CLOSURE PLAN IN SUPPORT OF THE ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED PROSPECTING RIGHT APPLICATION ON FARMS OUBIP 59- REM EXT, GAMS 60- PORTION 1, PORTION 4 AND REM EXT, UNDER KHAI MA LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE.

PROJECT REFERENCE: NC 30/5/1/1/2(12167) PR

SITATUNGA RESOURCES (PTY) LTD

JUNE 2018

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LIST OF ABBREVIATIONS

BAR	Basic Assessment Report
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme Report
EMS	Environmental Management System
IWULA	Integrated Water Use Licence Application
NEMA	National Environmental Management Act (Act 107 of 1998)
SANAS	South African National Accreditation System
SCC	Species of Special Concern

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EXPERTISE OF EAP

Name	Details
Niketiwe Dlamini	Niketiwe Dlamini holds a Master's of Science Degree in Environment and Society as well as an Honours Degree in Environmental Analysis and Management from the University of Pretoria. For her undergraduate studies, she completed a diploma in Environmental Health Sciences as well as a BSc degree in the same field majoring in Environmental Management at the University of Swaziland; she has also been trained as an Environmental Management Inspector at the University of Pretoria and therefore has a vast understanding of South African Environmental Legislation and monitoring compliance. As an Environmental Assessment Practitioner Niketiwe has been in involved in several EIA projects including; GIZA Minerals, Mining Right, Dlamini Trust, Prospecting Right Applications, Taung Prospecting Right Application, City of Tshwane Food and Energy Centre, Welkom 5MW Solar power plant, Springs Pyrolysis Plant, Sandown Castle S24G, Olievenhoutbosch and Garankuwa Mixed Scheme Development project, Leandra Landfill site to name but a few projects. She has 5 years of working experience and is also an experienced Environmental Auditor, with the following competencies: • Compliance Monitoring • Occupational Health and Safety Risk Assessments

Name	Details
	• Environmental, Health and Safety Auditing.
Ruan Mostert External Reviewer	Summary of Qualifications • Masters in Environmental Management • BSc Honours in Conservation Ecology <u>Summary of Experience:</u> Ruan has participated in the completion of variety environmental projects throughout South Africa, including BAR's, EIAs and EMPR's for construction projects, mining houses, industrial developments as well as infrastructure and has more than 11 years' experience as an Environmental Assessment Practitioner. His experience also includes the completion of Section 24G applications, Environmental Management Plans, EMPR's for prospecting and mining right applications, environmental audit reports, acting as an Environmental Control Officer (ECO) compiling monthly environmental compliance audits for construction sites, implementing and maintaining ISO 14 001 Environmental Management Systems and acting as an external ISO 14001 auditor. Due to the wide variety of projects he has been involved in, he has gained experience in a wide range of environmental disciplines.

1. INTRODUCTION

The proposed Oubip prospecting project is located in the Northern Cape Province. The project falls within the Khai Ma Local Municipality and Namakwa District Municipality. The project area is located 36.34 km South West of Poffadder, refer to **Figure 1**. Sitatunga Resources (Pty) Ltd proposes to prospect for Manganese, Iron Ore, Uranium, Zinc,Silver and Lead, Potassium Feldspar, Sheet Muscovite Mica, Beryl, Tantalum Ta205, Quartzite, Quartzite/Sandstone, Sand, Albite, Spessarite, Silica and Copper on the Farms Oubip 213-rem ext, and Portion 1, Gabaip 89-rem ext and Portion 1 and Voselstruishoek 88- rem ext and Portion 1

The prospecting activities will include the following activities:

- Literature survey- which will be a comprehensive review of published and unpublished work from secondary data sources. Time will be spent reviewing books, journals, government publications etc.
- Geological Mapping will be conducted such that accurate and meaningful structural and geological data may be derived from it and to communicate information gathered from the desktop study with mapping results.
- Borehole planning will involve drilling program design and implementation procedures to ensure that drilling is conducted as safe and economic as possible. This phase will include cooperation between the drilling contractor, services contractors, geologists and other technical specialists. The planning process will also ensure that the health and safety of all working on the drilling sites and the environment are protected.
- All core samples collected throughout drilling will be submitted to a SANAS-accredited laboratory for comprehensive analyses and metallurgical recovery tests.
- Geophysical wireline logging: Down hole geophysics will be conducted on specific boreholes to allow for stratigraphic correlation, for core recovery calculations and to aid in the interpretation and sampling of the various coal seams. Wireline logging is performed by lowering a 'logging tool' on the end of a wireline into a borehole and recording physical properties using a variety of sensors.
- Geological 3D modelling: After the extent and development of the coal seams are investigated by drilling, the acquired data will be modelled using geological modelling software. Geological 3D modelling includes integration of diverse types of observations into 3D geo-models using geological mapping data, borehole data and interpretations and any other field data.

- Environmental management and rehabilitation: Environmental management will include the maintenance and improvement of the state of the environment to ensure that the ecosystem is protected and maintained for equitable use by future human generations, and also, maintain ecosystem integrity. Rehabilitation on the other hand includes returning the land to some degree of its former state after drilling.

These proposed prospecting activities requires an environmental authorization in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA as amended) and will follow a Basic Assessment Process in terms of NEMA Regulations 982 (as amended). The NEMA Regulations Pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operation (GNR 114) requires that a final rehabilitation, decommissioning and mine closure plan is developed which includes the determination of financial provision to guarantee the availability of sufficient funds to undertake rehabilitation and remediation of the adverse environmental impacts of mining.

