

Reconnaissance Energy Namibia (Pty) Ltd

Final Environmental Management Plan (EMP) Report
Vol. 3 of 3 to Support the Application for Environmental
Clearance Certificate (ECC) for the Proposed Petroleum
(Oil and Gas) Exploration Operations (Drilling of Multiple
Stratigraphic Wells) in the Petroleum Exploration
License (PEL) No. 73 covering Blocks 1719, 1720,
1721, 1819, 1820 and 1821,
KAVANGO BASIN, KAVANGO WEST AND EAST
REGIONS, NORTHERN NAMIBIA

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June 2019

OPERATOR

Reconnaissance Energy Namibia (Pty) Ltd Subsidiary of
Reconnaissance Energy Africa Ltd (ReconAfrica)

LICENSE PEL 73

Blocks 1719, 1720, 1721, 1819, 1820 and 1821

WORKING INTERESTS

ReconAfrica owns 90%
National Petroleum Corporation of Namibia (Namcor)
(A State Owned Company) 10% with costs carried to the development stage

TYPE OF PETROLEUM EXPLORATION OPERATIONS

Drilling of Multiple Stratigraphic Wells Two (2) to Three (3)

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ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Dr. Sindila Mwiya (*PhD, PG Cert, MPhil, BEng (Hons), Pr Eng*)

CITATION: *Risk-Based Solutions (RBS), 2019. Environmental Management Plan (EMP) Report Vol. 3 of 3 to Support the Application for Environmental Clearance Certificate (ECC) for the Proposed Petroleum Exploration Operations (Drilling of Stratigraphic Wells) in Petroleum Exploration License (PEL) 73 Covering Blocks 1719, 1720, 1721, 1819, 1820 and 1821, Etosha Basin, Kavango West and East Regions, Northern Namibia.*

STATEMENT OF QUALIFICATIONS / SUMMARY CV /PROFILE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) – DR. SINDILA MWIYA

Dr. Sindila Mwiya has more than eighteen (18) years of direct technical industry experience in Environmental Assessment (SEA, EIA, EMP, EMS), Energy (Renewable and Non-renewable energy sources), onshore and offshore resources (minerals, oil, gas and water) exploration / prospecting, extraction and utilisation, covering general and specialist technical exploration and production support, Health, Safety and Environment (HSE) permitting for Geophysical Surveys such as 2D and 3D Seismic and Gravity Surveys for mining and petroleum (oil and gas) operations support, through to engineering planning, layout, designing, logistical support, recovery, production / operations, compliance monitoring, rehabilitation, closure and aftercare projects lifecycles.

Through his companies, Risk-Based Solutions (RBS) and Foresight Group Namibia (FGN) (Pty) Ltd, which he founded, he has undertaken more than 200 projects for local, regional (SADC) and international clients. He continues to work for global reputable resources (petroleum and mining / minerals) and energy companies such as BW Offshore (Singapore), Shell Namibia B. V. Limited (Namibia/ the Netherlands), Tullow Oil (UK), Debmarine (DBMN) (Namibia), Reconnaissance Energy Africa Ltd (ReconAfrica) (UK/Canada), Osino Resource Corporation (Canada/Germany/Namibia), Desert Lion Energy Corporation (Canada/ Australia), Petrobras Oil and Gas (Brazil) / BP (UK), REPSOL (Spain), ACREP (Namibia/Angola), Preview Energy Resources (UK), HRT Africa (Brazil / USA), Chariot Oil and Gas Exploration (UK), Serica Energy (UK), Eco (Atlantic) Oil and Gas (Canada / USA), ION GeoVentures (USA), PGS UK Exploration (UK), TGS-NOPEC (UK), Maurel & Prom (France), GeoPartners (UK), PetroSA Equatorial Guinea (South Africa / Equatorial Guinea), Preview Energy Resources (Namibia / UK), Sintezneftegaz Namibia LTD (Russia), INA Namibia (INA INDUSTRIJA NAFTE d.d) (Croatia), Namibia Underwater Technologies (NUTAM) (Namibia), InnoSun Holding (Pty) Ltd (Namibia / France) and OLC Northern Sun Energy (Pty) Ltd (USA /Namibia). Dr. Sindila Mwiya is highly qualified with extensive experience in petroleum, mining, renewable energy (Solar, Wind, Biomass, Geothermal and Hydropower), Non Renewable energy (Coal, Petroleum, and Natural Gas), applied environmental assessment, management and monitoring (Scoping, EIA, EMP, EMP, EMS) and overall industry specific HSE, cleaner production programmes, geoenvironmental, geological and geotechnical engineering specialist fields.

Dr. Sindila Mwiya has undertaken and continues to undertake and manage high value projects on behalf of global and local clients with the single biggest project executed recently valued at NAD4.9 Billion. Currently, (2019-2021) Dr. Sindila Mwiya is responsible for permitting planning through to completion compliance monitoring for four (4) major upstream petroleum operations valued at NAD4.2 Billion for three (3) of our global clients operating in Namibia and other parts of the World. He continues to work as an Environmental Assessment Practitioner (EAP), Technical Consultant (RBS / FGN), Project Manager and has worked as a Lecturer (University of Namibia- UNAM), External Examiner/ Moderator (Namibia University of Science and Technology-NUST), National (Namibia) Technical Advisor (Directorate of Environmental Affairs, Ministry of Environment and Tourism / DANIDA – Cleaner Production Component) and Chief Geologist for Engineering and Environment Division, Geological Survey of Namibia, Ministry of Mines and Energy and a Field-Based Geotechnician (Specialised in Magnetism, Seismic, Gravity and Electromagnetics Exploration and Survey Methods) under the Federal Institute for Geoscience and Natural Resources (BGR) German Mineral Exploration Promotion Project to Namibia, Geophysics Division, Geological Survey of Namibia, Ministry of Mines and Energy.

He has supervised and continues to support a number of MScs and PhDs research programmes and has been a reviewer on international, national and regional researches, plans, programmes and projects with the objective to ensure substantial local skills development pivotal to the national socioeconomic development through the promotion of sustainable natural resources coexistence developmental approaches, utilisation, management and for development policies, plans, programmes and projects financed by governments, private investors and donor organisations. Since 2006, he has provided extensive technical support to the Department of Environmental Affairs (DEA), Ministry of Environment and Tourism (MET) through GIZ and continues to play a significant role in the amendments of the Namibian Environmental Management Act, 2007, (Act No. 7 of 2007), preparation of new Strategic Environmental Assessment (SEA) Regulations, preparation of the updated Environmental Impact Assessment (EIA) Regulations as well as the preparation of the new SEA and EIA Guidelines and Procedures all aimed at promoting effective environmental management practices.

Among his academic achievements, Dr Sindila Mwiya is a holder of a PhD (Geoenvironmental Engineering and Artificial Intelligence) – Research Thesis: Development of a Knowledge-Based System Methodology (KBSM) for the Design of Solid Waste Disposal Sites in Arid and Semiarid Environments (Namibia)), MPhil/PG Cert and BEng (Hons) (Engineering Geology and Geotechnics), qualifications from the University of Portsmouth, School of Earth and Environmental Sciences, United Kingdom. During the 2004 Namibia National Science Awards, organised by the Namibian Ministry of Education, and held in Windhoek, Dr. Sindila Mwiya was awarded the Geologist of the Year for 2004, in the professional category. Furthermore, as part of his professional career recognition, Dr. Sindila Mwiya is a life member of the Geological Society of Namibia, Consulting member of the Hydrogeological Society of Namibia and a Professional Engineer registered with the Engineering Council of Namibia.

**WINDHOEK
JUNE 2018**

CONTENT LIST

NON TECHNICAL SUMMARY	VI
1. BACKGROUND TO THE PROJECT	- 1 -
1.1 Introduction	- 1 -
1.2 Petroleum Exploration License (PEL) No. 73.....	- 1 -
1.3 Project Location	- 1 -
1.4 Access to the Drilling Locations 6-2 and 5-6	- 8 -
1.4.1 <i>Overview</i>	- 8 -
1.4.2 <i>Accessibility Challenges</i>	- 8 -
2. THE EMP FRAMEWORK	- 19 -
2.1 Summary of the Impact Assessment Results.....	- 19 -
2.3 Summary of the EMP Objectives	- 20 -
2.4 Implementation of the EMP.....	- 20 -
2.4.1 <i>Roles and Responsibilities</i>	- 20 -
2.4.2 <i>Proponent's Representative (PR) / Project Manager (PM)</i>	- 21 -
2.4.3 <i>Project Health, Safety and Environment (Project HSE)</i>	- 21 -
2.4.4 <i>Contractors and Subcontractors</i>	- 22 -
3. SPECIFIC MITIGATION MEASURES	- 23 -
3.1 Hierarchy of Mitigation Measures Implementation	- 23 -
3.2 Mitigation Measures Implementation	- 23 -
4. REHABILITATION AND MONITORING	- 41 -
4.1 Rehabilitation Commitment and Process	- 41 -
4.2 Rehabilitation Evaluation and Performance Monitoring	- 43 -
4.3 Environmental Performance Monitoring and Reporting	- 44 -
5. CONCLUSION AND RECOMMENDATION	- 46 -
5.1 Conclusions	- 46 -
5.2 Recommendations	- 46 -
5.3 Summary ToR for Production.....	- 46 -

LIST OF FIGURES

- Figure 1.1: The Etosha Basin in northern Namibia showing the location of the PEL 70 covering Blocks 1718 and 1818 (Source: www.freeworldmaps.net).... **Error! Bookmark not defined.**
- Figure 1.2: Detailed layout of the proposed 120 km, lines 1-4, 2D seismic survey operations to be undertaken along existing tracks / roads within Block 1718 of the PEL No. 70. **Error! Bookmark not defined.**
- Figure 3.1: Reconnaissance Energy Namibia (Pty) Ltd organisational structure for the proposed survey over Blocks 1718 and 1818 situated in the Etosha Basin covering Kavango West Region in northern Namibia with respect to the implementation of this EMP..... **Error! Bookmark not defined.**

LIST OF TABLES

Table 3.1:	Project planning and implementation.	- 25 -
Table 3.2:	Implementation of the EMP, roles and responsibilities with resources allocation.	- 25 -
Table 3.3:	Public and stakeholders relations.....	- 26 -
Table 3.4:	Measures to enhance positive socioeconomic impacts.	- 26 -
Table 3.5:	Environmental awareness briefing and training.	- 27 -
Table 3.6:	Erection of supporting exploration infrastructure.	- 27 -
Table 3.7:	Use of existing access roads, tracks and general vehicle movements.	- 28 -
Table 3.8:	Mitigation measures for preventing flora and ecosystem destruction and promotion of conservation.	- 29 -
Table 3.9:	Mitigation measures for preventing faunal and ecosystem destruction and promotion of conservation.	- 30 -
Table 3.10:	Mitigation measures to be implemented with respect to the exploration camps and exploration sites.	- 31 -
Table 3.11:	Mitigation measures for surface and groundwater protection as well as general water usage.	- 32 -
Table 3.12:	Mitigation measures to minimise negative socioeconomic impacts.....	- 33 -
Table 3.13:	Mitigation measures to minimise health and safety impacts.....	- 34 -
Table 3.14:	Mitigation measures to minimise visual impacts.	- 35 -
Table 3.15:	Management of site and surrounding traffic and equipment movements.	- 35 -
Table 3.16:	Equipment / vehicles noise, vibrations and other emissions.....	- 36 -
Table 3.17:	Management of any likely site dust generation for the entire operations.	- 36 -
Table 3.18:	Spillages and accidental products or fuel leaks.	- 37 -
Table 3.19:	Mitigation measures for waste (solid and liquid) management.	- 38 -
Table 3.20:	Rehabilitation plan.	- 39 -
Table 3.21:	Environmental performance monitoring data collection.	- 40 -

NON TECHNICAL SUMMARY

Reconnaissance Energy Namibia (Pty) Ltd (the proponent) and subsidiary of Reconnaissance Energy Africa Ltd (ReconAfrica) holds 90% interest in the petroleum exploration rights under the Petroleum Exploration License (PEL) No. 73 covering the latitude and longitude degree square Blocks 1719, 1720, 1721, 1819, 1820 and 1821. The remaining 10% is held by National Petroleum Corporation of Namibia (Namcor), a State owned company (Parastatal) with costs carried to the development stage.

