

Application for a Mining permit and Associated Environmental Authorisation for the proposed mining of Clay at a portion of remainder erf 8622 in the Sol Plaatje Local Municipality, Northern Cape Province

Amended Basic Assessment Report

DMRE Reference Number: **NC10770 MP**

Report Prepared for

LIZUVAX (Pty) Ltd (KRD -Kimberly rehabilitation development) (Pty) Ltd



Report Prepared by



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Title:

Final Basic Assessment and Environmental Management

*Programme (BAR/EMPr) Report for the proposed mining of
Clay on the portion of remainder erf 8622 in the Sol Plaatje
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mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

AMENDED BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

DMRE Ref: NC10770 MP

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

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FILE REFERENCE NUMBER SAMRAD: **NC 10770 MP**

1 IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a mining permit, prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

2 Objective of the basic assessment process

The objective of the basic assessment process is to, through a consultative process—

- a. determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- b. identify the alternatives considered, including the activity, location, and technology alternatives;
- c. describe the need and desirability of the proposed alternatives,
- d. through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
 - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be managed, avoided or mitigated;
- e. (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

General Project Overview

Lizuvax appointed Ndi Geological Consulting Services-Sole Proprietary as the independent Environmental Assessment Practitioner (EAP) to facilitate the environmental authorisation process for its proposed Clay mining on the portion of remainder erf 8622 under Frances Baard district Municipality. The proposed mining area is situated approximately 500m West of Kimberley city and can be accessed through Long Street from the Kimberley city centre. The proposed mining activities is situated in the magisterial district of Francis Baard district in Sol Plaatje Municipality.

The proposed mining activities will cover an area of 3 hectares (Ha). The proposed site is located approximately +- 500 meters south west of the Kimberly big hole.

Lizuvax requires a mining permit in terms of the Mineral and Petroleum Resources Development Act (Act No. 22 of 2002) (MPRDA). Before the mining permit will be granted, Lizuvax must undertake an environmental authorisation process in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA). The competent authority for the environmental authorisation process is the Northern Cape Department of Mineral Resources and Energy in this regard (DMRE). There will be no construction of access road within the proposed mining area since the proposed mining area is situated within the build-up areas of streets like Waterloo, St Augustine's road, Green street, and Parsons Lane all these street can be used to access the proposed mining area, by machinery transporting dumps from the applied mining permit area to a processing site that is situated in Roodepan. Roodepan is situated at an approximate distance of 5km away from the applied mining permit area.

The mining activities from the proposed area will comprise of loading and hauling of Clay to a preferred site which is in Roodepan as mentioned above. There is no permanent infrastructure that will be constructed in the proposed mining operation.

The mining operation will be comprised and not limited to the following:

- Earth moving equipment;
- Loading, hauling and turning areas for loading and dump trucks;
- Guard room area for security official (Mobile container to be used);
- A temporary mobile toilet for staff (Mobile toilets to be serviced by registered service provider that will be appointed by Lizuvax (Pty) Ltd).

Rehabilitation or ripping of the area will be conducted while mining activities are undertaken. The final rehabilitation will be done once the mining activities have been completed at a site and before the mining team leaves the site.

The material that will be transported from the applied mining permit area as stated above will be transported to Roodepan portion 32 and 33 of Farm Roodepan 70. The end use of material mined from the proposed application area on the portion of remainder erf 8622 is earmarked for the construction of Clay bricks. It should also be noted that the area that is applied for the construction of

Clay bricks there is however an EIA application that will be submitted and is in process with the Northern Cape Department of Environment and Nature Conservation.

Lizuvax (Pty) Ltd submitted an application for an environmental authorisation to the DMRE in respect of a mining permit application June 2019.

Before Clay mining process can be planned and built, a number of tests and surveys must be conducted to ensure that the project is economically viable, technically feasible, and environmentally sound. Assessment of the geological information available has determined that the area in question may have good Clay reserves. In order to ascertain the above and determine the nature, location and extent of the reserves within the proposed mining area, it will be necessary that mining activity be undertaken. The mining activity will also determine if there are any features that may have an impact on the economic extraction of the clay (removal of debris).

The stakeholder engagement process, as part of the Environmental Authorisation process, is conducted in terms of NEMA (as amended) which provides clear guidelines for stakeholder engagement during an EIA. One of the general objectives of integrated environmental management set out in Section 23(2) of NEMA is to ensure the “adequate and appropriate opportunity for public participation in decisions that may affect the environment”.

The stakeholder engagement process is primarily aimed at affording Stakeholders and Interested and Affected Parties (I&APs) the opportunity to gain an understanding of the project. In addition, the purpose of consultation with the landowner, affected parties and communities is to provide them with the necessary information about the proposed project so that they can make informed decisions as to whether and to which degree the project will affect interested and affected parties. In addition, the purpose of consultation with the Stakeholders and I&APs is to provide the competent authority with the necessary information in order for them to make informed decisions.

Before an EAP submits a final report, they must have given registered I&APs access to, and an opportunity to comment on the report prior to the submission of the final report to the competent authority for approval.

Stakeholders were therefore provided with an opportunity to participate in the public participation process from 28 November 2019 (first announcement) via DFA advert to ensure that the assessment of impacts and proposed management of impacts have addressed their concerns. Comments received during the 30-day comment period (from the Draft BAR review) have been incorporated into this Final BAR/EMPr and will be submitted to the DMRE for decision making.

- Affected and adjacent surrounding communities were notified of the project and application as follows:
 - ✓ Newspaper advertisements were published in the Noordkaap on 26 August 2020 and the Diamond Fields Advertiser on 28 August 2020;
 - ✓ On-site notices were erected around the project area on the 27th of August 2020; and
 - ✓ A radio announcement informing the public of the proposed project and inviting I&APs to register on the stakeholder database were made as follows:

Table 2-1: Requirements of Appendix 1 of GNR 982 for a BAR

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Basic Assessment Reports	Section
Appendix 1: 3 (1) (a)	Details of – the EAP who prepared the report; and the expertise of the EAP, including a curriculum vitae	Section 5.1
Appendix 1: 3 (1) (b)	The location of the activity, including – The 21-digit Surveyor General code of each cadastral land parcel; Where available, the physical address and farm name; Where the required information in items (i) and (ii) is not available, co-ordinates of the boundary of the property or properties.	Section 6
Appendix 1: 3 (1) (c)	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is – A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or On land where the property has not been defined, the coordinates within which the activity is to be undertaken; or.	Section 6 Figure 7-1
Appendix 1: 3 (1) (d)	A description of the scope of the proposed activity, including – All listed and specified activities triggered and being applied for; A description of the activities to be undertaken, including associated structures and infrastructure.	Section 7.5 Section 7
Appendix 1: 3 (1) (e)	A description of the policy and legislative context within which the development is proposed including- an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and have been considered in the preparation of the report; and how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Section 8
Appendix 1: 3 (1) (f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.	Section 9
Appendix 1: 3 (1) (g)	A motivation for the preferred site, activity and technology alternative.	Section 10
Appendix 1: 3 (1) (h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including-	Section 11
	Details of all alternatives considered;	Section 11.1

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Basic Assessment Reports	Section
	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 11.2
	A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section 11.5
	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 12
	The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which the impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed, or mitigated.	Section 13
	The methodology used in deterring and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 14
	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographic, physical, biological, social, economic, heritage and cultural aspects;	Section 15
	The possible mitigation measures that could be applied and level of residual risk;	Table 13-1, Table 13-2 and Table 13-3
	The outcome of the site selection matrix;	N/A
	If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and;	Section 17
	A concluding statement indicating the preferred alternatives, including preferred location of the activity.	Section 18
Appendix 1: 3 (1) (i)	a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including— a description of all environmental issues and risks that were identified during the environmental impact assessment process; and an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section 18.1 Section 13

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Basic Assessment Reports	Section
Appendix 1: 3 (1) (j)	An assessment of each identified potentially significant impact and risk, including— cumulative impacts; the nature, significance and consequences of the impact and risk; the extent and duration of the impact and risk; the probability of the impact and risk occurring; the degree to which the impact and risk can be reversed; the degree to which the impact and risk may cause irreplaceable loss of resources; and the degree to which the impact and risk can be avoided, managed or mitigated;	Section 13
Appendix 1: 3 (1) (k)	where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	N/A
Appendix 1: 3 (1) (l)	an environmental impact statement which contains— a summary of the key findings of the environmental impact assessment; a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Section 21 Figure 21-1
Appendix 1: 3 (1) (m)	based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed [impact management objectives and the impact management outcomes for the development for inclusion in the EMPr;	Table 13-1, Table 13-2 and Table 13-3
Appendix 1: 3 (1) (n)	any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Section 23
Appendix 1: 3 (1) (o)	a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 24
Appendix 1: 3 (1) (p)	a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 25

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Basic Assessment Reports	Section
Appendix 1: 3 (1) (q)	where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	Section 26
Appendix 1: 3 (1) (r)	An undertaking under oath or affirmation by the EAP in relation to- The correctness of the information provided in the report; The inclusion of the comments and inputs from stakeholders and interested and affected parties; The inclusion of inputs and recommendations from the specialist reports where relevant; and Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	Section 27
Appendix 1: 3 (1) (s)	where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Section 28
Appendix 1: 3 (1) (t)	Any specific information required by the competent authority.	Section 29
Appendix 1: 3 (1) (u)	Any other matter in terms of Section 24(4)(a) and (b) of the NEMA	Section 29.3

Table 2-2: Requirements of Appendix 4 of GNR 982 for a an EMPr

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for EMPr	Section where addressed in the EMPr
Appendix 4 (a)	details of i. the EAP who prepared the EMPr; and ii. the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 5
Appendix 4 (b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 7
Appendix 4 (c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers	Figure 7-2
Appendix 4 (d)	a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including- i. planning and design; ii. pre-construction activities; iii. construction activities; iv. rehabilitation of the environment after	Section 31

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for EMPr	Section addressed where in the EMPr
	<p>construction and where applicable post closure; and</p> <p>v. where relevant, operation activities;</p>	
Appendix 4 (e)	a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 31
Appendix 4 (f)	<p>a description of proposed impact management actions, identifying the way the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to:</p> <ul style="list-style-type: none"> i. avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; ii. comply with any prescribed environmental management standards or practices; iii. comply with any applicable provisions of the Act regarding closure, where applicable; and iv. Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable. 	Section 36
Appendix 4 (g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f).	Section 36
Appendix 4 (h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f).	Section 38.2
Appendix 4 (i)	an indication of the persons who will be responsible for the implementation of the impact management actions	Section 38.3
Appendix 4 (j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 38.4
Appendix 4 (k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 38.5
Appendix 4 (l)	a program for reporting on compliance, considering the requirements as prescribed by the Regulations;	Section 38.5
Appendix 4 (m)	<p>an environmental awareness plan describing the manner in which-</p> <ul style="list-style-type: none"> i. the applicant intends to inform his or her employees of any environmental risk which may result from their work; and ii. risks must be dealt with to avoid pollution or the degradation of the Environment. 	Section 40
Appendix 4 (n)	Any specific information that may be required by the competent authority.	None

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List of abbreviations

BAR:	Basic Assessment Report
C Plan:	Conservation Plan
CBAs:	Critical Biodiversity Areas
CPR:	Competent Person's Report
CRR:	Comments and Responses Report
CV:	Curriculum Vitae
DEA:	Department of Environmental Affairs
DM:	District Municipality
DMRE:	Department of Mineral Resources
DWS:	Department of Water and Sanitation
EA:	Environmental Authorisation
EAP:	Economic Active Population
EAP:	Environmental Assessment Practitioner
ECO:	Environmental Control Officer
EHS:	Environmental Health and Safety
EIA:	Environmental Impact Assessment
EMF:	Environmental Management Framework
EMPr:	Environmental Management Programme
ESA:	Ecological Support Area
GA:	Generally Authorised
GIS:	Geographic Information Systems
GNR:	Government Notice Regulation
GNR:	Government Notice Regulation
GSSA:	Geological Society Of South Africa
I&APs:	Interested and Affected Parties
IDP:	Integrated Development Plans
LM:	Local Municipality
LUDS:	Land Use Development System
MPRDA:	Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
NEM:BA:	National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)
NEM:WA:	National Environmental Management Waste Act (Act No. 59 of 2008)
NEMA:	National Environmental Management Act (Act No. 107 of 1998)

NFEPA:	National Freshwater Ecosystem Priority Areas
NGA:	National Groundwater Archive
NHRA:	National Heritage Resources Act, 1999 (Act 25 of 1999)
NWA:	National Water Act, 1998 (Act 36 of 1998)
PM:	Particulate Matter
RDP:	Reconstruction and Development Programme
SAHRA:	South African Heritage Resources Agency
SAHRIS:	South African Heritage Resources Information System
SANBI:	South African National Biodiversity Institute
SANS:	South African National Standards
SAPD:	South African Police Department
SCC:	Species of Conservation Concern
SDF:	Spatial Development Framework
SDF:	Spatial Development Framework
WMA:	Water Management Area
WUL:	Water Use Licence

3 Project background

Lizuvax appointed Ndi Geological Consulting Services-Sole Proprietary as the independent Environmental Assessment Practitioner (EAP) to facilitate the environmental authorisation process for its proposed Clay mining on the portion of remainder erf 8622 under Frances Baard district Municipality. The proposed mining area is situated approximately 500m West of Kimberley city and can be accessed through Long Street from the Kimberley city centre. The proposed mining activities is situated in the magisterial district of Francis Baard district in Sol Plaatjie Municipality.

The proposed mining activities will cover an area of 3 hectares (Ha). The proposed site is located approximately +- 500 meters south west of the Kimberly big hole.

The total duration of the mining and evaluation activities is planned or estimated to last for a period of two (2) years.

Lizuvax requires a mining permit in terms of the Mineral and Petroleum Resources Development Act (Act No. 22 of 2002) (MPRDA). Before the mining permit will be granted, Lizuvax must undertake an environmental authorisation process in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA). The competent authority for the environmental authorisation process is the Northern Cape Department of Mineral Resources and Energy in this regard (DMRE). There will be no construction of access road within the proposed mining area since the proposed mining area is situated within the build-up areas of streets like Waterloo, St Augustine's road, Green street, and Parsons Lane all these street can be used to access the proposed mining area, by machinery transporting dumps from the applied mining permit area to a processing site that is situated in Roodepan. Roodepan is situated at an approximate distance of 5km away from the applied mining permit area.

The mining activities from the proposed area will comprise of loading and hauling of Clay to a preferred site which is in Roodepan as mentioned above. There is no permanent infrastructure that will be constructed in the proposed mining operation.

The mining operation will be comprised and not limited to the following:

- Earth moving equipment;
- Loading, hauling and turning areas for loading and dump trucks;
- Guard room area for security official (Mobile container to be used);
- A temporary mobile toilet for staff (Mobile toilets to be serviced by registered service provider that will be appointed by Lizuvax (Pty) Ltd).

Rehabilitation or ripping of the area will be conducted while mining activities are undertaken. The final rehabilitation will be done once the mining activities have been completed at a site and before the mining team leaves the site.

The material that will be transported from the applied mining permit area as stated above will be transported to Roodepan portion 32 and 33 of Farm Roodepan 70. The end use of material mined from the proposed application area on the portion of remainder erf 8622 is earmarked for the construction of Clay bricks. It should also be noted that the area that is applied for the construction of Clay bricks there is however an EIA application that will be submitted and is in process with the Northern Cape Department of Environment and Nature Conservation.

Lizuvax (Pty) Ltd submitted an application for an environmental authorisation to the DMRE in respect of a mining permit application June 2019.

Before Clay mining process can be planned and built, a number of tests and surveys must be conducted to ensure that the project is economically viable, technically feasible, and environmentally sound. Assessment of the geological information available has determined that the area in question may have good Clay reserves. In order to ascertain the above and determine the nature, location and extent of the reserves within the proposed mining area, it will be necessary that mining activity be undertaken. The mining activity will also determine if there are any features that may have an impact on the economic extraction of the clay (removal of debris).

The stakeholder engagement process, as part of the Environmental Authorisation process, is conducted in terms of NEMA (as amended) which provides clear guidelines for stakeholder engagement during an EIA. One of the general objectives of integrated environmental management set out in Section 23(2) of NEMA is to ensure the “adequate and appropriate opportunity for public participation in decisions that may affect the environment”.

The stakeholder engagement process is primarily aimed at affording Stakeholders and Interested and Affected Parties (I&APs) the opportunity to gain an understanding of the project. In addition, the purpose of consultation with the landowner, affected parties and communities is to provide them with the necessary information about the proposed project so that they can make informed decisions as to whether and to which degree the project will affect interested and affected parties. In addition, the purpose of consultation with the Stakeholders and I&APs is to provide the competent authority with the necessary information in order for them to make informed decisions.

Before an EAP submits a final report, they must have given registered I&APs access to, and an opportunity to comment on the report prior to the submission of the final report to the competent authority for approval.

- Affected and adjacent surrounding communities were notified of the project and application as follows:
 - ✓ Newspaper advertisements were published in the Noordkaap on 26 August 2020 and the Diamond Fields Advertiser on 28 August 2020;
 - ✓ On-site notices were erected around the project area on the 27th of August 2020; and
 - ✓ A radio announcement informing the public of the proposed project and inviting I&APs to register on the stakeholder database were made as follows:

4 Purpose and context of this document

The project triggers activities listed in terms of Listing Notices 1 of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) (as amended) and will require an Environmental Authorisation (EA) from the Department of Mineral Resources and Energy (DMRE), Northern Cape Province.

This document serves as the final Basic Assessment Report (final BAR) and includes the following objectives as a minimum:

- To comply with the requirements of NEMA and associated Regulations;
- Identify and assess the environmental (biophysical, socio-economic, and cultural) impacts of activities associated with decommissioning and closure of the of the mining activities. The cumulative impacts of the proposed mining activities development will also be identified and evaluated;
- Identify and evaluate potential management and mitigation measures that will reduce the possible negative impacts of the proposed development and enhance the positive impacts;
- Compile monitoring, management, mitigation and training needs in the EMPr; and
- Provide the decision-making authorities with sufficient and accurate information in order to make a sound decision on the proposed development and set conditions that must be adhered to.

All activities that trigger activities listed in GNR 983 require that a Basic Assessment (BA) process be followed. The BA process entailed:

- Compilation of an Initial Draft BAR and draft EMPr for the public to comment on before the submission of the application to DMRE.
- Submission of the EA Application to the DMRE.
- Finalisation of the Draft BAR and EMPr for the official public participation comment period of 30 days.
- Incorporation of stakeholder comments into the final BAR and EMPr.
- Public Participation Process (PPP).

The BAR process followed the procedure as prescribed in Regulations 19 to 20 as summarised in Figure 4-1.

