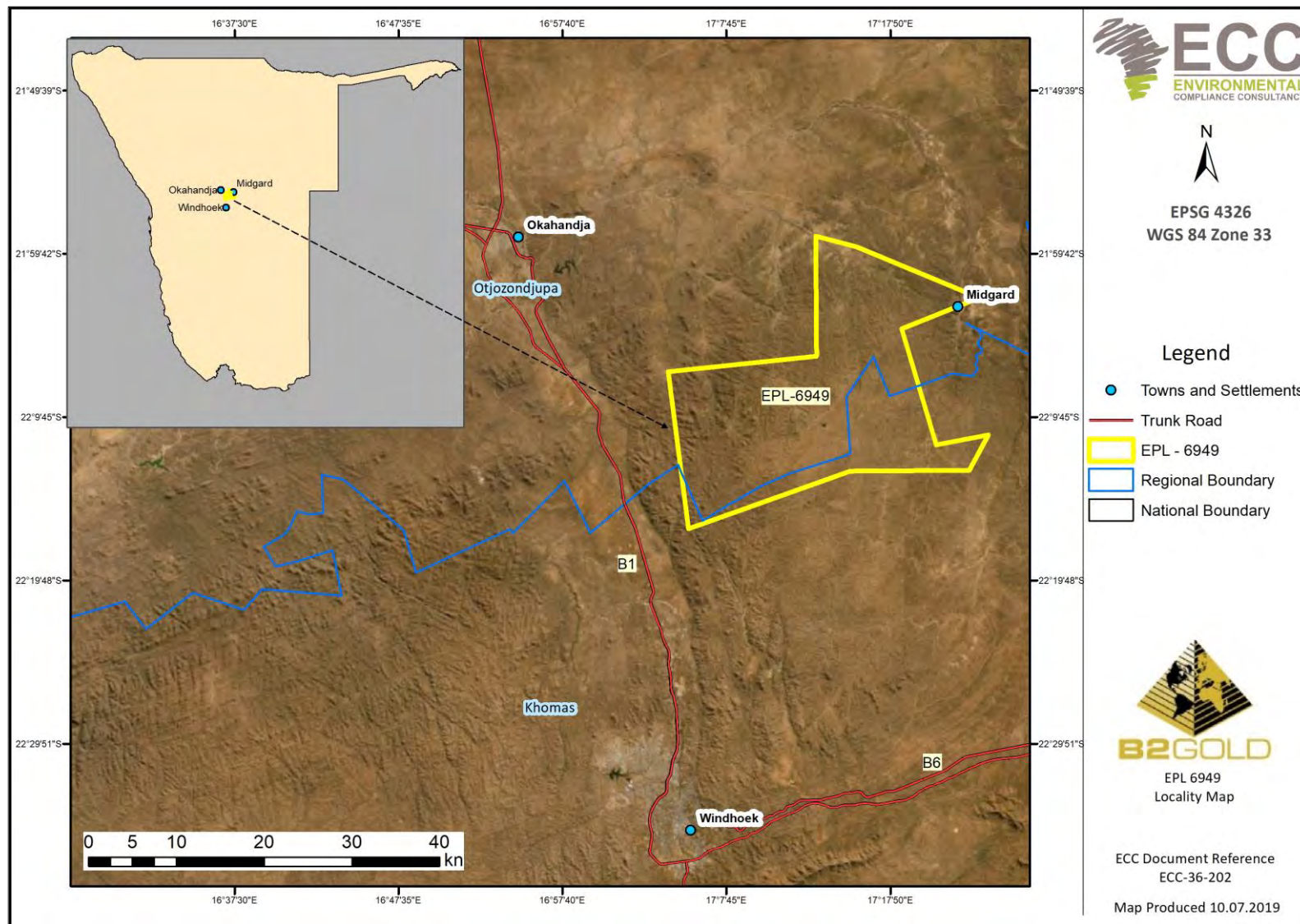


FIGURE 1 - LOCALITY MAP OF EPL 6949

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1.3 THE PROPONENT OF THE PROPOSED PROJECT

Khomas Exploration (Pty) Ltd, owned by B2Gold Namibia, holds the mineral exploration licence of EPL 6949. B2Gold was founded in 2012 and is also the operator of the Otjikoto Gold Mine near Otjiwarongo, which is one of the largest mines in Namibia with approximately 800 permanent employees. The Otjikoto Gold Mine has largely contributed to the socio-economic development of the region, primarily focusing on corporate social responsibly, health, livelihood, education, and environment.

The EPL ownership and details of the proponent are set out in Table 1 below.

TABLE 1: PROPONENT DETAILS

CONTACT	POSTAL ADDRESS	EMAIL ADDRESS	TELEPHONE	WEBSITE
B2GoldNamibia (Pty) Ltd	P O BOX 80363 Windhoek Namibia	vpetzel@b2gold.com	+264 67 306 518	N/A

1.4 ENVIRONMENTAL CONSULTANCY

ECC, a Namibian consultancy (registration number Close Corporation 2013/11401), has prepared this scoping report and impact assessment on behalf of the proponent. ECC operates exclusively in the environmental, social, health and safety fields for clients across Southern Africa, in both the public and private sectors. ECC is independent of the proponent and has no vested or financial interest in the proposed project, except for fair remuneration for professional services rendered.

All compliance and regulatory requirements regarding this EIA report should be forwarded by email or post to the following address:

Environmental Compliance Consultancy

PO BOX 91193
Klein Windhoek, Namibia
Tel: +264 81 6697608
Email: info@eccenvironmental.com

1.5 ENVIRONMENTAL REQUIREMENTS

The Environmental Management Act No.7 of 2007 stipulates that an environmental clearance certificate is required to undertake listed activities in terms of the Act and its regulations. Listed activities triggered by the proposed project in terms of the Environmental Management Act, 2007 and its regulations are as follows:

MINING AND QUARRYING ACTIVITIES

(3.1) The construction of facilities for any process or activities which requires a licence, right or other forms of authorisation, and the renewal of a licence, right or other forms of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992

- The proposed project requires a licence for the construction of exploration camps, drill sites and access roads;

(3.2) Other forms of mining or extraction of any natural resources whether regulated by law or not;

- Minerals (soil and sand), will be sampled and extracted from within the EPL 6949;

(3.3) Resource extraction, manipulation, conservation, and related activities

- The proposed project by its nature, involves resource extraction

WATER RESOURCE DEVELOPMENT

(8.1) The abstraction of ground or surface water for industrial or commercial purposes

- Due to the drilling of exploration boreholes, ground and surface water will be abstracted

1.6 REPORT STRUCTURE

The scoping report plus impact assessment is structured as per the contents set out in Table 2.

TABLE 2 - STRUCTURE OF THE REPORT

SECTION	TITLE	CONTENT
-	Executive Summary	Executive summary of the EIA
-	Acronyms	A list of acronyms used throughout the report
1	Introduction	This chapter introduces the EIA and provides background information on the proponent
2	Regulatory Framework	This chapter describes the Namibian, international and relevant environmental regulatory framework applicable to the project
3	Approach to the EIA	Provides the assessment methodology applied to the EIA
4	Project Description	Technical description of the project
5	Alternatives	This chapter considers alternative options for the project that allow the objectives of the project to be met detailing the reasons for the selection and rejection of options
6	Description of the baseline environment	This chapter describes the existing environment through the analysis of the baseline data regarding the existing natural and socio-economic environment
7	Prediction and Evaluation of Impacts Methodology	This chapter presents the methodology applied to the EIA
8	Assessment Findings and Mitigation	This chapter predicts the potential environmental and social impacts arising from the project, the assessment of impacts including residual impact This chapter also outlines the proposed management strategies for monitoring commitments to ensure the actual and potential impacts on the environment are minimised to “As Low As Reasonably Practicable” (ALARP) this informs the EMP
9	Environmental Management Plan	This chapter provides a short description of the EMP used to take proactive action by addressing potential problems before they occur and outline mitigation measures for each impact
10	Conclusions	Details the next steps for the EIA
11	References	A list of reference used for this report
12	Appendix	– Appendix A: Environmental Management Plan – Appendix B: Non-Technical Summary – Appendix C: Evidence of Public Consultation, Site notice, Newspaper adverts – Appendix D: ECC CVs

SECTION	TITLE	CONTENT
		– Appendix E: List of plant species

2 REGULATORY FRAMEWORK

This chapter outlines the regulatory framework applicable to the proposed project. TABLE 3 - LEGAL COMPLIANCE provides a list of applicable legislation and the relevance to the project.

TABLE 3 - LEGAL COMPLIANCE

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
Minerals (Prospecting and Mining) Act No 33 of 1992	Provides for the reconnaissance, prospecting and mining for, and disposal of, and the exercise of control, minerals in Namibia. Section 50 (i) requires <i>“an environmental impact assessment indicating the extent of any pollution of the environment before any prospecting operations or mining operations are being carried out and an estimate of any pollution, if any, likely to be caused by such prospecting operations or mining operations”</i> Section 50 sets out that in addition to any term and condition contained in a mineral agreement and any term and condition contained in any mineral licence, it shall be a term and condition of any mineral licence that the holder of such mineral licence shall: Exercise any right granted to him or her in terms of the provisions of this Act reasonably and in such manner that the rights and interests of the owner of any land to which such licence relates are not adversely affected, except to the extent to which such owner is compensated. Section 52 sets out that the holder of a mineral licence shall not exercise any rights conferred upon such holder by this Act or under any terms and conditions of such mineral licence (a) In, on or under any private land until such time as such holder- (i) Has entered into an agreement in writing with the owner of such land containing terms and conditions relating to the payment of compensation, or the owner of such land has in writing waived any right to	The proposed activity is prospecting for minerals; hence it requires an EIA to be carried out as it triggers listed activities in the Environmental Management Act regulations. This report presents the findings of the EIA. Works shall not commence until all conditions in the Act are met, which includes an agreement with the landowners and conditions of compensation have been agreed. The project shall be compliant with Section 76. With regards to records, maps, plans and financial statements, information, reports, and returns submitted. As the proponent will need to access privately owned land the proponent will ensure sections 50 and 52 are complied with.

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
	such compensation and has submitted a copy of such agreement or waiver to the Commissioner.	
Environmental Management Act, 2007 (Act No. 7 of 2007) and its regulations, including the Environmental Impact Assessment Regulation, 2007 (No. 30 of 2011)	The Act aim to promote sustainable management of the environment and the use of natural resources by establishing principles for decision-making on matters affecting the environment. It sets the principles of environmental management as well as the functions and powers of the Minister. The Act requires certain activities to obtain an environmental clearance certificate prior to project development. The Act states an EIA may be undertaken and submitted as part of the environmental clearance certificate application. The MET is responsible for the protection and management of Namibia's natural environment. The Department of Environmental Affairs under the MET is responsible for the administration of the EIA process.	This Environmental Scoping Report (and EMP) documents the findings of the environmental assessment undertaken for the proposed project, which will form part of the environmental clearance application. The assessment and report have been undertaken in line with the requirements under the Act and associated regulations.
Water Act, 1956	This Act provides for "the control, conservation and use of water for domestic, agricultural, urban and industrial purposes; to make provision for the control, in certain respect and for the control of certain activities on or in water in certain areas". The Ministry of Agriculture Water and Forestry Department of Water Affairs is responsible for the administration of the Water Act. The Minister may issue a Permit in terms of the regulations 5 and 9 of the government notice R1278 of 23 July 1971 as promulgated under section 30 (2) of the Water Act no. 54 of 1956, as amended.	The Act stipulates obligations to prevent pollution of water. The EMP sets out measures to avoid polluting the water environment. Measures to minimise potential groundwater and surface water pollution are contained in the EMP. Should the project require drilling and abstraction of water from surface and or underground sources, an application should be submitted to the Minister of Agriculture Water and Forestry.
Soil Conservation Act No.76 of 1969	Makes provision for the prevention and control of soil erosion and the protection, improvement and the conservation, improvement and manner of use of the soil and vegetation.	Taken into consideration during the design of the works to be undertaken within EPL 6949 sites. Measures in the EMP set out methods to avoid soil erosion.

NATIONAL REGULATORY REGIME	SUMMARY	APPLICABILITY TO THE PROJECT
National Heritage Act, No. 27 of 2004.	The Act provides provision of the protection and conservation of places and objects with heritage significance. Section 55 compels exploration companies to report any archaeological findings to the National Heritage Council after which a heritage permit needs to be issued	There is potential for heritage objects to be found on site, therefore the stipulations in the Act have been taken into consideration and are incorporated into the EMP. Section 55 compels exploration companies to report any archaeological findings to the National Heritage Council after which a permit needs to be issued before the find can be disturbed.

2.1 POLICY

2.2.1 MINERALS POLICY

The Minerals Policy was adopted in 2002 and sets guiding principles and direction for the development of the Namibian mining sector while communicating the values of the Namibian people. It sets out to achieve several objectives in line with the sustainable development of Namibia's natural resources. The policy strives to create an enabling environment for local and foreign investments in the mining sector and seeks to maximise the benefits for the Namibian people from the mining sector while encouraging local participation, amongst others.

The objectives of the Minerals Policy are in line with the objectives of the Fifth National Development Plan (NDP5) that include reduction of poverty, employment creation, and economic empowerment in Namibia. The proposed project conforms to the policy, which has been considered through the EIA process and the production of this report.

2.2 LICENCES

2.2.2 EXCLUSIVE PROSPECTING LICENCE

EPL 6949 was granted on the 30 of May 2018 and expires on the 29 April 2021. In terms of the Minerals (Prospecting and Mining) Act, 1992, an EPL may be renewed, however, may only be extended twice for two-year periods if demonstrable progress is shown. Renewals beyond seven years require special approvals from the Minister (Ministry of Mines and Energy, 2018). Such renewals are subject to a reduction in the size of the EPL. When a company applies for renewal of an EPL, the application must be lodged 90 days prior to the expiry date of the EPL or, with good reason, no later than the expiry date (Ministry of Environment and Tourism, Ministry of Mines and Energy, 2018).

The proposed project is expected to be scheduled over a seven-year period; therefore, two renewal applications are likely to be applied for. The MET must review the renewal application and make any comments and/or recommendations for consideration by the Minerals (Prospecting and Mining Rights) Committee (MPMRAC). Amendments and revisions may be required for the EIA and EMP. Due consideration must be given when renewing the licence to ascertain whether there is justification to renew the licence. Once an EPL expires and a new EPL is issued, even if it is to the previous holder, the full screening process must be followed with a full EIA process before operations may commence (Ministry of Environment and Tourism, Ministry of Mines and Energy, 2018).

3 APPROACH TO THE EIA

3.1 PURPOSE OF AN EIA

The EIA process in Namibia is governed and controlled by the Environmental Management, 2007 and the EIA Regulations, 2012, which is administered by the Office of the Environmental Commissioner through the Department of Environmental Affairs of the MET.

An EIA is a process of identifying, predicting, evaluating and mitigating the potential impacts of a proposed project on the natural and human environment. The aim of the scoping assessment and EIA process and subsequent report are to apply the principles of environmental management to proposed activities, reduce the negative and increase the positive impacts arising from a proposed project, provide an opportunity for the public to consider the environmental impacts of a proposed project through meaningful consultation, and to provide a vehicle to present the findings of the assessment process to competent authorities for decision making.

3.2 THE ASSESSMENT PROCESS

The EIA methodology applied to this EIA has been developed using the International Finance Corporation (IFC) standards and models, in particular Performance Standard 1, 'Assessment and management of environmental and social risks and impacts' (International Finance Corporation, 2017)(International Finance Corporation, 2012); Namibian Draft Procedures and Guidance for EIA and EMP (Republic of Namibia, 2008); international and national best practice; and over 25 years of combined EIA experience.

The process followed through the basic assessment is illustrated in FIGURE 2 - ECC SCOPING PROCESS and detailed further in the following sections.