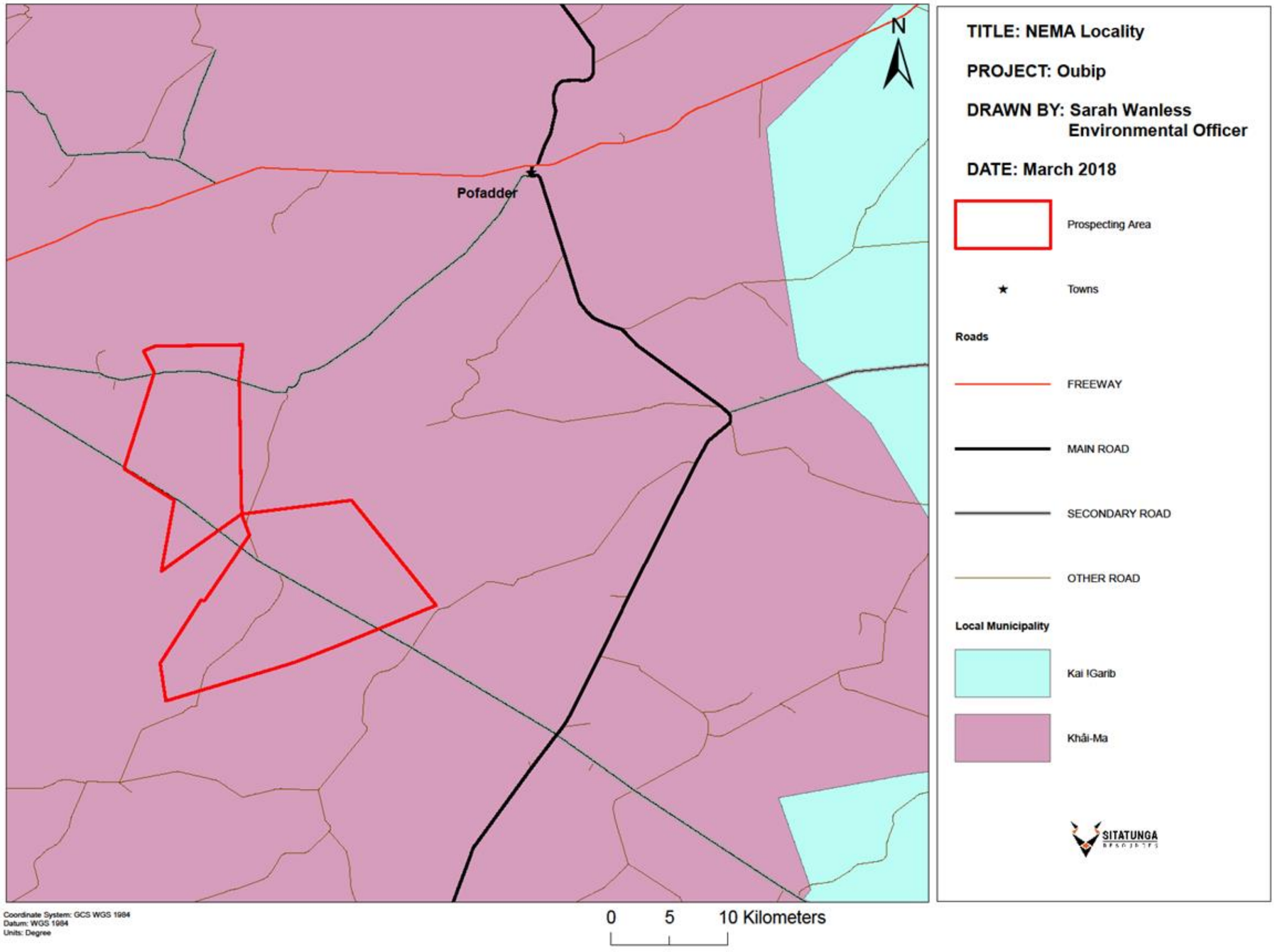

Figure 1 Locality map

1.1 Closure Objectives

Prospecting activities are anticipated to last for over a period of three years. The objective of this document is to present the final rehabilitation, decommission and closure plan for the proposed project. This closure plan therefore covers the footprint area of the proposed activities associated with the prospecting activities.

This report provides a plan that is measurable and auditable for Sitatunga Resources (Pty) Ltd (Sitatunga) and to the Department of Mineral Resources (DMR). A plan that takes into consideration the final land-use of the site, indicating what infrastructure and activities will ultimately be decommissioned, closed, removed and remediated and indicating monitoring, auditing and reporting requirements.

The objectives of the rehabilitation, decommissioning and closure plan are to:

- provide the vision, objectives, targets and criteria for final rehabilitation, decommissioning and closure of the project;
- explain the risk assessment approach and outcomes and link closure activities to risk rehabilitation;
- detail the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure;
- commit to a schedule, budget, roles and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure;
- detailing the full closure costs for the life of project; and
- outlining monitoring, auditing and reporting requirements.

2 REGULATORY REQUIREMENTS

There are a number of legal and regulatory frameworks with which Sitatunga must comply with, the following are key legislation which could materially affect rehabilitation and closure:

Table 1 legislation and its Implications to the Closure Plan

LEGISLATION	IMPLICATIONS FOR CLOSURE
The Constitution of the Republic of South Africa. In terms of Section 24 of the Constitution "Everyone has the right to an environment that is not harmful to their health or well-being; and to have the environment protected, for the benefit of present and future generations."	Constitutional requirement to ensure that the Plan includes measures that protect the rights of people to an environment that is not harmful to health or well-being post closure.
National Environment Management Act (Act 107, 1998) Sections 28 (1) and (3) of NEMA set out the duty of care principle, which is applicable to all types of pollution and must be taken into account in considering any aspects of potential environmental degradation. Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.	The measures required in terms of subsection (1) may include measures to - Investigate, assess and evaluate the impact on the environment; Inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed to avoid causing significant pollution or degradation of the environment; Cease, modify or control any act, activity or process causing the pollution or degradation; Contain or prevent the movement of pollutants or the causes of degradation; Eliminate any source of the pollution or degradation; or Remedy the effects of the pollution or degradation
Environmental Impacts Assessment Regulations, 2014 These regulations were developed for the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations.	Any new EIAs or BAs for mining activities will be required to consider closure during planning and to include a closure plan and closure estimate to support an authorisation application.
National Environment Management: Waste Act (Act 59 of 2008) Part 8 of Chapter 4 of the Act indicates the requirement to identify the status and risk of contaminated sites and provides a legal mechanism for remediation activities to be instigated and controlled.	Contamination resulting from operational activities will require remediation, with the final soil quality meeting requirements as specified in the Acts Regulations.
NEMA Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations. The purpose of these Regulations is to regulate and determine financial provision as contemplated in the Act for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts from prospecting, exploration, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. The Regulations also include detailed descriptions of the wording required in the documentation to support the provisioning for liability using Bank Guarantees and Trust Funds. Finally, the legislation also provides detailed on the information to be contained in the following plans: Annual rehabilitation plan Final rehabilitation, decommissioning and mine closure plan Environmental risk assessment report Care and maintenance plan	Closure planning process will need to be expanded to include Annual rehabilitation plan, Final rehabilitation, decommissioning and mine closure plan, Environmental risk assessment report Care and maintenance plan.