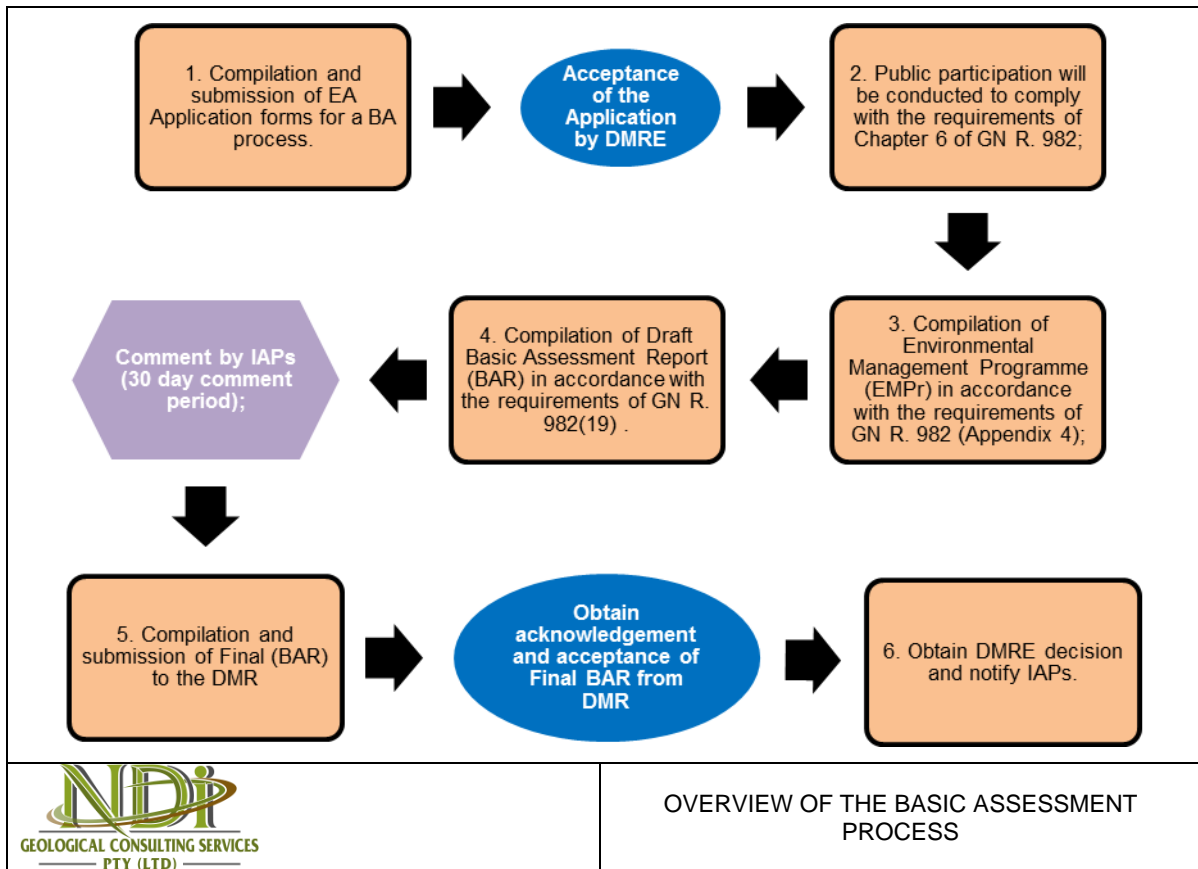


Figure 4-1: Overview the Basic Assessment Process

5 Contact Person and Correspondence Address

5.1 Details of EAP who prepared the report

The EAP involved in the compilation of this BAR and her contact details are provided in Table 5-1 below:

Table 5-1: EAP Contact Details

EAP Name	Contact Number	Fax Number	Email Address
Ndivhudzannyi Mofokeng	053 842 0687	086 538 1069	atshidzaho@gmail.com

5.2 Expertise of the EAP

5.2.1 Qualifications of the EAP

The qualifications of the EAP are provided for in Table 5-2 below, and copies of the qualifications are provided in Appendix 1.

Table 5-2: EAP Qualifications

EAP Name	Qualifications	Professional registration	Years' Experience
Ndivhudzannyi Mofokeng	BSc (Hons) Earth Sciences in Mining and Environmental Geology	GSSA & EAPASA	10

5.2.2 Summary of EAPs past experience

Ndivhudzannyi holds BSc (Hons) Earth Sciences in Mining and Environmental Geology. She has 10 years' experience in the exploration and open cast work in the mining industry and a member of the GSSA. She has proven leadership skills from supervising exploration rigs and in field exploration, mapping, borehole logging, borehole sampling, sample preparation for laboratory analysis, handling of GPS, supervisory duties within the field, geological report and Environmental Reports. She has been involved in environmental management projects including environmental assessments where she has been involved in identification and assessment of potential environmental consequences of projects as well as developing mitigation measures to avoid/and or minimise the significance of the identified impacts. In her early years as a Geologist, her job entailed conducting geological assessments for mining, to ensure sustainable mining of resources. Ndivhudzannyi experience with environmental management has been at project design phase where EIAs are the main environmental management tool used for the assessment of potential environmental consequences. In addition, environmental monitoring and auditing of projects to ensure that a developer complies with the EMPr, ensuring that adverse environmental impacts are being avoided and/or rehabilitation is being undertaken.

A detailed Curriculum Vitae (CV) of the EAP is provided for **Appendix 2**.

6 Project Location

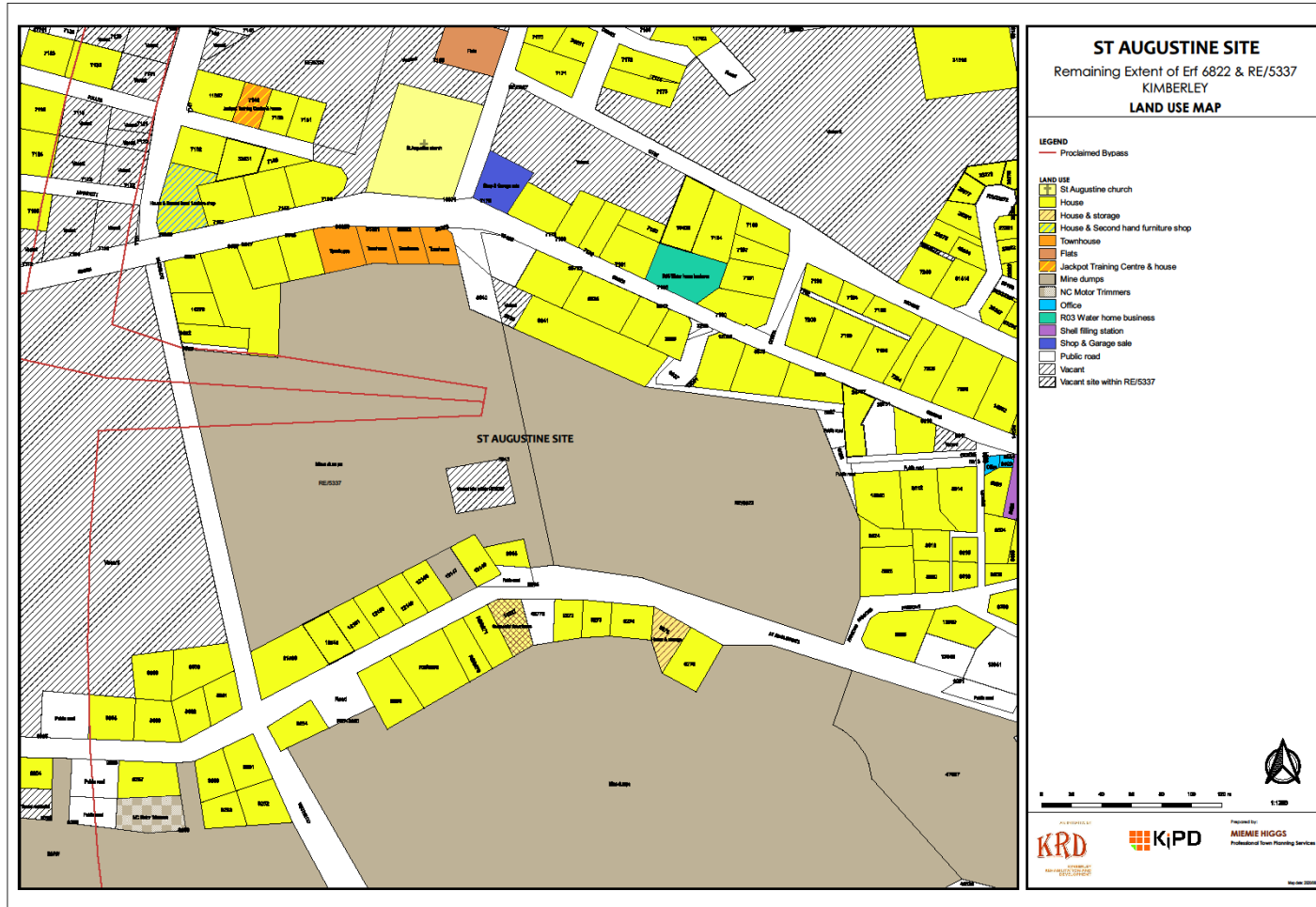
6.1 Property Description

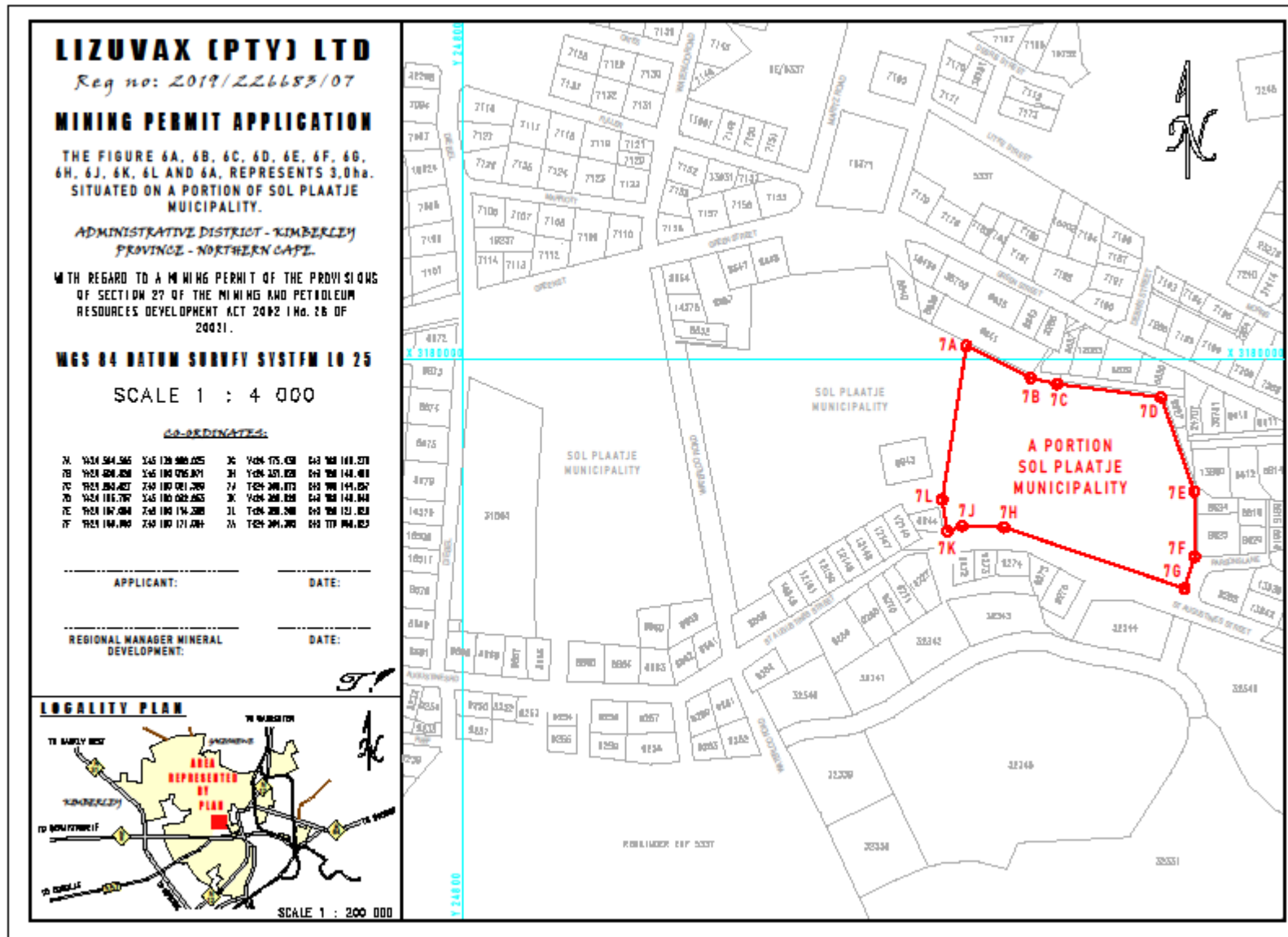
The description of the affected property is provided in Table 6-1 and map showing the affected property is provided in Figure 6-1.

Table 6-1: Description of Properties affected by the

Farm Name:	A portion of remainder erf 8622
Application area (Ha)	3 ha
Magisterial district:	Frances Baard District Municipality
Distance and direction from nearest town	+/_ 500 m south west from the big hole
21-digit Surveyor General Code for each farm portion	C0350000000008100000

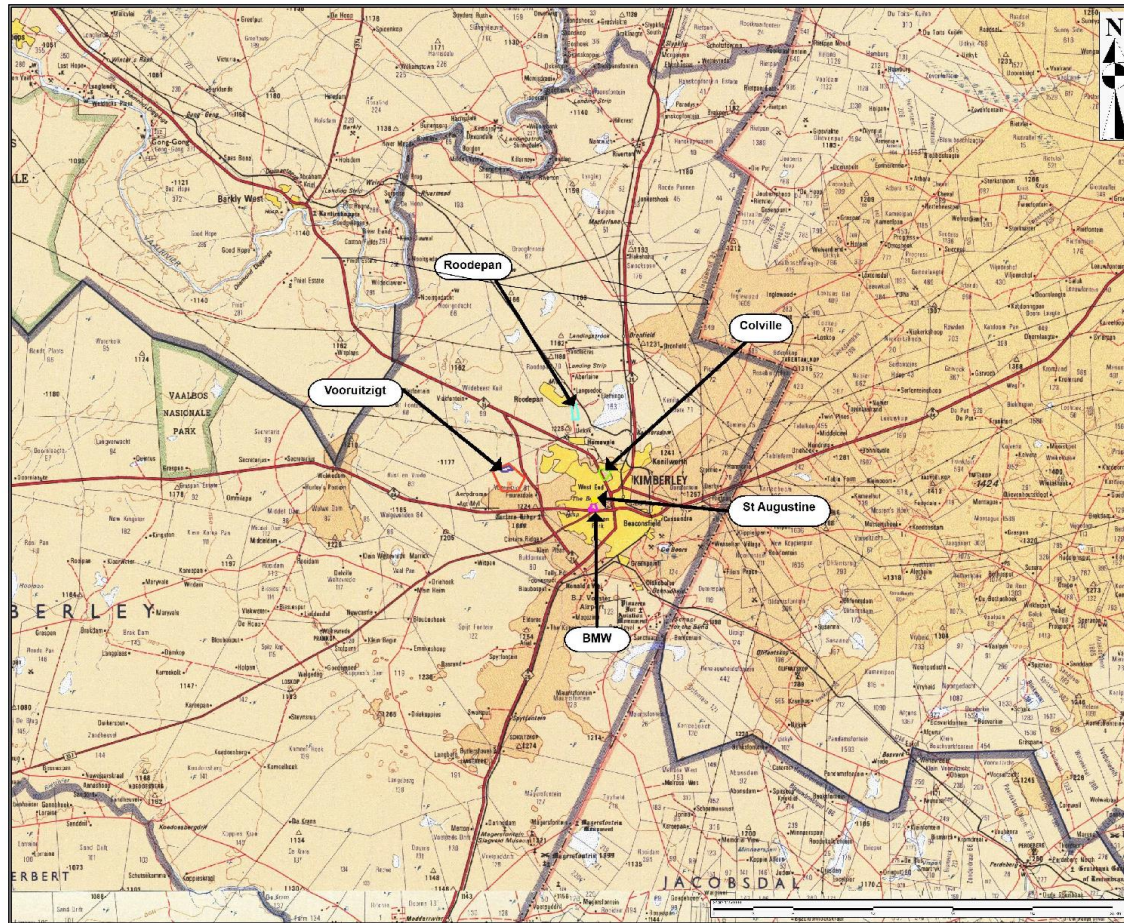
Figure 6-1: Cadastral Map





6.2 Locality map





Changing the Face of a City

Environmental Impact Assessment

PROJECT SITES LOCATIONS

Legend

Proposed Project Sites

- Vooruitzigt
- Colville
- BMW
- St Augustine
- Roodepan
- Vooruitzigt Manufacturing Area
- Vooruitzigt Mining Permit Area

Map by:

NDI
GEOLOGICAL CONSULTING SERVICES
PTY (LTD)

Prepared for:

AN INITIATIVE BY
KRD
KIMBERLEY
REHABILITATION AND
DEVELOPMENT

COORDINATE SYSTEM: WGS84



CADASTRAL MAP

Figure 6-2: Locality

Map

7 Description of the Scope of the Proposed Overall Activity

7.1 Overview

Lizuvax wishes to mine dumps that are situated +-500 m south west from the big hole.

The mining activities of the dumps will directly contribute to the city and the province as a whole in terms of socio-economic development, it is estimated that close to 10 people will be employed during mining activities which will include truck operators and security officials. The material that will be mined will be transported to another site outside Kimberly for further processing and construction of Clay bricks. The area in question is Farm Roodepan 70 portion 32 and 33, EIA application for further processing of the material is submitted to the Northern Cape Department of Environment and Nature conservation.

During mining activities vegetation that has grown on the old dumps will be removed to safely access the dumps. However, there is no any protected plants around the proposed mining area, +/- 500 m south west from the big hole. Machines that are anticipated to be utilised during mining activities is excavator, front end loader and Dump trucks

Figure 7-1: Layout Plan showing the location and area of the Mining permit Area



7.2 Listed and specified activities

Section 16 of the MPRDA requires, upon request by the Minister that an Environmental Management Programme report (EMPr) be submitted and that the applicant must notify and consult with Interested and Affected Parties (I&APs). Section 24 of the NEMA requires that listed activities, which may potentially affect the environment negatively, must obtain an environmental authorisation from a relevant authority before the activities may commence.

Such activities are listed under the EIA Regulations (2014 which has been amended in 2017) and consist of:

- EIA Process (Government Notice Regulation (GNR) 982);
- Listing Notice 1 GNR 983 – Basic Assessment process,
- Listing Notice 2 GNR 984 – Scoping and EIA process;
- Listing Notice 3 GNR 985 – Activities in specific identified geographical areas only.