Reconnaissance Energy Namibia (Pty) Ltd is the operator of the license situated in the Kavango Basin which is the eastern extension of the greater Etosha Basin in northern Namibia and the greater Kalahari Basin of Southern Africa. PEL 73 cover parts of the Kavango West and Kavango East Regions of northern Namibia.

In accordance with the provisions of the Petroleum Agreement (PA) signed between the Ministry of Mines and Energy (MME) representing the Government of the Republic of Namibia (GRN) and Reconnaissance Energy Namibia (Pty) Ltd, Reconnaissance Energy Namibia (Pty) Ltd has committed to undertaking exploration activities including the drilling of multiple stratigraphic wells within the license area in order to evaluate the subsurface geology and petroleum systems with potential for oil and / or natural gas occurrences within the license area. A total of eight (8) potential wells drilling locations were initially identified and only two (2) well locations numbers 5-6 and 6-2 falling within Blocks 1819 and 1820 will first be drilled in order to assess the extent of the potential active petroleum systems. Depending on the results of the proposed two (2) initial wells drilling outcomes, additional localities may be drilled.

This Environmental Management Plan (EMP), described in this report, is based on the findings and recommendations of the Environmental Impact Assessment (EIA) Report Vol. 2 of 3 and the specialist assessments undertaken. The proponent shall incorporate the EMP in the Environmental Management System (EMS) of the company in line with the Environmental Policy of the company.

This EMP Vol. 3 of 3 report incorporates the provisions of the Environmental Impact Assessment Regulations (2012) and the Environmental Management Act, 2007, (Act No. 7 of 2007) as well as all the key applicable legislative and permits requirements as outlined in the EIA Vol. 2 of 3 Report (Chapter 3).

All the responsibilities to ensure that the recommendations are executed accordingly, rest with the Reconnaissance Energy Namibia (Pty) Ltd (the proponent). Reconnaissance Energy Namibia (Pty) Ltd as the proponent and operator must provide all appropriate human and financial resources necessary for the effective implementation of this EMP. It is the responsibility of Reconnaissance Energy Namibia (Pty) Ltd (the proponent) to make sure that

all members of the workforce including contractors and subcontractors are aware of the EMP provisions and its overall objectives.

1. BACKGROUND TO THE PROJECT

1.1 Introduction

Reconnaissance Energy Namibia (Pty) Ltd (the Proponent and Operator) holds petroleum exploration rights under the Petroleum Exploration License (PEL) No. 73 covering Blocks 1719, 1720, 1721, 1819, 1820 and 1821. Reconnaissance Energy Namibia (Pty) Ltd, is a subsidiary of Reconnaissance Energy Africa Ltd (ReconAfrica), a public listed company in Canada and United Kingdom. The company intends to drill stratigraphic multi-wells within license area and starting with the two (2) well locations Nos. 5-6 and 6-2 to be drilled to a Total Depth (TD) of about 2500 m (2.5 km).

The overall aim and objective of the proposed stratigraphic multi-wells drilling operations is to study the geology and petroleum systems of the PEL 73 and in particular, the potential for both large scale conventional and non-conventional play types within the Kavango Basin. Depending on the outcomes of the proposed initial drilling operations, additional drilling operations may be undertaken within the license area.

1.2 Petroleum Exploration License (PEL) No. 73

ReconAfrica through its wholly owned subsidiary Reconnaissance Energy Namibia (Pty) Ltd owns 90% interest in Petroleum Exploration Licence 73 covering the Kavango Basin in northeast Namibia, pursuant to a Petroleum Agreement signed between the company and the Namibian Ministry of Mines and Energy (MME) representing the State. The National Petroleum Corporation of Namibia (Namcor), a State owned company (Parastatal) holds the remaining 10% interest in the Licence, with its costs carried to the development stage. The Licence has an exploration period comprising three phases, ending 29th January 2024, or if extensions are requested and granted, ending 29th January 2026.

Following declaration of a commercial discovery, the Petroleum Agreement entitles ReconAfrica to a production licence having a 25 year term. The fiscal terms of the Petroleum Agreement call for a 5% royalty, and an additional profits tax that applies late in the life of a producing field. ReconAfrica's Namibian subsidiary, Reconnaissance Energy Namibia (Pty) Ltd, is required to pay Namibian corporate income tax of 35%.

1.3 Project Location

The exploration licence covers an area of approximately 25,341.33 sq km (6.3 million acres), and based on commercial success. PEL No. 73 covering Blocks 1719, 1720, 1721, 1819, 1820 and 1821 falls within the Kavango Basin forming part of the greater Etosha Basin of northern Namibia and Kalahari Basin of Southern Africa (Figs. 1.1 -1.3). PEL 73 is situated in Kavango West and East Regions of northern Namibia (Figs. 1.3 and 1.4). A total of eight (8) potential well drilling locations have identified in Blocks 1819 and 1820 but only two (2) locations (Wells locations 5-6 and 6-2) will be drilled first to be followed by additional drilling if the initial results proves positive (Fig. 1.5).

The proposed well drilling locations 5-6 and 6-2 falls in the Ncamangoro and Mashare Constituencies of the Kavango West and East Regions, respectively (Fig. 1.5). Ncamangoro Mashare Constituencies falls within the boundaries of the Mbunza and Sambyu Traditional Authorities, respectively.



Figure 1.1: Regional location of PEL No. 73 covering Blocks 1719, 1720, 1721, 1819, 1820 and 1821 (Source: Risk-Based Solutions, 2015).

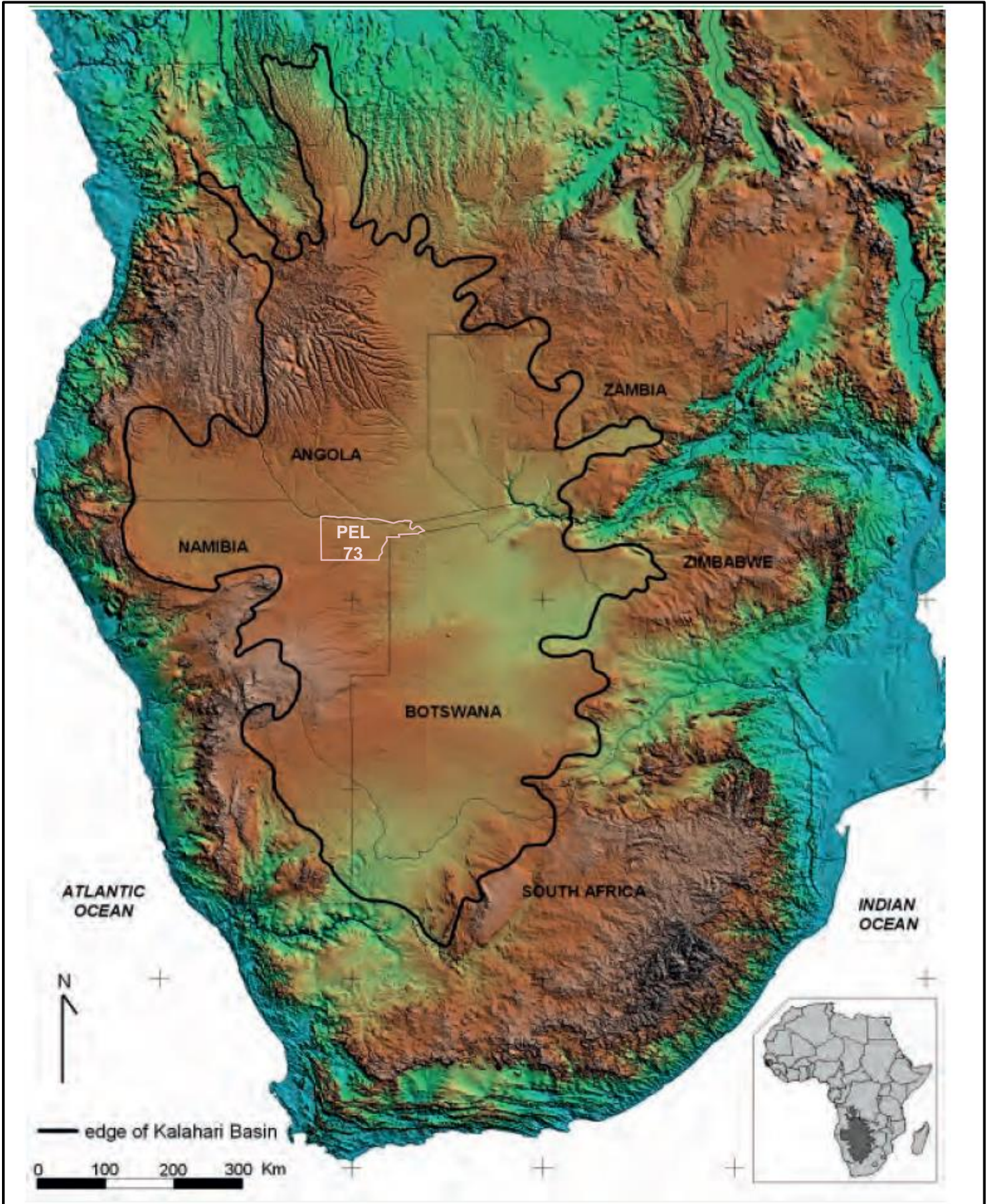


Figure 1.2: Lateral extent of Kalahari Group sediments (Source: Haddon, 2005).

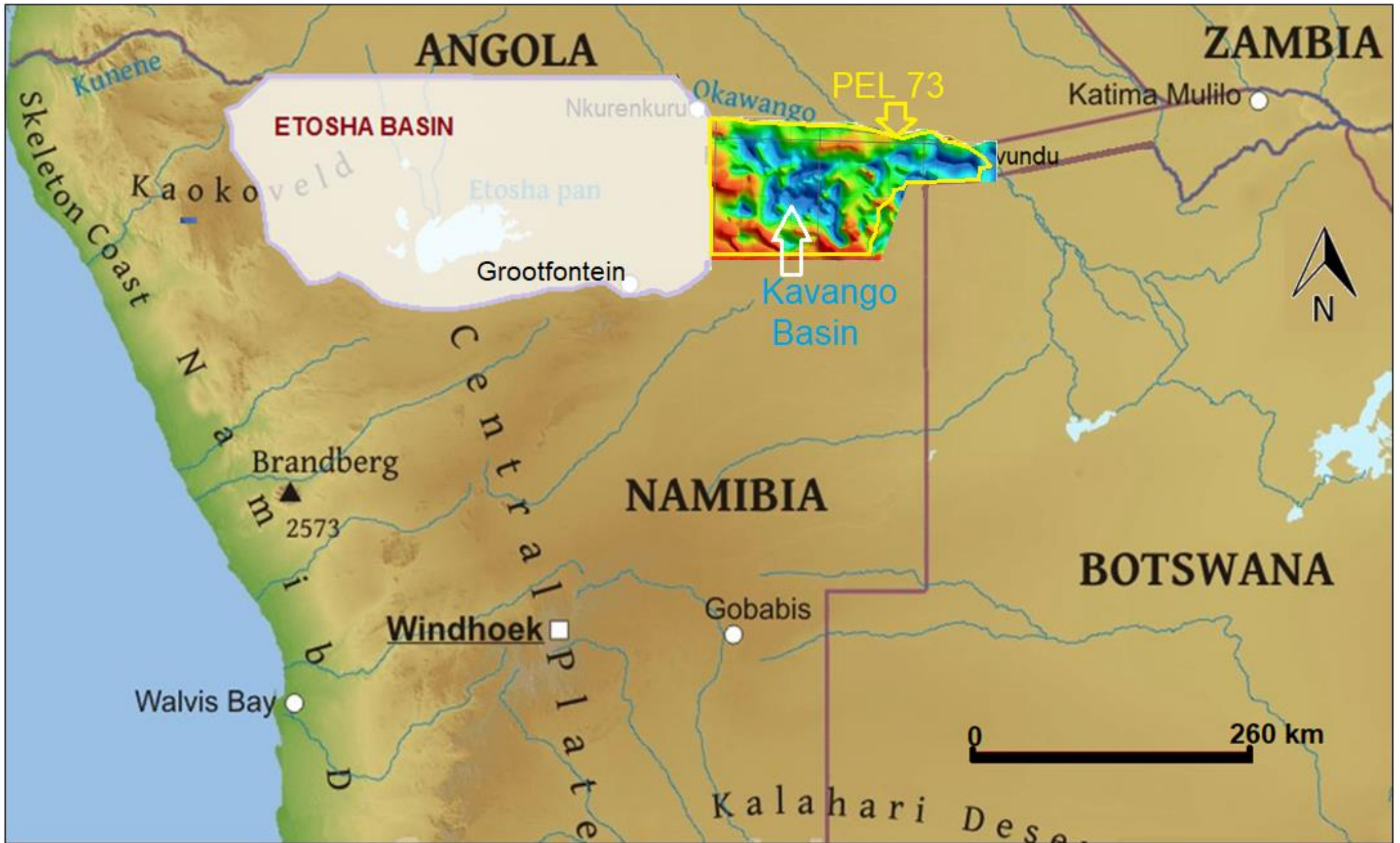


Figure 1.3: The Kavango Basin in north-eastern Namibia showing the location of the PEL 73 covering 1719, 1720, 1721, 1819, 1820 and 1821 (Source: www.freeworldmaps.net).