The National Environment Management: Air Quality Act, 2004. This Act regulates atmospheric pollution. The Act came into full effect on 1 April 2010 and entrusts the Department of Environmental Affairs with the task of preventing pollution and ecological degradation, while at the same time promoting justifiable economic and social development. Metropolitan and District Municipalities are charged with issuing atmospheric emission licenses for certain listed activities. It must be shown that the best practical means are being employed to limit air pollution before these certificates will be issued. Penalties and criminal sanctions are imposed for noncompliance with the National Management: Air Quality Act.	Other aspects of the NEMAQA such as monitoring and application of management/mitigation measures may apply during closure.
The National Environmental Management: Biodiversity Act, 2004: The Act seeks amongst other things, to manage and conserve biological diversity, to protect certain species and ecosystems, to ensure the sustainable use of biological resources and to promote the fair and equitable sharing of benefits arising from bio-prospecting involving those resources. The NEM: BA includes a Regulation related to the management of threatened and protected species. A similar Regulation is applied to Threatened Ecosystems. NEM: BA has a set of norms and standards for the development of management plans for both species (e.g. Threatened or Migratory Species) and ecosystems (Endangered or Critically Endangered).	If relevant species or threatened ecosystems are presence on the mine concession, a management plan must be developed in alignment with these norms and standards.
National Water Act Section 19 of the NWA sets out the principles for "an owner of land, a person in control of land or a person who occupies or uses land" to: • Cease, modify or control any act or process causing pollution; • Comply with any prescribed waste standard or management practice; • Contain or prevent the movement of pollutants; • Eliminate any source of pollution; • Remedy the effects of the pollution; and • Remedy the effects of any disturbance to the bed and banks of a watercourse	This places the obligation to mitigate any aspects that cause or have caused pollution as well as to remediate any residual contaminated water at closure.
Mine Health and Safety Act, 1996: This Act deals with the protection of the health and safety of persons in the mining industry but has some implications for environmental issues due to the need for environmental monitoring within mine operations and maintenance of mine residue deposits.	All closure activities will have to be undertaken in a safe manner where the Health and Safety of all workers involved in closure activities is protected.

3 DESCRIPTION OF THE RECEIVING ENVIRONMENT

3.1 Geology

The rock type is igneous rather like granite, it was formed from the depths of the earth as a magma over trillions of years. The pegmatite bodies of the earth have been formed in odd, irregular shapes. The prospecting area in question consists of a number of well-defined pegmatite bodies each in excess of many millions of metric tons.

Minerals of the columbite-tantalite group are of quite common occurrence. Like the other minerals they are found in zones of alteration if pegmatits containing later quartz. They are generally associated with albite and spessarite or, to a lesser extent, with the muscovite greisen.

The number of pegmatite intended to mine is estimated at 40,000 Metric Tons per month, which will give a life of mine in excess of 100 years. The rock formation can easily be mined opencast.

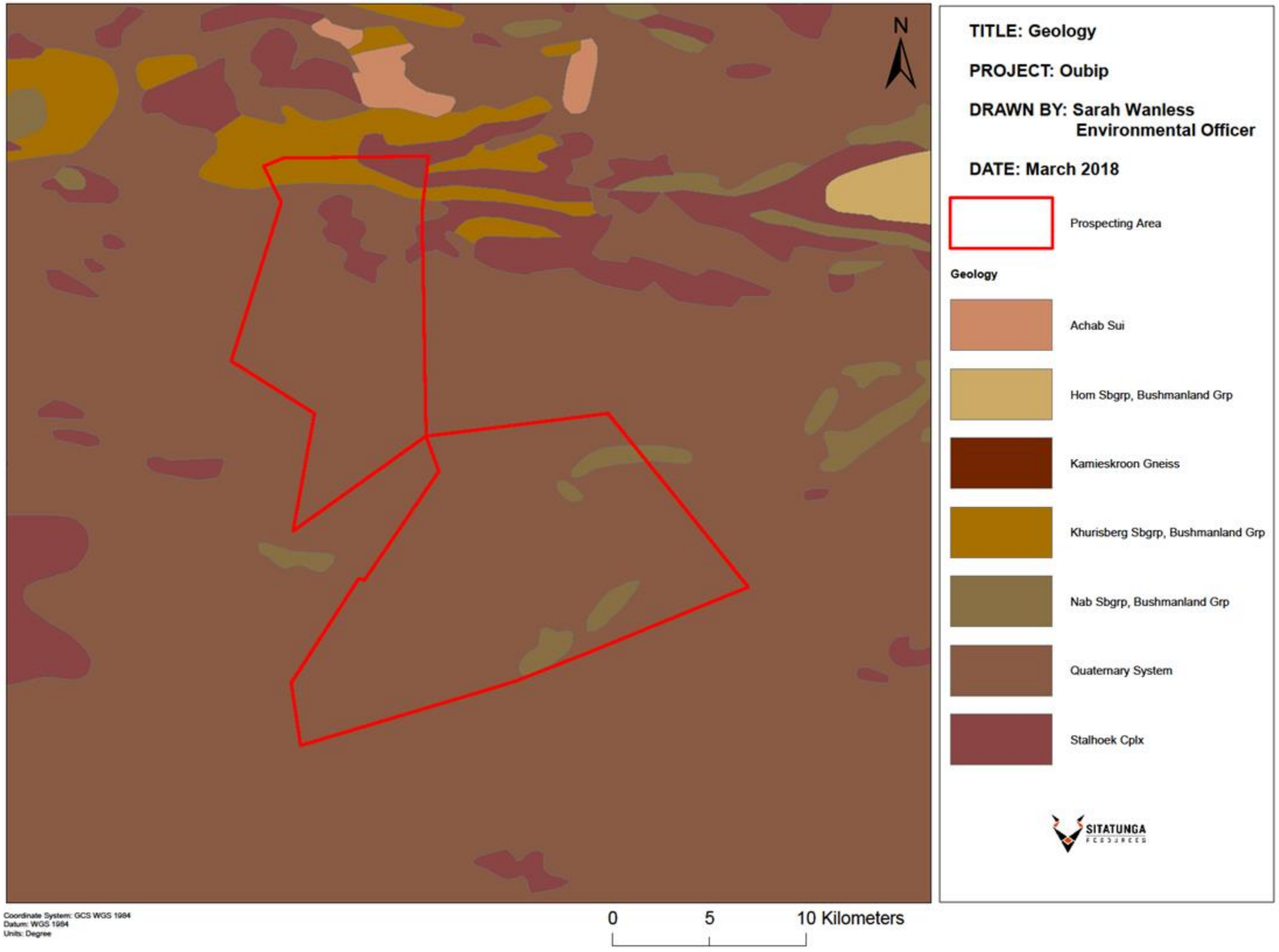

Figure 2 Geology of the Site

3.2 Climate

Pofadder normally receives about 23mm of rain per year, with most rainfall occurring mainly during autumn. The chart below (lower left) shows the average rainfall values for Pofadder per month. It receives the lowest rainfall (0mm) in January and the highest (11mm) in March. The monthly distribution of average daily maximum temperatures (centre chart below) shows that the average midday temperatures for Pofadder range from 17.5°C in July to 31.4°C in January. The region is the coldest during July when the mercury drops to 2.3°C on average during the night. Consult the chart below (lower right) for an indication of the monthly variation of average minimum daily temperatures.