GNR 982, 983, 984 and 985 have been amended in 2017 through GNR 324, 325, 326 and 327, respectively.

The purpose of these regulations is to avoid negative impacts on the environment, and where these cannot be avoided, ensure the mitigation and management of the impacts to acceptable levels, while optimising positive environmental impacts.

The proposed project triggers Listing Notice 1 GNR 983 – Basic Assessment process,

Table 7- provides a summary of the identified NEMA listed activities that will be triggered by the mining project.

Table 7-2: Applicable Activities

NAME OF ACTIVITY (E.g. For mining - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc E.g. for mining, - excavations, Mining, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)
Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including — (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource [,] ; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, and screening	3 ha	x	GNR 983 as mended by GNR 327, Listing 21

(offsite).			
The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan. Site Clearance and removal of vegetation Earth moving equipment; Loading, hauling and turning areas for loading and dump trucks; Guard room area for security official (Mobile container to be used); A temporary mobile toilet for staff	<1 ha	x	GNR 983 as amended by GNR 327, Listing 27
Mobile Office	0.0025 ha	x	GNR 983
Ablution Facility	0.0025 ha	x	GNR 983
Road (Loading Hauling & Transport)	100m ²	x	GNR983

7.3 Activities to be undertaken

7.3.1 Mining

KRD wishes to mine dumps that are situated +-500 m south west from the big hole.

The mining activities of the dumps will directly contribute to the city and the province as a whole in terms of socio-economic development, it is estimated that close to 10 people will be employed during mining activities which will include truck operators and security officials. The material that will be mined will be transported to another site outside Kimberly for further processing and construction of Clay bricks. The area in question is Farm Roodepan 70 portion 32 and 33, EIA application for further processing of the material is submitted to the Northern Cape Department of Environment and Nature conservation.

During mining activities vegetation that has grown on the old dumps will be removed to safely access the dumps. The site is currently vacant and mainly used as a pass-through by the local community. Wood harvesting, littering and illegal dumping occur on the site. Machines that are anticipated to be utilised during mining activities is excavator, front end loader and Dump trucks.

7.3.2 Establishment of Temporary Access Roads

There are several streets like Waterloo, St Augustine's road, Green street, and Parsons Lane that can be used to access the proposed mining

7.3.1 Power

Diesel powered vehicles and machinery will be utilised during mining activities

7.3.2 Processing Plant

No processing plant will be erected on site as dump materials will be transported off site to Farm Roodepan 70 portion 32 and 33 where EIA application has been submitted for the processing at DENC.

7.3.3 Water Supply

Drinking water and water for dust suppression will be trucked on site (purchased from the municipality) using Water bowsers

7.3.4 Ablution Facilities

Portable chemical toilets will be used for the management of sewage waste that will be generated on site.

7.3.5 Temporary Site Office Area

A temporary mobile site office area will be brought to site

7.3.6 Accommodation

No staff will be accommodated on site, workers will be transported to site by company vehicle, however security officials that will work shifts will be deployed or employed

7.3.7 Mining

No Mining activities will be conducted on site.

7.3.8 Waste Management

Hazardous Waste

Hazardous waste that is to be generated includes hydrocarbon wastes (oil and liquid fuel wastes) and sewage waste. Hydrocarbon waste will be collected in non-leaking drums for proper storage in areas where there are sufficient measures to control and manage accidental spillages. The removal of the drums or any other appropriate receptacle will be undertaken by a registered waste company, for disposal at a registered licensed waste landfill. After disposal of waste to a registered landfill the appointed company will issue a safe disposal certificate or Manifesto.

General Waste

General waste is waste that is expected to be generated from the proposed project area and it will include domestic waste which includes old food, polystyrene, old stationery, discarded Personal Protective Equipment like hand gloves, respiratory mask, ear muffs (PPE) and old clothing pieces generated from the mining activities. General waste will be collected with lidded or closed drums. Generated waste will be disposed off at a registered domestic waste disposal site in Kimberley. Safe waste disposal certificate or manifestos will be issued by the service provider to ensure safe disposal of waste occurred or happened.

It is expected that during the operational phase, the municipality will be responsible for the collection of refuse from the buildings and disposing of the waste at an approved site.

Waste Separation and Handling: General domestic waste will be disposed of through a colour coded bin system for different types of waste material. Domestic waste and scrap metals will be collected in rubbish bins.

Recycling: Provision for recycling of waste will be considered and all recyclable waste material will be disposed of at the Sol Plaatje Local Municipality registered landfill site. These facilities recycle plastics, glasses, papers, scrap metals, cardboard boxes, tins and cans.

Storage of Dangerous Goods (Hydrocarbons)

Limited quantities of diesel fuel, oil and lubricants will be stored on site where suitable measures to accommodate accidental hydrocarbon spillage will be implemented. The only dangerous good that will be stored in any significant amount will be the diesel fuel also sufficient measures to control and avoid hydrocarbon spillages will be implemented. No more than 30m³ of Diesel will be stored above ground in certified Diesel containers and tanks with measures to control or accommodate accidental hydrocarbon spillages.

8 Policy and legislative context

Table 8-1 provides a summary of the applicable legislation, policies and guidelines identified as relevant to the proposed project. In addition, a description of how the proposed activity complies with and responds to the legislation and policy context, is provided. This list is not exhaustive but rather represents an indication of the most applicable pieces of legislation relevant to the project.

Table 8-1: Applicable legislation, policies and guidelines

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT
Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) (As amended)	Application for Mining permit in terms of Section 27.	A mining permit application was submitted to the DMRE by the applicant on 4 March 2020.
National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA)	The project may trigger the requirements under Section 38 of the NHRA. However, the requirements for the permits have not yet been established.	<p>The Environmental Management Programme (EMPr) will regulate the applicant to apply for tree removal permits from the South African Heritage Resources Agency (SAHRA) prior to removal or relocation of any heritage resources.</p> <p>The BAR and EMPr was also be submitted to the SAHRA through the South African Heritage Resources Information System (SAHRIS) to determine whether or not any permits will be required.</p>
National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA)	This Basic Assessment Report (BAR) and Environmental Management Plan (EMP)	An application for an Environmental Authorisation was submitted to the DMRE on 4 March 2020. The BAR and EMPr will be submitted to the DMRE once finalised and have been subjected to a public participation process as required by Chapter 6 of the NEMA.
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEM:BA)	The possibility of the presence of protected flora	The EMPr will regulate the applicant to apply for tree removal permits prior to removal of any sensitive and/or protected species.
National Water Act, 1998 (Act 36 of 1998) (NWA)	Mining site establishment within 32 m of a watercourse or 500m of a wetland	<p>The South African National Biodiversity Institute (SANBI) National Wetlands database shows that there are a number of wetlands in the mining area. There are also watercourses and drainage lines that may be affected by the project. In terms of the NWA, any activities undertaken within 500 m of a wetland or within 32 m of a watercourse require a Section 21 (c) and (i) Water Use Licence (WUL). Should the impacts of the activities be of low significance, the activities may also be Generally Authorised (GA).</p> <p>Clarification is required from the DWS on whether or not a WUL or GA will be required.</p>
Municipal Integrated Development Plans (IDPs)	Land Claims	One of the key issues identified by the IDPs is to facilitate the land claims.
Francis Baard Spatial Development Framework (SDF)	Alternatives	The Francis Baard DM Spatial Development Framework shows that the area is not earmarked for any development by the Francis Baard DM.

9 Need and Desirability

The mining industry is of great importance to the South African economy. According to the DMRE, Clay mining opens up more opportunities to small scale miners since it requires less capital for operation.

A study conducted by Swisscontact in collaboration with CBA (Clay Brick Association of Southern Africa) indicated that South Africa is by far the largest producer of Clay Bricks. The country contributes with more than 70% of the overall manufacturing capacity of the region. 3.6 billion bricks per annum are manufactured in the country, with the remaining 1.4 billion is made up of the rest of the SADC region. Of the 150 formal Clay brick factories, 100 alone located in South Africa.

The study above was conducted in February 2017 for SADC

Given the study conducted by Swisscontact in collaboration with CBA (Clay Brick Association of Southern Africa) it is clear that the industry creates formal and informal job opportunities in the Country.

The definition of mining in terms of the MPRDA states: *“intentionally searching for any minerals by means of any method which disturbs the surface or sub-surface of the earth, including any portion of the earth that is under the sea or under other water...”*. Mining is the physical search for minerals, fossils, precious metals or mineral specimens, which allows a company to survey or investigate an area of land for the purpose of identifying an actual or probable mineral deposit, before investments are made into the mining activities.

Assessment of the geological information available has determined that the area in question may have good quality aggregate reserves. In order to ascertain the above and determine the nature, location and extent of the reserves within the proposed mining area, it will be necessary that mining be undertaken.

The planned mining will not have a conflict with the Spatial Development Plans (SDP) for the Sol Plaatje LM and Francis Baard DM, the Integrated Development Plans (IDP) and the Environmental Management Framework (EMF) for the affected municipalities.

10 Motivation

10.1 Preferred Site

The proposed project site is a preferred site due to its location where the Dumps are identified and there is no other area that was identified that had same dump quantity and easy access than the one site identified.

10.1.1 Regional Geology

The regional geology is characterised by:

- The Archaean age rocks which are found in the area are the Ventersdorp Supergroup, the Grinqualand West Sequence and the Karoo Sequence.
- The Grinqualand West Sequence: The Grinqualand West sequence unconformably follows the Ventersdorp Supergroup It comprises a concordant sequence which grades from the coarse to fine grained clastic rocks of the Vryburg Formation at the base through alternating

stromatolitic dolomite, limestone, sandstone and shale of the Schimtdsdrift Formation to limestone and dolomite of the Ghaaplato Formation.

- Karoo Sequence: The Karoo Sequence stratigraphically lies above the older formations unconformably. At the base the Dwyka Formation comprises glacial and fluvioglacial rocks which include tillite, varved shale, mudstone with pebbles and conglomerate. The Ecca Group, which follows concordantly on the Dwyka, consists almost exclusively of deep-water, fine grained clastic sediments and the lithological monotony of this sequence is only interrupted by the characteristic black, carbonaceous shale of the Whitehill Formation which is underlain and overlain respectively by dark-grey mudstone and shale of the Prins Albert and Tierberg Formation.

10.1.2 Local Geology

In this area the dolerite occurs widely spread as dykes, sills and funnel shaped bodies. Early Jurassic age igneous intrusions are abundant in the area. The intrusions are generally referred to loosely as dolerite, but the actual rock type varies. They occur in the form of dykes and sills and are composed primarily of plagioclase feldspar and pyroxene. The rocks are highly durable, and this are often seen capping the sandstone and mudstone hills. These dolerites (Jd) can also be seen at the bottom or south of the mining permit. The rest of the farm is covered by sand (Qs). Technologies

Due to the nature of the proposed mining activities, all infrastructure will be temporary and/or mobile. Excavator, Front End Loader and dump trucks will be used during this mining activities

In terms of the proposed technologies, these machines have been chosen based on long term proven success in mining. Figure 7-1.

10.2 Design/Layout

Since no complicated surface infrastructure will be required for this project design and layout alternatives for the proposed project were determined.

11 Full description of the process followed to reach the proposed preferred alternatives within the site.

The preferred site was chosen as it will result in fewer adverse socio-economic and environmental Impacts. In addition, there is an existing access road to the site which negates the need to build another access road. Access routes such as Waterloo street, St Augustine's road, Green street, and Parsons Lane. The existing access routes reduces the risk of further environmental degradation (habitat destruction and soil erosion) resulting from constructing another road. The technology to be used, include an excavator and loading of materials with a front-end loader and dump truck, was deemed the most feasible technology for the purpose of a temporary mining operation. Minimal infrastructure will result in cheaper and more effective rehabilitation upon mine closure.

11.1 Details of the Development Footprint Alternative Considered

11.1.1 The property on which or location where it is proposed to undertake the activity

The proposed mining area is characterized by old dumps and vegetation and shrubs is encroaching on those old dumps

11.1.2 The type of activity to be undertaken

The application is for mining permit and no other alternatives were considered. The mining process is simple as it includes only loading and hauling of old dumps off site to farm Roodepan 70 portion 32 and 33 for further processing of Clay bricks. The preferred technology that is planned to be used is machineries such as Front-End Loader, Excavator and Dump trucks.

All infrastructure will be temporary and/or mobile

11.1.3 The design or layout of the activity

The location of the infrastructure will be determined based on the location of the Dumps; Mine design for hauling and transportations is expected to change as mining progresses.

11.1.4 The technology to be used in the activity

The proposed technologies have been chosen based on long term proven success in mining.

11.1.5 The operational aspects of the activity

No permanent services in terms of water supply, electricity, and or sewage facilities has been catered for under this application.

11.1.6 The option of not implementing the activity

The option of not implementing the activity will result in negative Socio-economic value of the District.

11.2 Details of the Public Participation Process Followed

The Public Participation Process (PPP) was conducted in terms of Chapter 6 of the National Environmental Management Act, 1998 (Act 107 of 1998).

The stakeholder engagement process forms an important part of the impact assessment process. The stakeholder engagement process is primarily aimed at affording I&AP's the opportunity to gain an understanding of the proposed project. In addition, the purpose of consultation with the surrounding communities, key stakeholders, and I&AP's is to provide them with the necessary information about the proposed project so that they can make informed decisions as to whether the project will affect them or not, and provide the EIA team with local knowledge of the area and raise concerns relating to the biophysical, socio-economic and cultural impacts that may arise.

The stakeholder engagement process is conducted in terms of NEMA, which provides clear guidelines for stakeholder engagement during an EIA. Chapter 1 of the NEMA outlines the principles of environmental management, several pertaining to public consultation (e.g. Chapter 1, subsections (2), (3), (4) (f), (g), (h), (k), (q) and (r). Chapter 6, Regulations 39 – 44 of the amended EIA Regulations GNR) 982, promulgated on 8 December 2014, specify the minimum requirements

for stakeholder engagement in an EIA process conducted under the NEMA. In 2017, the Minister of Environmental Affairs published, in terms of Section 24J of the NEMA, Public Participation Guidelines which guide the Public Participation Process (PPP) in order to give effect to Section (2)(4)(f), (o) and 24 (1A) (C) of the NEMA.

Figure 11-1 provides a summary of the stakeholder engagement process followed for the proposed project.

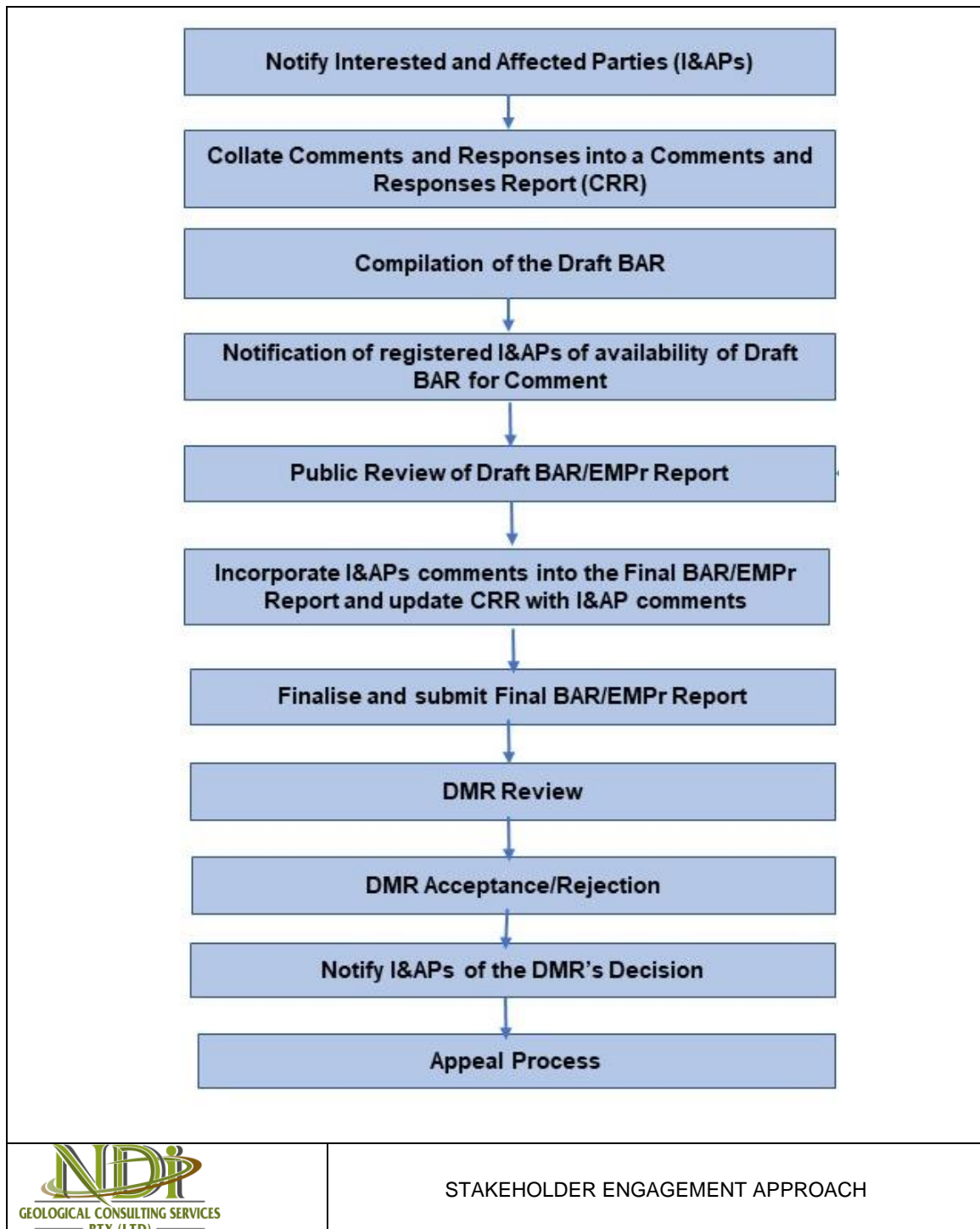


Figure 11-1: Summary of the Stakeholder Engagement Process followed.

All the above guidelines have been incorporated into this stakeholder engagement process. This application will be submitted to the DMRE for authorisation as the competent authority. Identified commenting authorities on this application include:

- DWS – Regional Office;
- SAHRA – Provincial;
- Sol Plaatjie Local Municipality;
- Francis Baard District Municipality; and

- Northern Cape Department of Nature Conservation (DENC).

All stakeholder engagement documents have been included in Appendix 4.

11.2.1 Stakeholder Identification Interested and Affected Parties

An I&APs register was developed using information from the surveyor general's office and from stakeholders that responded to the project announcement that was conducted through placement of newspaper advertisements, on-site notices, Radio interviews and notification letters sent to the adjacent and affected surrounding communities .