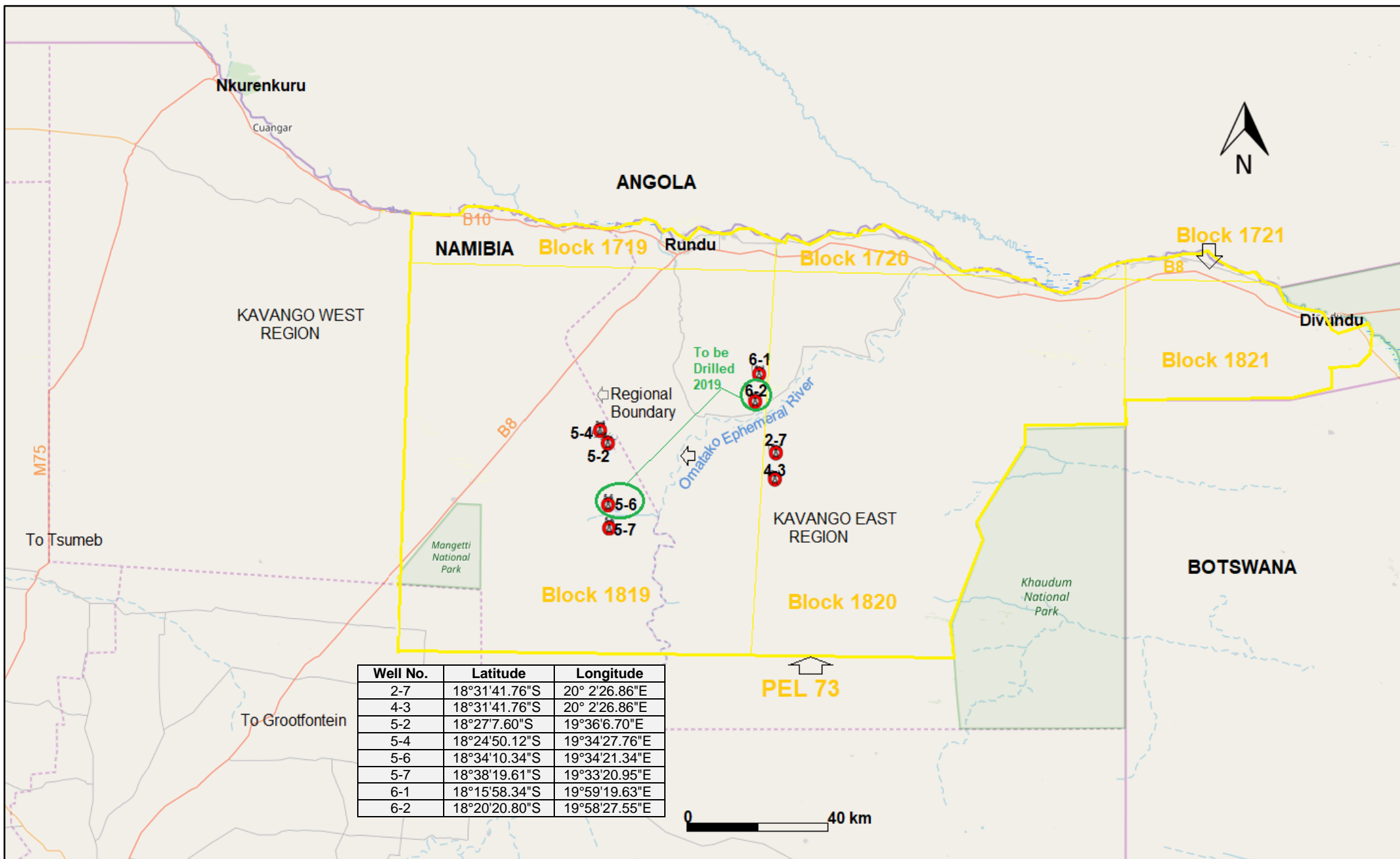


Figure 1.4: Kavango West and Kavango East Regional boundary and the wells locations (Data Source: www.mme.gov.na and Reconnaissance Energy Namibia, 2019).

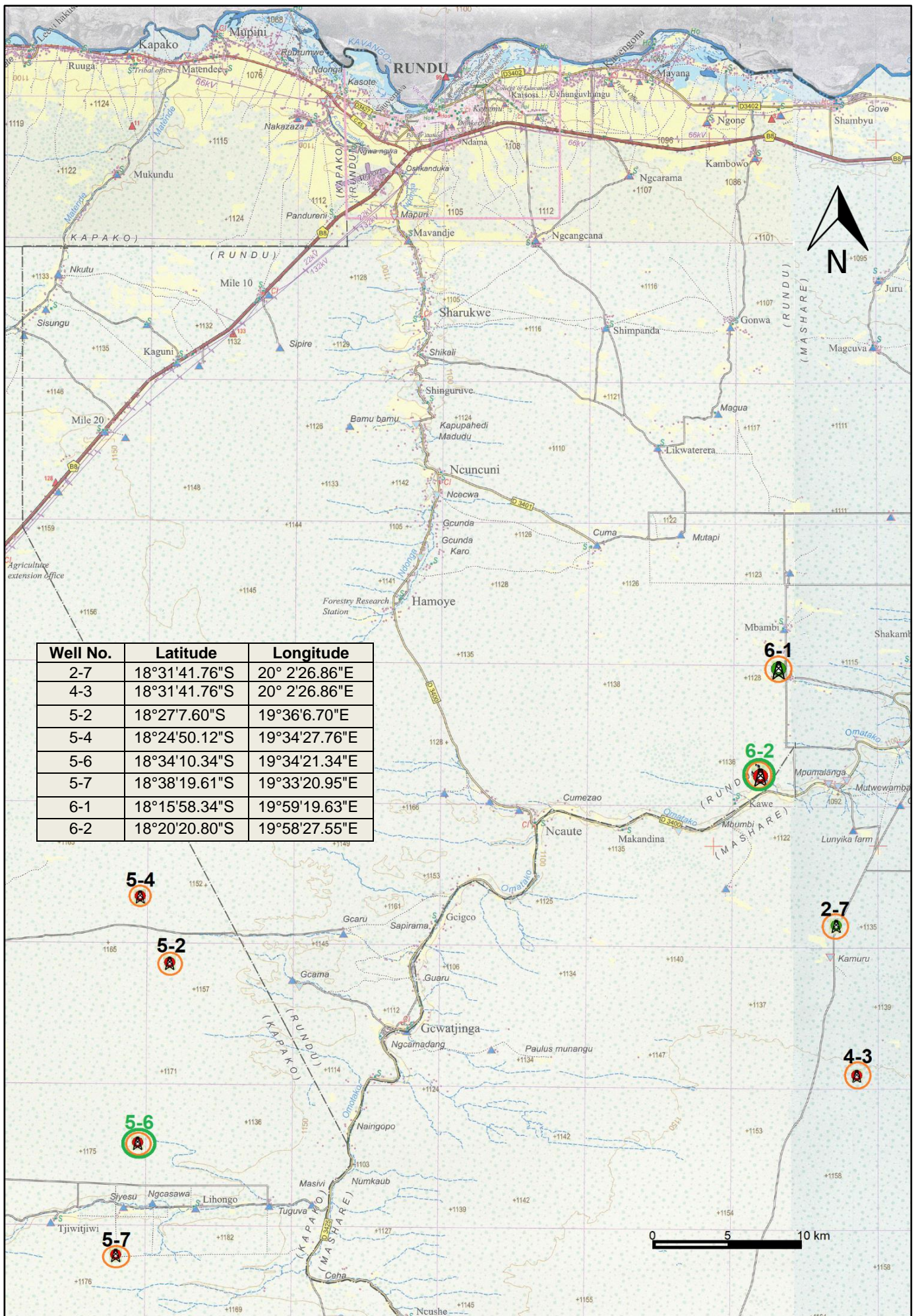


Figure 1.5 Detailed well locations (Source: Extract from the 1: 250000 Map Sheet, Namibia Survey General, 2002).

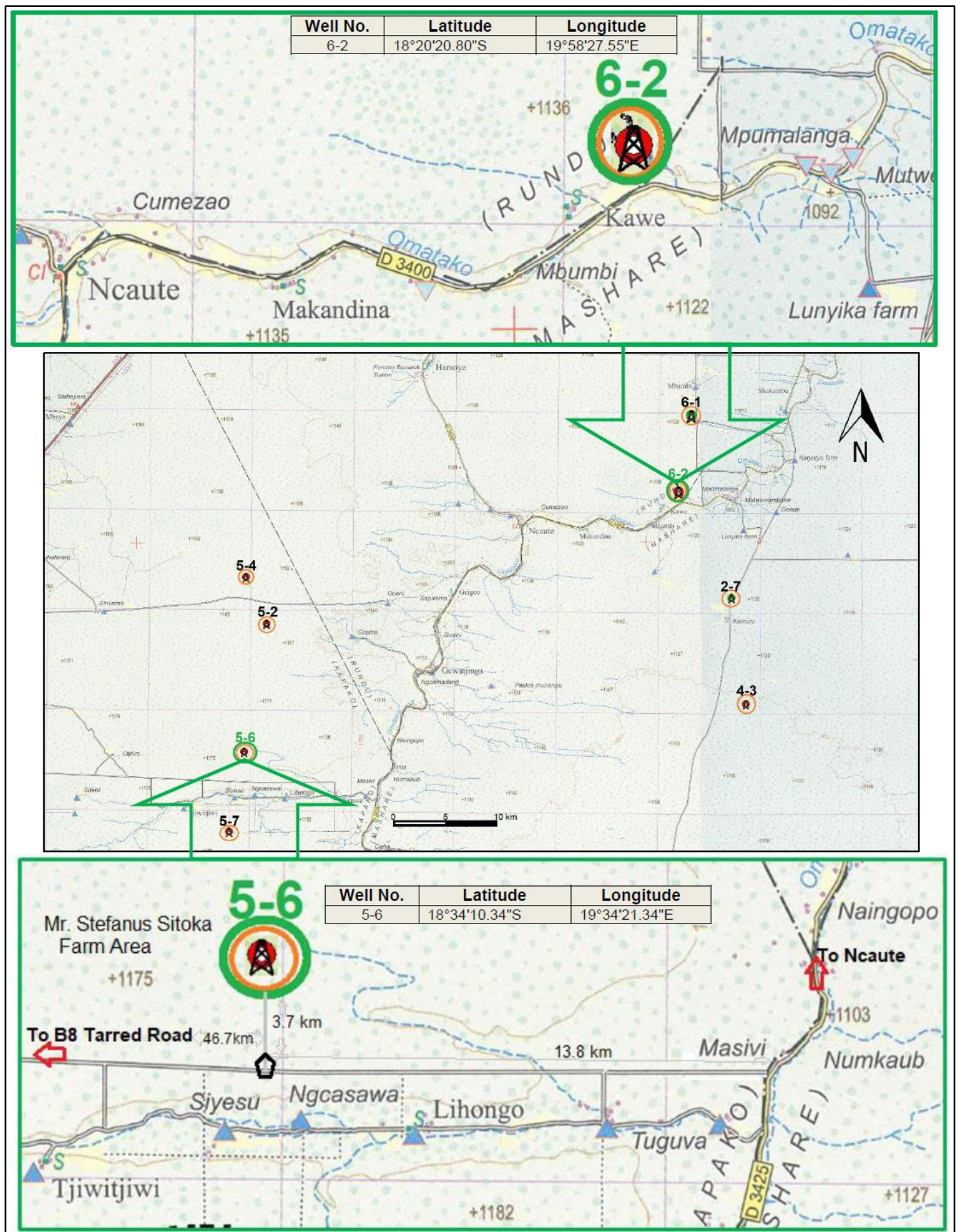


Figure 1.6 Enlarged detailed well locations 5-6 and 6-2 (Source: Extract from the 1: 250000 Map Sheet, Namibia Survey General, 2002).