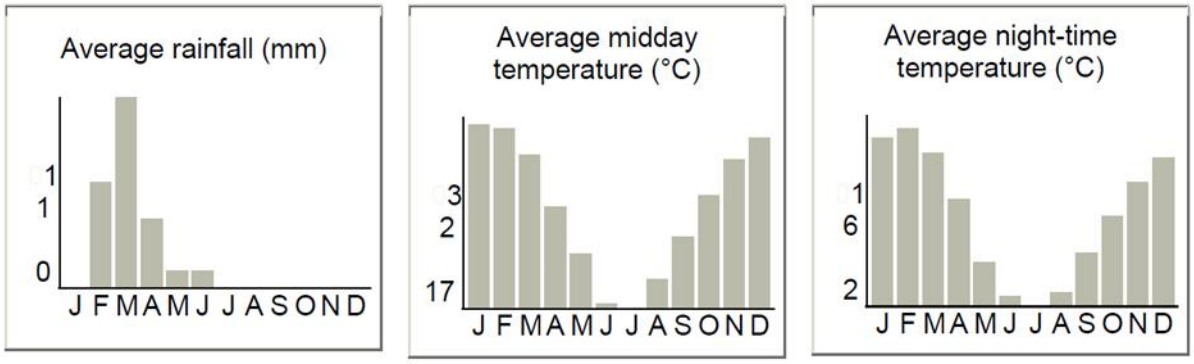

Figure 3 Average rainfall and temperatures

3.3 Topography

The greater extent of the Municipality presents fairly flat areas. Mountainous areas occur in the northern part along the Orange River and around Aggeneys town including Dabenoris Mountain, Elsberg, Groot Pellaberg, Namiesberg, Gamsberg, Aggeneys se Berg and Black Mountain, presenting steeper slopes varying between 9%-25%. Numerous non-perennial streams traverse the Municipality flowing in a northerly direction towards the Orange River. Runoff is generally high after heavy rainfalls due to the hard soil conditions.

3.4 Soils & Land Capability

Accordingly, 0% of the municipal area is regarded as high potential agricultural soils. The banks of the Orange River, presumed to have high agricultural potential, consist of soils not suitable for agriculture or commercial forestry, however, suitable for conservation, recreation or water catchments. The agricultural potential of land in Khai Ma allows for:

- Livestock (80%) and game farming; and
- Irrigation farming on the banks of the Orange River, including dates, export grapes, mangoes, cotton, hoodia and geranium and other crops.

3.5 Natural vegetation

The most extensive vegetation types in the Northern Cape are: Bushmanland, Orange River Nama Karoo, Shrubby Kalahari Dune Bushveld, Upper Nama Karoo and Upland Succulent Karoo. Khai Ma contains 11 vegetation types of which 3 are entirely endemic to the region, 1 type is classified as endangered namely the Lower Gariep Alluvial vegetation type. The SA vegetation types that occur within the Khai Ma Municipality include; *Aggeneys Gravel Vygieveld* (Endemic), *Blouputs Karroid Thornveld*, *Bushmanland Arid Grassland*, *Bushmanland Basin Shrubland*, *Bushmanland Inselberg*, *Shrubland*, *Bushmanland Sandy Grassland, Bushmanland Vloere*, *Eastern Gariep Plains Desert* (NDM Near Endemic), *Eastern Gariep Rocky Desert* (NDM Near Endemic), *Lower Gariep Alluvial Vegetation*, *Lower Gariep Broken Veld.*

Vegetation types found on the project site are the False Succulent Karoo, Namaqualand broken veld, Arid karoo and Desert False Grassland. The succulent karoo stretches from Namibia down the west coast of South Africa. The Namaqualand Broken veld comprises of taller shrubs and low trees. The name arises from the fact that the veld is broken" by the presence of trees.

3.6 Fauna

The Red Lark is endemic to the Municipality and is found in the red dune fields such as along the Koa River. The aquatic pans are an important habitat for wading birds. It is also expected that a wide variety of unique invertebrates are found in the area especially the south-facing slopes of the inselbergs and kloofs that have a much more moderated micro-climate. The study area has no aquatic pans and therefore no unique invertebrates are expected to be found on site. However, any prospecting activities that will take place, care will be taken to minimise habitat disturbance and avoid any collision with faunal species during invasive prospecting activities.

Figure 4 Vegetation Map

3.7 Surface water

The site is located in the Lower Orange Water Management Area (LOWMA). This area is dominated by the Orange River, with few perennial tributaries and several episodic tributaries. Most of the activities dependant on the river are concentrated within close proximity of the main stem of the river.

Based on the digital satellite imagery and relevant databases, the features identified within the study area, the prospecting area contains a NFEPA river running on the southern parts of the site. There are no wetlands on site, non-perennial drainage lines which do not have wetland characteristics are also found on site. These drainage lines are also defined as watercourse by the National Water Act (1998). All watercourses were delineated on a desktop level with the use of aerial photographs, digital satellite imagery and topographical maps. The delineations as presented in this report are regarded as a best estimate of the temporary zone boundaries based on digital signatures.