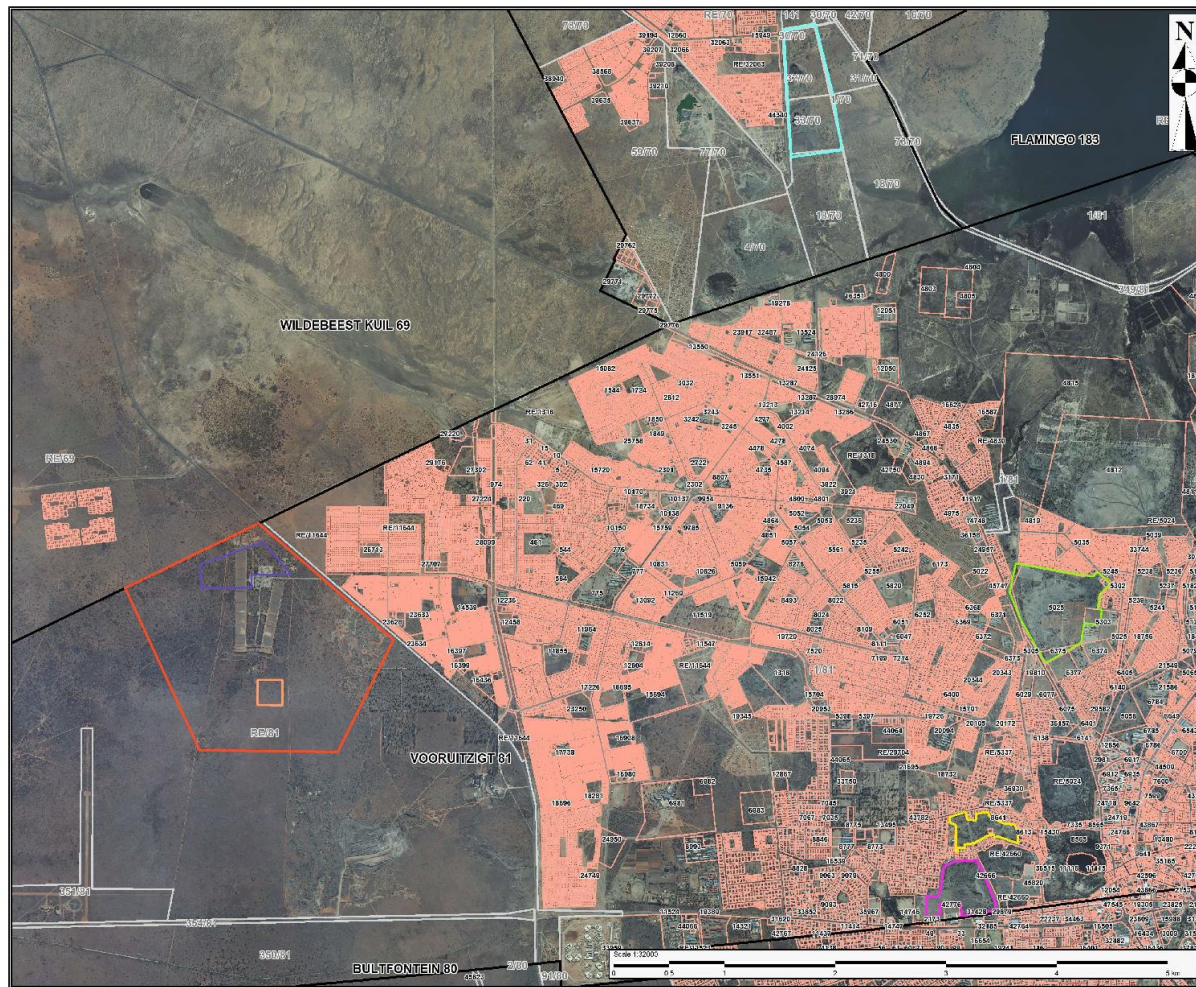
The I&APs register was maintained for the duration of the study where the details of stakeholders are captured and automatically updated upon communication to the EAP. The identification, registration, and comments from I&APs was conducted as an on-going activity.

The affected properties are provided in Table 11-1.

Table 11-1: List of Affected Farm and Farm Portions

Farm	Portions	21 Digit Survey General Code
A portion of remainder erf 8622		C00000000000008100000

A map of the affected and adjacent farm portions and farm portions of the site are illustrated in Figure 11-2.



Changing the Face of a City

Strategic Environmental Assessment

AFFECTED PROPERTIES

Legend

- Erven
- Farm Portions
- Parent Farms
- Proposed Project Sites
- Vooruitzig
- Colville
- BMW
- St Augustine
- Roodepan
- Vooruitzig Manufacturing Area
- Vooruitzig Mining Permit Area

Map by:

NDP
GEOLOGICAL CONSULTING SERVICES
PTY (LTD)

Prepared for:

AN INITIATIVE BY

KRD
KIMBERLEY
REHABILITATION AND
DEVELOPMENT

COORDINATE SYSTEM: WGS84



AFFECTED AND ADJACENT PROPERTIES

Figure 11-2: Affected

and

Adjacent

Properties

11.2.2 Project Announcement

This process takes cognisance of the requirements of Annexure 3 of the DEFF Disaster Management Directions of 5 June 2020.

Stakeholder engagement commenced with the applicant holding several meetings with different departments that will be involved in the proposed project. The following meetings were held with the different parties:

- Joint meeting with Sol Plaatje Local Municipality and Northern Cape Province representatives 26 June 2020;
- The council on 22 July 2020; and
- The Development Bank of South Africa (DBSA).

Ndi Geological (EAP) also made use of various methods to inform stakeholder of the proposed development and KRD's intention to undertake the required and environmental processes and EA application. The purpose of redoing public participation was to ensure the adequate and appropriate opportunity for public participation in decisions that may affect them and the environment. Ndi made provisions for the second round of public participation from 26 August 2020 to 26 September 2020. Stakeholders were provided with the opportunity to participate and register as I&AP's during the second round as follows:

- Project Announcement: Affected and adjacent surrounding communities were notified of the project and application as follows:
 - ✓ Newspaper advertisements were published in the Noordkaap on 26 August 2020 and the Diamond Fields Advertiser on 28 August 2020;
 - ✓ On-site notices were erected around the project area on the 27th of August 2020; and
 - ✓ A radio announcement informing the public of the proposed project and inviting I&APs to register on the stakeholder database were made as follows:

On Radio Taaemaneng : Slot 1: 07:15-07:45 am

Slot 2: 15:00-15:30 pm

On Revival FM: Slot 1: 08:20-08:45 am

Slot 2: 14:55-15:20 pm

- Identification of stakeholders: Affected and adjacent property owners were identified using Surveyor General Information on windeed (<https://search.windeed.co.za/DeedsOffice/Property/>) and was also based on responses received from the project announcement process.
- Creation and maintenance of the stakeholder database, including correspondence with the stakeholders: The information, including contact details was collated into a stakeholder database.

All the issues and comments received during the process have been collated into a Comments and Responses Register (CRR).

All stakeholder consultation documents are included in Appendix 4.

11.3 Public Review of the Draft Basic Assessment Report

The Draft BAR was compiled in terms of the requirements of GNR 326. All comments received during the announcement phase of the stakeholder engagement process were incorporated into Draft BAR and collated into a Comments and Responses Report (CRR) which formed an appendix to the draft BAR.

The availability of the Draft BAR was announced by means of SMSs, letters and emails to registered I&APs. Copies of the draft BAR were made available at the venues listed in Table 11-2.

Table 11-2: List of places the Draft BAR was placed for public review

Public Place	Locality	Telephone
Ndi Geological Services Website	http://www.ndigeoservices.co.za/	053 842 0687

The draft BAR was also made available to the competent and commenting authorities during the 30-day review and comment period.

11.4 Summary of Issues Raised by I&APs

Table 11-3 provides a summary of the comments received to date following the newspaper adverts, site notices, written notification of the project and the Draft BAR review period.

Table 11-3: Summary of issues raised by Interested and Affected Parties

Interested and affected parties. List the names of person consulted in this column, and mark with an X where those who must be consulted were in fact consulted		Date comments received	Issues raised	EAPs response to issues as mandated by the applicant.	Section and paragraphs reference in this report where the issues and or response were incorporated
INTERESTED AND AFFECTED PARTIES		16/09/2020	Issue raised was the fact he was not sure which area his notification must be sent to. He was under the impression that since there are three sites it means that there are different areas of notification.	The EAP has sent an email to assist with the correct area the party was under	
Mr Robert Van der Nest					
Land Owner Mrs Susan Van Nieker		28/09/2020	Issue raised was that since she is the owner of an estate in one of the sites, she approves the development and the project by	The EAP made a telephone call indicate acknowledgement of comment and to pass gratitude to the party	Please see Letter attached

			KRD		in Appendi x H.
Mr Enerst Nel Home Owner		29 /08/202 0	The concern was there effective dust control at times. The party called the office on 28/8/2020 to find out what measure are there to control dust pollution coming about with the project. The applicant requests that the people living in the area be given powers to halt the project anytime if they feel their lives; properly and health are at risk without involving the courts.	A meeting was held between Mr Enesrt; the EAP and the Director of KRD to explain all measures in place for the project to ensure effective dust control and was explain that the applicant KRD is obliged to work and respond as per the requirement given by DMR and all relevant legislation and cannot work outside of the empowering legislation.	
Radio Interview at Revival FM with Mr Makhaphela		26/08/2 020	On behalf of the listeners and from WhatsApp messages to the radio station by listeners the Radio DJ asked that people enquiring most about the job creation aspect of this project. The Radio Dj asked on behalf of the listeners if we will be able to hire even the elderly in our project The public was further informed	The EAP commented that indeed there will be job creation. As far as the brief as we were given by our client the applicant, He intends to use local labourers. He understands the lack of skills most of the locals have and is intending to have the locals trained and employed. We are anticipating having at least 1200 indirect and direct jobs created in this project. There will be need for truck drivers, brick layers, traffic controllers and builders.	

			about the 30-day period to send in their comment to the office of the EAP and to register so they can have access to the BAR as soon as is available.	and we told him that the experience and skill that comes with the elderly is very much appreciated and will come at great value to a project like ours.	
Radio Interview with RTS Show: Lesuka suka la tlhanaselo		26 /08/2020	The Radio Dj on behalf of the community asked Fist if we received the necessary consent to use the sites. Secondly if we have prepared ourselves in case illegal miners feel that the dumps belong to them. Thirdly if we going to create jobs for the locals or if people from far town will be the ones receiving the opportunity.	The EAP explained the process to apply for PR and how the guidelines are in place to ensure that the land is rightfully allowed to be given to applicant. The issue of illegal miners was not for the EAP to address but the EAP ensure that a legal and guaranteed job for a larger number of the community is assured in this project unlike the illegal mining that benefit the few. The EAP also explained that as per brief by the applicant the locals will be the people employed in this project.	Please see letter attached in Appendix J.
Radio Interview with RST Show: The Morning Fix Interview		26/08/2020	The radio Dj on behalf of the listeners asked First what an EAP was. Secondly if we will create job with this project. Thirdly exact objectives of KRD. Fourthly who are the stakeholders? Fifthly what are BNG houses Lastly how many	Noted	Please see letter attached in Appendix K.

			jobs are we going to create.		
Sol Municipality Facebook Page: Boitumelo Gopane		29 /09/202 0	The issues raised was that she personally welcome all plans in terms of developing n creating job opportunities to the city, but also would like to make a request in criteria of hiring .She hope the process will process be a fair n square process that will satisfy community. Just a suggestion I come up with. Let the unemployed be written per name put in box in raffled because processes of councillors and community members taking names forward goes with favouritism. it's been long our youth struggle to be given opportunity to prove their good side in making a difference in our society. And also will help fighting crime in terms of unemployment.	Noted by EAP	Please see letter attached in Appendix L.
Tshepo Smith		29/09/2 020	I hope there will be IDP and or community meetings to make input. We need to build also the middle-class houses as well and new shopping	Noted by EAP	

			<p>complexes.</p> <p>People who want to participate or invest in the project must be invited through media</p> <p>It must open to public participation process</p>		
George Koopman		29/09/2020	<p>Good plan. I like the start of 1500 direct and 2300 indirect permanent jobs. With paying rates and taxes. Income derived from the sale of service. Job creation for our youth. Sol you start to move now. And at the sometime battling the backlog of our housing challenges. Our communities must move now into the CBD. With the land they will avail now. It's a Good idea.</p>	Noted by EAP	
Thandisile Sindi		29/09/2020	<p>You are speaking about mining debris from the CBD that has attracted a lot of artisan miners and that debris is their source of income and you did not consult with them at all. Create permanent jobs not job</p>	Noted by EAP	

			opportunities.		
Kevin Niewenhuis		29/09/2020	Who is KRB and the directors of the board, public participation is needed to make such agreements, public meetings should be conducted first with the community's input as very imperative before such decisions can be taken, we need more information leaders	Noted by EAP	
Lynnete King		29/09/2020	Now where did this company jump out? There's an old song with the words 'dreams are 10 a penny' that comes to mind; good luck to whoever can turn us back into the Diamond City	Note by EAP	

12 Environmental Attributes Associated with the Alternatives

12.1 Baseline Environment

12.1.1 Geographical

The proposed project area is situated in the Sol Plaatjie Local Municipality within the jurisdiction, of Francis Baard District Municipality in the Northern Cape Province. The affected property is located approximately within the Kimberly CBD.

12.1.2 Topography

Kimberley is set in a relatively flat landscape with no prominent topographic features within the urban limits. The only "hills" are debris dumps generated by more than a century of diamond mining. Certain mine dumps, are in the vicinity of the Big Hole and have been proclaimed as heritage features and are to be preserved as part of the historic industrial landscape of Kimberley.

The surrounding rural landscape, not more than a few minutes' drive from any part of the city, consists of relatively flat plains dotted with hills, mainly outcropping basement rock (andesite) to the north and north west, or Karoo age dolerite to the south and east. Shallow pans formed in the plains.

12.1.3 Climate

Average Monthly Temperatures

The average monthly temperatures (Minimum and Maximum) as received from Kimberley are indicated in Figure 12-1.

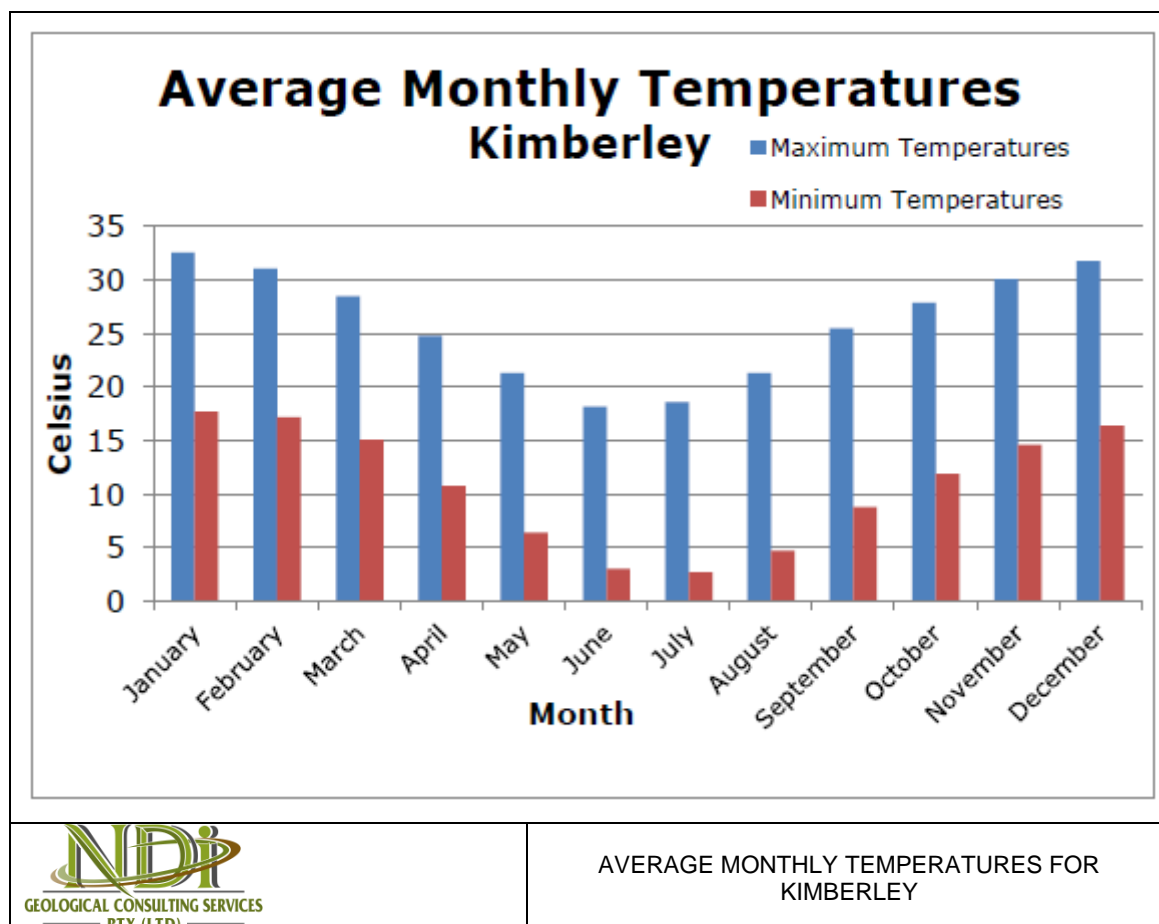
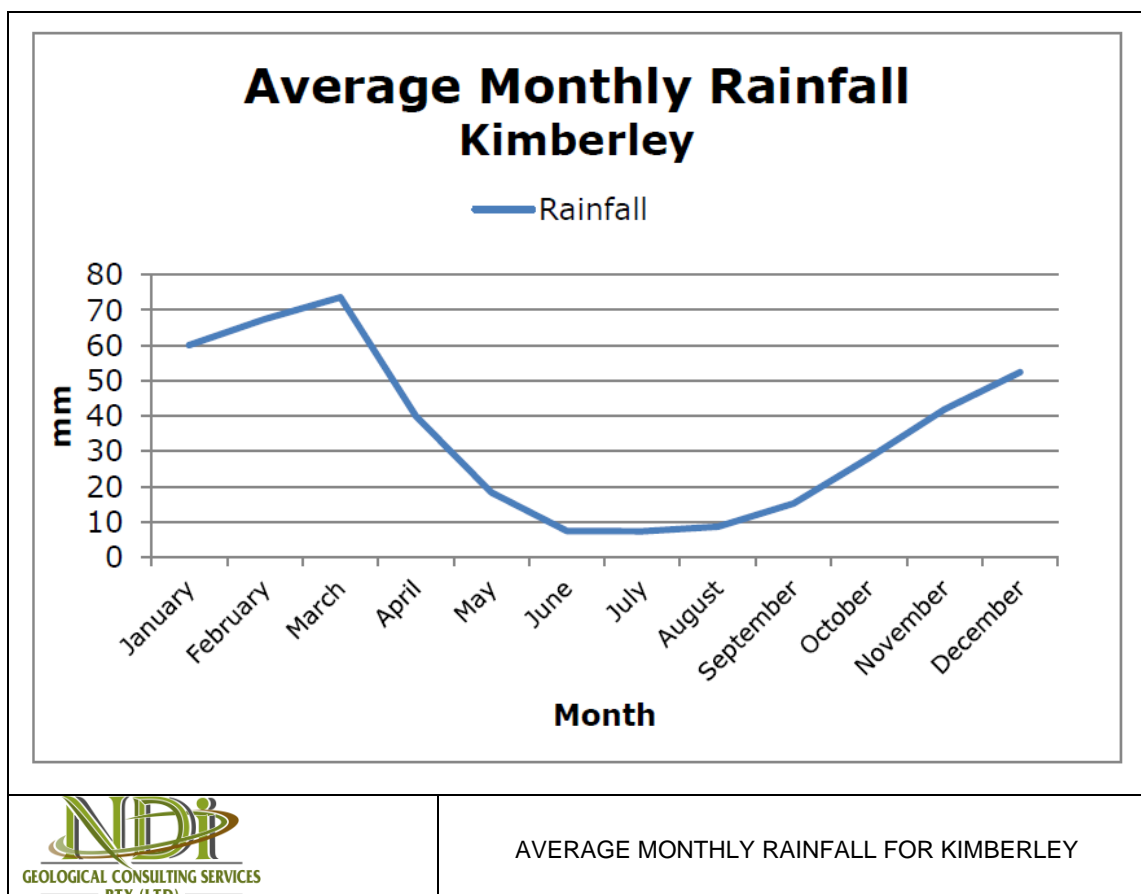


Figure 12-1: Average Monthly Temperatures for Kimberley (Source: Weather SA.)