1.4 Access to the Drilling Locations 6-2 and 5-6

1.4.1 Overview

The following is the summary of the local access to the two (2) initial targeted drilling locations 6-2 and 5-6 as shown in Figs. 1.6 and 1.7):

- (i) **The drilling location 6-2:** From Grootfontein along the B8 tarred road to Rundu drive for 253 km (2.5 km before the turn-off from the B8 into the Town of Rundu). Turn right into the D3425 gravel road to Ncaute which is 55.4 km away (Plate 1.1). Just before Ncaute settlement turn left into the excellent gravel road D3400 towards Makandena for 18 km (Plates 1.2 - 1.4). There is an existing 500 m long access track coming off the D3400 road (Plate 1.5 and Figs. 1.6 and 1.7). The drilling location is situated about 500 m to the north off the D3400 road (Plate 1.6).

Alternatively, from Grootfontein along tarred B8 Road to Rundu, drive for 156 km until the northern fence of the Mangetti National Park boundary (Fig. 1.7). Turn right into the straight sandy track parallel to the Park boundary fence and drive for 61 km along this track linking the D3425 to the B8 tarred Road from Grootfontein to Rundu to the location 18° 36" 08.51" S, 19° 42" 02.69" E and turn left at this location into D3425 road and drive for 35 km to Ncaute following the Omatako Ephemeral River Channel (Plates 1.7-1.9 and Figs. 1.6 and 1.7). Just after Ncaute settlement, turn right into the excellent gravel road D3400 towards Makandena for 18 km. The drilling location is situated about 500 m to the north off the D3400 road with an existing sandy track coming off the D3400 gravel road (Plate 1.6 and Figs. 1.6 and 1.7);

- (ii) **The drilling location 5-6:** From Grootfontein along the B8 tarred road to Rundu drive for 253 km (2.5 km before the turn-off from the B8 into the Town of Rundu) (Fig. 1.7). Turn right into the D3425 gravel road to Ncaute which is 55.4 km away (Plates 1.1 and 1.2). Along the D3425 road from Ncaute following the Omatako Ephemeral River Channel, drive for 35 km up to location 18° 36" 08.51" S, 19° 42" 02.69" E right turn. Turn right into the straight sandy track linking the D3425 to the B8 tarred Road from Grootfontein to Rundu (Plates 1.7 -1.9). Drive for 13.8 km to the location 18° 36" 07.41" S, 19° 34" 13.31" E and turn right at this location into a newly cleared private farm access of Mr. Stefanus Sitoka (Plates 1.10 - 1.12 and Figs. 1.6 and 1.7). The drilling location area 5-6 is about 3.7 km from this junction towards the north (Plate 1.13).

Alternatively, from Grootfontein along tarred B8 Road to Rundu, drive for 156 km until the northern fence of the Mangetti National Park boundary (Plate 1.9 and Fig. 1.7). Turn right into the straight sandy track parallel to the Park boundary fence and drive for 46.7 km along this track linking the D3425 to the B8 tarred Road from Grootfontein to Rundu to the location 18° 36" 07.41" S, 19° 34" 13.31" E, elevation 1181mamsl and turn north (left) at this location into a newly cleared private farm access of Mr. Stefanus Sitoka (Plates 10 -12 and Figs. 1.6 and 1.7). The drilling location area 5-6 is about 3.7 km from this junction towards the north (Plate 1.13).

1.4.2 Accessibility Challenges

Access challenges including heavy sandy terrain, thick bushes (Plates 1.14 -1.16) and potential for extremely slippery and muddy D3425 road during the rainy season (**December – March**) on certain sections of the 35 km stretch between Ncaute and the location 18° 36" 08.51" S, 19° 42" 02.69" E, along the Omatako Ephemeral River Channel (Plates 1.17 and 1.18).

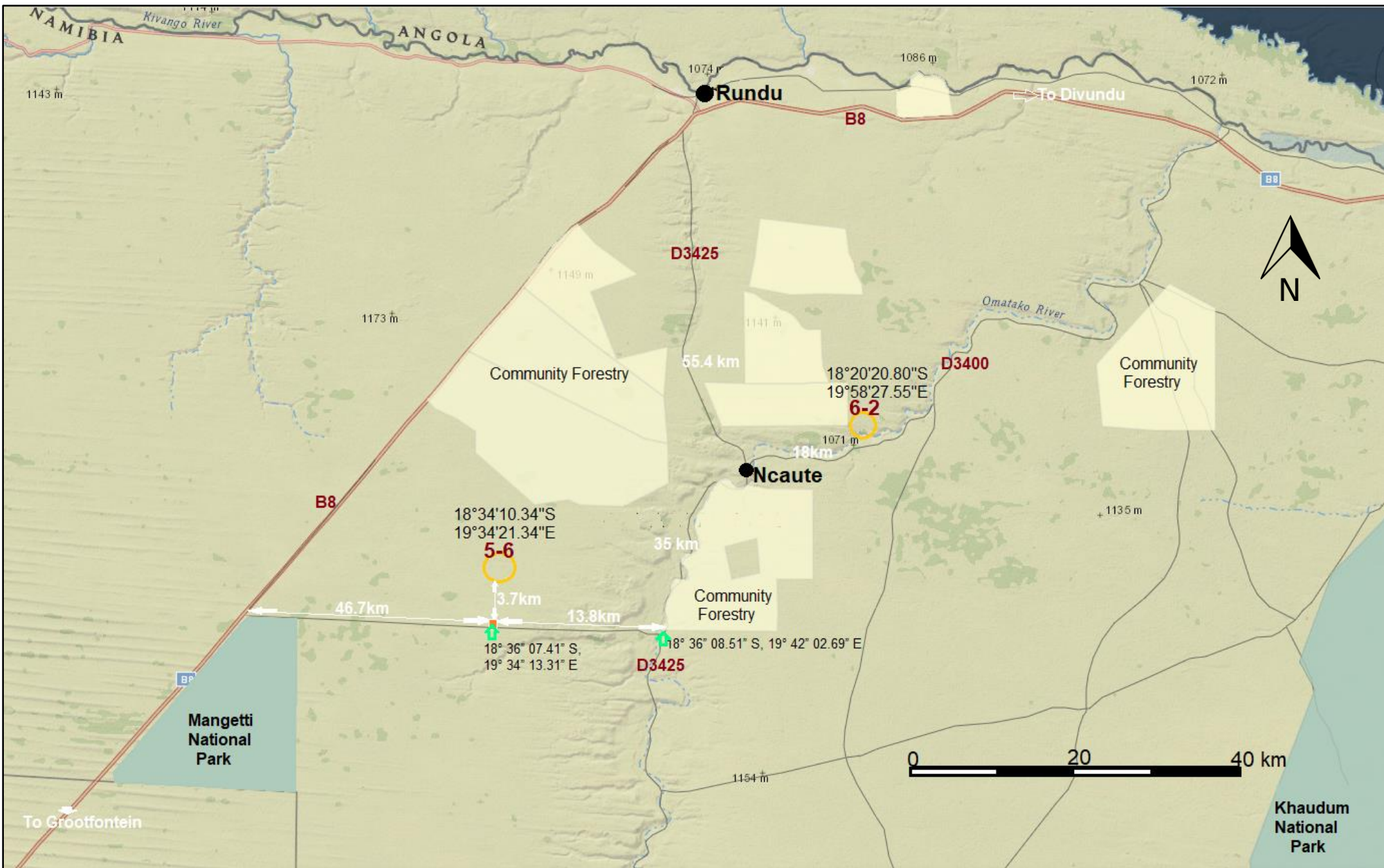


Figure 1.7 Access to the drilling locations 5-6 and 6-2 (Sources: www.kavangozambezi.org/en/- arcgis Accessed, March 2019).



Plate 1.1: The D3425 gravel road from Rundu to Ncaute which is 55.4 km away.



Plate 1.2: The settlement of Ncaute.



Plate 1.3: The D3400 18 km towards Makandena to the well location 6-2.



Plate 1.4: The nearest village / settlement to the well location 6-2.



Plate 1.5: Sandy access to the well location 6-2 coming off the D3400 road.



Plate 1.6: General view around the well location 6-2 showing plenty of low vegetation/ openings for a campsite or drilling location without cutting down the big trees.



Plate 1.7: The Omatako Ephemeral River Channel along the D3425 road from Ncaute to the well location 5-6.



Plate 1.8: The location $18^{\circ} 36'' 08.51''$ S, $19^{\circ} 42'' 02.69''$ E, a key turn to the well location 5-6 into the straight sandy track linking the D3425 to the B8 tarred Road from Grootfontein to Rundu. This turn is 35 km from Ncaute along the D3425 road.



Plate 1.9: The straight sandy track to the well location 5-6 linking the D3425 to the B8 tarred Road from Grootfontein to Rundu.



Plate 1.10: Location $18^{\circ} 36' 07.41''$ S, $19^{\circ} 34' 13.31''$ E, the key turning point from the well No. 5-6 location area through the newly cleared private farm access of Mr. Stefanus Sitoka.



Plate 1.11: Newly cleared private farm access by Mr. Stefanus Sitoka towards the well location 5-6.



Plate 1.12: Existing campsite by Mr. Stefanus Sitoka south of the general well location 5-6 area.



Plate 1.13: General view around well No. 5-6 location area showing plenty of low vegetation/ openings for a campsite or drilling location without cutting down the big trees.



Plate 1.14: Access challenges including heavy sandy terrain to well 5-6 location.



Plate 1.15: Well 5-6 bush thinking that will require bush clearing and winding of the access.



Plate 1.16: Well 6-2 bush thinking that will require bush clearing and winding of the access.



Plate 1.17: Potential for extremely slippery sections along the D3425 road during the rainy season (December – March) on certain sections of the 35 km stretch between Ncaute and the location $18^{\circ} 36'' 08.51''$ S, $19^{\circ} 42'' 02.69''$ E, along the Omatoko Ephemeral River Channel.



Plate 1.18: Potential for extremely muddy sections along the D3425 road during the rainy season (December – March) on certain sections of the 35 km stretch between Ncaute and the location $18^{\circ} 36'' 08.51''$ S, $19^{\circ} 42'' 02.69''$ E, along the Omatoko Ephemeral River Channel.

2. THE EMP FRAMEWORK

2.1 Summary of the Impact Assessment Results

Based on the outcomes of the EIA Vol. 2 of 3 and the flora, fauna, socioeconomic, groundwater and surface water and archaeological specialist assessments undertaken, the following is the summary of the impact assessment results of the key components of the receiving (physical, biological and socioeconomic, cultural and archaeological) environments:

1. Fauna and Flora: Campsite and drilling site physical disturbances, vehicles movements and actual drilling operations may affect the local fauna and the flora (*Assessment of negative Impacts localised Low, Significant Impact: Negligible*);
2. Water Pollutions: In the context of the impact assessment of the risk posed by the proposed oil and gas exploration drilling in the study area, it is concluded that most of the risk categories are *moderate to negligible* if proposed measures are adhered to. However, the risks associated with: aquifer pollution vulnerability, impacts due to contaminated water discharge, impacts due to tank bursts or/and pipe breaks and that associated with impacts due to backwash water have high to moderate impacts with regard to water resources negative impacts in the study area. The exploration hole will be materially isolated from the rest of its immediate surrounding by cement casing/grouting and properly closed on top; else total plugging of the exploration hole is recommended;
(1)
3. Noise and Dusts Generation – The proposed operations are likely to generate noise and dust from the campsite and drilling site physical disturbances, vehicles movements and actual drilling operations. Vehicle and other related noise will be limited around the operations based with no existing background noises (*Assessment of negative Impacts localised Low, Significant Impact: Negligible*);
4. Air Emissions: The main sources of air emissions are likely to be from combustion fuels from the vehicles, generators, and other equipment, vehicles and fugitive emissions (*Assessment of negative Impacts Localised Low, Significant Impact: Negligible*);
5. Solid Waste management: Although very limited for a very short period of time, various types of wastes are likely to be generated mainly around the proposed campsite and drilling locations. Waste management will not be an issue because necessary facilities and containers for waste management will be provided (*Assessment of negative Impacts Low, Significant Impact: Negligible*);
6. Liquid Waste management: Generated mainly around the proposed campsite and drilling locations. Liquid waste management will not be an issue because chemical toilets will be provided (*Assessment of negative Impacts Low, Significant Impact: Negligible*), and;
(2)
7. General Disturbances / Cultural and Social: Cultural Social issues will need to be considered seriously because the proposed survey area fall largely in communal land with different traditional authorities. However, the actually drilling locations do not have villages close nearby and the actual drilling locations are not fixed and can be shifted as maybe required (*Assessment of negative Impacts Localised Low, Significant Impact: Negligible*).