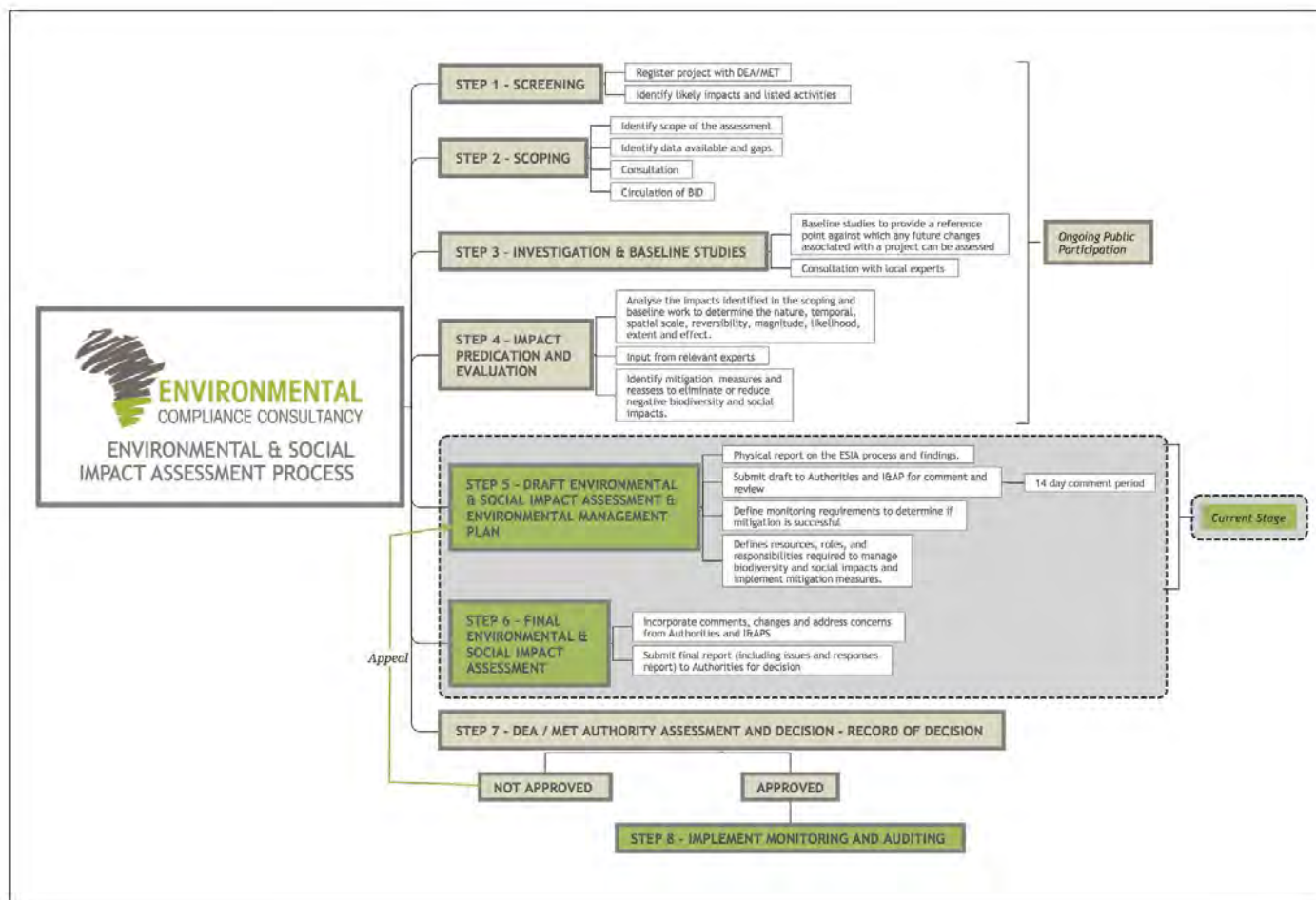


FIGURE 2 - ECC SCOPING PROCESS

4 PROJECT DESCRIPTION

4.1 INTRODUCTION

This chapter provides a technical description and presents the main features of the proposed project. This chapter includes:

- Need for the project
- Project EPL site
- Proposed exploration activities
- Exploration schedule
- Workers accommodation
- Resource use and waste management
- Successful exploration, and
- Rehabilitation.

4.2 NEED FOR THE PROPOSED PROJECT

Namibia is rich in a variety of minerals including copper, lead, gold, zinc, iron, limestone and fluorspar. The mining sector in Namibia contributes significantly to the country's Gross Domestic Product (GDP), government tax receipts and export revenues. For this reason, exploration activities are encouraged in Namibia and the vision of the Minerals Policy being to *"further attract investment and enable the private sector to take the lead in exploration, mining, mineral beneficiation and marketing"* supports the development.

The proposed project is in line with this vision and has the potential to create employment in local communities in the Khomas and Otjozondjupa Regions. In the event that exploration activities are successful, and a resource can be defined, with commercially viable mineral concentrations, exploration operations can potentially transcend into mining operations which can result in socio-economic development in the area.

4.3 ALTERNATIVES CONSIDERED

4.3.1 NO-GO ALTERNATIVE

Should exploration activities within EPL 6949 not take place, the anticipated environmental impacts from exploration activities would not occur, however, the social and economic benefits associated with project would also not be realised.

There would not be an opportunity to define resources within the project area, a missed opportunity for geological mapping and data collection that if found to be viable for mining could benefit the Namibian economy.

4.4 THE PROJECT SITE AND LOCATION

EPL 6949 straddles the boundary of the Khomas and Otjozondjupa Regions, approximately 24.73 km from Okahandja approximately 50km from Windhoek (see FIGURE 3 - EPL 6949 PROJECT LOCATION)

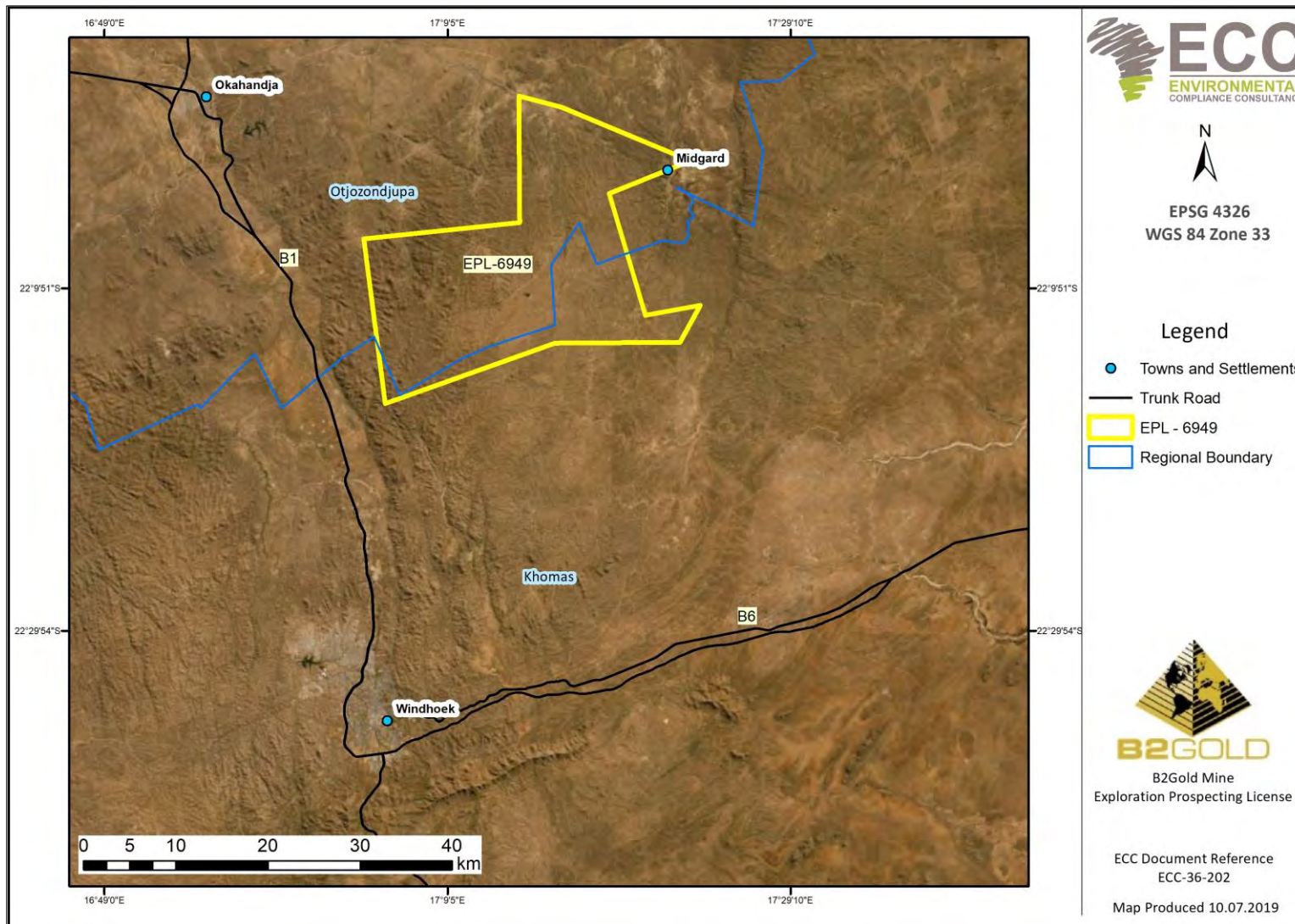


FIGURE 3 - EPL 6949 PROJECT LOCATION

4.5 SITE AND SURROUNDING ENVIRONMENT

There are various tourist attractions in the vicinity of Okahandja, such as the Von Bach Dam, now known as the Tungeni Africa Resort, Gross Barmen Hot Springs, several guesthouses, and a cultural village. In proximity to the EPL is Midgard Country Estate, which is largely known for its natural wilderness well suited for relaxation and outdoor adventures. Considering that approximately 8% of the area on the eastern boundary of the EPL intersects with the Midgard Country Estate site see **FIGURE 4 - EPL 6949 INTERSECTION WITH MIDGARD ESTATE** constant communication with the managers/Midgard landowner has to be maintained during exploration activities and prospecting of the site.

Additionally, EPL 6949 extends over 23 farm boundaries, as seen in **FIGURE 6 - ROADS AND ACCESS ROADS TO EPL 6949**. The land-use of the area is predominantly cattle farming, goats, and a few sheep with little evidence of other uses (Jurgens , Schmiedel , & Hoffman, 2010).

The site can be accessed via various routes. The main road B1 is being upgraded and is used when entering the EPL site from Okahandja. The D2161 and DD2172 are district roads and routes that lead to the site from the main road. The site can also be accessed from the south (Windhoek area) using the B6 trunk road. The D1510, D2102 and D2102A are district roads that lead to the site, see **FIGURE 6 - ROADS AND ACCESS ROADS TO EPL 6949**.