The figure indicates that:

- The highest maximum temperature is experienced during November, January and February.
- The average maximum goes beyond 33 °C.
- The coldest months of the year are June and July, where the average temperature drops well below 20 °C.

Figure 12-2 indicates the average monthly rainfall for the region.



AVERAGE MONTHLY RAINFALL FOR KIMBERLEY

Figure 12-2: Average Monthly Rainfall for Kimberley (Source: Weather SA.)

The average monthly rainfall data indicates that:

- The highest rainfall months are February to March with an average of ± 75 mm;
- November/December has a higher peak with just over 50mm;
- While the dry months are June and July with an average of below 10mm.

Average monthly Precipitation

The information available indicates the average monthly precipitation and indicates the following:

- The highest precipitation is in March (70mm) while;
- The lowest is in June to September with an average under 10mm.

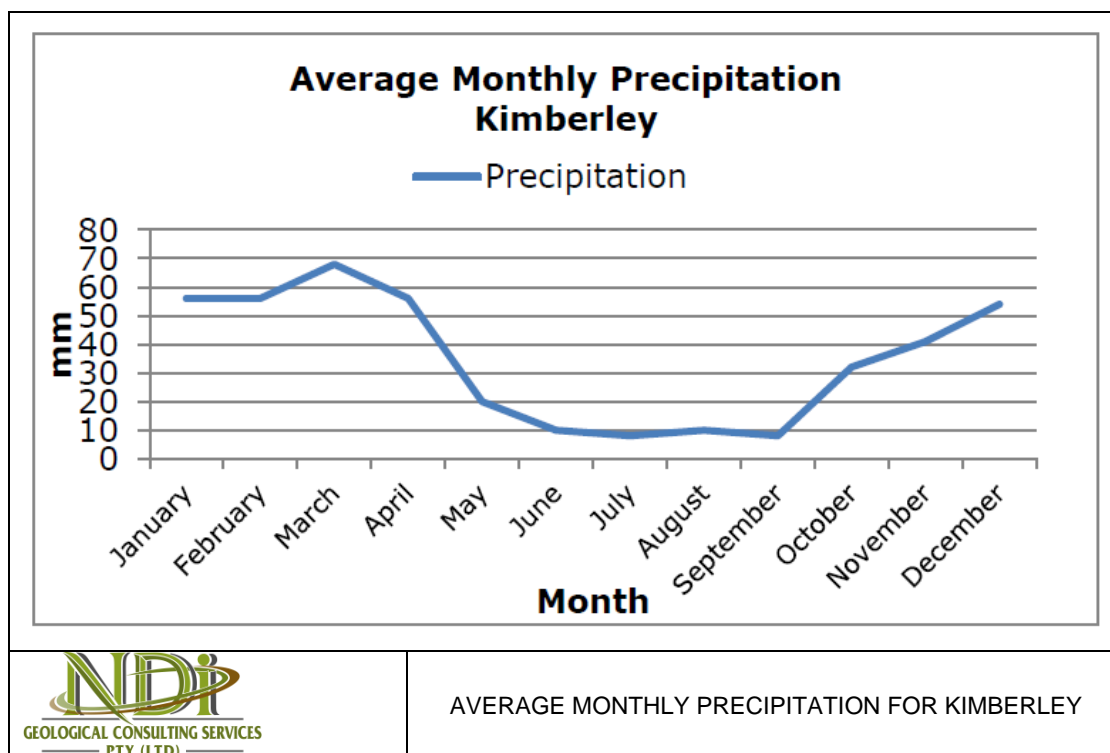


Figure 12-3: Average Monthly Precipitation for Kimberley. (Source: Weather SA)

12.1.4 Geology

The A portion of remainder erf 8622 is underlain by Archaean age rocks which also include a variety of Senozoic sediments and intrusive rocks. The gneiss, pegmatite, granite and amphibolite are some of the Archaean age rocks which outcrop in the area of study. The regional geology is characterised by:

- The Archaean age rocks which are found in the area are the Ventersdorp Supergroup, the Grinqualand West Sequence and the Karoo Sequence.
- The Ventersdorp Supergroup: The rocks in this group are quartz porphyry and quartz-feldspar porphyry of Makwassie Formation at the base, andesitic lava, volcanic breccia, tuff and chert of the Rietat Formation which forms the top of the sequence. The rocks in this group are mainly volcanic.
- The Grinqualand West Sequence: The Grinqualand West sequence unconformably follows the Ventersdorp Supergroup. It comprises a concordant sequence which grades from the coarse to fine grained clastic rocks of the Vryburg Formation at the base through alternating stromatolitic dolomite, limestone, sandstone and shale of the Schimtdsdrift Formation to limestone and dolomite of the Ghaaplato Formation.
- Karoo Sequence: The Karoo Sequence stratigraphically lies above the older formations unconformably. At the base the Dwyka Formation comprises glacial and fluvio-glacial rocks which include tillite, varved shale, mudstone with pebbles and conglomerate. The Eccca Group, which follows concordantly on the Dwyka, consists almost exclusively of deep-water, fine grained clastic sediments and the lithological monotony of this sequence is only interrupted by the characteristic black, carbonaceous shale of the Whitehill Formation which is underlain and overlain respectively by dark-grey.

12.1.5 Water Resources

The project is located within quaternary catchments, which include C91E (located within the Lower Vaal Water Management Area (WMA))

According to the SANBI Wetland Inventory (2006) National Freshwater Ecosystem Priority Areas (NFEPA) (2011), the affected quaternary catchment areas are not regarded as important in terms of fish sanctuaries, rehabilitation or corridors.

In addition, the project area is not considered important in terms of translocation and relocation zones for fish.

12.1.6 Wetlands

The SANBI data shows that there are no wetlands occurring on the study area.

12.1.7 Groundwater

Aquifer Characterisation

The Groundwater Harvest Potential Map of South Africa published by the Department of Water Affairs (Baron et al, 1998) classifies the area around Kimberley as having a harvest potential of 6 000 to 10 000 m³/km²/annum, defined as the maximum volume of groundwater that may annually be abstracted per square kilometre per annum without depleting the aquifers.

Local Geohydrology

The local hydrogeology within the study area is hosted by the Karoo dolerite rock and basement rocks. The surrounding lithological units are classified as intergranular and fractured with the estimated yield of 0.5 – 2 l/s.

Groundwater aquifers within the study area are potentially recharged through regional and local recharge system due to the limited rainfall in the area. Groundwater harvest potential as indicated by Baron et al, (1998) is approximately 6 000 to 10 000 m³/km²/annum, which is the maximum groundwater which can be sustainably abstracted per square kilometre.

Table 12-1: Potential Risk Significance and Mitigation

Activity of concern	Risk	Risk Level	Recommended Mitigation
Access and mine road	Compaction of footprint area. Reduction in groundwater levels.	Medium Impact	Implement acceptable protection zones around drainage lines, riparian zones. Implement access control. Plan and regulate vehicle movement. Impellent erosion protection.
Storage of chemical and fuels	Potential spillage of fuels, oils and lubricant contaminating groundwater	Low Impact	Train contractors and own staff on re-spills and disposal, procedure for storage, use and disposal of oils and grease. Activities monitored daily.
Ablution and waste collection	Faecal coliform and leachate from waste contaminating groundwater resource	Medium Impact	Disposable latrines should be used and emptied in the municipal sewage. Containers should be used to store waste and should be emptied and cleaned weekly depending on the rate of waste generation.

12.1.8 Biodiversity

Biomes

Portions of the site are classified as Ecological Support Areas (ESAs), which are areas that are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of Critical Biodiversity Areas and/or in delivering ecosystem services.

The biodiversity specialist assessment however found that the proposed St Augustine site is in a highly degraded state and should not be classified into any of the categories indicated on the map (**Error! Reference source not found.**).

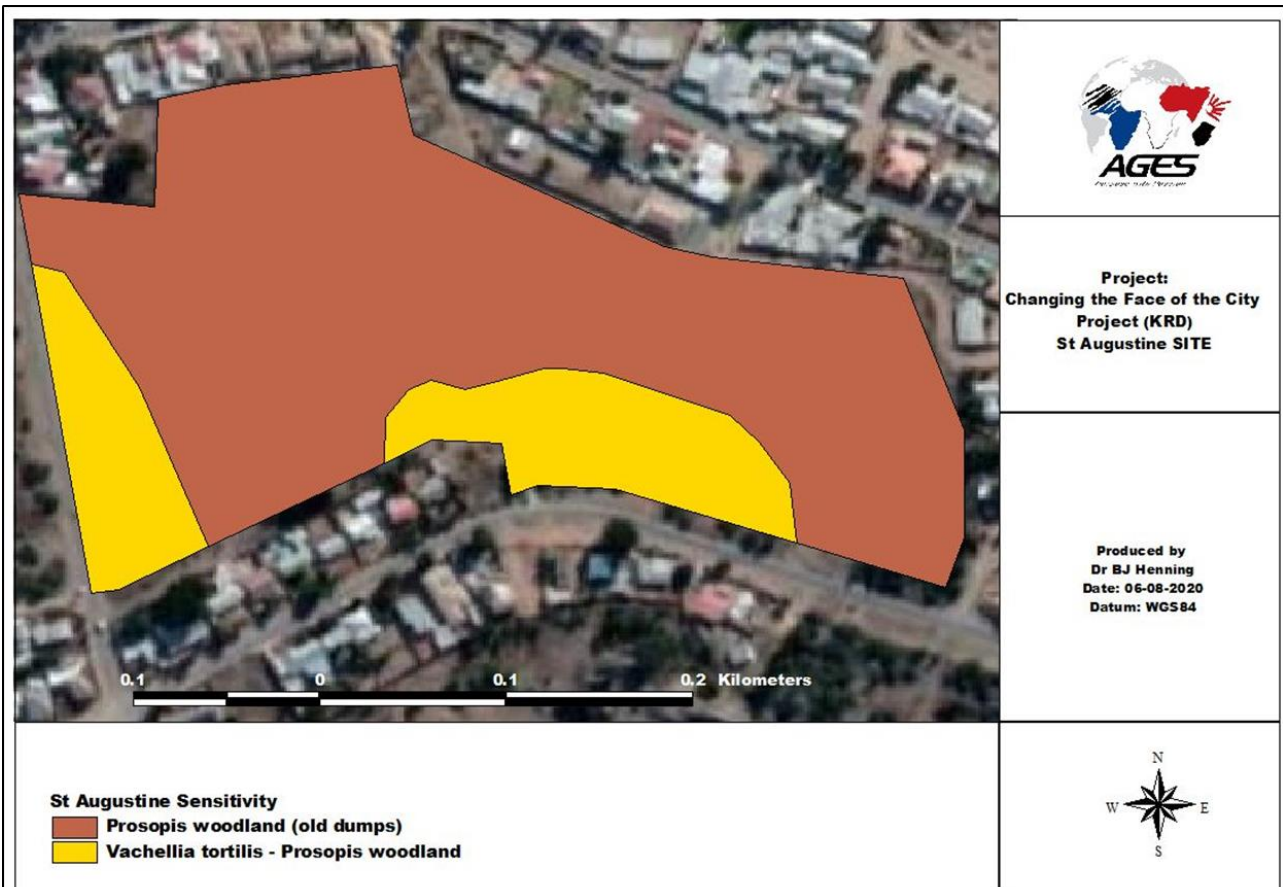
Vegetation Types

According to the biodiversity assessment, the indigenous flora of the area is mostly represented by the Kimberley Thornveld (Mucina & Rutherford, 2006) which occurs on slightly irregular plains with well-developed tree layer dominated by tree species such as *Vachellia erioloba*, *V. tortilis*, *V. karroo* and *Boscia albitrunca* and well developed shrub layer with occasional dense stands of *Tarchonanthus camphoratus* and *Senegalia mellifera*. The grass layer is often open with much uncovered soil, although erosion is very low. This vegetation type has a Least Threatened conservation status with 18% transformed mostly through cultivation, while only 2% conserved.

3 major vegetation units (**Error! Reference source not found.**) occur on the proposed development site as follows:

- *Degraded Vachellia tortilis – Prosopis woodland*: This vegetation unit occurs in the west and south of the site on red apedal soils of the Hutton soil form. The woody layer is characterised by the dominance of the indigenous *Vachellia tortilis* and the alien invasive *Prosopis glandulosa*. The woodland is typical of the Kimberley Thornveld vegetation type on plains and can be considered as the only natural vegetation unit occurring on the St Augustine Site. Herbaceous species within the understorey included grass species such as *Enneapogon cenchroides*, *Enneapogon desvauxii*, *Cenchrus ciliaris*, *Eragrostis echinochloidea*, *Aristida congesta*, *Fingerhutia africana* and *Themeda triandra*. The vegetation unit has a medium-low sensitivity and unlimited development can be supported within the footprint area.
- *Prosopis glandulosa woodland*: This vegetation unit represent the *Prosopis* invaded areas on the old mining dumps of the St Augustine Site. Two specific variations of this vegetation unit occur namely a more open unit This vegetation unit represent the *Prosopis* invaded areas on the old mining dumps of the St Augustine Site. Two specific variations of this vegetation unit occur namely a more open unit where *Prosopis* have invaded and a variation where the *Prosopis* trees form dense stands or thickets. The Mesquite tree (*Prosopis glandulosa*) is synonymous with dry arid areas in especially the Karoo and the Northern Cape. The tree is loved by livestock for its sweet seed pods which is sometimes also used among residents for its medicinal purposes. It has since become the second most widespread invasive tree species in South Africa. *Prosopis* trees are extravagant users of readily available groundwater and dense stands could seriously affect the hydrology of the ecosystems they invade. Dense stands compete with and replace indigenous woody and grassland species. Dense stands produce few pods and thus replace natural pasturage without providing pods in return. Dense stands are virtually impenetrable, restricting the movement of domestic and wild animals and causing injuries. These species and hybrids have been listed as invasive species in terms of the Alien and Invasive Species Regulations (AIS), National Environmental Management: Biodiversity Act (Act No 10 of 2004). They were listed as category 3 species in the Northern Cape recently and the Kimberley area have a serious problem with *Prosopis* invasion. The development will ensure that the *Prosopis* stands are controlled, although a specific approach would be needed to prevent spreading to neighbouring areas. The Mesquite tree (*Prosopis glandulosa*) is synonymous with dry arid areas in especially the Karoo and the Northern Cape. The tree is loved by livestock for its sweet seed pods which is sometimes also used among residents for its medicinal purposes. It has since become the second most widespread invasive tree species in South Africa. *Prosopis* trees are extravagant users of readily available groundwater and dense stands could seriously affect the hydrology of the ecosystems they invade. Dense stands compete with and replace indigenous woody and grassland species. Dense stands produce few pods and thus replace natural pasturage without providing pods in return. Dense stands are virtually impenetrable, restricting the movement of domestic and wild animals and causing injuries. These species and hybrids have been listed as invasive species in terms of the Alien and Invasive Species Regulations (AIS), National Environmental Management: Biodiversity Act (Act No 10 of 2004).

- They were listed as category 3 species in the Northern Cape recently and the Kimberley area have a serious problem with *Prosopis* invasion. The development will ensure that the *Prosopis* stands are controlled, although a specific approach would be needed to prevent spreading to neighbouring areas. The vegetation unit has a low sensitivity and unlimited development can be supported within the footprint area; and
- Degraded grassland / bare ground: This vegetation unit occurs along the edges of the old mining dumps in the central and western section of the site and represent secondary grassland. Most of the areas were previously degraded for mining related activities. Although secondary grasslands may superficially look like primary grasslands, they differ markedly with respect to species composition, vegetation structure, ecological functioning and the ecosystem services they deliver. These grasslands are still in an early successional state, although somewhat older (older than 5 years) with several grass species like *Enneapogon scoparius*, *Aristida junciformis*, *Aristida congesta s. congesta* and *Eragrostis echinchoidea*. The herbaceous layer is characterised by dense stands (density 60-70%) of climax grasses of medium height (0.6-1.2m). The vegetation unit has a Low Sensitivity and unlimited development can be supported within the footprint area



1. Figure 4: Vegetation Units on the St Augustine Site

2. A floral species level assessment found that:

Species of conservation concern

A list of SCC plant species previously recorded in the study area in which the proposed development is planned was obtained from the Plants of Southern Africa (POSA) database of South African National Biodiversity Institute (SANBI).

Error! Reference source not found. provides a list of the potential red data species occurring in the QDS of the study area with reference to the vegetation types.

3. **Table 12-1-8: Red data species potentially occurring in the quarter degree grid of the study area with specific reference to the vegetation types (SIBIS database)**

Species Name	Conservation Status
<i>Gallenia pallens</i>	<i>Data Deficient</i>

None of these species were documented during the surveys.

Protected Trees (National Forest Act, No.84 of 1998)

No protected tree species was documented on site.

Protected plants (Northern Cape Nature Conservation Act, No. 9 of 2009)

No NCNCA protected species are located on the site.