2.2 Summary of the EIA Conclusion and Recommendations

Based on the outcomes of the EIA Vol. 2 of 3 and the flora, fauna, socioeconomic, groundwater and surface water and archaeological specialist assessments undertaken, the overall significance negative impacts that the proposed project activities will have on the (physical, biological and socioeconomic, cultural and archaeological) environments will be localised, temporally for the duration of the drilling operations and will be of low significance without mitigations and negligible with mitigations.

The EIA has recommended that the proposed stratigraphic multi-well drilling operations in the PEL No. 73 covering Blocks 1719, 1720, 1721, 1819, 1820 and 1821 be issued with an new Environmental Clearance Certificate with the following key conditions:

- (i) The proponent must adhere to the provisions of all national legislation, regulations, policies, procedures and permits / authorisation requirements;
- (ii) The proponent shall adhere to all the provisions of the EMP and mitigation measures must be implemented and monitored as detailed in EMP Report Vol. 3 of 3, and;
- (iii) Villages / settlements and communal crop fields shall be avoided when choosing the access route, camp site, water well location and actual drilling location. A distance of 500 m to 1 km is hereby recommended between any local villages / settlements and the campsite / drilling locality.

The Environmental Management Plan (EMP) detailed in this report provides a detailed plan of action required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts respectively with respect to the proposed multiple stratigraphic well drilling operations in PEL 73. A range of mitigation measures have been identified and are detailed in this report.

2.3 Summary of the EMP Objectives

The Environmental Management Plan (EMP) provides a detailed plan of action required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts respectively.

The EMP gives commitments including financial and human resources provisions for effective management of the likely environmental liabilities during and after the exploration.

Regular assessments and evaluation of the environmental liabilities during the exploration will need to be undertaken and will ensure adequate provision of the necessary resources towards good environmental management at various stages of the proposed project development.

2.4 Implementation of the EMP

2.4.1 Roles and Responsibilities

This EMP report identifies the activity groups / environmental elements, the aspects / targets, the indicators, the schedule for implementation and who should be responsible for the management to prevent major impacts that the different exploration activities may have on the receiving environment (physical, biological and socioeconomic, cultural and archaeological).

2.4.2 Proponent's Representative (PR) / Project Manager (PM)

The proponent is to appoint a **Proponent's Representative (PR) / Project Manager (PM)** with the following responsibilities with respect to the EMP implementation:

- ❖ Act as the site project manager and implementing agent;
- ❖ Ensure that the proponent's responsibilities are executed in compliance with the relevant legislation;
- ❖ Ensure that all the necessary environmental authorizations and permits have been obtained;
- ❖ Assist the exploration contractor/s in finding environmentally responsible solutions to challenges that may arise;
- ❖ Should the PR be of the opinion that a serious threat to, or impact on the environment may be caused by the exploration activities, he/she may stop work; the proponent must be informed of the reasons for the stoppage as soon as possible;
- ❖ The PR has the authority to issue fines for transgressions of basic conduct rules and/or contravention of the EMP;
- ❖ Should the Contractor or his/her employees fail to show adequate consideration for the environmental aspects related to the EMP, the PR can have person(s) and/or equipment removed from the site or work suspended until the matter is remedied;
- ❖ Maintain open and direct lines of communication between the landowners and proponent, as well as any other identified Interested and Affected Parties (I&APs) with regards to environmental matters, and;
- ❖ Attend regular site meetings and inspections as may be required for the proposed / ongoing exploration programme.

2.4.3 Project Health, Safety and Environment (Project HSE)

The proponent is to appoint a Project Health, Safety and Environment (Project HSE) with the following responsibilities with respect to the EMP implementation:

- ❖ Assist the PR in ensuring that the necessary environmental authorizations and permits have been obtained;
- ❖ Assist the PR and Contractor in finding environmentally responsible solutions to challenges that may arise;
- ❖ Conduct environmental monitoring as per EMP requirements;
- ❖ Carry out regular site inspections (on average once per week) of all exploration areas with regards to compliance with the EMP; report any non-compliance(s) to the PR as soon as possible;
- ❖ Organize for an independent internal audit on the implementation of and compliance to the EMP to be carried out half way through each field-based exploration activity; audit reports to be submitted to the PR;

- ❖ Continuously review the EMP and recommend additions and/or changes to the EMP document;
- ❖ Monitor the Contractor's environmental awareness training for all new personnel coming onto site;
- ❖ Keep records of all activities related to environmental control and monitoring; the latter to include a photographic records of the exploration activities, rehabilitation process, and a register of all major incidents, and;
- ❖ Attend regular site meetings.

2.4.4 Contractors and Subcontractors

The responsibilities of the **Contractors and Subcontractors** that may be appointed by the proponent to undertake certain field-based activities of the proposed exploration programme include:

- ❖ Comply with the relevant legislation and the EMP provision;
- ❖ Preparation and submission to the proponent through the Project HSE of the following Management Plans:
 - Environmental Awareness Training and Inductions;
 - Emergency Preparedness and Response;
 - Waste Management, and;
 - Health and Safety.
- ❖ Ensure adequate environmental awareness training for senior site personnel;
- ❖ Environmental awareness presentations (inductions) to be given to all site personnel prior to work commencement; the Project HSE is to provide the course content and the following topics, at least but not limited to, should be covered:
 - The importance of complying with the EMP provisions;
 - Roles and Responsibilities, including emergency preparedness;
 - Basic Rules of Conduct (Do's and Don'ts);
 - EMP: aspects, impacts and mitigation;
 - Fines for Failure to Adhere to the EMP, and;
 - Health and Safety Requirements.
- ❖ Record keeping of all environmental awareness training and induction presentations, and;
- ❖ Attend regular site meetings and environmental inspections.

3. SPECIFIC MITIGATION MEASURES

3.1 Hierarchy of Mitigation Measures Implementation

A hierarchy of methods for mitigating significant adverse effects has been adopted in order of preference and as follows:

- (i) Enhancement, e.g. provision of new habitats;
- (ii) Avoidance, e.g. sensitive design to avoid effects on ecological receptors;
- (iii) Reduction, e.g. limitation of effects on receptors through design changes, and;
- (iv) Compensation, e.g. community benefits.

3.2 Mitigation Measures Implementation

Based on the findings of the impact assessment process as described in the EIA Report Vol. 2 of 3, Table 3.1 – 3.21 provides the detailed specific mitigations measures to be implemented by the proponent with respect to the proposed exploration activities and in particular for the field-based exploration activities. The following is the summary of the key areas of the migration measures provided in Tables 3.1-3.21:

1. Project planning and implementation;
2. Implementation of the EMP, roles and responsibilities with resources allocation;
3. Public and stakeholders relations;
4. Measures to enhance positive socioeconomic impacts;
5. Environmental awareness briefing and training;
6. Erection of supporting exploration infrastructure;
7. Use of existing access roads, tracks and general vehicle movements;
8. Mitigation measures for preventing flora and ecosystem destruction and promotion of conservation;
9. Mitigation measures for preventing faunal and ecosystem destruction and promotion of conservation;
10. Mitigation measures to be implemented with respect to the exploration camps and exploration sites;
11. Mitigation measures for surface and groundwater protection as well as general water usage;
12. Mitigation measures to minimise negative socioeconomic impacts;
13. Mitigation measures to minimise health and safety impacts;

14. Mitigation measures to minimise visual impacts;
15. Management of site and surrounding traffic and equipment movements;
16. Equipment / vehicles noise, vibrations and other emissions;
17. Management of any likely site dust generation for the entire operations;
18. Spillages and accidental products or fuel leaks;
19. Mitigation measures for waste (solid and liquid) management;
20. Rehabilitation plan, and;
21. Environmental performance monitoring data collection.

Table 3.1: Project planning and implementation.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<p>Establish a strong environmental awareness protocol from project implementation to final closure in order to ensure the least possible impact to the environment.</p>	<ol style="list-style-type: none"> 1. Resources (Human and Financial) are provided for the Environmental Awareness and Training, Regular Safety, Health and Environment meetings and for internal and external environmental monitoring costs as well as for any rehabilitation costs that may arise. 2. Appointment of a senior and experienced persons as Proponent's Representative (PR), Project Manager (PM) and Project HSE to assume responsibility for environmental issues. 3. All individuals including sub-contractors who work on, or visit, the sites are aware of the contents of the Environmental Policy and the EMP. 4. The EMP and Environmental Policy will be included in Tender Documents. 5. Field visit will take place during which main access tracks will be discussed in cooperation with the land owner/s 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.2: Implementation of the EMP, roles and responsibilities with resources allocation.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
<ol style="list-style-type: none"> 1. Define roles and responsibilities in terms of the EMP. To make all personnel, contractors and subcontractors aware of these roles and responsibilities to ensure compliance with the EMP provisions. 2. Implement environmental management that is preventative and proactive. 3. Establish the resources, skills, etc. required for effective environmental management. 	<ol style="list-style-type: none"> 1. Senior staff and senior contractors are aware of, and practice the EMP requirements. These persons shall be expected to know and understand the objectives of the EMP and will, by example, encourage suitable environmentally friendly behaviour to be adopted during the exploration 2. Recognition will be given to appropriate environmentally acceptable behaviour. 3. Inappropriate behaviour will be corrected. An explanation to why the behaviour is unacceptable must be given, and, if necessary, the person will be disciplined. e.g. fees set out for non-compliance 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.3: Public and stakeholders relations.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Maintain sound relationships with the Other land users/ land owner/s and other stakeholders / public	<ol style="list-style-type: none"> Project implementation updates shall be provided to the Competent Authority (MME) (Petroleum Commissioner) Whenever a project team goes to the field as part of the preparatory, implementation, operation, closure or abandonment the political (Governors and local Councillors) and traditional leaders of the Kavango West and East Regions shall be informed and kept updated on the proposed project progress in order for them to update the local community. All applicable permits, certifications and concerts shall be obtained before project implementations. 	<ul style="list-style-type: none"> Pre-construction and drilling requirements Construction phase Mobilisation Spudding and Conductor casing Drilling surface and setting casing and cementing process Plug and abandon hole Rehabilitate all surface disturbances and clear the site of any debris Camp removal, site closure / abandonment Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> Proponent's Representative (PR) Project Manager (PM) Project HSE Contractor Subcontractors

Table 3.4: Measures to enhance positive socioeconomic impacts.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>Measures to enhance positive socioeconomic impacts in order to:</p> <ol style="list-style-type: none"> Avoid exacerbating the influx of unemployed people to the area. Develop a standardised recruitment method for sub-contractor and field workers. 	<ol style="list-style-type: none"> Stipulate a preference for local contractors in its tender policy. Preference to local contractors should still be based on competitive business principles and salaries and payment to local service providers should still be competitive; Develop a database of local businesses that qualify as potential service providers and invite them to the tender process; Scrutinise tender proposals to ensure that minimum wages were included in the costing; Stipulate that local residents should be employed for temporary unskilled/skilled and where possible in permanent unskilled/skilled positions as they would reinvest in the local economy; Must ensure that potential employees are from the area, they need submit proof of having lived in the area for a minimum of 5 years; Must ensure that contractors adhere to Namibian Affirmative Action, Labour and Social Security, Health and Safety laws. This could be accomplished with a contractual requirement stipulating that monthly proof should be submitted indicating payment of minimum wages to workers, against their ID numbers, payment of social security and submission of affirmative action data; Encouraged to cater for the needs of employees to increase the spending of wages locally. 	<ul style="list-style-type: none"> Pre-construction and drilling requirements Construction phase Mobilisation Spudding and Conductor casing Drilling surface and setting casing and cementing process Plug and abandon hole Rehabilitate all surface disturbances and clear the site of any debris Camp removal, site closure / abandonment Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> Proponent's Representative (PR) Project Manager (PM) Project HSE Contractor Subcontractors