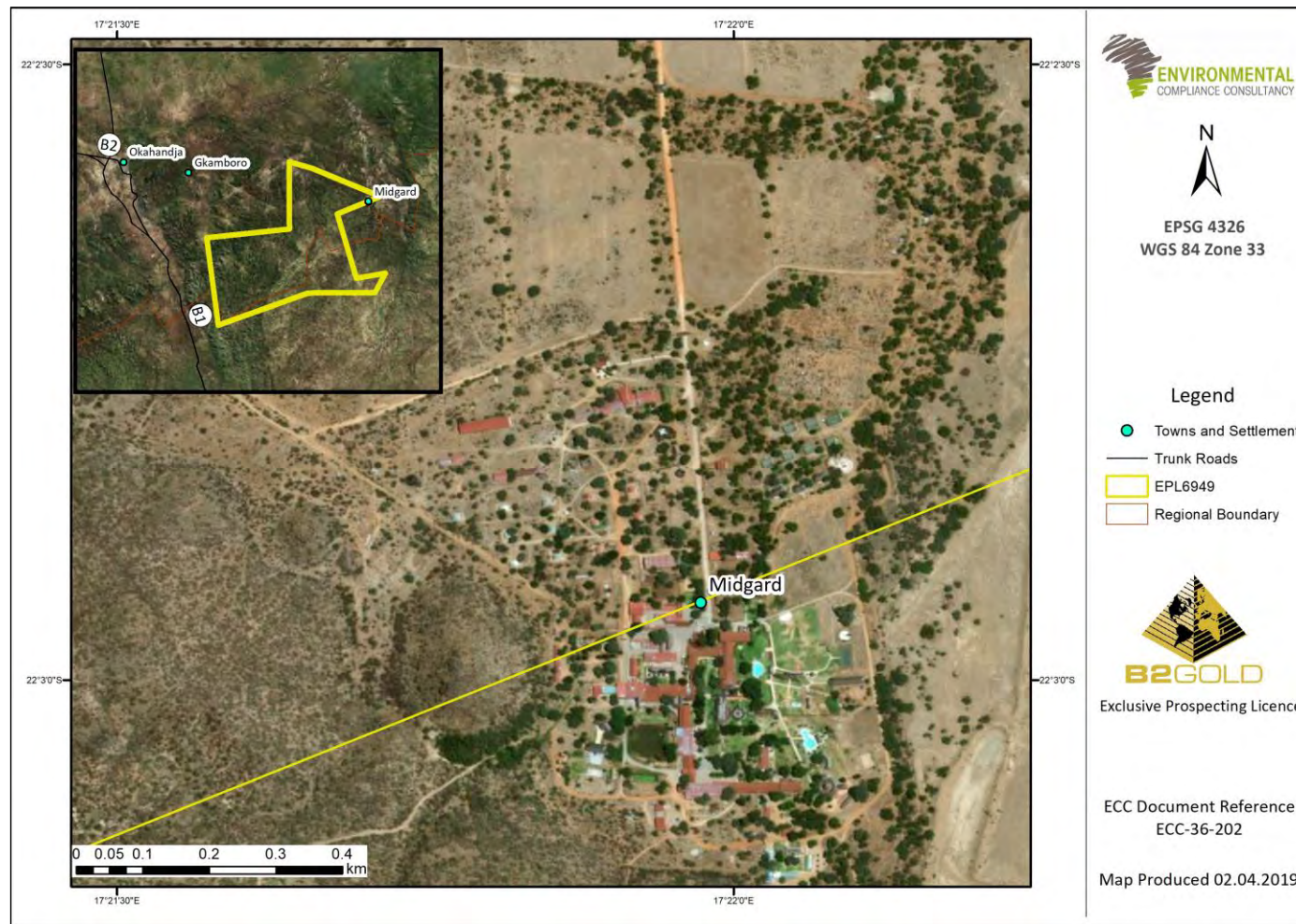


FIGURE 4 - EPL 6949 INTERSECTION WITH MIDGARD ESTATE

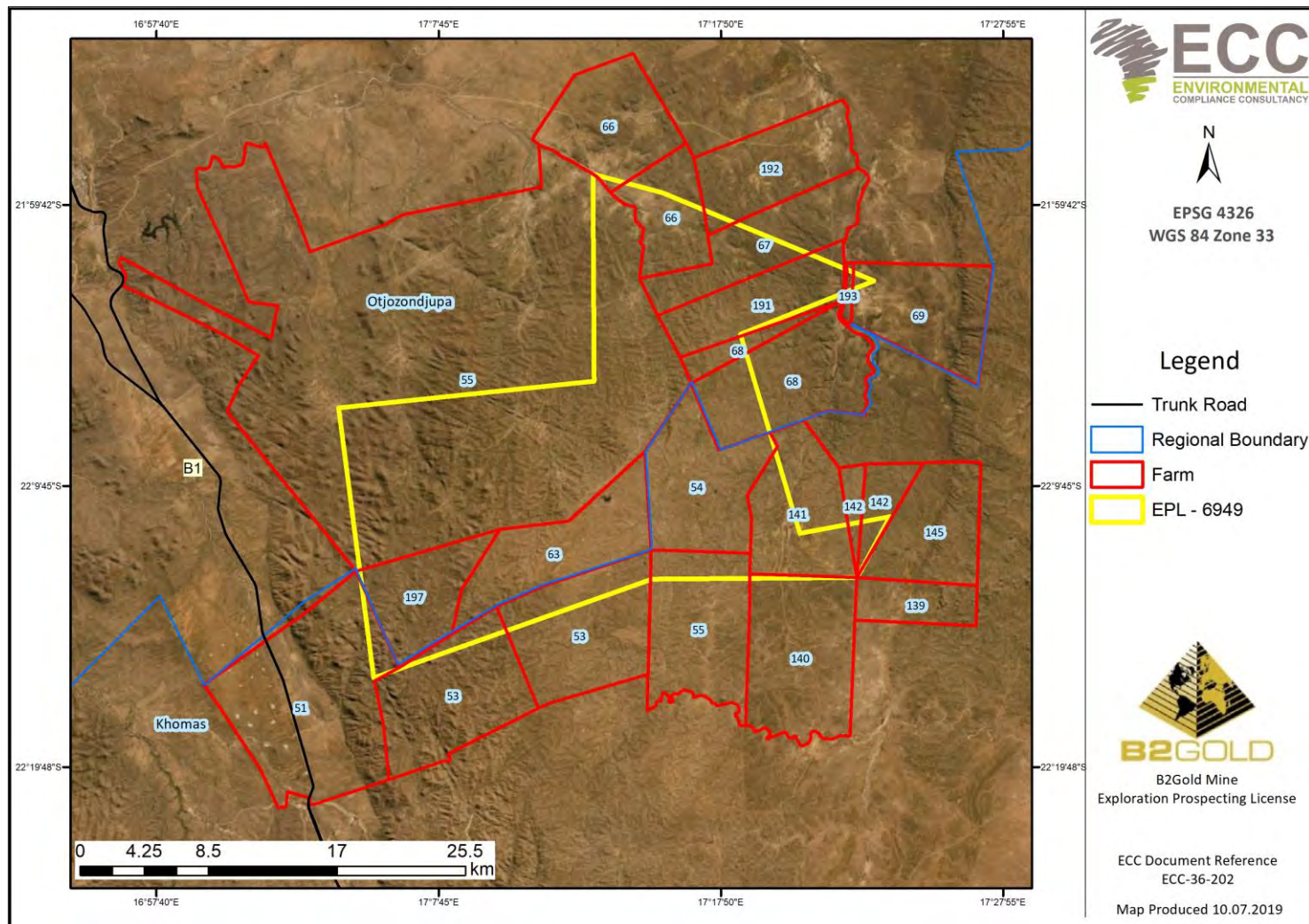


FIGURE 5 - MAP SHOWING LOCATION OF FARM BOUNDARIES

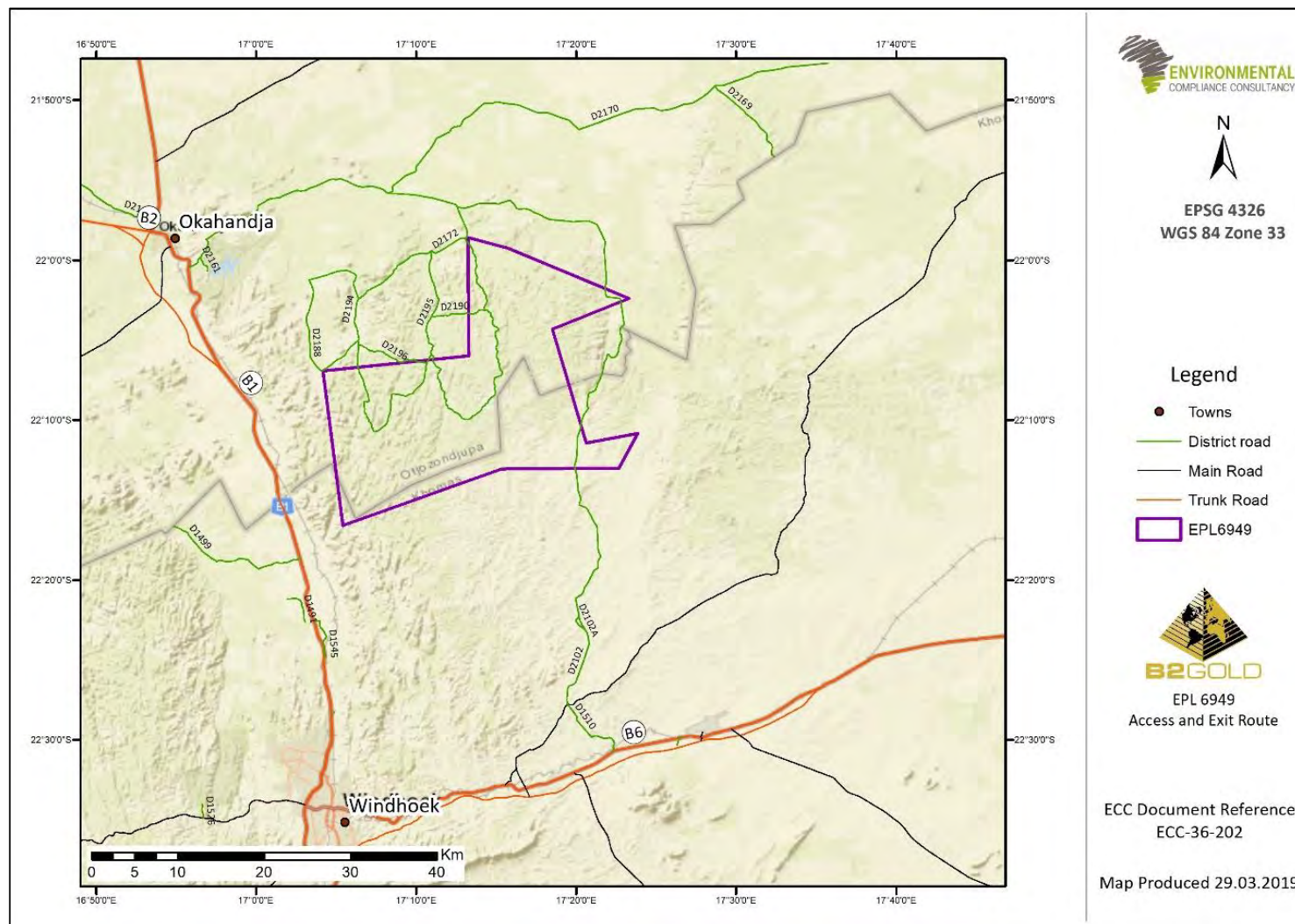


FIGURE 6 - ROADS AND ACCESS ROADS TO EPL 6949

4.6 PROPOSED EXPLORATION ACTIVITIES

The exploration activities on EPL 6949 will include the following methods: drilling, aerial or remote sensing, geophysical surveys, and mineral sampling. Further details of these methods are as follows.

- **REMOTE SENSING** mineral exploration enables explorers to find and assess deposits without having to undertake massive exploration operations. Remote sensing may be used to map the geology and existing faults and fractures that localise the ore deposits or may be used to recognise rocks which have been hydrothermally altered. Remote sensing involves using an airborne platform together and record spectral data from the surface of the earth. Remote sensing includes a number of tools and techniques including geographical information systems, radar, and sonar. Typically, a high-flying aircraft is used in the data collection process. It is a useful tool when searching for high value minerals such as gold and diamonds and gives a good indication of where deposits are situated and aids in narrowing down the field survey area.
- **GEOPHYSICAL GROUND AND AIRBORNE SURVEYS** may potentially be undertaken to collect basic data and map the rock type's structure and minerals. Techniques may include electromagnetic surveys, induced polarisation surveys, magnetotelluric (MT), radiometric and magnetic surveys. The method used will be dependent on the target mineral.
- **GEOCHEMICAL SURVEYS** involve the collection of soil, stream sediment and rock chip samples (about 50 grams per site) for geochemical analyses.
- **ROTARY AIR BLAST (RAB) DRILLING AND DIAMOND DRILLING** shall be undertaken to obtain samples. The collected samples will be temporarily stored in plastic bags on site and transported to Otjiwarongo and/or to the Lab. Exploration shall be undertaken in programmed segments. Approximately 50-200 holes will be made per programme during the RAB drilling and approximately 10-20 holes made with diamond drilling, however the number of drill holes may vary depending on the exploration findings. Equipment used during drilling will include two diamond drill rigs and one RAB drill rig.
- **REVERSE CIRCULATION DRILLING (RC)** a revolving piston drives a drill bit into the ground and drill cuttings are brought to the surface via an inner tube. RC drilling can drill to a greater depth, and can drill bigger diameter holes, resulting in more representative, larger samples. The samples are blown to surface through an inner tube, resulting in less contamination of the samples. The samples are submitted for geochemical analyses.

4.6.1 EXPLORATION SCHEDULE

Exploration techniques as discussed above are anticipated to be carried out over the licence validity period. Exploration is intended to commence in 2019 and may last for up to seven years. During this time, exploration activities shall be undertaken in programme segments that may last between one (1) to three (3) months, with breaks of up to twelve (12) months. The environmental clearance certificate along with all required permits will be renewed accordingly during this period.

4.6.2 WORKERS AND ACCOMMODATION

Approximately 17 workers will be employed during the exploration phase, workers will mainly be from Otjiwarongo. This includes three (3) geologists, two (2) geo-technicians, eight (8) semi-skilled workers, and four

(4) drill crew members. Workers may be required to stay at the exploration site in campsites or on existing properties during the exploration phase, the proponent shall have showers and portable toilets during this period. The camping equipment shall include tents and a portable kitchen.

4.6.3 RESOURCE AND WASTE MANAGEMENT

Water will be required for various uses including human consumption and for exploration activities. It will most likely be sourced from an existing water sources on site, after permission is granted from the farm owner. In the event that suitable water is not available, water maybe brought to site by truck, alternatively, a borehole will be drilled, in this case the required water borehole permits, and abstraction permit shall be obtained from the Ministry of Agriculture, Water and Forestry.

Waste will be produced on site, which will include sewerage and solid waste such as packaging. All solid waste shall be collected, taken off site and disposed of at the nearest waste management sites. Mobile toilets will be used on site, sewerage generated shall be managed by the toilet contractor. The proponent will ensure waste transport certificates are provided by the toilet contractor for sewerage waste removed from site. No waste shall be discharged into the environment.

4.6.4 REHABILITATION

Once exploration activities are completed the area shall be rehabilitated. Rehabilitation shall be determined during the exploration programme and shall be agreed with the landowner (as discussed in section 2.2).

5 ALTERNATIVES

The proposed project has been subject to a process of design evolution, informed by both consultation and an iterative environmental assessment. In terms of the Environmental Management Act, 2007 and its regulations, alternatives considered should be analysed and presented in the scoping assessment and EIA report. This requirement ensures that during the design evolution and decision-making process, potential environmental impacts, costs, and technical feasibility have been considered, which leads to the best option(s) being identified.

The EPL was granted by the MME on the 30th of May 2018, for the exploration of Base and Rare Metals, Industrial Minerals, and Precious Metals.

Exploration activities range from extremely low impact exploration such as remote sensing from satellites to more invasive methods such as extensive close spaced drilling. The methods used shall be determined, based on the exploration programme, which is further designed once more information and data is obtained. At this stage of the project, the exploration activities are yet to be finalised and therefore a range of options remain.

Once the exploration programme is further defined, the most suitable options and methods shall be identified to ensure the impacts on the environment and society are minimised.

6 ENVIRONMENTAL AND SOCIAL BASELINE

6.1 INTRODUCTION

This section provides an overview of the existing biophysical environment through the analysis of the baseline data regarding the existing natural and socio-economic environment. This section also incorporates consultation and public participation of the proposed project.

6.2 METHODOLOGY

Desktop studies on the national database are undertaken as part of the scoping stage to get information of the current status of the receiving environment. This provides a baseline where changes that occur as a result of the proposed project can be measured.

The environmental and social topics that may be affected by the proposed project are described in this section. The baseline focuses on receptors which could be affected by the proposed project.

6.3 CONSULTATION

Public participation and consultation is a requirement in terms of in section 21 of the Environmental Management Act No.7 of 2007 and its regulations for a project that requires an Environmental Clearance Certificate. Consultation is a compulsory and critical component in the EIA process, aimed at achieving transparent decision-making, and can provide many benefits.

A key aim of the consultation process is to inform stakeholders and interested and affected parties (I&AP) about the proposed project. The methods undertaken for the proposed project are detailed as follows, which are in line with the requirements of the EIA regulations.

6.3.1 NEWSPAPER ADVERTISEMENTS

Notices regarding the proposed project and associated activities were circulated in two newspapers namely the 'Namibian' on the 27th March and 03rd April 2019 and in the 'Informante' on the 4th and 11th of April 2019. The purpose of this was to commence the consultation process and enable I&APs to register an interest with the project. The adverts can be found in Appendix C.

6.3.2 NON-TECHNICAL SUMMARY

The Non-Technical Summary (NTS) presents a high-level description of the proposed project; sets out the EIA process and when and how consultation is undertaken. The contact details for further enquiries are made available to all registered I&APs and the NTS can be found in Appendix C.

6.3.3 SITE NOTICES

A site notice ensures neighbouring properties and stakeholders are made aware of the proposed project. The notice was set up at the boundary of the EPL as illustrated in Appendix C.

6.3.4 CONSULTATION FEEDBACK

No issues or concerns were raised by the I&APs during the consultation period. In addition, ECC sent registered post to all farm owners and Midgard Country Estate covered by the EPL are attached in Appendix C.

6.4 LIMITATIONS, UNCERTAINTY AND ASSUMPTIONS

The identification of the receiving environment had limitations as described below:

-
- Although the EPL is located within two regional boundaries (Khomas and Otjozondjupa Regions), 90% of the site boundary lies within Otjozondjupa Regional boundary therefore the majority of the baseline information is limited to this region.

Where uncertainties exist, a cautious approach has been applied, allowing the worst-case scenario for potential impacts to be identified. Where limitation and uncertainties exist, assumptions have been made and applied during the assessment process. These have been clearly described in the baseline section.

6.5 BASELINE OF THE BUILT ENVIRONMENT

The Otjozondjupa region is located on the north eastern part of Namibia and has a population of 143,903 inhabitants (Namibia Statistics Agency, 2011). The region covers a total area of 105,460 km² and the Otjiherero is the most widely spoken language. The region has various attractions such as the Gross Barmen hot springs, Von Bach Dam in the proximity of EPL6949. Various other tourist attractions include the site of the battle of Waterberg, the deceased leader of the Herero Day (celebrated every year) and the large woodcarver's market in Okahandja. Commercial and communal farming activities dominate in the region where overgrazing, and bush encroachment are some of the threats that the region faces that are directly linked to the incorrect management of farming systems. (Jurgens , Schmiedel , & Hoffman, 2010).

With regards to mining in general, the sector has been and remains a foundational contributor for the economy and plays a vital role in the Namibian economy. Since independence, it has consistently been one of the main contributors to Namibian Gross Domestic Product (GDP), contributing approximately 25% on average over the past 10 years. Namibia ranks among the top five countries in Africa in terms of its zinc, copper and lead reserves and production. In 2015 the mining industry accounted for approximately 19,000 jobs in Namibia vs. 14,000 in 2011. Indirectly the mining industry contributes to the livelihood of 100 000 people.(BDO Namibia, 2019).

6.6 SOCIO-ECONOMIC

6.6.1 GOVERNANCE

Namibia was established in 1990 and is led by a democratically-elected and stable government. The country ranked top fifth out of 54 African countries in the Ibrahim Index of African Governance in 2015 for the indicators including the quality of governance and the government's ability to support human development, sustainable economic opportunity, rule of law and human rights (National Planning Commission, 2017).

As a result of sound governance and stable macroeconomic management, Namibia has experienced rapid socioeconomic development. Namibia has achieved the level of 'medium human development' and ranks 125th on the Human Development Index out of 188 countries (National Planning Commission, 2017).

6.6.2 DEMOGRAPHIC PROFILE

Namibia is one of the least densely populated countries in the world, with a population of 2.3 million people. Life expectancy is 65 years and expected years of schooling is 11.7 (National Planning Commission, 2017).

Namibia's population is expected to increase from an estimated 2.11 million in 2011 to 3.44 million by 2041 (63%). In the 2011 Census, the population of the Otjozondjupa Region was 143,903(Namibia Statistics Agency, 2011).

6.6.3 HIV/AIDS IN NAMIBIA

HIV/AIDS in Namibia is a critical public health issue and is one of the leading causes of death. Namibia has a generalised HIV epidemic, meaning that there is a high HIV prevalence among the whole population. The epidemic is now starting to stabilise, after a rapid increase from the time that the first case of HIV was reported in 1986 through until a peak in 2002. HIV prevalence in Namibia is not yet measured through a population-based survey, instead, HIV prevalence among pregnant women attending Ante Natal Clinics is used. In 2010, 18.8% of pregnant women were HIV positive, a reduction from the high of 22% in 2002. However, HIV prevalence is unevenly distributed throughout the country, therefore this figure is not a national representation. The overall trend illustrates that HIV prevalence is stabilising rather than increasing (UNICEF, 2011).

6.6.4 EMPLOYMENT

Unemployment rates in Namibia particularly, among the youth are exceedingly high. According to the Namibia Labour Survey (2018), the unemployment rate of the country was 33.4% in 2018, with the Otjozondjupa region making up to 36.1% in the unemployment.

The labour force participation rate is the proportion of the economically active people in a given population group, which is calculated as the number of economically active people divided by the total population in the same population group. The labour force participation for the country was 71.2% (Namibia Labour Force Survey 2018).

6.6.5 ECONOMIC ACTIVITIES

The Namibian economy has grown on average by 4.6% per year between 2012 and 2016, however, slowed down in 2016 to 0.2% due to a reduction in productivity in the farming industry. The growth rate over the years has not reduced unemployment; in 2016 nearly 18% of the population lived in poverty. A lack of industrialisation and infrastructure has contributed to Namibia's economic imbalance. The 5th Namibian NDP (National Planning Commission (2017) states that, by modernising and industrialising of the major sectors of agriculture, fisheries, manufacturing, mining and tourism, and by providing trading opportunities so that workers can upgrade their skills. Namibia will create jobs in a diverse range of industries which will improve the economy.

The mining and quarrying sector is the largest income which contributed an overall 11.3 percent to GDP and 64.2 percent to gross primary industry contribution to GDP, this is then followed by the tourism, fishing and manufacturing (National Planning Commission , 2018).

6.6.6 CULTURAL HERITAGE

A review of the National Heritage Council database was conducted, and no known heritage sites were identified in the project area. In cases where heritage sites are discovered the chance find procedure will be used.

6.6.7 NOISE AND VIBRATIONS

Sensitive receptors surrounding/associated with the proposed project area are as follows and are illustrated in FIGURE 7–

- The 23 farm structures and or farm boundaries surrounding the EPL 6949
- The Midgard Country Estate lodge (on the north east boundary of the proposed site), and
- Residents with properties in the Doeبرا and Okamboro area.

6.6.8 AIR QUALITY

During the exploration phase, dust will be created by the drilling and vegetation clearing required to prepare the site and access roads. However, the impacts on the environment during exploration activities are expected to be minimal. Similarly, impact to sensitive receptors surrounding the proposed project area mentioned above may occur, refer to FIGURE 7–

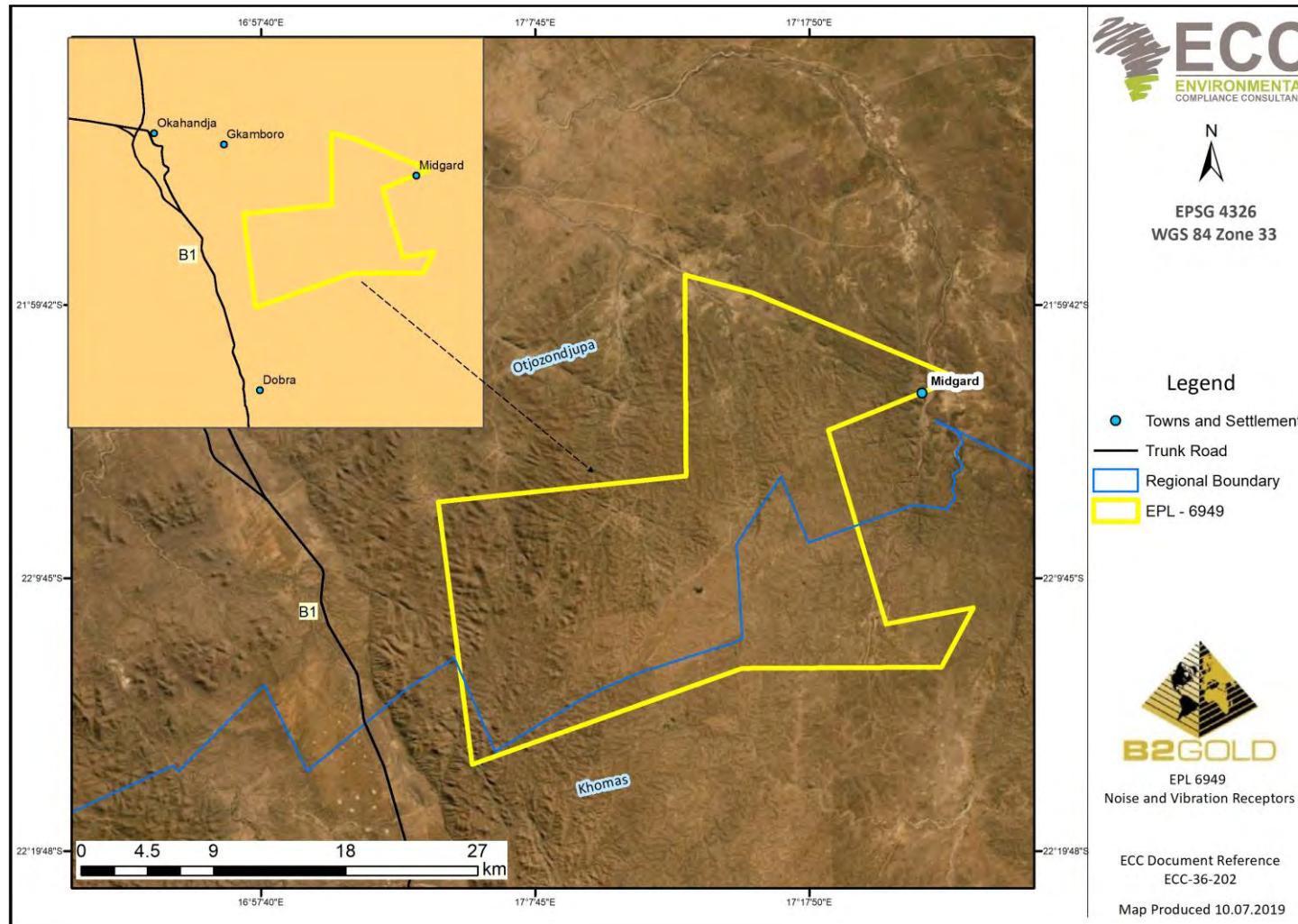


FIGURE 7—SENSITIVE RECEPTORS TO NOISE, VIBRATIONS AND AIR QUALITY

6.7 LANDSCAPE AND VISUAL IMPACTS

The Otjozondjupa region, lies in the central region of Namibia. It is characterized by a predominant land use comprising agriculture and tourism on freehold land, followed by small scale agricultural activities. There are large scale agricultural areas towards the central region of Otjozondjupa, with a large number of small sized urban and resettlement areas that predominantly lie along the western section of the region.