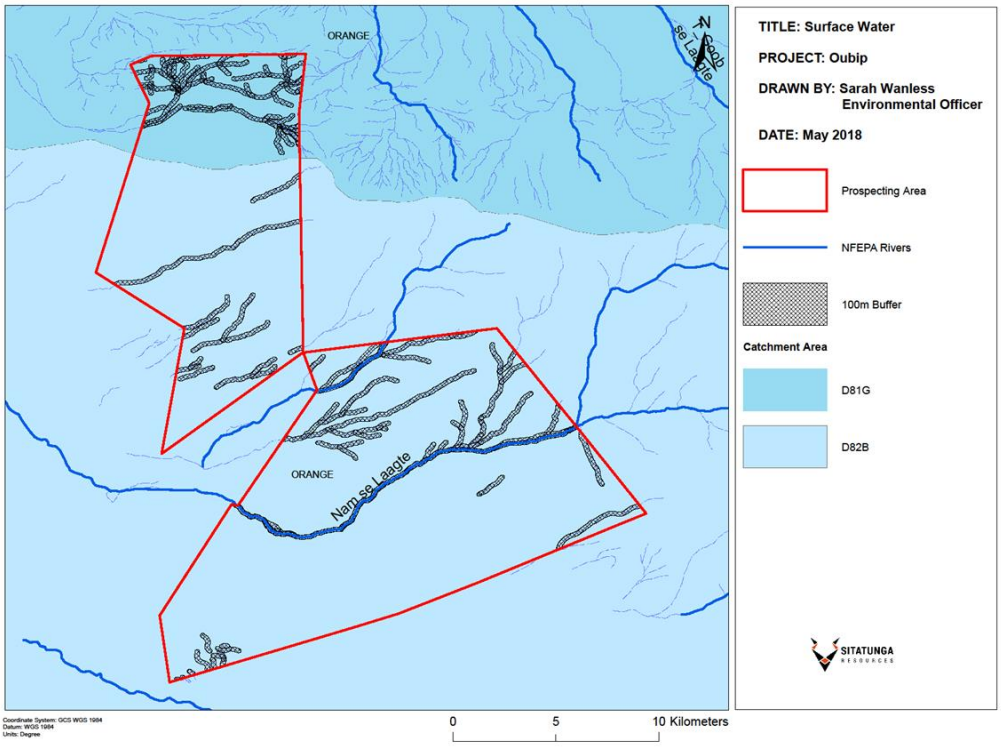

Figure 5 Surface water on site

3.8 Groundwater

Most of the rocks host a combination of intergranular and fractured aquifers. Aquifers are dependent on precipitation for recharge. This recharge varies with frequency of precipitation, rock type, plant and soil cover, river bed infiltration, preferred path infiltration to name a few. Studies from the area indicate that with a threshold precipitation of more than 20 mm less than 1% to seldom more than 10% of precipitation can infiltrate to reach the groundwater. During excessive precipitation events a larger percentage of the vast volumes of precipitation infiltrate.

The abstraction for water provision, irrigation and mine dewatering purposes is responsible for accelerated water level decline in aquifers. In well fields for water provision a few water levels declined to below 10 m. The biggest decline of water levels is more than 60 m in the Tosca Molopo aquifer. This was in reaction to over-abstraction for irrigation purposes. After 2004 water restrictions were imposed and stabilisation and recovery of the water level can be observed since then. At Sishen and Sishen South mine dewatering is also responsible for declines in excess of 50 m. These mines have extensive observation networks and agreements with proximate landowners and water users.

3.9 Regional socio-economic structure

The Northern Cape is characterised by an extreme disparity in wealth, with 44.7 % of the population earning less than 9.8 % of the income. The unequal income distribution has severely hampered development. Migration patterns suggest that there has been economic decline in the area, as people have been leaving the area in search of opportunities in other Provinces such as the Western Cape, Gauteng and Eastern Cape Provinces. Rapid population growth has given rise to a very young population structure. Rising levels of unemployment and the increase in the economically inactive population has resulted in increased pressure on the diminishing employed population and a high dependency on the State for support. The mining sector continues to be the dominant economic sector although recent trends in the sector show the sector to be in decline. Provision of services and infrastructure continues to be a challenge. This is exacerbated by the highly dispersed distribution of settlements.

The Project area falls into the Khai-Ma Local Municipality (LM). The main town in the Khai-Ma LM is Pofadder, which is both an economic hub and the seat of local government. The role of the LM is to monitor and manage service delivery to settlements within its jurisdiction, implement plans

and policies of the Namakwa District Municipality (NDM) and to carry out the development objectives outlined within the Local Economic Development Programme (LED).

3.10 Location, Population and distribution

The Northern Cape is characterised by an extreme disparity in wealth, with 44.7 % of the population earning less than 9.8 % of the income. The unequal income distribution has severely hampered development. Migration patterns suggest that there has been economic decline in the area, as people have been leaving the area in search of opportunities in other Provinces such as the Western Cape, Gauteng and Eastern Cape Provinces. Rapid population growth has given rise to a very young population structure. Rising levels of unemployment and the increase in the economically inactive population has resulted in increased pressure on the diminishing employed population and a high dependency on the State for support. The mining sector continues to be the dominant economic sector although recent trends in the sector show the sector to be in decline. Provision of services and infrastructure continues to be a challenge. This is exacerbated by the highly dispersed distribution of settlements.

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3.11 Major economic activities and sources of employment

The majority of people are involved in the agricultural sector, followed by mining and quarrying, wholesale and retail trade and then social and personal services. However, there has been a significant decrease indicated in the agricultural employment sector which has been absorbed, to a large degree, by an increase in mining, manufacturing and the community, social and personal service sectors. Currently 77% of households are considered indigent and received subsidies for basic services (Khai Ma IDP 2010).

The high poverty level directly affects the Municipality's financial ability to provide and maintain services. The main sources of income are the Black Mountain Mine at Aggeneys, government

departments (i.e. Department of Education, Health, Safety and Communication) and the local Municipality. Commercial farmers depend on income generated from their farms, whilst others make a living by rendering services to the agricultural sector. Many residents depend on government grants, whilst others earn a living by providing housekeeping or gardening services.

3.12 Employment

The Northern Cape is characterised by an extreme disparity in wealth, with 44.7 % of the population earning less than 9.8 % of the income. The unequal income distribution has severely hampered development. Rapid population growth has given rise to a very young population structure (Figure 13). Rising levels of unemployment and the increase in the economically inactive population has resulted in increased pressure on the diminishing employed population and a high dependency on the State for support. The mining sector continues to be the dominant economic sector.