Table 3.5: Environmental awareness briefing and training.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Implement environmental awareness briefing / training for individuals who visit, or work, on site.	<ol style="list-style-type: none"> Every senior/supervisory member of the team shall familiarise themselves with the contents of the EMP. They shall understand their roles and responsibilities with regard to personnel and project compliance with the EMP. Subject to agreement of the parties, the Environmental Coordinator will hold an Environmental Awareness Briefing meeting, which shall be attended by all contractors before the start of the mineral exploration activities. Briefings on the EMP and Environmental Policy shall discuss the potential dangers to the environment of the following activities: public relations, littering, off-road driving, waste management, poaching and plant theft etc. The need to preserve soil, conserve water and implement water saving measures shall be presented. Individuals can be questioned on the Environmental Philosophy and EMP and can recall contents. 	<ul style="list-style-type: none"> Pre-construction and drilling requirements Construction phase Mobilisation Spudding and Conductor casing Drilling surface and setting casing and cementing process Plug and abandon hole Rehabilitate all surface disturbances and clear the site of any debris Camp removal, site closure / abandonment Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> Proponent's Representative (PR) Project Manager (PM) Project HSE Contractor Subcontractors

Table 3.6: Erection of supporting exploration infrastructure.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<ol style="list-style-type: none"> Get Environmental Clearance Environmental Clearance Certificate (ECC) and any other additional permits before implementation Establishment of the supporting exploration infrastructure done on an area with the least disturbance to the environment and within the non-sensitive areas Consent shall be obtained from the local land owner / surface rights holder/s 	<ol style="list-style-type: none"> Documented copy of the Environmental Clearance Certificate (ECC) and any additional permits such as fresh water waste abstraction and water discharge shall be available onsite. All on site exploration infrastructure (e.g. water tanks, sewage tanks, waste disposal) are not situated on environmental sensitive area and have disturbed as less as possible. No littering signage around the site. 	<ul style="list-style-type: none"> Pre-construction and drilling requirements Construction phase Mobilisation Spudding and Conductor casing Drilling surface and setting casing and cementing process Plug and abandon hole Rehabilitate all surface disturbances and clear the site of any debris Camp removal, site closure / abandonment Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> Proponent's Representative (PR) Project Manager (PM) Project HSE Contractor Subcontractors

Table 3.7: Use of existing access roads, tracks and general vehicle movements.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<ol style="list-style-type: none"> 1. Plan a road/track network that considers the environmental sensitivity of the area and which is constructed in a technically and environmentally sound manner. 2. Stick to the recommended track and sensitivity management zones. 	<ol style="list-style-type: none"> 1. Avoid unnecessary affecting areas viewed as important habitat – i.e. Omuramba Omatako and its various tributaries, pans, clumps of protected tree species 2. Make use of existing tracks/roads as much as possible throughout the area; 3. Do not drive randomly throughout the area (could cause mortalities to vertebrate fauna and unique flora; accidental fires; erosion related problems, etc.); 4. Avoid off-road driving at night as this increases mortalities of nocturnal species; 5. Implement and maintain off-road track discipline with maximum speed limits (e.g.30km/h) as this would result in fewer faunal mortalities and limit dust pollution; 6. Use of "3-point-turns" rather than "U-turns"; 7. Where tracks have to be made to potential exploration sites off the main routes, the routes should be selected causing minimal damage to the environment – e.g. use the same tracks; cross drainage lines at right angles; avoid placing tracks within drainage lines; avoid collateral damage (i.e. select routes that do not require the unnecessary removal of trees/shrubs, especially protected species); 8. Leave vehicles on tracks and walk to point of interest, when possible; 9. Rehabilitate all new tracks created. 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.8: Mitigation measures for preventing flora and ecosystem destruction and promotion of conservation.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Prevent flora and ecosystem destruction and promote conservation</p>	<ol style="list-style-type: none"> 1. Limit the development and avoid i.e. Omuramba Omatako and its various tributaries, pans, clumps of protected tree species throughout the entire area; 2. Avoid development and associated infrastructure in sensitive areas – e.g. Ephemeral River, in/close to drainage lines. This would minimise the negative effect on the local environment especially unique features serving as habitat to various species; 3. Avoid placing access routes (roads and tracks) through sensitive areas – e.g. along drainage lines. This would minimise the effect on localised potentially sensitive habitats in the area; 4. Avoid driving randomly through the area (i.e. “track discipline”), but rather stick to permanently placed roads/tracks – especially during the detailed field-based exploration phase. This would minimise the effect on localised potentially sensitive habitats in the area; 5. Stick to speed limits of maximum 30km/h as this would result in less dust pollution which could affect certain flora – e.g. lichen species. Speed humps could also be used to ensure the speed limit; 6. Remove unique and sensitive flora before commencing with the development activities and relocate to a less sensitive/disturbed site if possible; 7. Attempt to avoid the removal of dense vegetated zones during the development phase(s) – especially with the development of access routes – as these serve as habitat for a myriad of fauna; 8. Rehabilitation of the disturbed areas – i.e. initial development access route “scars” and associated tracks as well as temporary accommodation sites. Such rehabilitation would not only confirm the company’s environmental integrity, but also show true local commitment to the environment. 9. Avoid excess damage to the local environment (e.g. fires, wood collection, poaching, etc.); 10. Implement erosion control. The area(s) towards and adjacent the drainage line(s) are easily eroded and further development may exacerbate this problem. Avoid undertaking any exploration activities including supporting activities such as camping within 20m of the main drainage line(s) to minimise erosion problems as well as preserving the associated flora; 11. Conduct a thorough investigation on the flora associated with the proposed exploration site(s); 12. Prevent the introduction of potentially invasive alien plant species (e.g. Tecoma stans, Pennisetum setaceum, etc.) for ornamental purposes as part of the landscaping should long-term exploration / development activities eventually commence. Alien species often “escape” and become invasive causing further ecological damage; 13. A thorough investigation of water use and ground water extraction should be undertaken as this would affect the local flora, especially the ephemeral vegetation, not only locally, but downstream as well. 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.9: Mitigation measures for preventing faunal and ecosystem destruction and promotion of conservation.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>Prevent faunal and ecosystem destruction and promote conservation</p>	<ol style="list-style-type: none"> 1. Limit the development and avoid i.e. Omuramba Omatako and its various tributaries, pans, clumps of protected tree species throughout the entire area; 14. Avoid development & associated infrastructure in sensitive areas – e.g. Limit the development and avoid i.e. Omuramba Omatako and its various tributaries, pans, clumps of protected tree species throughout the entire area. This would minimise the negative effect on the local environment especially unique features serving as habitat to various species; 2. Avoid placing access routes (roads & tracks) through sensitive areas – e.g. Limit the development and avoid i.e. Omuramba Omatako and its various tributaries, pans, clumps of protected tree species throughout the entire area. This would minimise the effect on localised potentially sensitive habitats in the area; 3. Avoid driving randomly through the area (i.e. “track discipline”), but rather stick to permanently placed roads/tracks. This would minimise the effect on localised potentially sensitive habitats in the area; 4. Stick to speed limits of maximum 30km/h as this would result in fewer faunal road mortalities. Speed humps could also be used to ensure the speed limit; 5. Never kill any fauna including sneaks. Remove (e.g. capture) unique fauna and sensitive fauna before commencing with the development activities and relocate to a less sensitive/disturbed site if possible; 6. Prevent and discourage the setting of snares (poaching), illegal collecting of veld foods (e.g. tortoises, etc.), indiscriminate killing of perceived dangerous species (e.g. snakes, etc.) and collecting of wood as this would diminish and negatively affect the local fauna; 7. Rehabilitation of the disturbed areas – i.e. initial development access route “scars” and associated tracks as well as temporary accommodation sites. Such rehabilitation would not only confirm the company’s environmental integrity, but also show true local commitment to the environment; 8. Implement erosion control. The area(s) towards & adjacent the drainage line(s) are easily eroded and further development may exacerbate this problem. Avoid undertaking activities including supporting activities such as camping within 20m of the main drainage line(s) to minimise erosion problems as well as preserving the associated fauna; 9. Conduct a thorough investigation on the fauna associated with the proposed exploration site(s); 10. Prevent the number of domestic pets – e.g. cats and dogs – accompanying the workers during the field-based exploration activities as cats decimate the local fauna and interbreed & transmit diseases to the indigenous African Wildcat found in the area. Dogs often cause problems when bonding on hunting expeditions thus negatively affecting the local fauna. The indiscriminate and wanton killing of the local fauna by such pets should be avoided at all costs. 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> (i) Proponent’s Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.10: Mitigation measures to be implemented with respect to the exploration camps and exploration sites.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>Promotion of conservation through preservation of flora, fauna and ecosystem around the exploration camps and exploration sites</p>	<ol style="list-style-type: none"> 1. Select camp sites and other temporary lay over sites with care – i.e. avoid important habitats (e.g. raptor breeding sites, pans); 2. Use portable toilets to avoid faecal pollution around camp and exploration sites; 3. Initiate a suitable and appropriate refuse removal policy as littering could result in certain animals becoming accustomed to humans and associated activity and result in typical problem animal scenarios – e.g. baboon, black-backed jackal, crows, etc.; 4. Avoid and/or limit the use of lights during nocturnal exploration activities as this could influence and/or affect various nocturnal species – e.g. bats and owls, etc. Use focused lighting for least effect; 5. Prevent the killing of species viewed as dangerous – e.g. various snakes – when on site; 6. Prevent the setting of snares for ungulates (i.e. poaching) or collection of veld foods (e.g. tortoises, monitor lizard) and unique plants (e.g. <i>Harpagophytum procumbens</i>) or any form of illegal hunting activities; 7. Avoid introducing dogs and cats as pets to camp sites as these can cause significant mortalities to local fauna (cats) and even stock losses (dogs); 8. Remove and relocate slow moving vertebrate fauna (e.g. tortoises, chameleon, snakes, etc.) to suitable habitat elsewhere in the general area; 9. Avoid the removal and/or damaging of protected flora potentially occurring in the general area – e.g. various <i>Baikiaea plurijuga</i>, <i>Pterocarpus angolensis</i>, etc.; 10. Avoid introducing ornamental plants, especially potential invasive alien species, as part of the landscaping of the camp site, etc., but rather use localised indigenous species, should landscaping be attempted, which would also require less maintenance (e.g. water); 11. Remove all invasive alien species wherever encountered – e.g. <i>Prosopis</i> spp. This would not only indicate environmental commitment, but actively contribute to a better landscape; 12. Inform contractors/workers regarding the above mentioned issues prior to exploration activities and monitor for compliance thereof throughout; 13. Rehabilitate all areas disturbed by the exploration activities – i.e. camp sites, tracks, exploration/drill sites, etc.; 14. Ensure that adequate firefighting equipment (e.g. fire beaters; extinguishers, etc.) is available at camp sites and clear kitchen areas to avoid accidental fires; 15. Liaises with MET officials whilst working close to the Mangetti and Kaudum NP's; 16. Employ an independent environmental auditor to ensure compliance, especially of the rehabilitation of all the affected areas. 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.11: Mitigation measures for surface and groundwater protection as well as general water usage.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>Effective management / protection of surface and groundwater resources and general water resources usage</p>	<ol style="list-style-type: none"> 1. Always use as little water as possible. Reduce, reuse and re-cycle water where possible; 2. All leaking pipes / taps must be repaired immediately they are noticed; 3. Never leave taps running. Close taps after you have finished using them. 4. Never allow any hazardous substance to soak into the soil; 5. Immediately tell your Contractor or Environmental Control Officer / Site Manager when you spill, or notice any hazardous substance being spilled during the field-based exploration activities or around the camp site; 6. Report to your Contractor or Environmental Control Officer / Site Manager when you notice any container, which may hold a hazardous substance, overflow, leak or drip; 7. Immediately report to your Contractor or Environmental Control Officer / Site Manager when you notice overflowing problems or unhygienic conditions at the ablution facilities; 8. No washing of vehicles, equipment and machinery, containers and other surfaces; 9. Limit the operation to a specific site and avoid sensitive areas and in particular the Ephemeral River Channel. This would sacrifice the actual area for other adjacent Ephemeral River areas and thus minimise any likely negative effect on water resources; 10. Disposal of wastewater into any public stream is prohibited; 11. The Proponent must obtain permission of the land owners before utilising any water resources or any associated infrastructure; 12. If there is a need to drilling a water borehole to support the exploration programme the proponent (Proponent) must obtain permission from the land owner and Department of Water Affairs in the Ministry of Agriculture and Forestry; 13. If there are any further (larger scale) exploration/drilling activities to follow from the initial planned drill holes, groundwater monitoring must be implemented to include water level monitoring and also water sampling on a bi-annual basis. In order to have greater transparency on the water monitoring activities, the affected landowners / farmers must be given full access to the results of the water monitoring analyses. 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ul style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.12: Mitigation measures to minimise negative socioeconomic impacts.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>Effective management of socioeconomic benefits of the proposed / ongoing project activities</p>	<ol style="list-style-type: none"> 1. The employment of local residents and local companies should be a priority. To ensure that potential employees are from the area, they need submit proof of having lived in the area for a minimum of 5 years; 2. Providing information such as the number and types of jobs available, availability of accommodation facilities and rental costs and living expenses, could make potential job seekers wary of moving to the area; 3. Addressing unrealistic expectations about large numbers of jobs would be created; 4. Exploration should be established in close consultation with the land owners; 5. Exploration camp should consider provision of basic services; 6. When employees contracts are terminated or not renewed, contractors should transport the employees out of the area to their hometowns within two days of their contracts coming to an end; 7. Tender documents could stipulate that contractors have HIV/Aids workplace policies and programmes in place and proof of implementation should be submitted with invoicing; 8. Develop strategies in coordination with local health officers and NGO's to protect the local communities, especially young girls. 9. Contract companies could submit a code of conduct, stipulating disciplinary actions where employees are guilty of criminal activities in and around the vicinity of the EPL. Disciplinary actions should be in accordance with Namibian legislation; 10. Contract companies could implement a no-tolerance policy regarding the use of alcohol and workers should submit to a breathalyser test upon reporting for duty daily; 11. Request that the Roads Authority erect warning signs of heavy exploration vehicles on affected public roads; 12. Ensure that drivers adhere to speed limits and that speed limits are strictly enforced; 13. Ensure that vehicles are road worthy and drivers are qualified; 14. Train drivers in potential safety issues. 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.13: Mitigation measures to minimise health and safety impacts.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>Promotion of health and safe working environment in line with national Labour Laws</p>	<ol style="list-style-type: none"> 1. An onsite ambulance, qualified medical practitioner and essential medical kits shall always be available onsite. 2. Physical hazards: Follow national and international regulatory and guidelines provisions, use of correct Personal Proactive Clothing at all times, training programme, as well as the implementation of a fall protection program in accordance with the Labour Act. 3. Some of the public access management measures that may be considered in an event of vandalism occurring are: <ul style="list-style-type: none"> • All exploration equipment must be in good working condition and services accordingly; • Control access to the exploration site through using gates on the access road(s) if required; • The entire site, must be temporally secured if required; the type of fencing to be used would, however, be dependent on the impact on the visual resources and/or cost; and; • Notice or information boards relating to public safety hazards and emergency contact details to be put up at the gate(s) to the exploration area. 4. Rubber gloves are used in case of an accident to reduce the risk of contracting HIV/AIDS; 5. All individuals have received instructions concerning the dangers of dehydration or hyperthermia. Encourage all to drink plenty of clean water not directly from the surface water bodies. 6. No person under the influence of alcohol or drugs is allowed to work on site. 7. The Exploration Manager ensures compliance with the requirements of the relevant Namibian Labour, Health and Safety Regulations. 8. Dangerous or protected / sensitive areas are clearly marked and access to these areas is controlled or restricted. 9. Due care must be taken when driving any vehicles on any roads particularly the gravel roads. ALL Drivers must drive with their headlights switched on when travelling on the gravel roads (day and night). 10. Persons driving a vehicle must be in possession of a valid driver's license 11. Awareness on HIV/AIDS among workers is raised 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.14: Mitigation measures to minimise visual impacts.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Preserve the landscape character in the development of supporting infrastructure and choice of visual screening	<ol style="list-style-type: none"> 1. Consider the landscape character and the visual impacts of the exploration area including camp site from all relevant viewing angles, particularly from public roads; 2. Use vegetation screening where applicable. Do not cut down vegetation unnecessary around the site and use it for site screening; 3. Avoid the use of very high fencing; 4. Minimise access roads and no off-road that could results in land scarring is allowed; 5. Minimise the presence of secondary structures: remove inoperative support structures; 6. Remove all infrastructure and reclaim, or rehabilitate the project site after exploration activities are completed. 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.15: Management of site and surrounding traffic and equipment movements.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Management of any likely increase on site and surrounding traffic and equipment movement	<ol style="list-style-type: none"> 1. Adhere to the site and national public roads speed limits; 2. Adhere to all the Road Authority road restrictions requirements 3. Adhere site equipment / vehicles movement procedures and protocols / operational manuals; 4. To insure safety of traffic movement, trip schedule should be advised for all scheduled heavy duty vehicles, all drivers should be in possession of valid driver's licence, speed limits should be adhered to. 5. The use of traffic and safety warning signs and flag persons to warn and control traffic should be advised where required. 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.16: Equipment / vehicles noise, vibrations and other emissions.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Minimise the noise and other emissions associated with site equipment / vehicles movements	<ol style="list-style-type: none"> Trucks deliveries of materials and equipment to sites shall be scheduled to avoid pick traffic hours around the public roads in order to minimise congestion Adhere to equipment / vehicles noise and other emissions management procedures at all times; Equipment / vehicles engines must maintained well to minimise the noise; Use noise screens if required Neighbours must be alerted of operations that are likely to produce excessive noise and timing of the noisy event Personal Protective Clothing must be use at all times. Clean fuels such as Liquefied Petroleum Gas (LPG) and electric vehicles / equipment should be used. LPG is non-toxic, non-corrosive, and free of tetra-ethyl lead or additives, it burns more cleanly than petrol. 	<ul style="list-style-type: none"> Pre-construction and drilling requirements Construction phase Mobilisation Spudding and Conductor casing Drilling surface and setting casing and cementing process Plug and abandon hole Rehabilitate all surface disturbances and clear the site of any debris Camp removal, site closure / abandonment Major land accidental incidence such as diesel / oil spill/ fire / explosion equipment movement 	<ol style="list-style-type: none"> Proponent's Representative (PR) Project Manager (PM) Project HSE Contractor Subcontractors