Invasive alien species (Alien and Invasive Species Regulations GNR 599 of 2014)

The Alien Invasive Plant Species identified during the survey are provided in **Error! Reference source not found.**

4. **Table 12-1-8: List of AIS documented in the project area**

Species	NEM:BA Category
<i>Agave sisalana</i>	2
<i>Argemone ochroleuca</i>	1b
<i>Atriplex nummularia</i>	2
<i>Cirsium vulgare</i>	1b
<i>Datura stramonium</i>	1b
<i>Flaveria bidentis</i>	1b
<i>Melia azedarach</i>	3 (in urban areas)
<i>Nicotiana glauca</i>	1b
<i>Opuntia ficus-indica; Opuntia stricta</i>	1b
<i>Prosopis glandulosa</i>	3
<i>Ricinus communis</i>	2
<i>Salsola kali</i>	1b
<i>Tipuana tipu</i>	3
<i>Xanthium strumarium</i>	1b

Fauna

- **Habitat:** The area has been settled for many centuries, and the fauna is usually considered impoverished due to overgrazing and other man-induced impacts. There are two main faunal habitat types present on the site that might be impacted on by the proposed project namely degraded grassland and mixed woodland (alien invasive and indigenous).
- **Mammals:** Large mammals that occurred historically at the site, are absent from the area, owing to anthropogenic impacts in recent centuries. This loss of large species means that the mammal diversity at the site is far from its original natural state not only in terms of species richness but also with regards to functional roles in the ecosystem. Mammals are sensitive to disturbances and habitat destruction and degradation and as such the anticipated species diversity of the study area would be low. Settlement areas have negated the possibility of encountering any medium to large mammals. The presence of dogs as well as poaching activities (snares observed on site), poses a threat to the presence of mammals on sites. The mammals are mostly represented by generalised species such as rodents and scrub hares that will move through the area while foraging. The proximity of the informal settlements does however place constant pressure on these mammal populations and many of these populations will eventually disappear from the area completely. Most mammal species are highly mobile and will move away during construction. The connectivity of the project site is low.
- **Birds (avifauna):** The project area represents woodland and degraded grassland avifauna habitats. Microphyllous woodland usually supports much higher bird numbers compared to the broadleaved woodlands. The area represents microphyllous woodland and supports many smaller bird species such as Ashy Tit, Pied Babbler, Kalahari Robin, Burntnecked Eremomela, Desert Barred Warbler, Marico Flycatcher, PiritBatis, Crimsonbreasted Shrike, Longtailed Shrike, Threestreaked Tchagra, Great Sparrow, Whitebrowed Sparrowweaver, Scalyfeathered Finch, Violeteared Waxbill and Blackcheeked Waxbill. Degraded grasslands sometimes cover extensive areas and have become an artificial habitat that attracts a wide range of generalist species. These grasslands represents a significant feeding area for many bird species in any landscape for the following reasons: through opening up the soil surface, land preparation makes many insects, seeds, bulbs and other food sources suddenly accessible to birds and other predators; the grass.
- **Herpetofauna (Reptiles and Amphibians):** Typical species associated with arid and semi-arid habitat types occur in the study area. Venomous species such as the puff adder and cape cobra are expected to occur in the larger study area, although the location within Kimberley City makes the probability of these snakes occurring on site virtually zero. The general habitat type for reptiles consists of open woodland and grassland with limited available habitat for diurnally active and sit-and-wait predators, such as terrestrial skinks and other reptiles. The amphibians appear to be poorly represented on site since no standing or perennial water sources are located on site. The stormwater canal might hold water for limited times of the year that could attract a few locally occurring frog or toad species. No threatened species occur in the area.

12.1.9 Conservation Plan

According to the Northern Cape Provincial Biodiversity Conservation Plan (C Plan), a portion of the affected property is classified as an Ecological Support Area (ESA). Ecological Support Areas are not essential for meeting biodiversity targets.

12.1.10 Heritage Resources

Heritage resources may be tangible, such as buildings and archaeological artefacts or intangible such as landscapes and living heritage. Their significance is based upon their aesthetic value, architectural, historical scientific, social, spiritual, linguistic economic or technological values; their representation of a particular period; their rarity and their sphere of influence. There are a number of heritage and cultural resources in the Northern Cape Province. However, there are no major heritage resources sites that are associated with the affected properties. Although the specialist found no graves on site, it is still likely that there may be graves missed during the survey that may be affected by the proposed mining activities.

12.1.11 Socio-Economic

The proposed mining project will be located within the Sol Plaatje Local Municipality which is situated in the Francis Baard District Municipality.

Population: The municipality has experienced negative growth (-0.3%) in the population from 1996 to 2001 and an upswing to 2% from 2001 to 2011. With almost 260 000 people, the Sol Plaatje Local Municipality housed 0.5% of South Africa's total population in 2015. Between 2005 and 2015 the population growth averaged 2.22% per annum which is slightly higher than the growth rate of South Africa as a whole (1.51%). Compared to Frances Baard's average annual growth rate (1.78%), the growth rate in Sol Plaatje's population at 2.22% was slightly higher than that of the district municipality. The population projection of Sol Plaatje Local Municipality shows an estimated average annual growth rate of 1.9% between 2015 and 2020. The average annual growth rate in the population over the projection period for Frances Baard District Municipality, Northern Cape Province and South Africa is 1.7%, 1.5% and 1.4% respectively and is lower than that the average annual growth in Sol Plaatje Local Municipality.

The population pyramid reflects a projected change in the structure of the population from 2015 and 2020. The differences can be explained as follows:

- In 2015, there is a significantly larger share of young working age people between 20 and 34 (27.4%), compared to what is estimated in 2020 (25.4%). This age category of young working age population will decrease over time.
- The fertility rate in 2020 is estimated to be slightly higher compared to that experienced in 2015.
- The share of children between the ages of 0 to 14 years is projected to be slightly smaller (27.4%) in 2020 when compared to 2015 (27.6%).
- In 2015, the female population for the 20 to 34 years age group amounts to 14.3% of the total female population while the male population group for the same age amounts to 13.2% of the total male population. In 2020, the male working age population at 12.1% does not exceed

that of the female population working age population at 13.3%, although both are at a lower level compared to 2015.

Level of Education: Of the population over 20 years, 30% have matric and higher education, while 10% indicate no schooling. The remaining 60% have some primary schooling and some secondary schooling. This will pose a serious problem for the future economic trajectory as skills will have to be built to suit the economic path and in the short-term skills will have to be brought in from skilled areas. Within Sol Plaatje Local Municipality, the number of people without any schooling decreased from 2005 to 2015 with an average annual rate of -3.43%, while the number of people within the 'matric only' category, increased from 32 100 to 49 200. The number of people with 'matric and a certificate/diploma' increased with an average annual rate of 3.65%, with the number of people with a 'matric and a Bachelor's' degree increasing with an average annual rate of 7.82%. Overall improvement in the level of education is visible with an increase in the number of people with 'matric' or higher education.

Employment Levels: In 2005, 39.7% of the total population in Sol Plaatje Local Municipality were classified as economically active which decreased to 39.6% in 2015. Compared to the other regions in Frances Baard District Municipality, Sol Plaatje local municipality had the highest Economic Active Population (EAP) as a percentage of the total population within its own region relative to the other regions. Of the economically active people in the municipality, 31.9% are unemployed (narrow definition of unemployment). 41.7% of the economically active youth (15 – 34 years) in the area are unemployed. This figure is compelling enough to direct a special focus on youth employment. In 2015 the labour force participation rate for Sol Plaatje was at 60.0% which is very similar when compared to the 59.2% in 2005. The unemployment rate is an efficient indicator that measures the success rate of the labour force relative to employment. In 2005, the unemployment rate for Sol Plaatje was 36.6% and decreased overtime to 36.0% in 2015. The gap between the labour force participation rate and the unemployment rate decreased which indicates a negative outlook for the employment within Sol Plaatje Local Municipality.

Economic Statistics: the tertiary sector employs relatively little unskilled labour compared to the primary and secondary sectors. Therefore, growth in the tertiary sector does not normally have a significant impact on unemployment as the majority of unemployed people are not highly skilled. compared to the national economy of South Africa, Sol Plaatje Local municipality has a comparative advantage on community services and almost the same advantage on the transport industry. A slight advantage is also noted on financial services. However, when it comes to specifically manufacturing, Sol Plaatje has a significant comparative disadvantage relative to the country as a whole. In terms of trade the quotient of Sol Plaatje is relatively similar to that of South Africa. Generally speaking, Sol Plaatje has a very narrow economy.

12.2 Description of the current land uses.

The site is currently vacant land and mainly used as a pass-through by the local community. Wood harvesting, littering and illegal dumping occur on the site. The proposed project will lead to beneficial use of the site.

12.3 Description of specific environmental features and infrastructure on the site.

The proposed mining area is generally characterised by old dumps and vegetation that is encroaching through the dumps.

12.4 Environmental and current land use map.

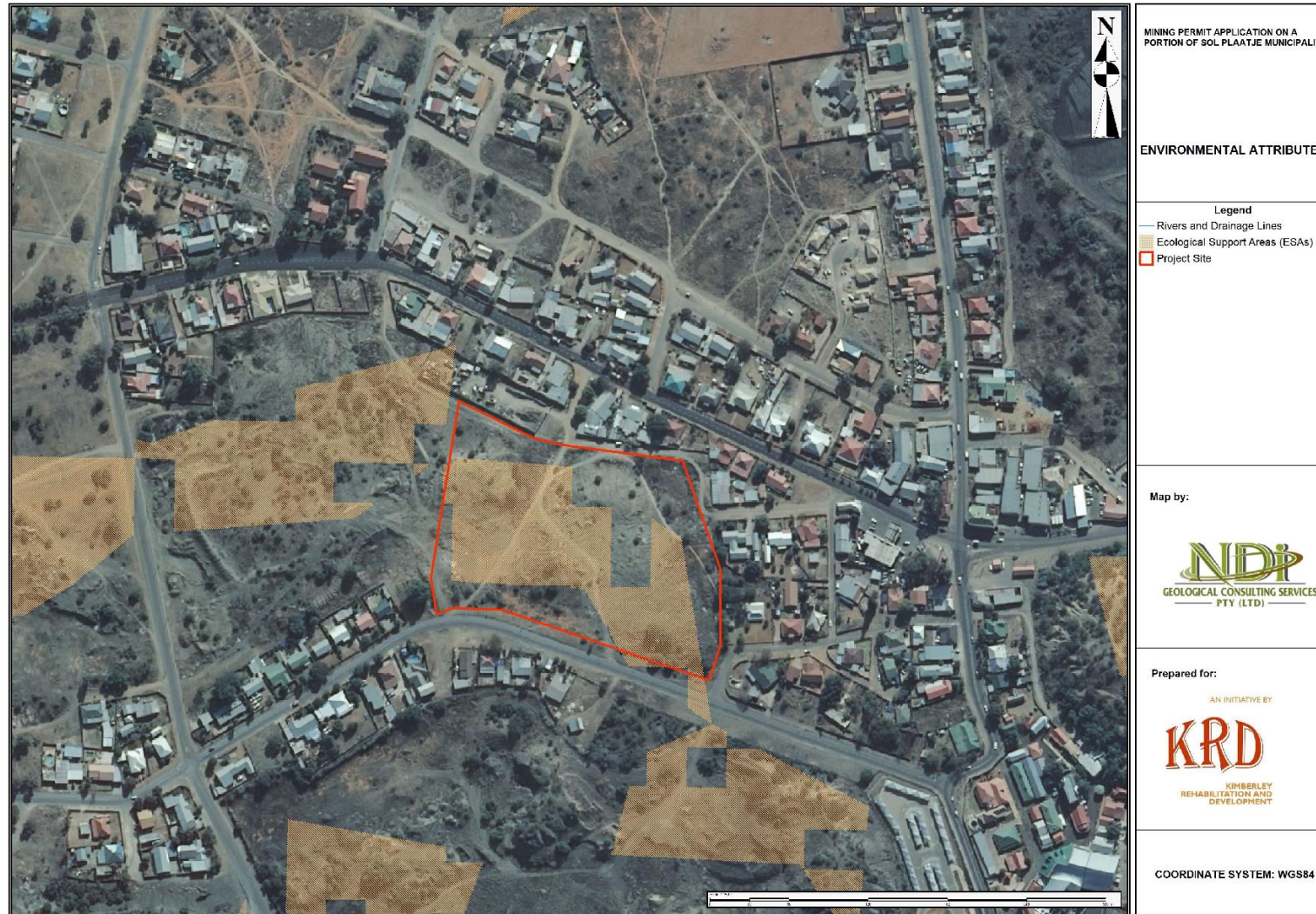


Figure 12-5: Current Environmental Attributes and Landuse Map

13 Impacts and Risks Identified

Table 13-1 provide a high-level assessment of the potential impacts and associated mitigation measures which could result from the proposed mine during construction, operation and decommissioning/closure. These impacts will be further refined and assessed according to the impact assessment methodology in Section 14.

Table 13-1: Summary of Potential Environmental Impacts Associated with the Proposed Development

Element of Environment	Potential Impact Descriptions
Socio-Economic	Possible job opportunities during the construction and operation.
Hydrogeology	Possible groundwater contamination.
Air Quality	Possible impact on Air Quality in the area.
Climate Change	Possible contribution to climate change through emission of Green House Gases
Noise	Possible generation of noise during construction and operation.
Soils/Land Use/Land Capability	Loss of soil resource and change in land capability and land use.
Biodiversity	Disturbance and loss of biodiversity, especially SCC.
Heritage	Highly unlikely, but possible impact on heritage and cultural resources (including graves) in the area.
Traffic	Potential safety issues due to the increased traffic.
Cumulative Impacts	Cumulative Impacts

13.1 Operational Phase

The proposed mining activity will start at direct operational phase as there won't be construction phase due to the fact that there won't be any construction phase that is envisaged.

13.1.1 Social-Economic

It is expected that during the operation phase the project will result in the creation of employment of +- 10 people including security officials and operators of machines. The community will continue to benefit as a result of the continued boost in small local businesses. The socio-impacts expected during the operation phase include:

- Impact on the day to day operation by surrounding communities in the area, which may have an impact on their livelihoods;
- Negative impacts on health and safety of the local communities as a result of additional vehicles on the roads;
- Negative impact on, local community health and safety due to influx of employees, the presence of job seekers, which may lead to criminal activities. Illegal informal settlement of job seekers in the area may exacerbate the situation; and

13.1.2 Groundwater

The use of heavy machines during mining activities may result in the spillages of hydrocarbons from vehicles and machinery. This may result in the contamination of soils and groundwater.

13.1.3 Surface water

No surface water will be impacted by this phase

13.1.4 Flora

The project may result in the following impacts on the floral environment during the operation phase:

- Destruction of potential floral habitats as a result of continual disturbance of soil, leading to altered floral habitats, erosion and sedimentation;
- Impact on floral diversity as a result of possible uncontrolled fires;
- Potential spreading of alien invasive species as a result of floral disturbance; and

13.1.5 Fauna

The project may result in the following impacts on the faunal environment during the operation phase:

- Migration of fauna from the mining area due to noise as a resulting of movement of machines that may cause noise,
- Loss of faunal species due to collisions with vehicles and machinery;
- Loss of faunal diversity and ecological integrity as a result of poaching and faunal species trapping;

13.1.6 Soils, Land Use and Land Capability

The use of vehicles during mining activities may result in the spillages of hydrocarbons from the vehicles and machinery. This will result in the contamination of soils.

13.1.7 Air Quality

The movement of vehicles and machinery will likely result in an increase in nuisance dust, PM10 and PM2.5. There is also potential for increase in carbon emissions and ambient air pollution due to the movement of vehicles and machinery. It is expected that the implementation of dust suppressing mitigation measures will result in the reduction in nuisance dust.

13.1.8 Visual

Mining machineries will be visible from nearby locations and will have visual impact on the local communities in close proximity to the mining area.

13.1.9 Heritage, Archaeological Resources

The mining activities may result in the destruction of graves and other heritage resources. Although the specialist found no graves on site, it is still possible that there may be graves missed during the survey that may be affected by the proposed mining activities.

13.1.10 Palaeontology Impacts

Earth moving activities may result in the destruction of fossils (if any).

13.1.11 Ambient Noise

The use of vehicles and machinery may result in an increase in noise in the immediate vicinity of the project. The Mining activities will also result in an increase in noise in the vicinity of the project.

13.1.12 Traffic

The movement of vehicles in the project area will result in an increase in traffic on the roads and turning points.

13.1.13 Climate

The movement of vehicles and machinery may result in the production of carbon dioxide (Green House Gas), which may have an impact on the climate in the area.