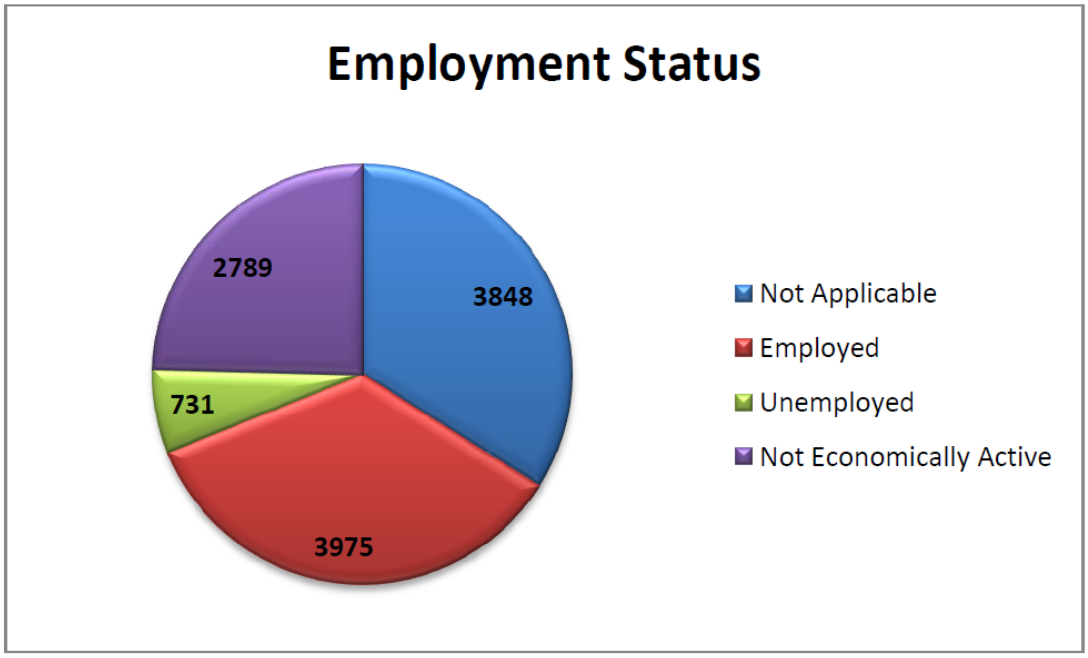

Figure 6 Employment Status, Khai Ma LM

3.13 Access to Basic Services

The recent Community Survey undertaken by Statistics South Africa (2016) has revealed some outstanding results for Namakwa District but also challenges that need to be address in the

coming 5 years to prevent possible community protests. Below is a basic assessment of the access to services within the District:

- Access to pipe water for drinking (95.3%);
- Access to improved sanitation (80.1%);
- Connected to Electricity (88%).

Currently 77% of households under Khai Ma Local Municipality are considered indigent and receive subsidies for basic services delivery. This situation hampers the municipality's financial ability to provide engineering services. The erection of informal structures, especially at Pofadder and Pella, is a clear indication of the need for housing. There are no funds available to upgrade or extend the electricity network of Pofadder which is very old.

4 CLOSURE VISION, OBJECTIVES AND TARGETS

The closure vision for the proposed project is to establish a safe, stable and non-polluting post-prospecting landscape that can facilitate integrated, self-sustaining and value generating opportunities, thereby leave a lasting positive legacy. This plan is aimed at achieving the following targets:

- Creating a safe, physically stable rehabilitated landscape that limits long-term erosion potential and environmental degradation;
- Sustaining long term catchment yield and water quality;
- Focusing on establishing a functional post-prospecting landscape that enables self-sustaining agricultural practices where possible;
- To encourage, where appropriate, the re-instatement of terrestrial and aquatic wetland biodiversity

5 ALTERNATIVES CONSIDERED

Considering that this is a prospecting application, the proposed Oubip prospecting project is not complex and the risks associated with prospecting are understood and can be mitigated at closure. Alternative options for closure are limited. There are only two options that have been considered as activity alternatives for the closure plan:

Preferred Alternative: Closure/ Backfill of boreholes with overburden removed during drilling

Alternative 1: To Leave boreholes open, in-order to allow for groundwater recharge by surface run-off

5.1 Preferred Alternative: Rehabilitation/ Backfill of boreholes

Rehabilitation is the restoration of a disturbed area that has been degraded as a result of activities such as mining, road construction or waste disposal, to a land use in conformity with the original land use before the activity started. This also includes aesthetical considerations, so that a disturbed area will not be visibly different to the natural environment. This also involves maintaining physical, chemical and biological ecosystem processes in degraded environments, hence the preferred option of backfilling the boreholes with the overburden removed during development and cover with growth medium to establish vegetation. This option has several advantages as discussed below:

Advantages

- The site will be aesthetically acceptable;
- The site will blend in with the environment;
- The site will go back to being a suitable habitat for fauna and flora;
- The site will be safe and pollution free;
- Revegetating the site will ensure that the site in non-erodible.

Opting for alternative 1, which is to leave boreholes without backfilling poses a risk in that, these boreholes may fill in with water, which may become attractive to wildlife and communities leading to drowning and the risk of being trapped in the declines. To mitigate these risks, it is necessary to backfill. Treatment technologies should be used to prevent decanting.

6 CLOSURE ASSUMPTIONS

This closure plan has been developed based on limited available information including environmental data. Some of the information currently available may need to be supplemented during the operational period. Therefore, a number of assumptions were made about general conditions, and closure and rehabilitation of the facilities at the site to develop the proposed

closure actions. As additional information is collected during operations, these assumptions will be reviewed and revised as appropriate.

The assumptions used to prepare this plan include the following:

- The closure period will commence once the last planned weight of minerals has been extracted from the site for laboratory testing;
- The proposed prospecting sites will be adhered to minimise the potential impacts;
- Vegetation establishment will be in line with a project area's indigenous vegetation
- Water management infrastructure developed for the operational phase will be retained for closure /end of the life of the project as necessary;
- There are limited opportunities for any infrastructure to be built on site and if any infrastructure is built, it will be of limited benefit to the community. Therefore, all buildings will be demolished;
- All hazardous and domestic waste will be transported offsite for disposal in licensed landfills;
- No roads are anticipated to be constructed to access the site, existing roads will be used as far as possible. Where access tracks have been developed in cases where there are no roads, these will be rehabilitated and closed as part of normal closure actions.

7. FINAL LAND USE

Post closure land use, will return to being agricultural activities. This will include livestock farming, cultivation and plantations. The built-up environment on these farms will not be disturbed during prospecting activities and these will continue to exist post closure.

8. CLOSURE AND REHABILITATION ACTIVITIES

The rehabilitation actions intended to be undertaken at the end of the life of the proposed prospecting activities are described below. These actions are designed to comply with the objectives of this plan which are derived from NEMA GN 1147.