The area of the proposed site is characterized by deserted plains and mountains with a height ranging from 1400m to 2200meters above sea level. Towards the west the area is dissected by a tributary of the Swakop River, draining to the north.

Located in the area is the Ovitoto village and other 10 communities in the vicinity including the Okamboro, Osona military base and a military area called the Swakophoehe, formerly a commercial farm, with several other settlements in the surrounding area.

6.8 CLIMATE AND TOPOGRAPHY

The climate of the area resembles that of Windhoek, which is characterized by semi-arid conditions. The minimum temperature during summer is on average at 18°C. Rainfall is highly erratic and unpredictable over the entire region. Rainfall occurs mostly in the summer months of January to March, with an average rainfall between 314mm and 370 mm per year and average evaporation rate ranging between 3000 to 3200 mm a year. Winter is between the months of June – August and are regarded as mild and sunny with cloudless skies with minimum temperatures frequently below 5°C (Haarmeyer et al, 2010). In Windhoek light easterly winds predominate, with an average of 2.5 m/s see FIGURE 8 - **WIND DIRECTION OF SPEED IN THE** (Iowa State University, n.d.).

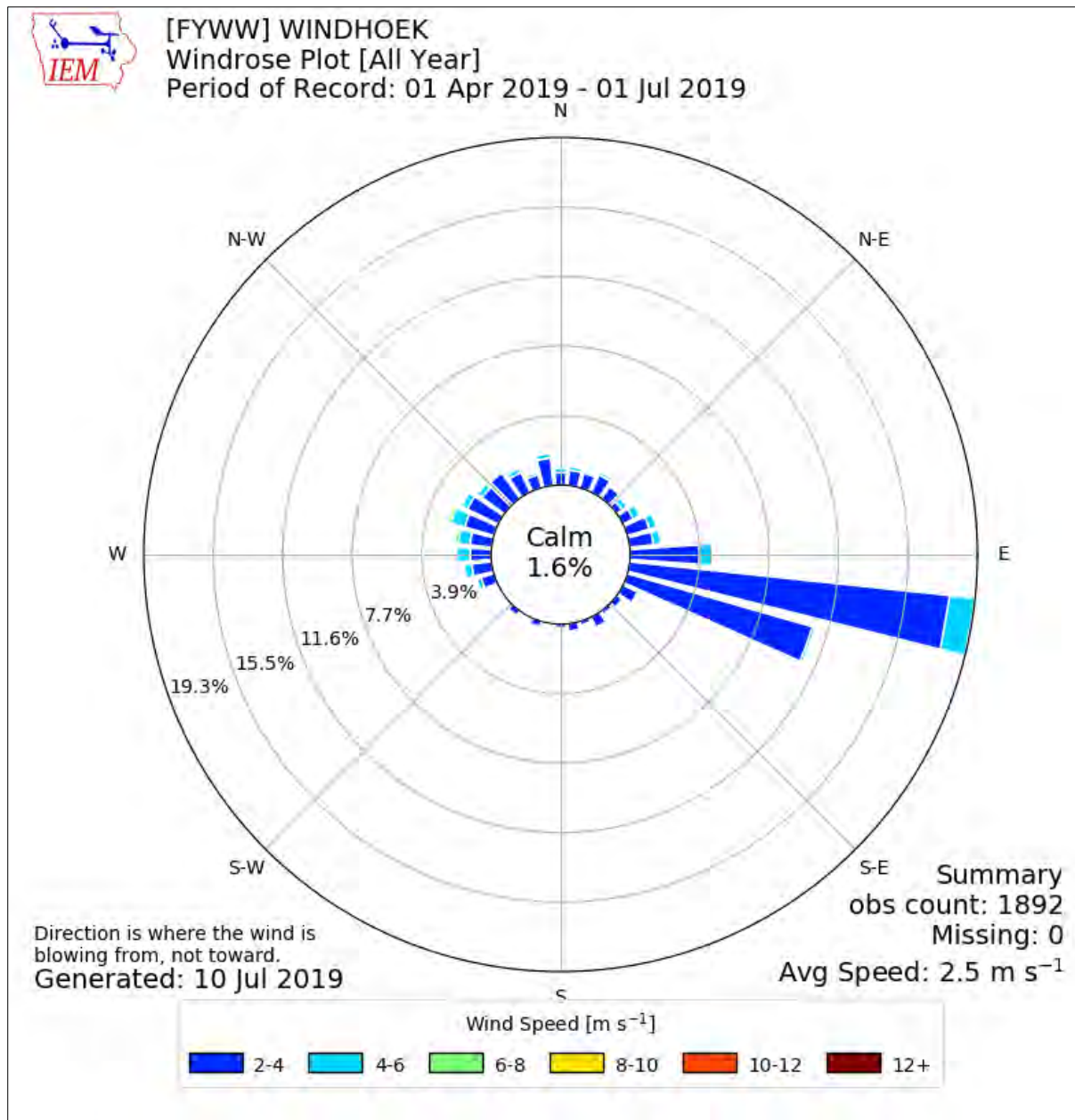


FIGURE 8 - WIND DIRECTION OF SPEED IN THE WINDHOEK KHOMAS REGION

6.9 VEGETATION AND SOIL

The area has a thin soil cover (sand) and supports a thorn bush savannah. The soil is susceptible to erosion during the rainy season. The soil type in the area is dominated by lithic leptosols (Jurgens , Schmiedel , & Hoffman, 2010) .

Vegetation comprises - thorn bush and highland savannah dominated by thorny *Acacia* species and grasses. The vegetation cover alternates between relatively dense grassy and herbaceous vegetation with small patches of woody vegetation and areas with a higher shrub coverage. Woody vegetation becomes dominant along the riverbeds, while the plains and foothills of the mountains tend to be more open (Jurgens , Schmiedel , & Hoffman, 2010). A list of plant species is presented in Appendix E (National Herbarium of Namibia (WIND), 2016).

6.10 FAUNA SPECIES

According the Atlas of Namibia (Mendelshon, 2002), the overall terrestrial diversity of the area ranges from medium to high. The number of mammal species ranges between 61 and 90. Reptiles have the highest diversity in the area, extending from the north-west eastwards into Otjozondjupa. There are about 60 species in this broad zone spread across varying terrains including gravel plains, shrub-lands, mountains and other distinct habitats.

The area is surrounded by up to 10 communities living on communal land which is surrounded mainly by commercial farms. Land-use is predominantly pastoralism and livestock herding, which is the main form of agriculture particularly in Ovitoto and Okamboro area. Cattle, goats and sheep, to a lesser degree, range across approximately 58km³ of communal land (Jurgens , Schmiedel , & Hoffman, 2010).

6.11 SITE GEOLOGY AND HYDROLOGY

The stratigraphy of the study area encompasses the Khomas Complex of the Damara Supergroup. The regional geology within the Khomas Complex comprises metamorphic sedimentary rocks (schist, quartzite and marble) as well as mafic lavas (Matchless Belt) and granite intrusions. The soil type is dominated by Lithic Leptosols. The site is approximately 1600-1900 metres above sea level.

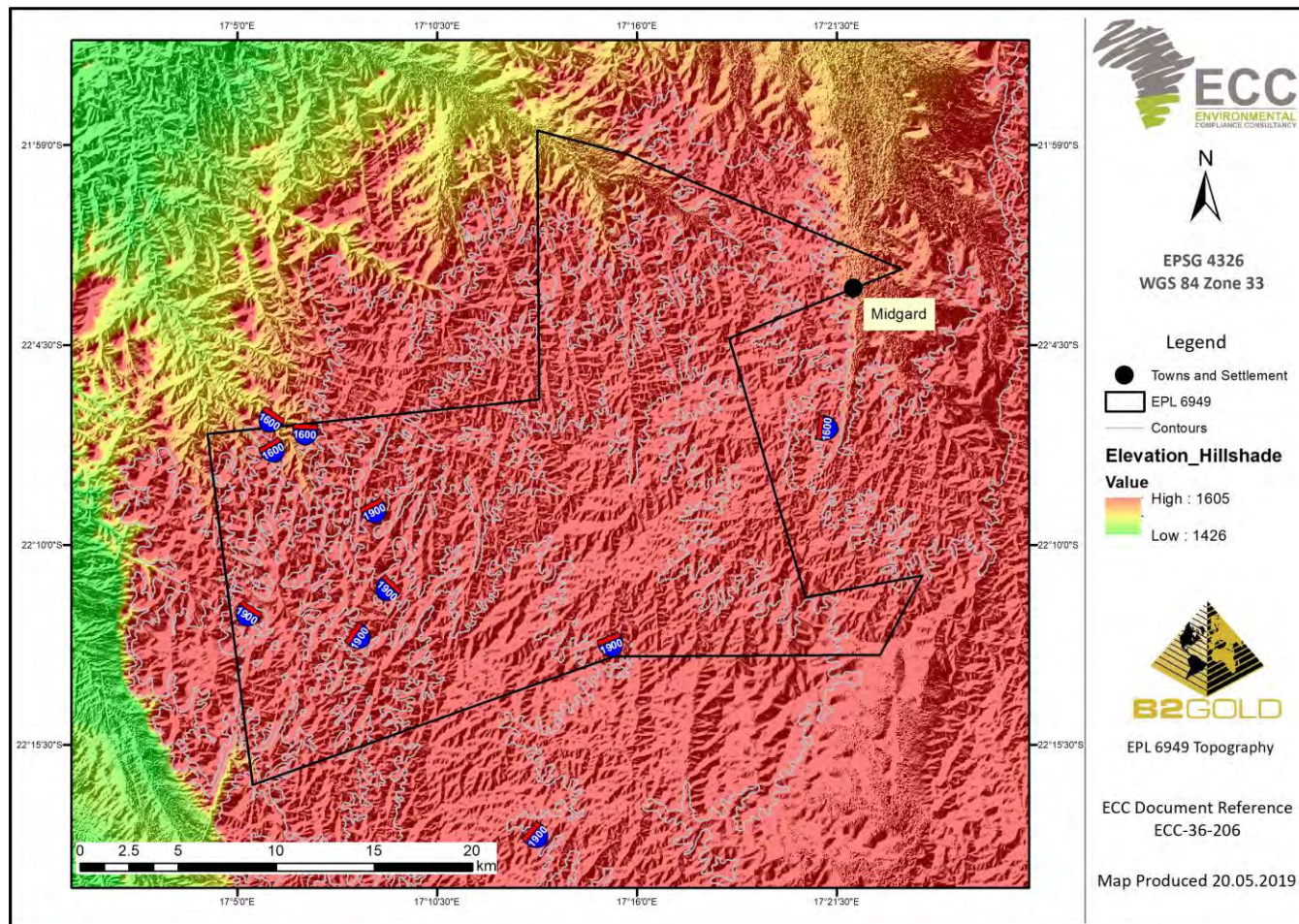


FIGURE 9 – ELEVATION MAP OF EPL 6949

6.12 HYDROLOGY

The majority of the area of the proposed site falls within the Omaruru-Swakop Basin. This basin is one of the most urbanized and popular tourist destinations in the country. Its water supply comes from ephemeral surface water flows and groundwater. A small portion of the southern part of the EPL boundary stretches over the Nossob Auob River Basin (Joint Venture Consultants (Namibia), n.d).

Overall water resource inventory, monitoring, control, regulation and management falls under the control of the Directorate of Resources Management within the Ministry of Agriculture, Water and Forestry (MAWF). Bulk water supply is the responsibility of Namibia Water Corporation (NamWater), who abstracts water from primary sources (e.g. rivers, aquifers or dams) and supplies water directly to end-users (Joint Venture Consultants (Namibia), n.d). Groundwater is abstracted by means of boreholes and wells. Some boreholes are drilled for monitoring the water quality.

The ephemeral Swakop River and the Klein Otjosazu River, which only flow during heavy rain periods, cross the EPL, along with other ephemeral streams (FIGURE 10- SITE HYDROLOGY OF EPL 6949).

There are number of existing boreholes within the EPL (Fig. 8) and these can be considered for water abstraction for the exploration activities. Should the project require drilling and abstraction of water from surface and or underground sources, an application must be submitted to the Minister of Agriculture, Water and Forestry.

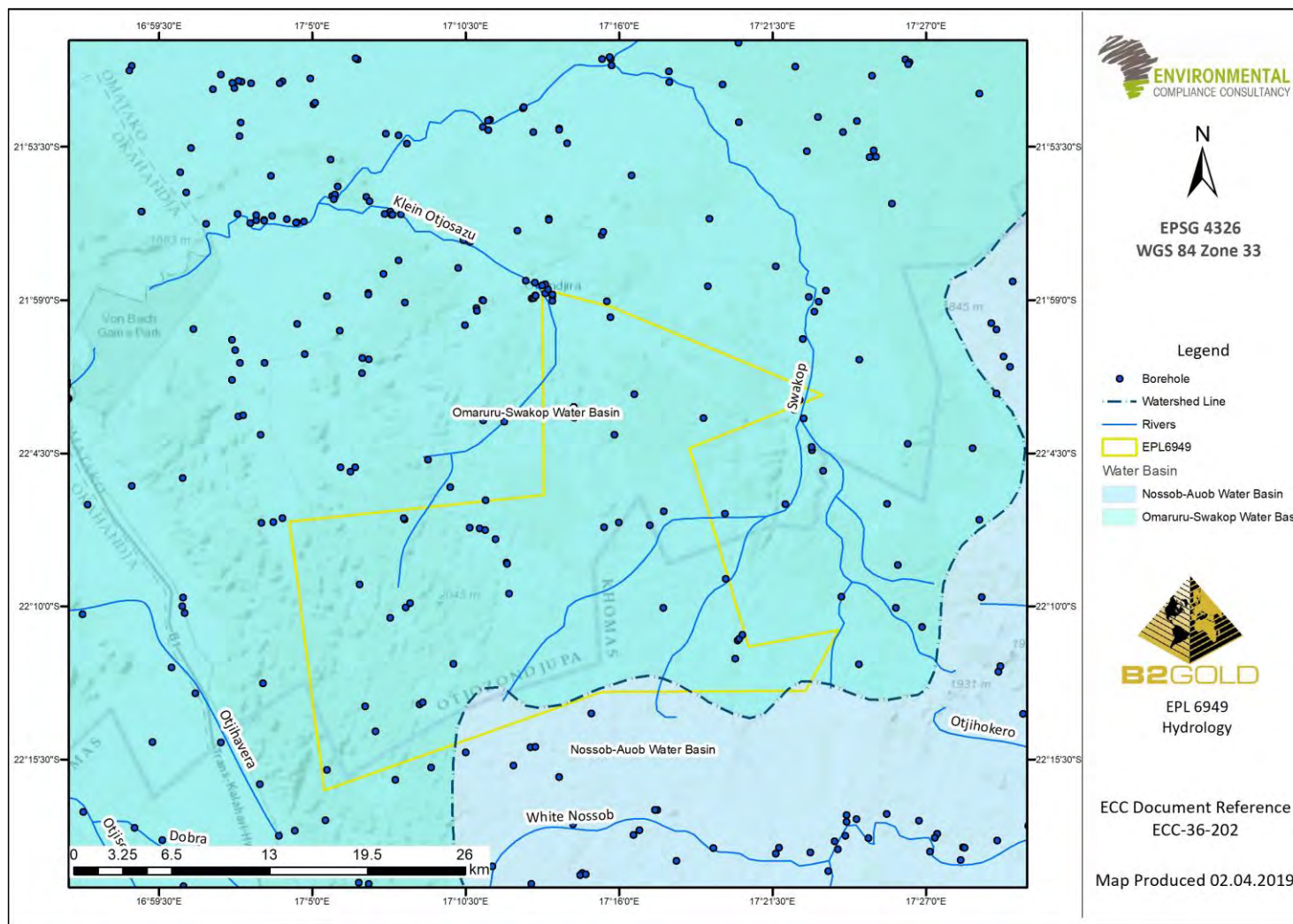


FIGURE 10- SITE HYDROLOGY OF EPL 6949

7 PREDICTION AND EVALUATION OF IMPACTS METHODOLOGY

7.1 INTRODUCTION

This section provides an overview of the scoping assessment process detailing each of the steps completed, currently being undertaken and those proposed to be carried out at some future date. Prediction and evaluation of impacts is a key step in the scoping assessment and EIA process. This chapter outlines the method followed to predict and evaluate the impacts arising from the proposed project. The findings of the assessment are presented in chapter 8.