Table 13-2: Impact Assessment Table for the Operation Phase

Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation							Impact Management Actions (Proposed Mitigation Measures)	Environmental Impact Significance After Mitigation						
		Consequence			Probability					Consequence			Probability			
		Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact	Significance	Significance Rating		Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact	Significance	Significance Rating
Socio-Economic	Operation may affect the day to day operation of the surrounding communities hence result in direct impact on their livelihood.	2	1	2	2	3	25	Low	Random and regular alcohol and drug testing shall be conducted on all personnel responsible for operating machinery and driving construction vehicles to ensure the safety of the public; Mining site shall be kept to a minimum; Surrounding communities shall be informed of the exact location of the Mining site, indicating the days on which hauling and transportation to take place.	1	1	2	1	1	8	Low
	Uncontrolled access during operation may result in conflict with surrounding communities.	2	1	1	2	2	16	Low	Security and safety should be emphasized; No workers shall be allowed to access private properties without the owner's knowledge and consent;	1	1	1	1	1	6	Low
	Negative impact as a result of additional trucks on the roads, impacting on local communities' health and safety.	3	3	2	1	2	24	Low	Local speed limits and traffic laws shall apply at all times to minimise the occurrences of accidents on public roads; Where possible the transportation of materials and rubbish shall be undertaken outside traffic peak hours to minimise inconveniencing residents; The number of vehicles on the roads shall be kept to a minimum; Materials transported on public roads must be covered.	1	2	1	1	1	8	Low
	Negative impact on, local community health and safety due to potential influx of employees, the presence of job seekers, which may lead to prostitution and conflict with the local communities. Illegal informal settlement of job seekers in the area may exacerbate the situation.	3	3	2	1	2	24	Low	Liaise with the SAPD and existing forums in order to implement effective crime prevention strategies; and The applicant will ensure that as far as possible locals will be used during the operation of the mining project. Recruitment will not be undertaken on site.	1	2	1	1	1	8	Low
Groundwater	The use of vehicles and machineries during mining activities may result in the spillages of hydrocarbon liquids from the vehicles and machinery. This will result in the contamination of the vegetation cover and soils.	3	2	2	2	2	28	Medium Low	Ensure that the mining activities is conducted in such a manner that the environment is protected from probable spillages and contamination. All oil spills will be remedied using approved methodologies. The contaminated soils will be removed and disposed of at a licensed waste disposal facility. All waste generated from the mining activities will be collected in proper receptacles and removed to a registered disposal facility e.g., sewage treatment plant, solid waste disposal site or hydrocarbon recycling or treatment facilities.	2	1	2	1	2	15	Low
	Storage of hydrocarbons and chemicals, which may impact on groundwater as a result of spillages and uncontrolled release.	3	2	2	2	2	28	Medium Low		2	1	2	1	2	15	Low
Biodiversity	Continued destruction of potential floral habitats for species of conservational concern as a result continual disturbance of soils leading to altered floral habitats, erosion and sedimentation.	2	1	3	2	2	24	Low	All disturbed areas must be rehabilitated in tandem with construction activities. The collection of any plant material for firewood or medicinal purposes shall be strictly prohibited.	2	1	1	1	1	8	Low
	Impact on floral species of conservational concern as a result of an increased in alien species proliferation and ineffective rehabilitation of exposed areas	2	1	3	2	2	24	Low	The existing integrity of flora surrounding the study area shall be upheld and no activities shall be carried out outside the footprint of the demarcated Mining site.	2	1	1	1	1	8	Low
	Loss of faunal habitat and ecological structure as a result of increased fires mining operation and introduction of alien species, leading to transformation of the natural habitat	2	1	3	2	2	24	Low	The rehabilitation of the disturbed areas must be conducted such that the rehabilitated areas will encourage the migration of animals back into the rehabilitated areas. The proposed development footprint areas shall remain as small as possible and where possible be confined to already	1	1	1	1	1	6	Low

Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation							Impact Management Actions (Proposed Mitigation Measures)	Environmental Impact Significance After Mitigation								
		Consequence			Probability		Frequency	Significance		Significance Rating	Consequence			Probability		Frequency	Significance	Significance Rating
		Severity	Spatial	Duration	Frequency	Activity					Severity	Spatial	Duration	Frequency	Activity			
									disturbed areas. No trapping or hunting of fauna shall be permitted. Edge effects of all operational activities, such as erosion and alien plant species proliferation, which may affect faunal habitat shall be strictly managed. No informal fires in the vicinity of mining area shall be permitted. An alien vegetation control plan must be implemented in order to manage alien plant species occurring within the study area, and to prevent further faunal habitat loss. Poaching of wild animals and livestock will be prohibited.									
Soils Land use and Land Capability	Soil contamination as a result of operational activities can be as a result of a number of activities (i.e. hazardous substance storage, incidental hydrocarbon leakages from construction vehicles).	3	1	2	2	2	24	Low	Ensure that topsoil is properly stored, away from the streams and drainage areas. Tarpaulins will be placed on the ground to prevent oil, grease, hydraulic fluid and diesel spills during emergency repairs. Soil disturbance within the Mining site shall be kept to a minimum.	2	1	1	1	1	8	Low		
Air Quality	The mining operation will require vehicular movement which may result in Possible increase in dust generation, PM10 and PM2.5 as a result of stockpiling material, use of heavy machinery, and material movement.	2	3	2	2	2	28	Medium Low	Dust suppression must be conducted during the operational phase of the project. Correct speed will be maintained at the proposed project site. Vehicle maintenance must be conducted regularly to avoid excessive diesel fumes.	1	1	1	1	1	6	Low		
	Increase in carbon emissions and ambient air pollutants (NO2 and SO2) as a result of movement of vehicles and operation of machinery/equipment.	2	3	2	2	2	28	Medium Low	Where practical possibly rehabilitation should be undertaken progressively. A speed limit of 40 km/hr shall apply to limit vehicle entrained dust from the unpaved roads. All construction equipment must be scheduled for preventative maintenance to ensure the functioning of the exhaust systems to reduce excessive emissions and limit air pollution. Dust control suppression shall be implemented on dry weather days and periods of high wind velocities; Appropriate dust suppression measures may include limiting the extent of open areas, reducing the frequency of disturbance and spraying with water; Materials transported on public roads must be covered; and Where practical rehabilitation should be undertaken progressively. Odours Putrescible waste must be handled, stored and disposed of before the probability of it generating odours; and Chemical toilets must be emptied / serviced on a regular basis. Proof of this must be provided to the Engineer.	1	1	1	1	1	6	Low		
Visual	Machines that will be used during mining activities will be visible from the nearby residents and properties.	2	2	3	2	3	35	Medium Low	Ensure that the time period used for the mining activities is optimised Materials transported on public roads must be covered.	1	1	1	1	1	6	Low		

Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation							Impact Management Actions (Proposed Mitigation Measures)	Environmental Impact Significance After Mitigation								
		Consequence			Probability		Frequency	Significance		Significance Rating	Consequence			Probability		Frequency	Significance	Significance Rating
		Severity	Spatial	Duration	Frequency	Activity					Severity	Spatial	Duration	Frequency	Activity			
Heritage Resources	The mining activities may result in the destruction of graves and any other heritage sites during operational phase of the project if any.	3	2	2	1		2	21	Low	In the event that sites or features (eg high density of artefacts, a burial, or ostrich eggshell cache) being found during the mining project, SAHRA should be informed immediately to determine steps (e.g. have an archaeologist assess the find/s and recommend mitigation, if necessary)	1	1	1	1		1	6	Low
Noise	Vehicular movement may generate noise in the immediate vicinity	2	2	2	2		2	24	Low	Ensure that proper management measures as well as technical changes are undertaken to reduce the impacts on surrounding residents and employees. This include ensuring that less noisy equipment is used, that equipment is kept in good working order and that the equipment must be fitted with correct and appropriate noise abatement measures and where possible use white-noise generators instead of tonal reverse alarms on heavy vehicles operating on roads. Adjacent surrounding communities must be advised of any work that will take place outside of normal working hours, that may be disruptive (e.gw. noise) in advance. Surrounding communities must be notified in advance of noisy construction activities. All equipment should be provided with standard mufflers. Muffling units on vehicles and equipment must be kept in good working order. Construction staff working in areas where the 8-hour ambient noise levels exceed 85 Dba should wear ear protection equipment. Where possible, operation of several equipment and machinery must be avoided; All equipment must be kept in good working order, with immediate attention being paid to defective silencers, slipping fan-belts, worn bearings and other sources of noise; Equipment must be operated within specifications and capacity (e.g. no overloading of machines); Regular maintenance of equipment must be undertaken, particularly with regard to lubrication; Equipment shall be switched off when not in operation; Appropriate directional and intensity settings must be maintained on all hooters and sirens; The Contractor must ensure that the employees conduct themselves in an appropriate manner while on site; Adjacent surrounding communities shall be notified in writing if work needs to be carried out after hours or if any Mining will be required.	1	1	1	1		1	6	Low
	Increase in ambient noise levels as a result of the hauling and transportation activities.	2	2	2	2		2	24	Low		1	1	1	1		1	6	Low
Traffic	Increase in traffic volumes as a result of mining activities which may lead to an increase in traffic congestion	2	3	1	2		2	24	Low	Local speed limits and traffic laws shall apply at all times to minimise the occurrences of accidents on public roads; and Where possible the transportation of materials and rubbish shall be undertaken outside traffic peak hours to minimise inconveniencing residents.	1	2	1	1		1	8	Low
Climate	Emissions of Green House Gases as a result of the moving machinery.	2	2	2	2		2	24	Low	The number of mining vehicles and shall be kept to a minimum All the vehicles shall undergo maintenance on a regular basis to improve on the combustion engine vehicle efficiency.	1	1	1	1		1	6	Low
Waste Management	Inadequate control, management and disposal of waste on site during operation activities	2	1	1	2		2	16	Low	<i>Storage of waste</i> General waste will be collected in an adequate number of litter	1	1	1	1		1	6	Low

Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation							Impact Management Actions (Proposed Mitigation Measures)	Environmental Impact Significance After Mitigation								
		Consequence			Probability		Frequency	Significance		Significance Rating	Consequence			Probability		Frequency	Significance	Significance Rating
		Severity	Spatial	Duration	Frequency	Activity					Severity	Spatial	Duration	Frequency	Activity			
									bins located throughout the construction site; Bins must have lids in order to keep rainwater out; Bins shall be emptied regularly to prevent the bins from overflowing; All work areas shall be kept clean and tidy at all times; All waste management facilities will be maintained in good working order; Waste shall be stored in demarcated areas according to type of waste; Flammable substances must be kept away from sources of ignition and from oxidizing agents; No storage of waste shall be permitted within 32 m of the water courses or within 500 m of riparian areas; Demolition waste and surplus concrete shall be disposed of responsibly; Waste shall not be buried or burned on site; and The maximum retention time for temporary storage of waste generated shall not exceed 30 days, provided the waste does not present a health hazard or risk of odour. <i>Disposal of hazardous waste</i> No dumping shall be allowed in or near the construction site; Hazardous containers shall be disposed of at an appropriate licensed site; Hazardous waste will be removed and managed by an approved service provider; A safe disposal certificate will be provided by the approved service provider as proof of responsible disposal of hazardous waste; and The safe disposal certificate shall be stored and provided on request. <i>Disposal of general waste</i> No dumping shall take place in or near the Mining site; and All general waste shall be disposed of to the nearest licensed landfill site.									

13.2 Decommissioning and Closure

It is expected that the impacts for the decommissioning and closure phases will be similar to the impacts during the operational phase and have not been assessed in detail (please refer to the operational phase assessment). The most significant impacts will be:

13.2.1 Soils and Land Capability

The rehabilitation of the mined-out area will result in the affected soil and land use being restored. This will also result in the resumption of the use of the land since the infrastructure would have been removed. However, should the rehabilitation of affected sites not be conducted properly, it may result in loss of usable soils and agricultural land, resulting in reduced land capability.

13.2.2 Land Use

Positive impacts will result due to the reduction in areas of disturbance and the return of land use of the affected areas and making available an area that was covered by Mining area.

13.2.3 Soils and Vegetation

The use of vehicles/machinery during the rehabilitation of the mining site may result in the compaction of soils and in the spillages of hydrocarbon liquids from the vehicles and machinery. This will result in the contamination and destruction of the vegetation cover, soils and groundwater.

13.2.4 Air Quality

Rehabilitation and removal of the mining equipment will require vehicular movement. This will result in the generation of dust by movement of vehicles and due to blowing winds. Vehicles and machinery will also generate diesel or petrol fumes. Generated dust will migrate towards the predominant wind direction and may settle on surrounding properties including nearby vegetation.

13.2.5 Noise

Noise will be generated during the removal of equipment and rehabilitation of the sites. The noise is not expected to exceed occupational noise limits and will be short lived.

The summary of the impact assessment during the decommissioning and closure phase is provided in Table 13-3.

Table 13-3: Impact Assessment Table for the Decommissioning and Closure Phase

Environmental Aspect	Nature of potential impact/risk	Environmental Impact Significance Before Mitigation							Impact Management Actions (Proposed Mitigation Measures)	Environmental Impact Significance After Mitigation								
		Consequence			Likelihood (Probability)		Frequency: Impact	Significance		Significance Rating	Consequence			Likelihood (Probability)		Frequency: Impact	Significance	Significance Rating
		Severity	Spatial	Duration	Frequency: Activity	Severity					Spatial	Duration	Frequency: Activity	Severity	Spatial			
Soils, Land Capability and Land Use	The removal of mining equipment and the rehabilitation of the access infrastructure will result in the affected soil and land use being restored. This will also result in the resumption of the use of the land since the infrastructure would have been removed.	N/A	N/A	N/A	N/A	N/A	0	N/A	Ensure that contamination of the rehabilitate area by hydrocarbon liquids is prevented. Ensure that the rehabilitation work is done in such a manner that the environment is protected from probable spillages. All oil spills will be remedied using approved methodologies. The contaminated soils will be removed and disposed of at a licensed waste disposal facility. All waste generated from the rehabilitation sites will be collected in proper receptacles and removed to registered disposal facilities e.g., sewage treatment plant, solid waste disposal site or hydrocarbon recycling or treatment facilities.	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Land Use	Positive impacts will result due to the reduction in areas of disturbance and the return of land use of the affected areas and making available an area that was covered by mining activities	N/A	N/A	N/A	N/A	N/A	0	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Soils and Vegetation	The use of vehicles/machinery during the rehabilitation of the mining site may result compaction of soils and in the spillages of hydrocarbon liquids from the vehicles and machinery. This will result in the contamination and destruction of the vegetation cover and soils.	2	1	2	2	2	20	Low		1	1	2	1	2	12	Low		
Air Quality	Rehabilitation and removal of the mining sites and equipment will require vehicular movement. This will result in the generation of dust by movement of vehicles and due to blowing winds. Vehicles and machinery will also generated diesel or petrol fumes. Generated dust will migrate towards the predominant wind direction and may settle on surrounding properties including nearby vegetation.	1	3	2	2	2	24	Low		1	1	1	1	2	9	Low		
Noise	Noise will be generated during the removal of equipment and rehabilitation of the sites. This noise is not expected to exceed occupational noise limits and will be short lived.	2	1	2	2	2	20	Low		1	1	1	1	2	9	Low		

14 Impact Assessment Methodology

All the identified potential impacts were assessed according to the following Impact Assessment Methodology as described below. This methodology has been utilised for the assessment of environmental impacts where the consequence (severity of impact, spatial scope of impact and duration of impact) and likelihood (frequency of activity and frequency of impact) have been considered in parallel to provide an impact rating and hence an interpretation in terms of the level of environmental management required for each impact.

The first stage of any impact assessment is the identification of potential environmental activities¹, aspects² and impacts which may occur during the commencement and implementation of a project. This is supported by the identification of receptors³ and resources⁴, which allows for an understanding of the impact pathway and an assessment of the sensitivity to change. Environmental impacts⁵ (social and biophysical) are then identified based on the potential interaction between the aspects and the receptors/resources.

The significance of the impact is then assessed by rating each variable numerically according to defined criteria as outlined in Table 9. The purpose of the rating is to develop a clear understanding of influences and processes associated with each impact. The severity⁶, spatial scope⁷ and duration⁸ of the impact together comprise the consequence of the impact and when summed can obtain a maximum value of 15. The frequency of the activity⁹ and the frequency of the impact¹⁰ together comprise the likelihood of the impact occurring and can obtain a maximum value of 10. The values for likelihood and consequence of the impact are then read off a significance rating matrix table as shown in Table 14-1. This matrix thus provides a rating on a scale of 1 to 150 (low, medium low, medium high or high) based on the consequence and likelihood of an environmental impact occurring.

¹An **activity** is a distinct process or task undertaken by an organisation for which a responsibility can be assigned. Activities also include facilities or pieces of infrastructure that are possessed by an organisation.

²An **environmental aspect** is an 'element of an organisations activities, products and services which can interact with the environment'. The interaction of an aspect with the environment may result in an impact.

³**Receptors** comprise, but are not limited to people or man-made structures.

⁴**Resources** include components of the biophysical environment.

⁵**Environmental impacts** are the consequences of these aspects on environmental resources or receptors of particular value or sensitivity, for example, disturbance due to noise and health effects due to poorer air quality. Receptors can comprise, but are not limited to, people or human-made systems, such as local residents, communities and social infrastructure, as well as components of the biophysical environment such as aquifers, flora and palaeontology. In the case where the impact is on human health or well-being, this should be stated. Similarly, where the receptor is not anthropogenic, then it should, where possible, be stipulated what the receptor is.

⁶**Severity** refers to the degree of change to the receptor status in terms of the reversibility of the impact; sensitivity of receptor to stressor; duration of impact (increasing or decreasing with time); controversy potential and precedent setting; threat to environmental and health standards.

⁷**Spatial scope** refers to the geographical scale of the impact.

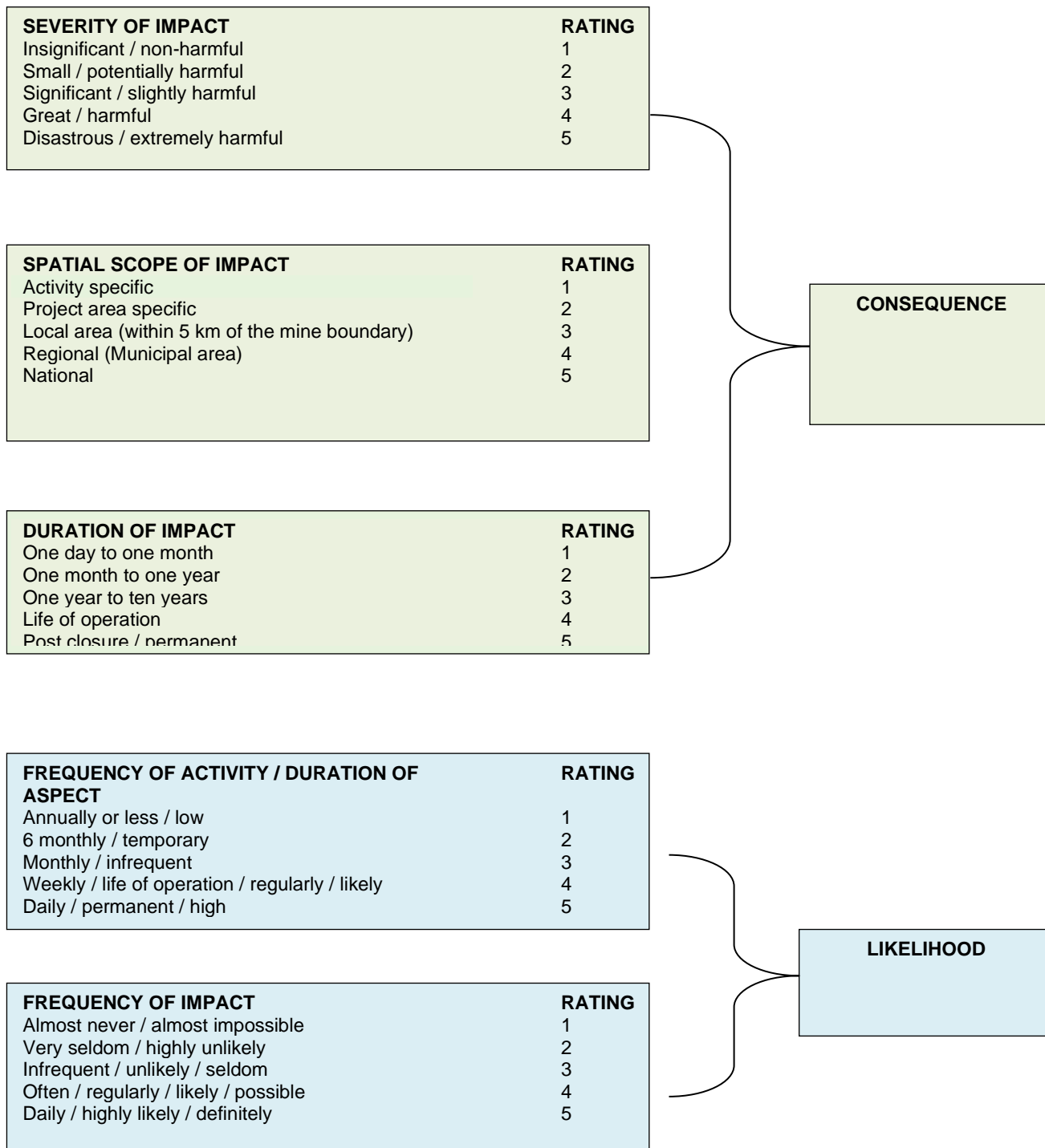
⁸**Duration** refers to the length of time over which the stressor will cause a change in the resource or receptor.