Table 3.17: Management of any likely site dust generation for the entire operations.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Management of any likely site dust that maybe be generated along the access road and on site	<ol style="list-style-type: none"> Adhere to the site / public roads and as per Road Authority road restrictions requirements speed limits. Fine grained and potentially dust generating products shall be transported only in bags or closed containers and stockpiles shall be covered and managed in enclosed facilities; Trucks and all materials transfer points shall have dust suppression systems installed or be covered at all times; Temporary measure: Use high pressure water dust control spray system with manual or automated, high frequency, light watering of materials to prevent dust lift off on site; Workers must use Personal Protective Clothing / Equipment at all times, and; Adhere to the material handling and site equipment / vehicles movement procedures and protocols around the drilling site. 	<ul style="list-style-type: none"> Pre-construction and drilling requirements Construction phase Mobilisation Spudding and Conductor casing Drilling surface and setting casing and cementing process Plug and abandon hole Rehabilitate all surface disturbances and clear the site of any debris Camp removal, site closure / abandonment Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> Proponent's Representative (PR) Project Manager (PM) Project HSE Contractor Subcontractors

Table 3.18: Spillages and accidental products or fuel leaks.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>Sites management with respect to vehicles, trucks, earthmoving equipment and movement of drilling materials and finished products as well as wastes</p>	<ol style="list-style-type: none"> 1. Adhere to site management procedures at all times in order to prevent spillages; 2. Ensure that the integrity of any storage medium and its associated delivery point are inspected on a regular basis. 3. The personnel designated to receive deliveries of materials/fuel/ should receive practical training on how to prevent and respond to a spills 4. The designated personnel should also be aware of any potential areas in their vicinity that are at risk of contamination, such as fauna, flora, Ephemeral River Channels or water supply borehole. 5. Clean up any site spillages and no spills must be allowed to enter the environment / soak into the ground 6. Site must have spillage containment traps where required. 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.19: Mitigation measures for waste (solid and liquid) management.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>Promotion of effective waste (solid and liquid) management through the adoption of sound and hierarchical approach to waste management, which would include waste minimisation, re-use, recovery, recycling, treatment, and proper disposal.</p>	<ol style="list-style-type: none"> 1. Burial of waste on anywhere within the PEL area is not allowed and all generated solid waste must be disposed at the at an approved municipal waste disposal site; 2. Toilet and ablution facilities must be provided on site and should not be located close to Ephemeral Rivers or water supply borehole; 3. Provide site information on the difference between the two main types of waste, namely: <ul style="list-style-type: none"> • General Waste; and • Hazardous Waste. 4. Sealed containers, bins, drums or bags for the different types of wastes must be provided. Never dispose of hazardous waste in the bins or skips intended for general waste; 5. All solid and liquid wastes generated from the proposed / ongoing project activities shall be reduced, reused, or recycled to the maximum extent practicable; 6. Trash may not be burned or buried, except at approved sites under controlled conditions in accordance with the municipal regulations; 7. Never overfill any waste container, drum, bin or bag. Inform your Contractor or the Environmental Control Officer / Site Manager if the containers, drums, bins or skips are nearly full; 8. Never litter or throwaway any waste on the site, in the field or along any road. No illegal dumping; 9. Littering is prohibited. 10. Latrines and French drains built >100m from watercourses or pans to avoid pollution of primary and secondary aquifers. 11. Chemical toilets or suitable waste water management system shall be provided on site and around the camp as may be required. 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.20: Rehabilitation plan.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>Contributions toward environmental preservation and sustainability through rehabilitation of disturbed areas such as exploration sites and remove all unwanted part of the fixtures and restore the sites to close an approximation of the pristine state as is technically, financially and reasonably possible.</p>	<ol style="list-style-type: none"> 1. The following rehabilitation actions are practiced: <ul style="list-style-type: none"> • Rehabilitate all site scars; • Litter from the site has been taken to the appropriate disposal site; • Debris, scrap metal, etc is removed before moving to a new site or closure of the drilling site. • Water tanks are dismantled and removed if not need for after use. • Tracks on site and the access road are rehabilitated by smoothing the 'middle mannetjie'(middle ridge between the tracks) and raking the surface. 2. The following should be undertaken at all disturbed areas that require further rehabilitation: <ul style="list-style-type: none"> • if applicable the stockpiled subsoil to be replaced (spread) and/or the site is neatly contoured to establish effective wind supported landscape patterns; • Replace the stored topsoil seed bank layer. • Five (5) years after rehabilitation the sites are not visible from 500 m away. 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ol style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 3.21: Environmental performance monitoring data collection.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
<p>1. Collect data that will add value to environmental monitoring and reporting to the regulators</p> <p>2. Collect data that will add to the general scientific and geographic knowledge of the environment in which the exploration process takes place.</p> <p>3. Acknowledged that the required skills and knowledge to collect all the suggested data may not be available within the exploration team, however, as much data as is practical should be collected.</p>	<p>1. Environmental Monitoring Report compiled and submitted by the Environmental Coordinator to the regulators</p> <p>2. The following types of information should be gathered:</p> <ul style="list-style-type: none"> • Fauna. What tracks or signs of animal activity have been seen or affected onsite? (photographs and GPS recording) What animals, birds etc were identified? Alternatively provide a description and/ or photo if unidentified. • Unusual weather conditions, e.g. records of the prevailing wind direction and the direction from which storm events come. Was there rain or intense heat? Preferably have a thermometer and rain gauge on site. • Vegetation. Record trees, shrubs, grass, etc. that are found in the vicinity. Some plants do only occur after rainfall and might not have been seen for decades. • Any archaeological, cultural or historical sites that may be found and reported the project archaeologist. GPS co-ordinates, photograph and plot the position on a 1: 50 000 map. • Other including surface water, large scale geological features etc 	<ul style="list-style-type: none"> • Pre-construction and drilling requirements • Construction phase • Mobilisation • Spudding and Conductor casing • Drilling surface and setting casing and cementing process • Plug and abandon hole • Rehabilitate all surface disturbances and clear the site of any debris • Camp removal, site closure / abandonment • Major land accidental incidence such as diesel / oil spill/ fire / explosion 	<ul style="list-style-type: none"> (i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

4. REHABILITATION AND MONITORING

4.1 Rehabilitation Commitment and Process

The following is the summary of key rehabilitation process to be implemented by the proponent:

1. Step 1: Backfilling all site surface excavation:

- Transporting all stockpiled overburden, whether being stockpiled or used as berms, back to the excavated areas;
- Backfilling the trenches, pits and quarries using this material;
- If applicable, backfill the various layers of overburden in the reverse order in which they were removed, i.e. Last out should be first in as far as possible;
- Replace the subsoil layer by backfilling the soil on top of the overburden and contour cap the subsoil with a topsoil layer about 10cm deep;
- Cap the topsoil containing the seedbank with a layer of gravel by manually spreading the fragments across the surface using a rake, and;
- When backfilling, bear in mind that some space must be left for the backfilling of the soil on top of the overburden.