7.2 ECC METHODOLOGY FOR THE IMPACT ASSESSMENTS

ECCs methodology for environmental impact assessments is adopted and based on models for environmental and social impact assessments set out by the International Finance Corporation (IFC) principal 1 'Assessment and management of environmental and social risks and impacts'. Furthermore, this impact assessment was undertaken for B2Gold in accordance with Namibian legal requirements.

This impact assessment is a formal process in which the effects of certain types of development on the biophysical, social and economic environments are identified, assessed and reported, so that the effects can be taken into account when considering whether to grant development consent or to provide financial support.

Final mitigation measures and recommendations are based on the cumulative experience of the consulting team and the client, taking into consideration the potential environmental and social impacts.

7.3 DETERMINATION OF SIGNIFICANCE

The evaluation and prediction of the environmental and social impacts require the assessment of the project characteristics against the baseline characteristics, ensuring all potentially significant impacts are identified and assessed

The significance of an impact is determined by taking into consideration the combination of the sensitivity and importance/value of environmental and social receptors that may be affected by the proposed project, the nature and characteristics of the impact, and the magnitude of potential change. The magnitude of change (the impact) is the identifiable changes to the existing environment which may be direct or indirect; temporary/short term, long-term or permanent; and either beneficial or adverse. These are described as follows and thresholds are provided in Table 4, 5 and 6.

- The **sensitivity and value of a receptor** is determined by identifying how sensitive and vulnerable a receptor is to change, and the importance of the receptor (internationally, nationally, regionally and locally).
- The **nature and characteristics of the impact** is determined through consideration of the frequency, duration, reversibility and probability of the impact occurring.
- The **magnitude of change** measures the scale or extent of the change from the baseline condition, irrespective of the value. The magnitude of change may alter over time, therefore temporal variation is considered (short-term, medium-term; long-term, reversible, irreversible or permanent)

TABLE 4 - SENSITIVE AND VALUE RECEPTOR

SENSITIVITY AND VALUE	DESCRIPTION
High	Of value, importance or rarity on an international and national scale, and with very limited potential for substitution; and/or very sensitive to change, or has little capacity to accommodate a change
Medium	Of value, importance or rarity on a regional scale, and with limited potential for substitution; and/or moderate sensitivity to change, or moderate capacity to accommodate a change.
Low	Of value, importance or rarity on a local scale; and/or not particularly sensitive to change or has considerable capacity to accommodate a change.

TABLE 5 - NATURE OF IMPACT

NATURE	DESCRIPTION
Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change.
Negative	An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor
Direct	Impacts causing an effect through direct interaction between a planned project activity and the receiving environment/receptors.
Indirect	Impacts that result from other activities that are encouraged to happen as a result / consequence of the project. associated with the project and may occur at a later time or wider area
Extend/Geographic Scale	
On-site	Impacts that are limited to the boundaries of the project site
Local	Impacts that occur in the local area of influence, including around the proposed site and within the wider community
Regional / National	Impacts that affect a receptor that is regionally important by virtue of scale, designation, quality or rarity
International	Impacts that affect a receptor that is internationally important by virtue of scale, designation, quality or rarity
Duration	
Short-term	Impacts that are likely to last for the duration of the activity causing the impact and are recoverable
Medium-term	Impacts that are likely to continue after the activity causing the impact and are recoverable
Long term	Impacts that are likely to last far beyond the end of the activity causing the damage but are recoverable over time
Reversibility	
Permanent / Irreversible	Impacts which are not reversible and are permanent
Temporary / Reversible	Impacts are reversible and recoverable in the future

TABLE 6 - MAGNITUDE OF CHANGE

MAGNITUDE OF CHANGE	DESCRIPTIONS
Major	Loss of resource, and quality and integrity of resource; severe damage to key characteristics, features or elements; or Large scale or major improvement of resources quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate impact	Loss of resource, but not adversely affecting its integrity; partial loss of/damage to key characteristics, features or elements; or Benefit to, or addition of, key characteristics, features or elements; improvements of attribute quality
Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (or maybe more) key characteristic, feature or element; or Minor benefit to, or addition of, one (or maybe more) key characteristic, feature or element; some beneficial effect on attribute quality or a reduced risk of a negative effect occurring
Negligible	Very minor loss or detrimental alteration to one (or maybe more) characteristic, feature or element; or Very minor benefit to, or positive addition of, one (or maybe more) characteristic, feature or element.

A level of certainty has also been applied to the assessment to demonstrate how certain the assessment to demonstrate how certain the assessment conclusions are and where there is potential for misinterpretation or a requirement to identify further mitigation measures, thereby adopting a precautionary approach. Where there is a low degree of certainty, monitoring and management measures can be implemented to determine if the impacts are worse than the predicted and support the identification of additional mitigation measures through the lifetime of the proposed project.

TABLE 7 - LEVEL OF CERTAINTY

LEVEL OF CERTAINTY	DESCRIPTIONS
High	Likely changes are well understood. Design/information/data used to determine impacts is very comprehensive. Interactions are well understood and documented. Predictions are modelled, and maps based on interpretations are supported by a large volume of data. Design/information/data has very comprehensive spatial coverage or resolution.
Medium	Likely changes are understood. Design/information/data used to determine impacts include a moderate level of detail.

	Interactions are understood with some documented evidence. Predictions are modelled but not yet validated and/or calibrated. Mapped outputs are supported by a moderate spatial coverage or resolution.
Low	Interactions are currently poorly understood and not documented. Predictions are not modelled, and the assessment is based on expert interpretation using little or no quantitative data. Design is not fully developed, or information has poor spatial coverage or resolution.

The significance of impacts has been derived using professional judgment and applying the identified thresholds for receptor sensitivity and magnitude of change (as discussed above), and guided by the matrix presented in FIGURE 11. The matrix is applicable for impacts that are either positive or negative. The distinction and description of significance and whether the impact is positive or negative is provided in TABLE 8.

Magnitude of Change				Sensitivity
Negligible	Minor	Moderate	Major	
Minor (3)	Moderate (6)	Major (9)	Major (12)	
Low (2)	Minor (4)	Moderate (6)	Major (8)	
Low (1)	Low (2)	Minor (3)	Moderate (4)	Low

FIGURE 11 - GUIDE TO SIGNIFICANCE RATING

Significance is not defined in the Namibian EIA Regulations, however the Draft Procedure and Guidance for EIA and EMP states that the significance of a predicted impact depends upon its context and intensity. Accordingly, definitions for each level of significance have been provided in TABLE 8. These definitions were used to check the conclusions of the assessment of receptor sensitivity, nature of impact and magnitude of impact was appropriate.

TABLE 8 - SIGNIFICANCE DESCRIPTION

SIGNIFICANCE OF IMPACT	DESCRIPTION
Major (negative)	Impacts are considered to be key factors in the decision-making process that may have an impact of major significance, or large magnitude impacts occur to highly valued/sensitive resource/receptors. Impacts are expected to be permanent and non- reversible on a national scale and/or have international significance or result in a legislative non- compliance.
Moderate (negative)	Impacts are considered within accepted limits and standards. Impacts are long term, but reversible and/or have regional significance. These are generally (but not exclusively) associated with sites and features of national importance and resources/features that are unique and which, if lost, cannot be replaced or relocated.
Minor (negative)	Impacts are considered to be important factors but are unlikely to be key decision-making factors. The impact will be experienced, but the impact magnitude is sufficiently small (with and without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value. Impacts are considered to be short term, reversible and/or localized in extent.
Low (negative)	Impacts are considered to be local factors that are unlikely to be critical to decision-making.
Low – Major (Beneficial)	Impacts are considered to be beneficial to the environment and society:

The colour green has been applied to highlight positive impacts over negative impacts shown in shades of yellow, orange and red. The description for each level of significance presented in Table 20 was also followed when determining the level of significance for a beneficial impact.

The level of significance of impacts has been derived using professional judgment and applying the identified thresholds for receptor sensitivity and magnitude of change, as well as the definition for significance. In most instances, moderate and major adverse impacts are considered as significant, and however there may be some instances where impacts are lower than this but are still considered to be significant. The following thresholds were therefore used to double check the assessment of significance had been applied appropriately; a significant impact would meet at least one of the following criteria:

- It exceeds widely recognized levels of acceptable change;
- It threatens or enhances the viability or integrity of a receptor or receptor group of concern; and
- It is likely to be material to the ultimate decision about whether or not the environmental clearance certificate is granted.

8 ASSESSMENT OF FINDINGS AND MITIGATION

This section sets out the overall approach that was adopted to assess the potential environmental and social impacts associated with the project. To fully understand the significance of each of the potential impacts, each impact must be evaluated and assessed.**Error! Reference source not found.**

8.1 SCOPING ASSESSMENT FINDINGS

When undertaking the scoping exercise, the design of the proposed project and best practice measures were considered to ensure the likely significant effects and any required additional mitigation measures were identified. A summary of the potential impacts and mitigation and/or control measures are discussed below.

The following topics were considered during the scoping phase:

- Surface water and ground water (including geomorphology)
- Soils and geology
- Socio-economics (employment, demographics, and land-use)
- Noise
- Ecology (fauna and flora)
- Air Quality (including dust), and
- Cultural heritage.

8.2 LIMITATIONS, UNCERTAINTIES AND ASSUMPTION

A number of limitations and uncertainties were acknowledged during the EIA process. In line with EIA best practice, assumptions have been made based on realistic worst-case scenarios, thereby ensuring that the worst-case potential environmental impacts are identified and assessed.

The following assumptions and uncertainties identified during the assessment process include:

TABLE 9 - SUMMARY OF LIMITATION, UNCERTAINTIES AND ASSUMPTION OF THE EIA PROCESS

LIMITATION / UNCERTAINTY	ASSUMPTION
The program of exploration works is not confirmed	It is assumed that exploration work shall take up to seven years and involve drilling; aerial or remote sensing; geophysical surveys; and mineral sampling. Pitting and trenching are unlikely.
Number of employees and area they will come from	It is assumed that most of the workers will come from Otjozondjupa Region
Number of boreholes to be created or water source is unconfirmed and needs to be able to supply at least 5m ³ / hour	Water will be acquired from existing sources on site. If this is not possible, water will be brought on site by a truck or a borehole will be drilled
Access route and creation of new tracks	No new tracks or access roads shall be created, public roads to be used to access the EPL

TABLE 10 - SUMMARY OF POTENTIAL IMPACTS

RECEPT OR	DESCRIPTION OF ACTIVITY	DESCRIPTION OF IMPACT	EFFECT/DESCRIPTION OF MAGNITUDE	VALUE OF SENSITIVITY	MAGNITUDE OF CHANGE	SIGNIFICANCE OF IMPACT	IMPACT MANAGEMENT/CONTROL MEASURES	RESIDUAL IMPACT AFTER MITIGATION
Ground water	Exploration drilling can contaminate ground water through potential spillages of drill fluid, lubrication etc.	- Drilling could penetrate the groundwater table, and - Drill fluid could enter the aquifer causing pollution.	Direct Local Medium-Term Temporary/reversible Likely	Medium	Moderate	Moderate (6)	- Ensure drill pads and spill kits are in place - Consider alternative sites when the water table is too high - Drill system should be dug to direct any accidental spills into sumps - Extraction volumes of water shall be minimal during exploration and where possible, water from existing water sources shall be used	Low (2)
Soil	Fuel handling and storage, lubrication of equipment	- Spillages lead to groundwater contamination and soil contamination	Direct On-site Short-term Temporary/reversible Likely	Medium	Moderate	Moderate (6)	Safe delivery and handling: - Training employees and toolbox talks - Good housekeeping across the site - Spill kits to be placed at designated areas across the site - Absorption material should be available and at hand. Where saw dust is used it	Low (2)

RECEPT OR	DESCRIPTION OF ACTIVITY	DESCRIPTION OF IMPACT	EFFECT/DESCRIPTION OF MAGNITUDE	VALUE OF SENSITIVITY	MAGNITUDE OF CHANGE	SIGNIFICANCE OF IMPACT	IMPACT MANAGEMENT/CONTROL MEASURES	RESIDUAL IMPACT AFTER MITIGATION
							should be cleaned up immediately and not left for long periods as this poses a fire hazard - Any major spill is reported to the project manager and Ministry of Mines and Energy - Equipment to be well maintained and serviced regularly - The use of hydrocarbons under 200 litres can be used for mobile refuelling or servicing Storage: - All tanks to be stored on a non-porous floor and bunded area - Bund need to be capable of storing at least 110% of the volume of the tank - All containers should to be suitable for use and not damaged	

RECEPT OR	DESCRIPTION OF ACTIVITY	DESCRIPTION OF IMPACT	EFFECT/DESCRIPTION OF MAGNITUDE	VALUE OF SENSITIVITY	MAGNITUDE OF CHANGE	SIGNIFICANCE OF IMPACT	IMPACT MANAGEMENT/CONTROL MEASURES	RESIDUAL IMPACT AFTER MITIGATION
							- Tanks should be locked at all times Refuelling: - Drip tray to be used during refuelling of vehicles and must be on permeable flat surface where possible, and - Funnel should be available and used to avoid spillage during decanting	
Soil	- Drilling and the use of equipment can cause reduction in soil quality)	- Drilling can cause reduction in soil quality (soil contamination) , and - Soil erosion can be caused through vegetation clearance and possible creation of tracks	Direct On-site Short-term Reversible Likely	Medium	Moderate	Moderate (6)	- Topsoil should be separately stockpiled to be re-spread when backfilling - Equipment must be in good condition to ensure that the oil spills do not contaminate the site, and - During drilling oil absorbent matting should be placed under and around the rig	Low (2)

RECEPTOR	DESCRIPTION OF ACTIVITY	DESCRIPTION OF IMPACT	EFFECT/DESCRIPTION OF MAGNITUDE	VALUE OF SENSITIVITY	MAGNITUDE OF CHANGE	SIGNIFICANCE OF IMPACT	IMPACT MANAGEMENT/CONTROL MEASURES	RESIDUAL IMPACT AFTER MITIGATION
Community	- Exploration activities can result in loss of farming area	- Loss of farming area	- Indirect - On-site - Short-term - Reversible - Likely	Medium	Moderate	Moderate (6)	- Farm should have access to all farm areas and shall be made available at all times, and - Where water holes and feeding areas exist, area will remain unaffected, and - Provision of new water holes if needed.	Low (2)
Terrestrial Ecology and biodiversity	- Exploration activities in non-sensitive environments - Drilling operations - Vegetation clearing - Hauling equipment - Vehicle movements	- Possible injury or death of animals - Poaching - Habitat fragmentation from clearing, pitting and trenching - Habitat loss from excessive Clearing	- Direct - Local - Short-term - Temporary/reversible - Certain	Medium	Low	Minor (2)	- Use existing tracks where possible - Route new tracks around established and protected trees, and clumps of vegetation - Identify rare, endangered, threatened and protected species and demarcate them and avoid cutting them down. - All workers on-site are to be notified avoid any excluded areas or species	Low (2)

RECEPTOR	DESCRIPTION OF ACTIVITY	DESCRIPTION OF IMPACT	EFFECT/DESCRIPTION OF MAGNITUDE	VALUE OF SENSITIVITY	MAGNITUDE OF CHANGE	SIGNIFICANCE OF IMPACT	IMPACT MANAGEMENT/CONTROL MEASURES	RESIDUAL IMPACT AFTER MITIGATION
							- Progressive rehabilitation during the exploration phase should be applied - Natural drainage patterns should be restored - Relocation of protected plant species if disturbance cannot be avoided.	
Community	- Dust creation due to drilling activities	- Impacts of public health and visibility - Impact on fauna and flora	Direct Local Temporary Reversible Likely	Low	Minor	Minor (3)	- Avoid off-road driving - Apply dust suppression methods- water sprinkling - Communication with farmers/landowners/neighbours - Drill rig selection/drill method will be selected depending on proximity to sensitive receptor.	Low (2)
Community and environment	- Noise generation through the use of airborne equipment	- Disruption to neighbour and nearby settlements	Direct Local Temporary	Low	Negligible	Low (2)	- No flying is to be conducted (aerial surveys) between dusk and dawn, on Sundays and on public holidays	Low (1)

RECEPTOR	DESCRIPTION OF ACTIVITY	DESCRIPTION OF IMPACT	EFFECT/DESCRIPTION OF MAGNITUDE	VALUE OF SENSITIVITY	MAGNITUDE OF CHANGE	SIGNIFICANCE OF IMPACT	IMPACT MANAGEMENT/CONTROL MEASURES	RESIDUAL IMPACT AFTER MITIGATION
	(remote sensing drone, helicopter)	- Disturbance of local wildlife - Increased noise levels to sensitive receptors	Reversible Likely				- When operating a drone, a minimum distance of 50m must be maintained for uninvolved persons and other objects such as vehicles, buildings etc. - Correspond with wildlife authorities to determine the best time to conduct aerial surveys, and - When possible avoid flying directly over human settlements.	
Neighbours /Landowners/ Tourists	- Visual impact from drill rigs, equipment on and laydown area on site	- Eyesore due to poor housekeeping - Change in landscape - Obscuring views	Direct Local Short-term Reversible Certain	Low	Minor	Minor (3)	- Make provision for visual barriers at exploration site, and - Maintain good housekeeping on site	Minor (3)