8.1 Infrastructure

All infrastructures will be decommissioned and the footprints rehabilitated for the establishment of vegetation. Material inventories will be managed near the end of prospecting activities to minimize any surplus materials at closure. Where practicable, equipment and materials with value not needed for post-closure operations will be sold and or removed from the site. Equipment with scrap or salvage value will be removed from the site and sold to recyclers.

A soil contamination investigation will be conducted on completion of demolition activities. The purpose of this is to identify areas of possible contamination and design and implement appropriate remedial measures to ensure that the soil contaminants are removed.

Closure actions will include:

- All power and water services to be disconnected and certified as safe prior to commencement of any decommissioning works;
- All remaining inert equipment and decommissioning waste will be disposed to the nearest licensed general waste disposal facility;
- Salvageable equipment will be removed and transported offsite prior and during decommissioning;
- All tanks, pipes and sumps containing hydrocarbons to be flushed or emptied prior to removal to ensure no hydrocarbon/chemical residue remains;

8.2 Boreholes

Closure of boreholes will entail backfilling with overburden stripped ahead of prospecting activities. All overburden should be replaced into the void and the final surface reshaped to simulate surrounding topography while ensuring that the surface is free draining.

Once backfilling is complete a growth medium cover will be placed and vegetation will be established. There may be a requirement to include sacrificial erosion protection measures on the surface while vegetation is being established.

8.3 Roads and parking areas

Existing roads will be used as far as possible. Closure actions concerning roads and parking areas will include:

- Removal of all signage, fencing, shade structures, traffic barriers, etc.;
- All ‘hard top’ surfaces to be ripped along with any concrete structures;
- All potentially contaminated soils are to be identified and demarcated for later remediation; and
- All haul routes that have been treated with saline dust suppression water need to be treated, with the upper surface ripped and removed to designated contaminant disposal areas.

8.4 Remediation of Contaminated Areas

All soil, contaminated with hydrocarbons, will be identified, excavated, if possible to at least 200 mm below the contaminated zone and then treated.

- All tanks, pipes and sumps containing hydrocarbons will be flushed or emptied;
- Removed soils will be managed as determined by the nature and extent of the contamination;
- Liquid storage tanks will be emptied, the structure removed/demolished and sub-surface holes filled; and
- All equipment in which chemicals have been stored or transported will be cleaned and disposed of in a suitable disposal facility.

8.5 Vegetation

Successful revegetation will help control erosion of soil resources, maintain soil productivity and reduce sediment loading in streams utilizing non-invasive plants that fit the criteria of the habitat (e.g. soils, water availability, slope and other appropriate environmental factors). Invasive species will be avoided and the area will be managed to control the spread of these species.

To counter the effects of erosion, naturally occurring grassland species will be planted on slopes. These species will provide soil holding capacity and reduce runoff velocity. The flatter areas will be re-vegetated with the objective of creating a sustainable ecosystem. The occurrence of protected plant species will need to be determined before vegetation is removed and the required permits will be obtained for either destruction or relocation.

8.6 Waste Management

Waste management activities will include:

- Hazardous waste will be managed as per the Minimum Requirements for Handling, Classification and Disposal of Hazardous Waste.
- Non-hazardous will be disposed in the nearby licensed landfill site;
- Scrap and waste steel will be sold to recyclers.
- It may be necessary to fence temporary salvage yards for security reasons, particularly where these are located close to public roads.

9. ENVIRONMENTAL RISK ASSESSMENT

Risks associated with the closure of the prospecting activities are described and a determination was taken to assess the nature of the risk and then risk is ranked according to predetermined criteria for probability and consequence. Five categories were considered to describe the nature of the risk. The nature of the risk was assessed to fall into one of the following categories:

- Health and Safety
- Environment
- Financial
- Legal and regulatory obligations
- Reputational, Social or Community

Once the risks had been captured the probability of the risk occurring as well as the consequence of the risk occurring were rated according to the criteria presented below. A matrix listing the probability and consequence is then used to numerically rank the risk and determine whether the risk level is: High, Moderate to high, Moderate, Moderate to low or Low.

Table 2 significance rating

Score out of 100	Significance
1 to 20	Low
21 to 40	Moderate to Low
41 to 60	Moderate
61 to 80	Moderate to high
81 to 100	High

Table 3 Methodology

The status of the impact		
Status		Description
Positive:		a benefit to the holistic environment
Negative:		a cost to the holistic environment
Neutral:		no cost or benefit
The duration of the impact		
Score	Duration	Description
1	Short term	Less than 2 years
2	Short to medium term	2 – 5 years
3	Medium term	6 – 25 years
4	Long term	26 – 45 years
5	Permanent	46 years or more
The extent of the impact		
Score	Extent	Description
1	Site specific	Within the site boundary
2	Local	Affects immediate surrounding areas
3	Regional	Extends substantially beyond the site boundary
4	Provincial	Extends to almost entire province or larger region
5	National	Affects country or possibly world
The reversibility of the impact		
Score	Reversibility	Description
1	Completely reversible	Reverses with minimal rehabilitation & negligible residual affects
3	Reversible	Requires mitigation and rehabilitation to ensure reversibility
5	Irreversible	Cannot be rehabilitated completely/rehabilitation not viable
The magnitude (severe or beneficial) of the impact		
Score	Severe/beneficial effect	Description
1	Slight	Little effect - negligible disturbance/benefit
2	Slight to moderate	Effects observable - environmental impacts reversible with time
3	Moderate	Effects observable - impacts reversible with rehabilitation
4	Moderate to high	Extensive effects - irreversible alteration to the environment
5	High	Extensive permanent effects with irreversible alteration
The probability of the impact		
Score	Rating	Description
1	Unlikely	Less than 15% sure of an impact occurring
2	Possible	Between 15% and 40% sure of an impact occurring
3	Probable	Between 40% and 60% sure that the impact will occur
4	Highly Probable	Between 60% and 85% sure that the impact will occur
5	Definite	Over 85% sure that the impact will occur
The Consequence		= Magnitude + Spatial Scale + Duration + Reversibility.
The Significance		= Consequence x Probability.