2. Step 2: Remove all waste and unwanted materials:

- Once the slimes ponds have dried sufficiently, scrape out the slimes and transporting back to the surface excavated area during the overburden backfilling stage;
- Bulldoze the slimes pond walls over and contour;
- Allow the pollution control dam to evaporate completely, scrape all waste that has collected in the pond and dispose of these and the pond lining at a suitable site;
- Bulldoze the walls of the pollution control pond over and contour;
- Collect remaining domestic waste on site and transport to a formal municipal solid waste disposal site;
- Clean out the oil traps, collect the waste material in drums and transport to a suitable municipal waste disposal site, and;
- Manually remove all weedy species that are present at the site (the entire plant can easily be removed because the plants tend not to root deeply).

3. Step 3: Remove all structures:

- Remove all the site drilling supporting infrastructure such as housing container / tents;

- Disassemble all the drilling structures;
- Remove all materials from the sites and either:
 - Transporting to a new site if it is to be used or stored elsewhere; or
 - Disposing at a suitable site; or
 - Making them available to the farmer or local persons; or
 - Selling at an auction.
- Remove all machinery from the site and transport to a new site where it is to be used or stored or sell at an auction;
- Remove all fences that have been constructed and either make the material available to the local persons/farmer, dispose at a suitable site or sell at an auction;
- Remove the generators from the sites from site and either transport to a new site for storage or sell it to the farmer or an auction;
- Seal all petrol, diesel, oil and grease containers and remove from the site to a storage facility or make it available to the farmer;
- Collect all scrap metal and dispose at a suitable site or sell at an auction;
- Break up all concrete slabs and structures on site and transport the fragments to a suitable municipal waste disposal or use a fill materials along the sandy / slippery / muddy access road;
- The concrete reservoirs if created, can probably remain intact provided that the farmer wishes to utilize them at some stage - this will need to be negotiated;
- The future use of the water borehole/s and water pipelines as well as any additional infrastructures that has been added to the borehole shall be handed over to the Regional Council who will work with the local community on usage and maintenance of the infrastructure, and;
- Any unused pipes shall be removed, disassemble and transport the component parts to a storage site or sell at an auction.

4. **Step 4: Rehabilitate the storm-water channel:**

- Remove the Hyson cells or gabions;
- Dispose of the plastic/wire and use the fill material to backfill the storm-water channel;
- Cap with a layer of topsoil to a depth of about 10cm, and;

- Cap the topsoil containing the seedbank with a gravel layer by manually spreading the fragments across the surface using a rake.

5. **Step 5: Rehabilitate another surrounding affected areas**

- Compaction of the substrate will result from utilisation of these areas or the pressure of overlying structures;
- Rip the surfaces to a depth of 40 cm to 50 cm using a multi-toothed ripper and tractor;
- Cover with a layer of topsoil to a depth of about 10 cm, and;
- Cap the topsoil containing the seedbank with a layer of gravel by manually spreading the fragments across the surface using a rake.

6. **Step 6: Rehabilitate the roads**

- Compaction of the road will result from the continuous passage of heavy vehicles so it will be necessary to break up the road surface;
- Rip the road surface to a depth of at least 50 cm using a multi-toothed ripper and tractor;
- Disk the ripped surface to break up the clods;
- Cover with a layer of topsoil to a depth of about 10 cm, and;
- Cap the topsoil containing the seedbank with a gravel layer by manually spreading the fragments across the surface using a rake.

4.2 Rehabilitation Evaluation and Performance Monitoring

The following is the summary of key rehabilitation evaluation and performance monitoring to be implemented by the proponent:

- ❖ **Monitoring:** Monitoring program is instituted to ensure that the requirements of the mining site rehabilitation program are met. Rehabilitation program may be subjected to various natural or man-made forces that can hinder the progress and lead to problems or failure of the rehabilitation program. Regular monitoring will ensure that these factors are identified early so they may be resolved through appropriate recommendations;
- ❖ **Frequency:** All rehabilitated areas should be monitored over a 3 years period from the onset of the rehabilitation procedures. The frequency of monitoring suggested above is dependent on satisfactory performance. If, however, the requirements are not being met, the frequency of monitoring can be increased. It is suggested that the monitoring be conducted once a year around September when the grasses and forbs are flowering;
- ❖ **Methods:** The rehabilitated areas might be monitored by the sampling randomly located 1m² quadrates. Approximately 10 quadrates per hectare (or a minimum of 3) should be sampled per plant community. The factors that will be examined in each quadrate include:

- Percentage basal cover;
 - Percentage aerial cover;
 - Species composition and diversity;
 - Vigor and health of plants;
 - Presence of and evidence of fauna, and;
 - Nature of the substrate.
- ❖ **Controls:** To enable a comparison, control plots located within the surrounding un-mining areas should also be monitored. This will give an indication of the progress of rehabilitated areas versus the natural vegetation and will set the goals, which ultimately should be achieved. By monitoring the natural vegetation annually, it will also be possible to assess the natural changes that are taking place. These findings can then be applied to the rehabilitated areas so as to account for the changes, which may have resulted from natural events. Approximately 5 to 10 quadrates of 1m² should be sampled per community type to set the controls;
 - ❖ **Maintenance:** Maintenance requirements may include seeding (if there is poor germination of the seedbank), fertiliser applications, correcting erosion problems, removing weeds, etc. Maintenance of the rehabilitated areas will be necessary periodically. The need for and extent of maintenance activities will be determined during the regular monitoring of the site, and;
 - ❖ **Qualified Personnel:** The rehabilitation procedures from implementation to monitoring should be overseen by qualified personnel. Any persons involved in the rehabilitation of the mining site should be trained in the techniques involved.

4.3 Environmental Performance Monitoring and Reporting

The monitoring of the environmental performances for the proposed exploration project can be divided into two (2) parts and these are:

- (i) Routine / ongoing daily monitoring activities to be undertaken by the Project HSE Officer with the support of the external specialist consultants as maybe required, and;
- (ii) Preparation of annual Environmental Monitoring Report and Environmental Closure covering all activities related to the Environmental Management Plan during exploration / prospecting stages and at closure of the proposed / ongoing exploration to be undertaken by the Project HSE Officer with the support of the external specialist consultants as maybe required.

The proponent will be required to report regularly (twice in a year or as the case maybe) to the Environmental Commissioner in the Ministry of Environment and Tourism (MET), the environmental performances as part of the ongoing environmental monitoring programme. Environmental monitoring programme is part of the EMP performances assessments and will need to be compiled and submitted as determined by the Environmental Commissioner. The process of undertaking appropriate monitoring as per specific topic (such as fauna and flora) and tracking performances against the objectives and documenting all environmental activities

is part of internal and external auditing to be coordinated by the Project HSE Officer.

The second part of the monitoring of the EMP performance will require a report outlining all the activities related to effectiveness of the EMP at the end of the planned mineral exploration to be undertaken by the Project HSE Officer with the support of the external specialist consultants as maybe required. The objective will be to ensure that corrective actions are reviewed and steps are taken to ensure compliance for future EIA and EMP implementation.

The report shall outline the status of the environment and any likely environmental liability after the completion of the proposed / ongoing project activities. The report shall be submitted to the Environmental Commissioner in the Ministry of Environment and Tourism and will represent the final closure and fulfilment of the conditions of the Environmental Clearance Certificate (ECC) issued by the Environmental Commissioner in the Ministry of Environment and Tourism (MET).

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusions

Reconnaissance Energy Namibia (Pty) Ltd (**the Proponent**) intends to drill stratigraphic multi-wells within license area and starting with the two (2) well locations Nos. 5-6 and 6-2 to be drilled to a Total Depth (TD) of about 2500 m (2.5 km). The overall aim and objective of the proposed stratigraphic multi-wells drilling operations is to study the geology and petroleum systems of the PEL 73 and in particular, the potential for both large scale conventional and non-conventional play types within the Kavango Basin. Depending on the outcomes of the proposed initial drilling operations, additional drilling operations may be undertaken within the license area.

The overall severity of potential environmental impacts of the proposed project activities on the receiving environment (physical, biological, socioeconomic environments and ecosystem functions, services, use and non-use values or passive uses) will be of low magnitude, temporally duration, localised extent and low probability of occurrence. Mitigation measures must be implemented as detailed in this report. The proponent must obtain permission of the land owner (surface rights holder) before exercising the subsurface rights with respect to the proposed multiple stratigraphic well drilling operations in PEL 73, Kavango Basin, northeast Namibia.

5.2 Recommendations

It's hereby recommended that the proposed / ongoing exploration activities be issued with an Environmental Clearance Certificate (ECC). The proponent shall take into consideration the following key requirements for implementing the proposed exploration programme:

- (i) Mitigation measures must be implemented as detailed in this report;
- (ii) The proponent shall negotiate Access Agreement with the land owner as maybe applicable;
- (iii) The proponent shall obtain all other applicable permits as maybe applicable;
- (iv) The Proponent shall adhere to all the provisions of the EMP and conditions of the Access Agreement to be entered between the proponent and the land owner/s in line with all applicable national regulations, and;
- (v) The proponent must give advance notices to the land owners as may be required or agreed with the land owner/s.

The proponent must take all the necessary steps to implement all the recommendations of the EMP for the successful implementation and completion of the proposed drilling programme covering the PEL 73.

5.3 Summary ToR for Production

In an event that economic petroleum resources are discovered within PEL 73 area and could lead to the development of an onshore oil and/ gas field, a new Environmental Clearance Certificate (ECC) to support the application for a Production License (PL) will be required. The application for ECC being supported by this report, only covers the exploration activities.

The EIA and EMP studies to support the application for the ECC for the production stage shall form part of the prefeasibility and feasibility study / field development appraisals. The site-specific EIA and EMP shall cover the entire field area as well as all areas to be used for infrastructural support areas / corridors. In addition to the Terms of Reference (ToR) to be developed during the Environmental Scoping study phase, the following field-based and site-specific specialist studies shall be undertaken as part of the EIA and EMP for production operations in an event of a discovery of economic resources:

- (i) Assessment of all linear structures such as roads, powerline and water supply and discharge of wastewater;
- (ii) Groundwater studies including modelling as maybe applicable;
- (iii) Site-specific field-based flora and fauna diversity;
- (iv) Archaeology;
- (v) Dust, noise and sound modelling linked to engineering studies;
- (vi) Socioeconomic assessment, and;
- (vii) Others as may be identified / recommended by the stakeholders/ land owners/ Environmental Commissioner or specialists.

The aims and objectives of the Environmental Assessment (EA) covering EIA and EMP to be implemented as part of the feasibility study if economic resources are discovered are:

- (i) To assess all the likely positive and negative short- and long-term impacts on the receiving environment (physical, biological and socioeconomic environments) at local (PEL Area), regional (Kavango West and Kavango East Regions), national (Namibia) and Global levels using appropriate assessment guidelines, methods and techniques covering the complete project lifecycle. The EIA and EMP to be undertaken shall be performed with reasonable skill, care and diligence in accordance with professional standards and practices existing at the date of performance of the assessment and that the guidelines, methods and techniques shall conform to the national regulatory requirements, process and specifications in Namibia and in particular as required by the Ministry of Mines and Energy, Ministry of Environment and Tourism and Ministry of Agriculture, Water Affairs and Forestry, and;
- (ii) The development of appropriate mitigation measures that will enhance the positive impacts and reduce the likely negative influences of the negative impacts identified or anticipated. Such mitigation measures shall be contained in a detailed EMP report covering the entire project lifecycle.

END