RECEPT OR	DESCRIPTION OF ACTIVITY	DESCRIPTION OF IMPACT	EFFECT/DESCRIPTION OF MAGNITUDE	VALUE OF SENSITIVITY	MAGNITUDE OF CHANGE	SIGNIFICANCE OF IMPACT	IMPACT MANAGEMENT/CONTROL MEASURES	RESIDUAL IMPACT AFTER MITIGATION
Topography and landscape	- Creation of new tracks and roads	- Environmental disturbance - Loss of flora and fauna - Disturbance of migratory animals in the area	Direct Local Short-term Reversible Likely	Medium	Moderate	Moderate (6)	- Make use of existing tracks if available - When developing a new track off an existing roadway ensure the junction is discreet but is also safe - Monitor the condition of the track before, during, and after use. - Do not needlessly remove vegetation from either side of the roadway.	Low (2)
Heritage	- Drilling can destroy heritage remains - Direct and indirect impacts to cultural resources	- Impact on view shed/landscape surrounding heritage features	Direct On site Long-term Irreversible Unlikely	High	Major	Major (9)	If discovery of unearthened archaeological remains to be uncovered, the following measures (chance find procedure) shall be applied: - Works to cease, area to be demarcated with appropriate tape by the site supervisor, and the Site Manager to be informed - Site Manager to visit the site and determine whether	Minor (4)

RECEPT OR	DESCRIPTION OF ACTIVITY	DESCRIPTION OF IMPACT	EFFECT/DESCRIPTION OF MAGNITUDE	VALUE OF SENSITIVITY	MAGNITUDE OF CHANGE	SIGNIFICANCE OF IMPACT	IMPACT MANAGEMENT/CONTROL MEASURES	RESIDUAL IMPACT AFTER MITIGATION
							work can proceed without damage to findings, mark exclusions boundary – If work cannot proceed without damage to findings, Site Manager is to inform the Environmental Manager who will get in touch with an archaeologist for advice – Archaeological specialist is to evaluate the significance of the remains and identify appropriate action, for example, record and remove; relocate or leave in situ (depending on the nature and value of the remains) – Inform the police if the remains are human, and – Obtain appropriate clearance or approval from the competent authority, if required, and recover and remove the remains to the National Museum or	

RECEPTOR	DESCRIPTION OF ACTIVITY	DESCRIPTION OF IMPACT	EFFECT/DESCRIPTION OF MAGNITUDE	VALUE OF SENSITIVITY	MAGNITUDE OF CHANGE	SIGNIFICANCE OF IMPACT	IMPACT MANAGEMENT/CONTROL MEASURES	RESIDUAL IMPACT AFTER MITIGATION
							National Forensic Laboratory as appropriate.	
Social Economic	Job creation due to exploration activities	- Employment creation and skills development - Opportunities during the exploration phase (Approx. 10-20 jobs)	Direct Regional Long-term Reversible Certain	Medium	Minor	Minor (4)	- Maximise local employment and local business opportunities to promote and improve the local economy - Enhance the use of local labour and local skills as far as reasonably possible. Where the required skills do not occur locally, and where appropriate and applicable, ensure that relevant local individuals are trained, and - Ensure that goods and services are sourced from the local and regional economy as far as reasonably possible	Low major beneficial
Community Environment	Generation of waste due to exploration activities	Nuisances (odours and visual), and	Direct On-site Short-term	Moderate	Low	Minor (3)	- Training and toolbox talk to workers shall be provided - Ensure good housekeeping across site - Implement the waste management hierarchy	Low (2)

RECEPT OR	DESCRIPTION OF ACTIVITY	DESCRIPTION OF IMPACT	EFFECT/DESCRIPTION OF MAGNITUDE	VALUE OF SENSITIVITY	MAGNITUDE OF CHANGE	SIGNIFICANCE OF IMPACT	IMPACT MANAGEMENT/CONTROL MEASURES	RESIDUAL IMPACT AFTER MITIGATION
		Litter (nuisance and ecological risk)	Reversible Likely				across the site: avoid, reuse, and recycle - Waste shall be collected and shall be removed on a regular basis to avoid bad odours - It is unlikely that hazardous material and wastes will be produced, however in the event that they do, they shall be managed in a safe and responsible manner so as to prevent contamination of soils, pollution of water and/or harm to people or animals as a result of the use of these materials, and - Hazardous and non-hazardous waste shall be stored separately at all times	

8.3 FURTHER CONSIDERATION: LANDSCAPE AND VISUAL AMENITY

Exploration and mining activities have the potential to disrupt visual amenity (loss of scenery) due to placement and installation of machinery/equipment and stockpiles, thereby obscuring the natural landscape of the site. This temporarily alters and affects the lifestyles and daily tasks of receptors (neighbours, farms, tourists). Such disturbances brought about by these activities are often short-term in nature and reversible. For the duration of the proposed project, communication with the affected parties and key stakeholders shall be maintained. In the event where the drill site is located in proximity to the receptors (neighbours, farms, tourists), measures will be taken to reduce the visual impacts.

Through the application of the EIA methodology presented in section 3.2 the conclusion of the assessment is that with additional mitigation, the significance of effect is expected to be minor. No additional studies are considered necessary to further assess this impact.

TABLE 11 – SUMMARY OF EFFECTS

ACTIVITY	RECEPTOR	IMPACT	NATURE OF IMPACT	VALUE & SENSITIVITY	MAGNITUDE OF CHANGE	SIGNIFICANCE OF IMPACT
Visual impact of drill rig, equipment and laydown areas on site	– Neighbours/ Landowners/ Tourists	Eyesore due to poor housekeeping Change in landscape Obscuring views	Direct Local/onsite Short-term Reversible Certain	Low	Minor	Minor Adverse

The following additional mitigation measures have been identified and shall be communicated to the proponent to ensure environmental effects are minimised as reasonably practicable.

- Drill equipment shall be suitably positioned such that the equipment is away from human receptors, maintenance of good housekeeping on site
- Barriers or fences shall be used if drilling occurs in locations that may affect residents
- Residents shall be provided at least two weeks' notice of drilling operations within 1km of their property, and
- Continual engagement with residents shall be undertaken with the proponent.

The potential impact therefore is not considered significant as it does not widely exceed recognised levels of acceptable change, does not threaten the integrity of the receptors, nor is it material to the decision making.

9 ENVIRONMENTAL MANAGEMENT PLAN

The EMP for the proposed project is presented in Appendix A. It provides management options to ensure the impacts of the proposed project are minimised. An EMP is a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures might be included if necessary. The management measures should be adhered to during all stages of the exploration activities. All persons involved and partaking in the proposed activities should be made aware of the measures outlined in the EMP to ensure activities are conducted in an environmentally sound manner.

The objectives of the EMP are:

- To include all components of the development and operations of the project
- To prescribe the best practicable control methods to lessen the environmental impacts associated with the project
- To monitor and audit the performance of operational personnel in applying such controls, and
- To ensure that appropriate environmental training is provided to responsible operational personnel.

10 CONCLUSION

The environmental assessment that was undertaken for the proposed project, followed ECC's EIA methodology to identify if there is potential for significant effects to occur as a result of the proposed project. Through the scoping process, the most significant effect identified is the disruption to visual amenity which is likely to affect the natural landscape of the site. All other social and environmental receptors were scoped out as requiring further assessment as it was unlikely that there would be significant effects. Through further analysis and identification of mitigation and management methods, the assessment concludes that the likely significance of effects on visual amenity is expected to be minor. Various best practice and mitigation measures have been identified to avoid and reduce effects as far as reasonably practicable, as well as to ensure the environment is protected and unforeseen effects are avoided.

On this basis, it is of the opinion of ECC that an environmental clearance certificate could be issued, on conditions that the management and mitigation measures specified in the EMP are implemented and adhered to.

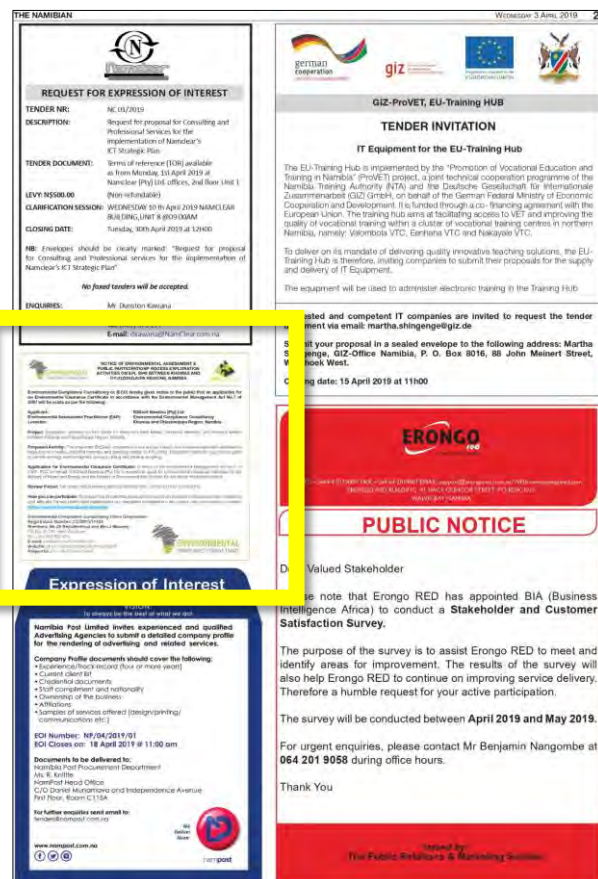
REFERENCES

- BDO Namibia. (2019). Retrieved from <https://www.bdo.com.na/en-gb/industries/natural-resources/mining-in-namibia>
- High Commission of the Republic of Namibia. (n.d.). Retrieved from <http://www.namibiahc.org.uk/economy.php>
- International Finance Corporation. (2012). *IFC Performance Standards on Environmental and Social Sustainability*. The World Bank.
- International Finance Corporation. (2017). *A Guide to Biodiversity for the Private Sector. The Social and Environmental Impact Assessment Process*.
- Iowa State University. (n.d.). Retrieved from https://mesonet.agron.iastate.edu/sites/windrose.phtml?network=NA__ASOS&station=FYWW
- Joint Venture Consultants (Namibia). (n.d). *Integrated Water Resources Management: Omaruru-Swakop River Basin*. Windhoek.
- Jurgens , N., Schmiedel , U., & Hoffman, T. M. (2010). Biodiversity in Southern Africa. In *Biodiversity in Southern Africa* (p. 232). Windhoek: Klaus Hess.
- Mendelshon, J., Jarvis, A., Roberts, C., & Robertson, T. (2002). *Atlas of Namibia; A Portrait of the Land and its People*. Cape Town: David Philip Publishers, South Africa.
- Ministry of Environment and Tourism, Ministry of Mines and Energy. (2018). *National Policy on the Prospecting and Mining in Protected Areas* . Windhoek: Ministry of Environment and Tourism, Ministry of Mines and Ener.
- Ministry of Mines and Energy. (2018, August). *Mineral Rights and Resources Development* . Retrieved from Ministry of Mines and Energy: <http://www.mme.gov.na/mines/mrrd/>
- (n.d.). *Namibia Labour Force Survey 2018*. Windhoek: Namibia Statistics Agency.
- Namibia Statistics Agency. (2011). *Namibia 2011 Population and housing census main report*. Windhoek.
- National Herbarium of Namibia (WIND). 2016. BRAHMS Database. National Herbarium of Namibia (WIND), National Botanical Research Institute, MAWF, Windhoek, Namibia.
- National Planning Commission . (2018). *STATUS OF THE NAMIBIAN ECONOMY* . Windhoek : National Planning Commission .
- Republic of Namibia. (2008). *The Government Gazette of the Republic of Namibia, Draft Procedures and Guidelines for Environmental Impact Assessment and Environmental Management*. Windhoek: Republic of Namibia,.

APPENDIX A- EMP

APPENDIX B - NON-TECHNICAL SUMMARY

APPENDIX C - EVIDENCE OF PUBLIC CONSULTATION



The following was advertised in the Informante on the 28th March and 4th April 2019.

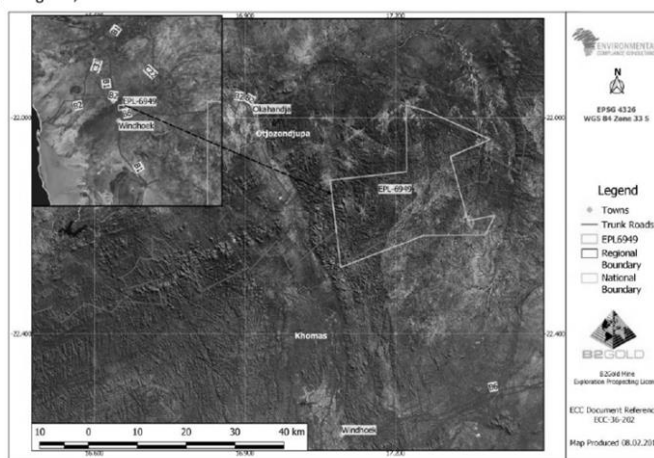


NOTICE OF ENVIRONMENTAL ASSESSMENT & PUBLIC PARTICIPATION PROCESS EXPLORATION ACTIVITIES ON EPL 6949 BETWEEN KHOMAS AND OTJOZONDJUPA REGIONS, NAMIBIA



Environmental Compliance Consultancy cc (ECC) hereby gives notice to the public that an application for an Environmental Clearance Certificate in accordance with the Environmental Management Act No.7 of 2007 will be made as per the following:

Applicant: B2Gold Namibia (Pty) Ltd
Environmental Assessment Practitioner (EAP): Environmental Compliance Consultancy
Location: Khomas and Otjozondjupa Region, Namibia
Project: Exploration activities on EPL 6949 for Base and Rare Metals, Industrial Minerals, and Precious Metals between Khomas and Otjozondjupa Regions, Namibia.



Proposed Activity: The proponent (B2Gold) proposes to carry out low impact, non-intrusive exploration activities for base and rare metals, industrial minerals, and precious metals on EPL 6949. Exploration methods may include aerial or remote sensing, electromagnetic surveys, drilling and mineral sampling.

Application for Environmental Clearance Certificate: In terms of the Environmental Management Act No.7 of 2007, ECC on behalf of B2Gold Namibia (Pty) Ltd is required to apply for Environmental Clearance Certificate to the Ministry of Mines and Energy and the Ministry of Environment and Tourism for the above mentioned project.

Review Period: The review and comment period is effective from: 28/03/2019 to 11/04/2019.

How you can participate: To ensure that all potential issues and concerns are included in the assessment, Interested and Affected Parties (I&APs) and stakeholders are requested to register for the project using the website provided: <https://eccenvironmental.com/projects/>

Environmental Compliance Consultancy Close Corporation
Registration Number: CC/2013/11404
Members: Mr JS Bezuidenhout and Mrs J Mooney
PO Box 91193, Klein Windhoek
Tel: +264 816 697 608
E-mail: info@eccenvironmental.com
Website: <https://eccenvironmental.com/projects/>
Project ID: ECC-36-202-ADT-05-B



APPENDIX D -ECC CVS



Hello! :)



ABOUT ME

Name
Jacobus Stephan Bezuidenhout
- But you can call me Stephan -

Born
11 April 1989

Phone
+264 81 262 7872

Email
stephan@eccenvironmental.com

Website
www.eccenvironmental.com

Contact me!

How to reach me!

kid.bezuidenhout 

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Stephan 
Bezuidenhout

Stephan Bezuidenhout

ENVIRONMENTAL ASSESSMENT PRACTITIONER



University of Pretoria
South Africa
2012

University of Stellenbosch
South Africa
2008

Additional Qualifications:

Education & Qualifications

Postgraduate Degree in Environmental Management & Analysis

Bachelors in Applied Science

- Snake Bite and Snake Handling
- Level 1 & 2 First Aid
- Industrial Environmental Compliance

N.S., et al., Some ecological side-effects of chemical and physical bush clearing in a southern African rangeland ecosystem, Southern African Journal of Botany (2015), <http://dx.doi.org/10.1016/j.sajb.2015.07.012>

The FSC National Forest Stewardship Standard of Namibia (Draft V 4). Co-authored by S Bezuidenhout, P Cunningham, A Ashby, F Detering, W Enslin & D Honsbein



Current

Experience & Work History

Managing Director

Since 2012, Stephan has been working as an environmental assessment practitioner. Stephan has a strong ecological background and has gained more than seven years experience in the environmental industry. As a lead practitioner, Stephan has successfully driven environmental impact assessments and compliance assessments within Southern Africa. His hands on and practical experience and knowledge of international standards, such as IFC and World Bank standards allows Stephan to advise his clients and teams constructively and effectively.

ENVIRONMENTAL CONSULTANT & PRACTITIONER

Stephan manages a dynamic team of environmental practitioners and graduates at Environmental Compliance Consultancy. The firms' core objective is to improve the national standard of environmental compliance by developing local capacity. To date Stephan and his team have successfully completed over 30 projects for various industries, including mining, energy, infrastructure, conservation and tourism.



ENVIRONMENTAL
COMPLIANCE CONSULTANCY

Stephan Bezuidenhout

Managing Director
+264 81 262 7872

References

Feel free to ask the boss :)

SALOME BEESLAAR

Environmental Practitioner
Pr.Sci.Nat: 400385/14

ESCA COETZEE

Environmental Scientist
Sasol Technology

PHIL BARKER

Pipeline Construction Superintendent
Worley Parsons

Or ask those who have worked for me?