Table 4 Outcome of Risk Assessment

Where Significance = Consequence x Probability															
RISK ISSUES DURING CLOSURE	**WHAT IS THE ROOT CAUSE OF THE HAZARD?**	**WHAT ARE THE CONSEQUENCES?**	**BEFORE IMPLEMENTATION OF CLOSURE STRATEGY**					**SIGNIFICANCE RATING**	**CONCEPTUAL CLOSURE STRATEGY**	**AFTER IMPLEMENTATION OF CLOSURE STRATEGY**					**SIGNIFICANCE RATING**
			E	**D**	**R**	**M**	**P**			**E**	**D**	**I**	**R**	**P**	
HEALTH AND SAFETY															
Boreholes or excavations which are not properly backfilled may pose health and safety risks such as injuries to animals and local community members accessing the site during post closure activities	Leaving excavations opened	Injuries and loss of livestock	**1**	**2**	**1**	**3**	**3**	**Negative Moderate Low risk (21)**	A security fence including a perimeter fence should be retained to limit access during decommissioning. Once prospecting activities are completed, backfilling should be undertaken as soon as practicable possible	**1**	**2**	**1**	**3**	**2**	**Negative Low risk (14)**
ENVIRONMENTAL															
Operational and decommissioning activities may result in soil being contaminated.	Dismantling of oil storage tanks, and oil drips from machinery.	Change in soil properties	**1**	**2**	**1**	**3**	**3**	**Negative Moderate low risk (21)**	Operational impacts will be remediated as far as possible during operation phase. During closure, contaminated soils with coal particulates and	**1**	**2**	**1**	**3**	**2**	**Negative low risk (14)**

									hydrocarbon will be removed and disposed according to regulatory requirements.						
FINANCIALS															
Delaying closure once prospecting activities are complete may allow for vandalism and interference of infrastructure which may lead to costlier remedial measures being implemented when closure actions are undertaken.	Poor security on site	Loss of equipment	**1**	**2**	**3**	**3**	**3**	**Negative Moderate low risk (27)**	Appropriate security measures will be retained to secure infrastructure until infrastructure can be demolished.	**1**	**2**	**3**	**3**	**2**	**Negative low risk (18)**
Closure material balance not sufficient to implement closure actions leading to environmental impacts remaining unmitigated.	Poor storage of subsurface material	Loss of indigenous backfill material	**1**	**2**	**3**	**3**	**3**	**Negative Moderate low risk (27)**	Material designated for closure will be protected within the operational foot print of the site. However, in the event that insufficient closure material is available, alternative sources will be investigated.	**1**	**2**	**3**	**3**	**2**	**Negative low risk (18)**
The closure quantum has been significantly underestimated and that funds insufficient funds are available to mitigate impacts at closure resulting in legal	Underestimating impacts	Poor rehabilitation of site	**1**	**2**	**2**	**3**	**3**	**Negative Moderate low risk (24)**	Sitatunga will continually evaluate closure liability and will adjust estimates as more information becomes available	**1**	**2**	**2**	**3**	**2**	**Negative low risk (16)**

obligations not being discharged.									relating to operational impacts requiring mitigation, residual and latent closure risks, closure actions and rates for the implementation of the closure actions.						
REPUTATION, SOCIAL OR COMMUNITY															
Risk that labour expectations are not achieved if there are no livelihood replacement opportunities, leading to unrest of those who loose employment.	Closure of project	Loss of livelihood	**2**	**2**	**3**	**2**	**2**	**Negative Low risk (18)**	Continual engagement with internal stakeholders will be undertaken as described in the Social Labour Plan to assist with the transition to the post closure period.	**2**	**2**	**3**	**2**	**1**	**Negative low risk (9)**

10. CLOSURE COST ESTIMATION

The liability for closure of the aspects associated with the prospecting activities has been determined using the approach advocated by the Department of Mineral Resources (DMR) Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provisions (2005). The approach to calculating the closure quantum as specified in the DMR Guideline which was utilised in this assessment is as summarised in Table 5 below.

Table 5 Closure Quantum

No.:	Description:	Unit:	A Quantity	B Master rate	C Multiplication factor	D Weighing factor 1	E=A*B*C*D Amount (Rands)
			Step 4.5	**Step 4.3**	**Step 4.3**	**Step 4.4**	
3	Access Roads	m^2	0	R34.05	1	1.1	R0.00
10	General Surface Rehabilitation	ha	0.5	R105372.05	1	1.1	R57954.62
		Sub total 1	**Weighing factor 2** (step 4.4) According to Peri-urban			**1.05**	**R60852.36**
		(Sum of total items 3 and 10 multiplied by **weighing factors**)					
1	Preliminary and General	Add 12% of Subtotal 1 if Subtotal 1 is less than R100,000,000.00					R7302.28
2	Contingencies	10% of Subtotal 1					R6085.24
		Subtotal 2					**R74239.88**
		VAT (15%)					R11 135.98
		(Subtotal plus VAT)				**GRAND TOTAL**	**R85 375.86**

11. MONITORING AND AUDITING

In terms of auditing and monitoring the following will be conducted:

- Internal monitoring, auditing and reporting – a review undertaken by Sitatunga Resources to update the plan to account for changes to the environment and risk profile and to update the liability assessment to reflect liability at that point in time;
- External monitoring, auditing and reporting – a review undertaken by the financial auditors as part of the annual financial/accounting audit to determine that the plan is appropriate and that the quantum of the liability is included in the operations provisions;
- Legislated audits – these are the auditing requirements of the Act, Regulation, EMPr and EA. Pertinent aspects relating to closure, such as changes to the risk assessment, changes in closure options and changes in the quantum of the liability will be reported

The findings from the various audits will be captured in the Sitatunga Resources' Environmental Management System (EMS) and responsibilities and timelines allocated to the rectification of the findings, as practical. Once addressed, these findings will be closed out, only after a second party has assessed that the finding is appropriately addressed.

The objective of the monitoring programme will be to track the recovery of the site in accordance with the overall closure objectives. The anticipated monitoring will include:

- Surface water: Quality monitoring against parameters as required by DWS
- Groundwater: Quality monitoring of aquifers against the parameters required by DWS
- Erosion monitoring: This will take the form of developing a representative reference site on the disturbed footprints and undertaking visual and topographic assessments to determine erosion rate.
- Vegetation establishment: Vegetation condition will be monitored using standard field techniques to determine whether the vegetation has been established with a species composition and density similar to that of the site prior to prospecting activities.
- Photographic records should be maintained together with findings, follow up actions and close out records as part of the Sitatunga Resources Environmental Management System.

12. CONCLUSIONS

Sitatunga Resources (Pty) Ltd will provide for the closure liability associated with the project through the purchase of a Bank Guarantee as allowed by the Financial Provision for Prospecting, Exploration, Mining or Production Operations Regulations, with the Bank Guarantee provided to the DMR following authorisation of the project.