Michael Moreland

Environmental Scientist
CSP Solar Energy Projects

Professional Associations

- South African Institute of Ecologists and Environmental Scientists (SAIE&ES)
- Environmental Assessment Practitioners Association of Namibia (EAPAN#172).
- Member of FSC Environmental Chamber
- Executive Committee Member of Namibian Chamber of Environment

Fun Facts:

- Keen fisherman
- Passionate Hunter & Conservationist
- 21ft vessel certified skipper
- Summated Kilimanjaro
- Have survived scorpion stings and snakebites!
- Did I mention I love camping?

Words I live by:

'Do what makes you happy
the rest will follow'

Experience & Work History

Over the past two years he has mentored over eight interns (of which most still work closely with him) building their careers in environmental management, conservation and rangeland management.

Examples of projects successfully completed include:

- **Abengoa Solar SA Paulputs CSP (Pty) Ltd. 150 MW CSP Tower** Environmental Assessment Practitioner during EIA Process
Northern Cape Province, South Africa
- **Abengoa Solar SA, Xina Solar One (200 MW) CSP Trough** Environmental Control Officer during construction phase. Northern Cape Province, South Africa
- **Abengoa Solar SA, Khi Solar One (50 MW) CSP Tower.** Environmental Control Officer during commissioning and rehabilitation phases. Northern Cape Province, South Africa for Abengoa Solar
- **Isondlo Project Support (IPS) (Pty) Ltd.** Soil Remediation and commissioning report of NGALA Camp. Gauteng, South Africa
- **Berekisanang Empowerment Farm.** Annual external Water Use Licence audit and 70 hectare agricultural development. Northern Cape, South Africa.

Environmental Coordinator

ROMPCO PIPELINE – Worley Parsons
Mozambique and South Africa

Stephan was employed by the Procurement, Management and Construction (PMC) consultant, Worley Parsons to manage the environmental aspects of the proposed linear development. Stephan managed a team of 12 positions for the duration of the project ensuring compliance of National and best practice such as IFC standards.



Jessica Mooney

Environment & Safety Specialist

Hello! :)



ABOUT ME

Name

Jessica Mooney

Born

24 October 1984

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m

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Contact me!

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+264 81 653 1214



Jessica Mooney



Education & Qualifications

Federation University
Australia
2003-2006

Bachelor of Applied Science -Environmental Management

Additional Qualifications

Management Systems Leadership
ICAM - Incident Cause Analysis Method
Certificate II in Metalliferous Mining core safety and risk management
Certificate III in Mine Emergency Response & Rescue
Level 3 – HLTFA402B Apply Advanced first Aid
Emergency Rope Rescue
Level 2 - 21593VIC First Aid level 2
Bonded Asbestos Removal >10m2
Leading and Managing People –
Brisbane North Institute of TAFE



Current

Experience & Work History

Environment and Safety Specialist

Environmental Compliance Consultancy
Providing professional consulting services to clients in Namibia with particular focus on approvals, ECCs, reporting and compliance.

- ECC Approvals
- Mine Closure Plans
- Rehabilitation
- Pipeline projects
- Cultural Change programmes
- IMS (ISO14001 and 18001)

Group HSE Manager

Weatherly Mining Namibia
An exciting role covering the breadth of two operational underground mines (Otjiase and Matchless) and the construction of a new open pit mine (Tschudi) working for Weatherly Mining in Namibia, Africa.

- Managed company's SHEQ portfolio
- Full scale construction of new greenfield mine into operational copper mine
- Reduced LTIFR by 90% from 23.1 to 2.4 in 22 months!
- Implemented integrated management system
- Approvals, ECC renewals and EMPs
- Established the first mining environmental forums in Namibia
- Implemented SAFE COPPER cultural change programme



Jessica Mooney

Environment & Safety Specialist

References

Feel free to ask the boss :)

MR CRAIG THOMAS

Managing Director
Weatherly Mining

MR COLIN BULLEN

Managing Director
Imerys (client)

Group Manager Lihir Gold

MR NICK CURREY

Director at Sustainable Mining Strategies

Or ask those who have worked for me?

Ms Asteria Salmon

Worked as Control Room Operator
WMN

Mr. Hermanus Lamprecht

Paramedic Safety Officer

Professional Associations

- Chamber of Mines Namibia
- Women on Boards
- The Chamber of Minerals and Energy of Western Australia Industry Member – Mining, Minerals and Resources

Fun Facts:

- I can deadlift 135kg
- To keep fit I Olympic weight lift
- I run ultra Marathons & the longest run yet the fish river Canyon 65km
- I am one of 6 children - do you think that means 4 of us suffer middle child syndrome?

Words I live by:

'The journey will bring you
happiest, not the
destination'



Experience & Work History

Environmental Consultant

Ensolve Pty Ltd - Australia

In February 2013 an opportunity came about to launch my own business, Blue Wren Environmental Services.

During this time I have worked alongside Ensolve Pty Ltd to deliver several environmental projects including:

- A mine closure project taking an operating mine site into the rehabilitation and closure phase. This project involved the full development of a mine closure plan, facilitation of the government approvals, stakeholder engagement and technical environmental studies to inform the mine closure plan
- Sustainability reporting in accordance with the Global Reporting Initiative
- Rehabilitation of historic exploration sites and obtaining associated government approvals for relinquishment of bonds.

Site Environmental Manager

Panoramic Resources – Australia

- Brought the site into full compliance with the Environmental Licence within 1 year.
- Managed projects relating to the expansions of the current mine tailings dams including obtaining approvals under the Mining Act 1978 and Environmental Protection Act 1986.
- Managed the environmental and community aspects of three operations; Savannah Nickel Mine, Copernicus Nickel Mine (currently in care and maintenance) and the operations at Wyndham Port
- Responsible for the environment, sustainability and social reporting portfolio
- Developed productive working relationships with local government environmental agencies and non-government agencies, which assisted with the approvals process.
- Developed strategies for the recruitment and retention of local Indigenous personnel

Environmental Systems Coordinator

Lihir Gold Limited – Australia

Working on site to provide technical environmental and community advice to ensure all regulatory and licence obligations were met or exceeded

- Regulatory Approvals (State and Federal Government)
- Environment and social aspects of the international cyanide management code
- Operational budgeting and bond management for mine closure
- Compliance with the legislative framework
- Community engagement



Emerita Lyapaka Ashipala Environmental Graduate

Hello! :)



ABOUT ME

Name

Emerita Lyapaka Ashipala

Born

15 February 1994

Phone

+264 81 701 6851

Email

emerita@eccenvironmental.co
m

Website

www.eccenvironmental.com



Education & Qualifications

Glasgow Caledonian
University, UK
2017 - 2018

*Master's Degree in Environmental Management (Oil
& Gas) (Distinction)*

University of Namibia
2013 -2016

Bachelors in Environmental Biology



Experience & Work History

Environmental Graduate

Current

Working with Environmental Compliance Consultancy
Providing professional consulting services to clients in
Namibia with particular focus on:

- Drafting EIA adverts and NTS documents
- Assisting in the development of scoping reports and
- Environmental Management Plans for exploration projects

Intern

Community-Based Natural Resource Management
(CBNRM) Project, GIZ Namibia

Roles and Responsibilities:

- Managed a high-volume workload within a deadline-driven environment.
- Responsible for weekly press review.
- Compilation and analyses of data collected from field for baseline study of projects.
- Assists in project management activities.
- Ensure work ethics is compliant with approved codes and standards.
- Even/workshop assistance planner.
- Engaged in clients and stakeholders' meetings.
- Provides overall project management support throughout the entire life cycle of projects.

Team Leader (Ad hoc Registration Official)

Electoral Commission of Namibia

Roles and Responsibilities:

- Kit operator
- Printing of registration cards
- Responsible for keeping order and safe guarding of all equipment

**ENVIRONMENTAL**
COMPLIANCE CONSULTANCY

Emerita Lyapaka Ashipala

Environmental Graduate

References

Feel free to ask the boss :)

JESSICA MOONEY
Environment & Safety Specialist

STEPHAN BEZUIDENHOUT
Managing Director

Or ask those who have worked with me?

Prof Jim Baird
Programme Leader
Glasgow Caledonian University
j.baird@gcu.ac.uk

Fun Facts:

- *I am an adventurous*
- *Passionate on learning more about Oil and Gas*

Words I live by:

"Be willing to go all out, in pursuit of your dream. Ultimately it will pay off. You are more powerful than you think you are."



Experience & Work History

Undergraduate Internship

South African Science Of Climate Change and Adaptive Land Management (SASCCAL), Namibia
Role and Responsibilities:

- Compilation of news in all regions, for newsletter publication
- Using qGIS to digitise map drawings
- Organising various task research portfolios

APPENDIX E - LIST OF PLANT SPECIES ON EPL 6964

SPECIES	PLANTDESC	MAJORARE	MINORAREA
<i>Abutilon rehmannii</i> Baker f.	Shrub 1 m high. Few upright ster	Khomas	Windhoek District
<i>Acacia karroo</i> Hayne	Single-stemmed tree, 6 m high.	Khomas	Windhoek District
<i>Acacia reficiens</i> Wawra subsp. <i>reficiens</i>	Perennial tree, 4-7 m high. Stem	Khomas	Windhoek District
<i>Acalypha segetalis</i> Müll.Arg.	Annual herbs up to 30 cm high.	Khomas	Windhoek District
<i>Achyranthes aspera</i> L. var. <i>sicula</i> L.	Herb; Notes: Savanna. Hill slope.	Khomas	Windhoek District
<i>Aeollanthus buchnerianus</i> Briq.	Perennial herb with swollen base	Khomas	Windhoek District
<i>Agrostis lachnantha</i> Nees var. <i>lachnantha</i>	Perennial grass 45 cm high.	Khomas	Windhoek District
<i>Aizoon asbestinum</i> Schltr.	Perennial herb. Woody base. Flo	Khomas	Windhoek District
<i>Aizoon virgatum</i> Welw. ex Oliv.		Khomas	Windhoek District
<i>Albuca setosa</i> Jacq.	Bulb up to 3.5 cm in diameter, pi	Khomas	Windhoek District
<i>Amaranthus thunbergii</i> Moq.	Shrub 0.40 m high.	Khomas	Windhoek District
<i>Androcymbium melanthioides</i> Willd. subsp. <i>melanthioides</i>	Lily.	Khomas	Windhoek District
<i>Anthephora pubescens</i> Nees	Graminoid.	Khomas	Windhoek District
<i>Anthospermum rigidum</i> Eckl. & Zeyh. subsp. <i>pumilum</i> (Sond.) Puff	Small dense perennial.	Khomas	Windhoek District
<i>Aponogeton desertorum</i> Zeyh. ex A.Spreng.	Hydrophyte. Leaves floating. Flo	Khomas	Windhoek District
<i>Aptosimum albomarginatum</i> Marloth & Engl.	Shrublet, about 15 cm high. Blue	Khomas	Windhoek District
<i>Aptosimum arenarium</i> Engl.		Khomas	Windhoek District
<i>Aptosimum lineare</i> Marloth & Engl.		Khomas	Windhoek District
<i>Aptosimum lineare</i> Marloth & Engl. var. <i>lineare</i>		Khomas	Windhoek District
<i>Aptosimum spinescens</i> (Thunb.) F.E.Weber	Shrublet 15 cm high. Pale blue fl	Khomas	Windhoek District
<i>Arctotis venusta</i> Norl.	Annual herb.	Khomas	Windhoek District
<i>Aristida adscensionis</i> L.	Annual grass.	Khomas	Windhoek District
<i>Aristida congesta</i> Roem. & Schult. subsp. <i>congesta</i>	Annual grass.	Khomas	Windhoek District

<i>Indigofera cryptantha</i> Benth. ex Harv. var. <i>occidentalis</i> Baker f.	Herb 30 cm high stout. Flowers	Khomas	Windhoek District
<i>Ipomoea oenotherae</i> (Vatke) Hallier f. var. <i>oenotherae</i>	Leaves more or less rosette-like	Khomas	Windhoek District
<i>Ipomoea oenotheroides</i> (L.f.) Raf. ex Hallier f.	Erect, perennial shrub up to 0.9 m	Khomas	Windhoek District
<i>Kalanchoe brachyloba</i> Welw. ex Britten		Khomas	Windhoek District
<i>Kalanchoe lanceolata</i> (Forssk.) Pers.	Succulent annual or short living	Khomas	Windhoek District
<i>Kohautia caespitosa</i> Schnizl. subsp. <i>brachyloba</i> (Sond.) D.Mantell		Khomas	Windhoek District
<i>Kohautia cynanchica</i> DC.	Small herb. Flowers brownish	ou Khomas	Windhoek District
<i>Kyllinga alba</i> Nees		Khomas	Windhoek District
<i>Lantana rugosa</i> Thunb.	Perennial shrub. Flowers light purple	Khomas	Windhoek District
<i>Lapeirousia coerulea</i> Schinz	Bulbous plant. Flowers pale blue	Khomas	Windhoek District
<i>Ledebouria luteola</i> Jessop		Khomas	Windhoek District
<i>Leonotis ocymifolia</i> (Burm.f.) Iwarsson var. <i>schinzii</i> (Gürke) Iwarsson	Annual, erect herb up to 1.2 m high	Khomas	Windhoek District
<i>Leptochloa fusca</i> (L.) Kunth	Tufted perennial grass.	Khomas	Windhoek District
<i>Leucosphaera bainesii</i> (Hook.f.) Gilg	Small dense woody shrublets with	Khomas	Windhoek District
<i>Limeum dinteri</i> G.Schellenb.	Perennial herb. Woody base.	Khomas	Windhoek District
<i>Limeum fenestratum</i> (Fenzl) Heimerl var. <i>exalatum</i> Friedrich	Flowers white, 40 cm high.	Khomas	Windhoek District
<i>Limeum myosotis</i> H.Walter var. <i>myosotis</i>	Viscous annual herb.	Khomas	Windhoek District
<i>Limosella grandiflora</i> Benth.	Prostrate on soil, forming cushion	Khomas	Windhoek District
<i>Listia heterophylla</i> E.Mey.	Prostrate herb, rooting at nodes,	Khomas	Windhoek District
<i>Lobelia thermalis</i> Thunb.	Perennial prostrate herbs with	leaves Khomas	Windhoek District
<i>Lycium keenii</i> S.Moore	Perennial several stemmed	untidy Khomas	Windhoek District
<i>Lycium villosum</i> Schinz	Perennial, untidy shrub, 65 cm high	Khomas	Windhoek District

Gladiolus permeabilis D.Delaroche subsp. edulis (Burch. ex Ker Gawl.) Oberm.		Khomas	Windhoek District
Gnaphalium filagopsis Hilliard & B.L.Burt	Herb, at least biennial, creeping,	Khomas	Windhoek District
Gnidia polycephala (C.A.Mey.) Gilg	Broom-like dwarf shrub up to 45	Khomas	Windhoek District
Gomphocarpus fruticosus (L.) W.T.Aiton subsp. fruticosus		Khomas	Windhoek District
Gomphostigma virgatum (L.f.) Baill.	Perennial herbs 0.60 m high. Flo	Khomas	Windhoek District
Grewia flava DC.	Shrub.	Khomas	Windhoek District
Gymnosporia linearis (L.f.) Loes. sub	Perennial shrub, 2 m high with a	Khomas	Windhoek District
Helichrysum herniarioides DC.	Spreading, ascending herb. Bract	Khomas	Windhoek District
Helichrysum zeyheri Less.		Khomas	Windhoek District
Hermannia abrotanoides Schrad.		Khomas	Windhoek District
Hermannia affinis K.Schum.	Small shrublet.	Khomas	Windhoek District
Hermannia glandulosissima Engl.	Herb.	Khomas	Windhoek District
Hermannia modesta (Ehrenb.) Mast.	Perennial shrublet 15 cm high. Fl	Khomas	Windhoek District
Hermannia quartiniana A.Rich.	Prostrate herb. Flowers pendulo	Khomas	Windhoek District
Hermbstaedtia odorata (Burch.) T.Cooke var. odorata	Erect annual up to 0.80 m high. S	Khomas	Windhoek District
Heteromorpha papillosa C.C.Towns.		Khomas	Windhoek District
Heteropogon contortus (L.) Roem. & Schult.	Perennial grass, 80 cm high.	Khomas	Windhoek District
Hibiscus fleckii Gürke	Biennial herb, 50 cm high. Leave	Khomas	Windhoek District
Hibiscus pusillus Thunb.	Herb in shade of Acacia detinens	Khomas	Windhoek District
Hirpicium gazanioides (Harv.) Roessler	Erect herb.	Khomas	Windhoek District
Hypertelis bowkeriana Sond.		Khomas	Windhoek District
Indigastrum costatum (Guill. & Perr.) Schrire subsp. macrum (E.Mey.) Schrire	Slender, erect, annual herb. Flow	Khomas	Windhoek District
Indigofera alternans DC. var. alternans	Prostrate herb.	Khomas	Windhoek District

<i>Eriocephalus luederitzianus</i> O.Hoffm.	Loosely branched shrub, up to 4	Windhoek District
<i>Eriospermum bakerianum</i> Schinz subsp. <i>bakerianum</i>	Geophyte. Bulbous monocot. Flc	Windhoek District
<i>Eriospermum roseum</i> Schinz	Geophyte. Bulbous monocot. Flc	Windhoek District
<i>Erythrina decora</i> Harms	Khomas	Windhoek District
<i>Euphorbia spartaria</i> N.E.Br.	Shrublet about 0.90 m high. Milk	Windhoek District
<i>Felicia clavipilosa</i> Grau subsp. <i>clavipilosa</i>	Perennial, from underground shoot. Erect, somewhat woody at base, up to 30 cm high. Leaves 35: 4-5 mm, thinly appressed, white pubescent. Hairs towards tip erect, with few or no pubescence. Ray florets intensive purple.	Windhoek District
<i>Ferraria glutinosa</i> (Baker) Rendle	Tuber flat, hard, dark brown, 2.5	Windhoek District
<i>Fingerhuthia africana</i> Lehm.	Perennial grass 60 cm high.	Windhoek District
<i>Fockea angustifolia</i> K.Schum.	Herb 20 cm high. Flower cordla	Windhoek District
<i>Galeomma stenolepis</i> (S.Moore) Hilliard	Small, dense, cushion-like. Capit	Windhoek District
<i>Geigeria ornativa</i> O.Hoffm.	Perennial herb. Leaves yellow. Si	Windhoek District
<i>Geigeria pectidea</i> (DC.) Harv.	Dwarf shrub 50 cm high. Flowers	Windhoek District
<i>Geigeria plumosa</i> Muschl.	Upright squarrose herb, up to 45	Windhoek District
<i>Gisekia africana</i> (Lour.) Kuntze var. <i>africana</i>	Fleshy. Prostrate annual. Flower:	Windhoek District

<i>Dombeya rotundifolia</i> (Hochst.) Planch. var. rotundifolia	Many-stemmed shrubs, 2.5 m hi	Khomas	Windhoek District
<i>Drimia sanguinea</i> (Schinz) Jessop	Geophyte. Flat, red bulb. Many c	Otjozondju	Grootfontein District
<i>Echinochloa holubii</i> (Stapf) Stapf	Hygrophyllus grass. Forming larg	Khomas	Windhoek District
<i>Eleocharis limosa</i> (Schrad.) Schult.	Hydrophyte. Froming tufts.	Khomas	Windhoek District
<i>Elephantorrhiza elephantina</i> (Burch.) Skeels		Khomas	Windhoek District
<i>Elionurus muticus</i> (Spreng.) Kuntze		Khomas	Windhoek District
<i>Enneapogon cenchroides</i> (Licht. ex Roem. & Schult.) C.E.Hubb.	Grass.	Khomas	Windhoek District
<i>Enneapogon desvauxii</i> P.Beauv.	Annual grass, 15 cm high.	Khomas	Windhoek District
<i>Eragrostis biflora</i> Hack. ex Schinz	Annual slender grass, 15 cm high	Khomas	Windhoek District
<i>Eragrostis cilianensis</i> (All.) Vignolo ex Janch.	Annual grass. Forming tufts.	Khomas	Windhoek District
<i>Eragrostis echinochloidea</i> Stapf	Perennial subclimax grass, 55 cm	Khomas	Windhoek District
<i>Eragrostis glandulosipedata</i> De Winter	Annual grass 50 cm high.	Khomas	Windhoek District
<i>Eragrostis leersiiformis</i> Launert	Soft annual grass.	Khomas	Windhoek District
<i>Eragrostis lehmanniana</i> Nees var. lehmanniana	Perennial grass 60 cm high.	Khomas	Windhoek District
<i>Eragrostis nindensis</i> Ficalho & Hiern	Grass. Forming small tufts.	Khomas	Windhoek District
<i>Eragrostis pilgeriana</i> Dinter ex Pilg.	Annual grass.	Khomas	Windhoek District
<i>Eragrostis porosa</i> Nees	Annual grass with hairy sheaths.	Khomas	Windhoek District
<i>Eragrostis rigidior</i> Pilg.	Grass.	Khomas	Windhoek District
<i>Eragrostis rotifer</i> Rendle	Perennial grass forming loose tu	Khomas	Windhoek District
<i>Eragrostis scopelophila</i> Pilg.	Grass.	Khomas	Windhoek District
<i>Eragrostis superba</i> Peyr.	Grass.	Khomas	Windhoek District
<i>Eragrostis trichophora</i> Coss. & Durieu	Densely tufted grass.	Khomas	Windhoek District
<i>Eragrostis truncata</i> Hack.	Small dense tufts of grass.	Khomas	Windhoek District

Commelina africana L. var. barberae (C.B.Clarke) C.B.Clarke	Herb 0.15 m high. Flowers yellow	Khomas	Windhoek District
Commelina africana L. var. krebsiana (Kunth) C.B.Clarke		Khomas	Windhoek District
Commelina livingstonii C.B.Clarke		Khomas	Windhoek District
Convolvulus sagittatus Thunb.	Creeper. Flowers light blue.	Khomas	Windhoek District
Corallocarpus welwitschii (Naudin) Hook.f. ex Welw.	Clusters of conical fruit with cap	Khomas	Windhoek District
Crassula tabularis Dinter	Annual or biennial herbs, 5-10 cm	Khomas	Windhoek District
Crotalaria dinteri Schinz	Annual herb.	Khomas	Windhoek District
Cucumis africanus L.f.		Khomas	Windhoek District
Cucumis meeusei C.Jeffrey	Prostrate. Flowers yellow.	Khomas	Windhoek District
Cullen obtusifolia (DC.) C.H.Stirt.	Herb.	Khomas	Windhoek District
Cymbopogon caesius (Hook. & Arn.) Stapf	Perennial grass, up to 1 m high.	Khomas	Windhoek District
Cymbopogon pospischilii (K.Schum.) C.E.Hubb.	Dense tufts with fine leaves.	Khomas	Windhoek District
Cyperus fulgens C.B.Clarke var. contractus Kük.	Flowers purple.	Khomas	Windhoek District
Cyperus marginatus Thunb.	Tufted perennial.	Khomas	Windhoek District
Datura ferox L.	Annual or perennial herb, 25 cm	Khomas	Windhoek District
Denekia capensis Thunb.	Annual, prostrate, spreading, up to	Khomas	Windhoek District
Deverra denudata (Viv.) Pfisterer & Podlech subsp. aphylla (Cham. & Schltdl.) Pfisterer & Podlech		Khomas	Windhoek District
Diandrochloa pusilla (Hack.) De Winter	Soft annual grass.	Khomas	Windhoek District
Dicoma dinteri S.Moore	Spherical shrub up to 35 cm high	Khomas	Windhoek District
Dicoma macrocephala DC.	Biennial herb. Inflorescence a spike	Khomas	Windhoek District
Dipcadi bakerianum Bolus	Geophyte. Bulbous monocot.	Khomas	Windhoek District

Aristida meridionalis Henrard	Annual grass.	Khomas	Windhoek District
Artemisia afra Jacq. ex Willd.		Khomas	Windhoek
Asparagus exuvialis Burch. forma exuvialis	Perennial shrub, 0.50 m high, crc	Khomas	Windhoek District
Asparagus laricinus Burch.	Large many stemmed clumps ab	Khomas	Windhoek
Babiana hypogea Burch. var. ensifolia			
G.J.Lewis	Herb. Deep underground bulb. F	Khomas	Windhoek District
Babiana hypogea Burch. var. hypogea	Flowers blue just above ground I	Khomas	Windhoek District
Barleria rigida Nees	Shrublet 15 cm high.	Khomas	Windhoek District
Blepharis integrifolia (L.f.) E.Mey. ex Schinz			
var. integrifolia		Khomas	Windhoek District
Brachiaria nigropedata (Ficalho & Hiern)			
Stapf	Perennial grass forming big tufts	Khomas	Windhoek District
Bromus catharticus Vahl	Grass.	Khomas	Windhoek District
Catophractes alexandri D.Don		Khomas	Windhoek District
Cenchrus ciliaris L.	Grass.	Khomas	Windhoek District
Chamaecrista biensis (Steyaert) Lock		Khomas	Windhoek District
Chascanum pinnatifidum (L.f.) E.Mey. var. pinnatifidum		Khomas	Windhoek District
Cheilanthes parviloba (Sw.) Sw.	Fern, 0.40 m high.	Khomas	Windhoek District
Chloris virgata Sw.	Grass.	Khomas	Windhoek District
Chlorophytum calyptrocarpum (Baker) Kativu	Sedge. Leaves numerous, grass-l	Khomas	Windhoek
Chlorophytum krauseanum (Dinter) Kativu	Root stiff, wine-like. Base surrou	Khomas	Windhoek District
Cineraria vallis-pacis Dinter ex Merxm.	Erect herb 0.6-0.9 m high. Heads	Khomas	Windhoek District
Cleome gynandra L.	Herb.	Khomas	Windhoek District
Cleome rubella Burch.	Annual herb.	Khomas	Windhoek District
Coccinia rehmannii Cogn.	Climber with tendrils.	Khomas	Windhoek District
Coccinia sessilifolia (Sond.) Cogn.		Khomas	Windhoek District

Manulea conferta Pilg.		Khomas	Windhoek District
Manulea dubia (Skan) Overkott ex Roessler	Semi-prostrate herb, with strong	Khomas	Windhoek District
Marsilea farinosa Launert subsp. arrecta J.E.Burrows		Khomas	Windhoek District
Melanospermum foliosum (Benth.) Hilliard	Annual herb 0.03 m high. Someti	Khomas	Windhoek District
Melianthus comosus Vahl		Khomas	Windhoek
Melinis repens (Willd.) Zizka subsp. grandiflora (Hochst.) Zizka	Annual grass, 50 cm high.	Khomas	Windhoek District
Melinis repens (Willd.) Zizka subsp. repens	Perennial grass, 50 cm high. Inflc	Khomas	Windhoek District
Melolobium microphyllum (L.f.) Eckl. & Zeyh.	Shrub 30 cm high, 45 cm in diam	Khomas	Windhoek District
Microchloa caffra Nees	Perennial grass with long sickle-l	Khomas	Windhoek District
Microchloa kunthii Desv.	Small inconspicuous tough tufts	Khomas	Windhoek District
Mimulus gracilis R.Br.	Small annual herb.	Khomas	Windhoek District
Momordica balsamina L.	Pear-shaped fruit.	Khomas	Windhoek District
Monandrus squarrosus (L.) vorster s	Annual herb, 0.10 m high.	Khomas	Windhoek District
Monechma divaricatum (Nees) C.B.Clarke	Shrublet 0.15 m high.	Khomas	Windhoek District
Monelytrum luederitzianum Hack.	Grass.	Khomas	Windhoek District
Monsonia angustifolia E.Mey. ex A.Rich.	Annual herb.	Khomas	Windhoek District
Monsonia glauca R.Knuth	Annual herb, 25 cm high. Flower	Khomas	Windhoek District
Moraea pallida (Baker) Goldblatt	Tubers with grey-brown net-like	Khomas	Windhoek District
Moraea polystachya (Thunb.) Ker Gawl.		Khomas	Windhoek District
Nerine laticoma (Ker Gawl.) T.Durand & Schinz	Bulbous plant.	Khomas	Windhoek District
Nidorella resedifolia DC. subsp. resedifolia		Khomas	Windhoek District
Ocimum americanum L. var. americanum	Herb 15 cm high. Flowers blue. S	Khomas	Windhoek District

<i>Urochloa panicoides</i> P.Beauv.	Graminoid. Tufted annual.	Khomas	Windhoek District
<i>Vernonia fastigiata</i> Oliv. & Hiern	A herb with blue radial heads. Strongly perennial scrambler/climber, 15 cm high. Stems many, straight, thin, growing along ground. Flowers mauve, sweet-pea shape and size, clustered. Fruit dehiscent, elongated pods, 7 cm long, clustered.	Khomas	Windhoek District
<i>Vigna frutescens</i> A.Rich. subsp. <i>frutescens</i> var. <i>buchneri</i> (Harms) Verdc.		Khomas	Windhoek District
<i>Wahlenbergia annularis</i> A.DC.	Leaves rosette-like. Inflorescence	Khomas	Windhoek
<i>Wahlenbergia denticulata</i> (Burch.) A.DC. var. <i>denticulata</i>	Decumbent-ascending, up to 20	Khomas	Windhoek
<i>Wahlenbergia undulata</i> (L.f.) A.DC.	Perennial herb 35 cm high. Flow	Khomas	Windhoek District
<i>Walafrida saxatilis</i> (E.Mey.) Rolfe	Small, erect, herb. Flowers white	Khomas	Windhoek District
<i>Walleria nutans</i> J.Kirk		Khomas	Windhoek District
<i>Withania somnifera</i> (L.) Dunal		Khomas	Windhoek District
<i>Xerophyta humilis</i> (Baker) T.Durand & Schinz		Khomas	Windhoek District
<i>Xerophyta viscosa</i> Baker	Flowers mauve. Leaves coarse to	Khomas	Windhoek District
<i>Zygophyllum pubescens</i> Schinz		Khomas	Windhoek District

<i>Pteronia cylindracea</i> DC.	Shrublet 0.30 m high. The heads	Khomas	Windhoek District
<i>Rhus marlothii</i> Engl.	Perennial shrub, about 2 - 2.5 m	Khomas	Windhoek District
<i>Rhynchosia fleckii</i> Schinz	Annual herb, 5 cm high. Flower y	Khomas	Windhoek District
<i>Salvia stenophylla</i> Burch. ex Benth.		Khomas	Windhoek District
<i>Schmidtia pappophoroides</i> Steud.	Perennial grass, 45 cm high.	Khomas	Windhoek District
<i>Selago dinteri</i> Rolfe subsp. <i>dinteri</i>	Shrublet 0.30 m high. Flowers wl	Khomas	Windhoek District
<i>Senna italica</i> Mill. subsp. <i>arachoides</i> (Burch.) Lock		Khomas	Windhoek District
<i>Sesamum schenckii</i> Asch.	Erect herb, 0.84 m high. Flowers	Khomas	Windhoek District
<i>Setaria pumila</i> (Poir.) Roem. & Schult.	Annual grass.	Khomas	Windhoek District
<i>Solanum dinteri</i> Bitter		Khomas	Windhoek District
<i>Sporobolus acinifolius</i> Stapf	Grass.	Khomas	Windhoek District
<i>Stachys spathulata</i> Burch. ex Benth.	Felty shrub, up to 30 cm tall. Flo	Khomas	Windhoek District
<i>Stipagrostis namaquensis</i> (Nees) De Winter	Grass.	Khomas	Windhoek District
<i>Stipagrostis uniplumis</i> (Licht.) De Winter var. <i>uniplumis</i>	Perennial grass, 80 cm high.	Khomas	Windhoek District
<i>Striga bilabiata</i> (Thunb.) Kuntze subsp. <i>bilabiata</i>	Annual herb, 25 cm high. Flower	Khomas	Windhoek District
<i>Tagetes minuta</i> L.	Prostrate herb, 80 cm high. Flow	Khomas	Windhoek District
<i>Tapinanthus oleifolius</i> (J.C.Wendl.) Danser	Semiparasite on <i>Acacia hereroer</i>	Khomas	Windhoek District
<i>Tarchonanthus camphoratus</i> L.		Khomas	Windhoek District
<i>Tephrosia rhodesica</i> Baker f. var. <i>rhodesica</i>	Small herb. Flower purpish.	Khomas	Windhoek District
<i>Tetradenia riparia</i> (Hochst.) Codd	Perennial herb, 1.2 m high. Aron	Khomas	Windhoek District
<i>Themeda triandra</i> Forssk.	Perennial grass 60 cm high, form	Khomas	Windhoek District
<i>Tragus racemosus</i> (L.) All.	Small annual grass.	Khomas	Windhoek District
<i>Trichoneura grandiglumis</i> (Nees) Ekman	Annual grass.	Khomas	Windhoek District
<i>Urochloa brachyura</i> (Hack.) Stapf	Graminoid; Notes: In waterway.	Khomas	Windhoek District
<i>Urochloa oligotricha</i> (Fig. & De Not.) Henrard	Perennial, spreading, large tufte	Khomas	Windhoek District

<i>Oenothera rosea</i> L' Hér. ex Aiton	Annual, basally woody, up to 25	Khomas	Windhoek District
<i>Orbea lutea</i> (N.E.Br.) Bruyns subsp. <i>vaga</i> (N.E.Br.) Bruyns	Many stems, 4-angled, up to 1m	Khomas	Windhoek District
<i>Ornithogalum stapfii</i> Schinz	Bulbous monocot. Flowers white	Khomas	Windhoek District
<i>Osteospermum scariosum</i> DC. var. <i>integrifolium</i> (Harv.) Norl.		Khomas	Windhoek District
<i>Otoptera burchellii</i> DC.	Strongly perennial scrambler, 10	Khomas	Windhoek District
<i>Oxalis purpurascens</i> T.M.Salter	Flowers purple.	Khomas	Windhoek District
<i>Oxygonum sinuatum</i> (Hochst. & Steud. ex Meisn.) Dammer	Annual weed.	Khomas	Windhoek District
<i>Panicum arbusculum</i> Mez	Perennial herb, 60 cm high.	Khomas	Windhoek District
<i>Panicum lanipes</i> Mez	Grass.	Khomas	Windhoek District
<i>Panicum stapfianum</i> Fourc.	Perennial, tufted grass 60 cm high	Khomas	Windhoek District
<i>Pavonia burchellii</i> (DC.) R.A.Dyer	Shrub forming the undergrowth	Khomas	Windhoek District
<i>Peliostomum leucorrhizum</i> E.Mey. ex Benth.	Small perennial herb. Flowers m	Khomas	Windhoek District
<i>Peristrophe hereroensis</i> (Schinz) K.Balkwill		Khomas	Windhoek District
<i>Persicaria hystricula</i> (J.Schust.) Soják	Plants procumbent, lower nodes	Khomas	Windhoek District
<i>Persicaria lapathifolia</i> (L.) Gray	Annual herbs up to 60 cm high.	Khomas	Windhoek District
<i>Plectranthus dinteri</i> Briq.	Perennial herbs, much-branched	Khomas	Windhoek District
<i>Portulaca kermesina</i> N.E.Br.	Fleshy herb. Flowers pale red.	Khomas	Windhoek District
<i>Portulaca wightiana</i> Wall. ex Wall. & Arn.		Khomas	Windhoek District
<i>Pseudogaltonia clavata</i> (Mast.) E.Phillips	Geophyte 50 cm high. Very big w	Khomas	Windhoek District