⁹**Frequency of activity** refers to how often the proposed activity will take place.

¹⁰**Frequency of impact** refers to the frequency with which a stressor (aspect) will impact on the receptor.

Natural and existing mitigation measures, including built-in engineering designs, are included in the pre-mitigation assessment of significance. Measures such as demolishing of infrastructure, and reinstatement and rehabilitation of land, are considered post-mitigation.

Table 14-1: Criteria for Assessing Significance of Impacts



		Consequence														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Likelihood	1	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	2	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	3	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	4	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	5	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
	6	12	24	36	48	60	72	84	96	108	120	132	144	156	168	180
	7	14	28	42	56	70	84	98	112	126	140	154	168	182	196	210
	8	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
	9	18	36	54	72	90	108	126	144	162	180	198	216	234	252	270
	10	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300

High	76 to 150	Improve current management
Medium High	40 to 75	Maintain current management
Medium Low	26 to 39	
Low	1 to 25	No management required

SIGNIFICANCE = CONSEQUENCE x LIKELIHOOD

15 Positive and Negative Impacts

The impacts of the proposed site layout will be the same as those of the alternative sites that may be identified during the mining exercise.

The positive impacts of the activities are the creation of employment, which is required in the region.

Clay mining in South Africa is of important economic value, especially for the construction industry. This mining activities has a potential to decrease level of unemployment rate in proposed areas and surroundings. This mining activities will bring revenue into the city and the province which will in turn boost the economy of the country.

The proposed activities have medium to low significance impacts, which will be short term activities in nature. The probability of occurrence of an impact was determined and most of the activities can be controlled and impacts can be reduced or avoided. The probability was also determined based on other mining activities of similar nature.

16 The possible mitigation measures that could be applied and the level of risk.

Please refer to Section 13 for the management and mitigation measures.

17 Motivation where no alternative sites were considered.

As discussed previously, the site is located in an area where there are Dumps and those dumps contains material that construct Clay bricks and of good quality. The site is therefore regarded as the preferred site and alternatives sites are not considered. No alternatives outside of the no-go alternative were considered for the project. The sites were selected in accordance with their highest and best land use potential. Sol Plaatje Municipality, particularly Kimberley has valuable land such as at the St Augustine site, locked under old mine dumps. Not only are these dumps a hindrance to land use, but, according to the Sol Plaatje IDP, they cause an unpleasant authenticity to the city, that it is forgotten mining town. Under the proposed project, KRD proposes to recycle and implement beneficiation projects from the dumps, including the dump located on the St Augustine site.

The site is currently vacant and mainly used as a pass-through by the local community. Wood harvesting, littering and illegal dumping occur on the site.

The proposed project will lead to beneficial use of the site.

18 Statement motivating the alternative development location within the overall site. (Provide a statement motivating the final site layout that is proposed)

The location and extent of the mining activities is based on the information derived from the quantity survey conducted around the proposed mining area. The proposed mining area has got easy access routes. Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site.

Mining debris will be removed from the St Augustine site and transported to the Roodepan Quarry where the debris will be reworked to extract clay for brick making. The clay bricks from the Roodepan Quarry together with the cement bricks manufactured at Vooruitzicht Quarry will be used for the mixed-use and housing developments at the three sites (BMW, Colville and St Augustine).

19 Assessment of each identified potentially significant impact and risk

Table 19-1: Assessment of each identified potentially significant impact and risk

NAME OF ACTIVITY		POTENTIAL IMPACT (Including the potential impacts for cumulative impacts)	ASPECTS AFFECTED	PHASE In which impact is anticipated	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
Data Collection and Assessment	Desktop Study	None	N/A	Planning	N/A	Control potential deviations from the approved EMPr through the effective implementation of the data acquisition and desktop study.	N/A
Geological Mapping		None	N/A	Planning	N/A	Control potential deviations from the approved EMPr through the effective implementation of the data acquisition and desktop study.	N/A
Planning for mining		None	N/A	Planning	N/A	Control potential deviations from the approved EMPr through the effective implementation of the data acquisition and desktop study.	N/A
Access Roads	Establishment of access roads, campsite, physical surveying	Loss of soils, erosion of the soils and impacts on surrounding communities' livelihood.	Soils, Land capability and Land use	Construction	Low	Rehabilitation of areas cleared of vegetation and dust control	Low
Dumps		Contamination of groundwater from hydrocarbon spillages	Groundwater	Construction	Medium Low	Control through management and monitoring of spillages. Where spillages occur, the soil must be stripped and disposed of as stipulated in the EMPr.	Low
Temporary Soil Storage Area		Contamination of surface water due to erosion of soils which will lead to increased turbidity as well as contamination from hydrocarbon spillages	Surface water	Construction	Medium Low	Monitoring through rehabilitation and management of spoil sites	Low
Fence		Aquatic Ecosystem contamination, destruction and loss of habitat	Aquatic ecosystems	Construction	Medium Low	Control of access to aquatic ecosystems and riparian habitat areas and within the regulated 500 m buffer.	Low
Hydrocarbon storage area		Destruction of graves and cultural heritage sites	Heritage and archaeological resources	Construction	Low	Control through clear demarcation of mining areas to ensure avoidance of graves and other heritage sites	Low
Mobile office		Destruction of fossils	Palaeontological resources	Construction	Low	Management of mine site. Should any fossils be discovered, operations must cease and SAHRA must be notified	Low
Ablution Facility		Loss of natural vegetation in the affected areas	Flora	Construction	Low	Rehabilitation of areas cleared of vegetation. Control of alien invasive plant species	Low
		Migration of fauna due to disturbance caused by the proposed project	Fauna	Construction	Low	Relocation of affected species of conservation importance	Low
		Air pollution through nuisance dust, PM 10 and PM2.5 as well as emissions from construction vehicles and machinery.	Air Quality	Construction	Low	Dust control measures	Low
		Increase in ambient noise due to movement of construction vehicles and machinery	Noise	Construction	Low	Management and maintenance of construction vehicles. Management through the use of noise dissipating technologies e.g. noise mufflers Control through the limiting of the activities to the daytime and the implementation of an open and transparent channel of communication	Low
		Visual impacts as a result of vegetation clearance	Visual	Construction	Low	Rehabilitation of areas cleared of vegetation	Low
Loading		Increased traffic on the roads due to additional construction vehicles	Traffic, Socio-economic	Operational	Medium Low	Speed control and limitation of the times when construction vehicles may be on the roads	Low
Hauling		Impact of carbon dioxide (GHG) produced by construction vehicles on the local climate	Climate Change	Operational	Low	Control and keep to a minimal the number of vehicles used for construction. Vehicles must be maintained to ensure efficient use	Low

NAME OF ACTIVITY		POTENTIAL IMPACT (Including the potential impacts for cumulative impacts)	ASPECTS AFFECTED	PHASE In which impact is anticipated	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
						of fuel.	
Data Analysis	Feasibility Studies	None	N/A	Operation	N/A	N/A	N/A
Feasibility Studies Report		None	N/A	Operation	N/A	N/A	N/A
Removal of equipment and infrastructure	Closure and Rehabilitation of sites	The removal of Mining equipment and the rehabilitation of the mined out dumps and associated access infrastructure will result in the affected soil and land use being restored. This will also result in the resumption of the use of the land since the infrastructure would have been removed.	Soils, Land Capability and Land Use	Decommissioning and Closure	N/A	N/A	N/A
		Positive impacts will result due to the reduction in areas of disturbance and the return of land use of the affected areas and making available an area that was covered by Mining area.	Land Use	Decommissioning and Closure	N/A	N/A	N/A
		The use of vehicles/machinery during the rehabilitation may result compaction of soils and in the spillages of hydrocarbon liquids from the vehicles and machinery. This will result in the contamination and destruction of the vegetation cover and soils.	Soils and Vegetation	Decommissioning and Closure	Low	Control and prohibit access of vehicles and machinery to areas outside of established access tracks Control through the clear delineation of the mining area. Control through the implementation of environmental induction and toolbox talks, as well as the implementation of a fine system. Control through the implementation of a soil management programme in terms of the correct tops oil removal, stockpiling and rehabilitation practices as discussed in the EMPr.	Low
		During the decommissioning and closure phases equipment will be removed, G5 material will be used for rehabilitation, remaining sumps will be backfilled, levelled, top soiled and the area re-seeded. During the process of rehabilitation surface water runoff from the rehabilitation site may have elevated silt load, which may cause pollution of the nearby water environment.	Surface Water	Decommissioning and Closure	Medium Low	Control through the clear delineation of the mining area. Control through the implementation of environmental induction and toolbox talks, as well as the implementation of a fine system. Control through the implementation of the NWA GN 704 water management principles.	Low
		Rehabilitation and removal of the mining sites and equipment will require vehicular movement. This will result in the generation of dust by movement of vehicles and due to blowing winds. Vehicles and machinery will also generate diesel or petrol fumes. Generated dust will migrate towards the predominant wind direction and may settle on surrounding properties including nearby vegetation.	Air Quality	Decommissioning and Closure	Low	Dust control measures and rehabilitation of areas stripped of vegetation	Low
		Noise will be generated during the removal of equipment and rehabilitation of the sites. This noise is not expected to exceed occupational noise limits and will be short lived.	Noise	Decommissioning and Closure	Low	Management and maintenance of construction vehicles. Management through the use of noise dissipating technologies e.g. noise mufflers	Low

The supporting impact assessment conducted by the EAP must be attached as an appendix, marked Appendix

20 Summary of specialist reports

The DEA Screening tool classified the environmental attributes in the project area as of *low* sensitivity therefore desktop information was mostly used to compile the report and to conduct the impact assessment. Heritage Impact Assessment, Hydrogeology have been conducted for the application.

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Heritage Resources Assessment	<p>A very low density 'background scatter' of cf. Fauresmith artefacts was noted in areas where Hutton Sands are removed, both on the mining site and in an immediately adjacent property (Morris 2012). No colonial era or other cultural resources were in evidence. Archaeological significance of the area is reckoned to be LOW. There is potential for subsurface material across the entire area, but indications are that densities would be low. Steps for reporting in the event of archaeological material being found are indicated.</p> <p>In summary, the proposed mining is not expected to have a negative impact on the heritage resources of the area. Archaeologists should be granted access to the mining operation at any time to inspect sections and exposed areas at the base of the Hutton Sands.</p>	<p>In the event that sites or features (eg high density of artefacts, a burial, or ostrich eggshell cache) being found during the mining project, SAHRA should be informed immediately to determine steps (e.g. have an archaeologist assess the find/s and recommend mitigation, if necessary). All archaeological traces are protected by legislation, as indicated above.</p>	Section 13
Wetland and Ecology	<p>Detailed ecological (fauna habitat & flora) surveys were conducted during July 2020 to verify the ecological sensitivity, floristic components and vegetation of the site at ground level. A sensitivity analyses was conducted for the vegetation units to identify the most suitable site for the development.</p>	<p>Mitigation measures are provided that would reduce these impacts from a higher to a lower significance. Furthermore, the proposed layout plan of the development should be consistent with the sensitivity map and recommendations stipulated in this report, and the impact on the sensitive habitats on site should be kept to a minimum.</p>	Section 13
Noise	<p>The environmental noise impact assessment will be done by means of approved scientific methods and the expertise of the specialist will ensure that the impact assessment will be done with utmost sensitivity towards the receptors, expansion</p>	<p>Environmental noise surveys to be carried out monthly during the construction phase for the first year after it may be changed to a bi-annual</p>	Section 13

	<p>project establishment and associated infra-structure.</p> <p>Acoustic screening measures such as screens, earth-berms and good maintenance of the machinery and/or vehicles will have to be in place;</p> <p>Compliance to the Building Regulations in terms of servitudes along the boundaries of the buildings;</p> <p>Restriction of working hours in sensitive areas (residential areas) to daytime periods only;</p> <p>Speed limit of hauling vehicles to comply with the speed limits per area;</p>	<p>basis.</p>	
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Attach copies of Specialist Reports as Appendix 9

21 Environmental impact statement

21.1 Summary of the key findings of the environmental impact assessment;

During the proposed mining operation impacts may occur on soils, natural vegetation, surface water, groundwater, sensitive landscapes, air quality, noise, visual aspects, and sites of archaeological and cultural importance should the EMPr not be adhered to.

KRD will undertake measures to ensure that the identified impacts are minimised. Assessment of the impacts with the proposed mitigation measures has shown the significance of the impacts on all affected environmental aspects to be reduced from medium and low to low and negligible significance.

Land use will not change. Surrounding communities within the proposed project area may be affected although on a temporary basis due to the need to access the mining site. Measures such as safety along the roads and dust suppression will be undertaken to ensure that the impacts on the surrounding communities are minimised.

Storm water runoff from the dirty water areas of the Mining area, its associated surface infrastructure (campsite) may have a detrimental impact on the surrounding water environment should this water be released to the environment. In order to prevent the occurrence of the above-mentioned impacts, dirty water collection will be used to collect all dirty water from the site.

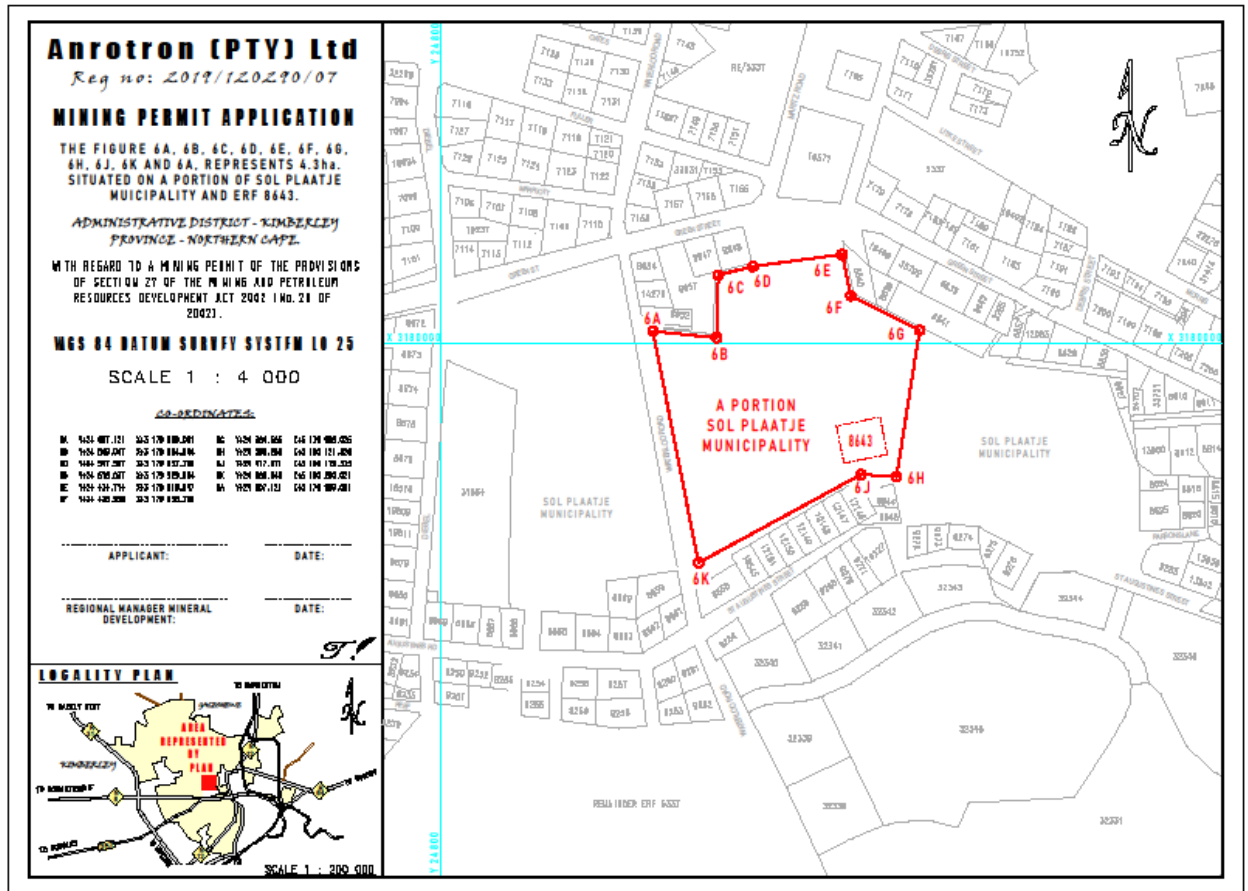
The employees will undergo training and will be given strict instruction not to undertake activities that will affect the environment and that may have an impact on the surrounding communities. Waste generated from the site will be collected in proper receptacles and disposed of in registered waste disposal sites.

Key findings of the environmental impact assessment include:

- All the identified impacts will be localised, short term and will have a medium and low significance. The significance of potential environmental impacts can be reduced to low and very low significance with implementation of mitigation measures and monitoring.
- Cumulative noise, visual and air quality (dust) impacts are deemed to not be significant (low) when proper mitigation measures are implemented.
- Vegetation loss is unavoidable during the construction phase of the project. This will however be limited to the footprint of the infrastructure (access road, camp, boreholes). Care must be taken to manage any species of special concern as well as the proliferation of alien invasive plant species.

21.2 Final Site Map

Please refer to Appendix 6 for the preliminary site map which includes the environmental sensitive areas.



21.3 Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

The proposed activities have medium to low significance and will be short term activities. The probability of occurrence of an impact was determined and most of these activities can be controlled and impacts can be reduced or avoided. The planned activities negative impacts can be controlled and avoided or minimised. Mitigation measures will be used to manage and control any potential impact. The main impacts will include:

- Increased ambient noise levels resulting from mining activities and increased traffic movement;
- Potential water and soil pollution resulting from hydrocarbon spills and soil erosion which may impact on the water resources utilised by the communities and surrounding communities;
- Potential water and soil pollution resulting from hydrocarbon spills and soil erosion which may impact on ecosystem functioning;
- Increased vehicle activity within the area resulting in potential destruction and disturbance of flora and fauna;
- Poor access control to farms may impact on cattle movement, breeding and grazing practices;
- Influx of job seekers to site may result in increased opportunistic crimes;

- Potential visual impacts by mining activities as well as vegetation clearance;
- Mining will be undertaken by special sub-contractors and it is anticipated that employment opportunities for local and/or regional communities will result from mining activities; and
- Short term boost for local businesses.

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22 Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

The objectives of the EMPr will be to:

- Provide sufficient information to strategically plan the mining activities as to avoid unnecessary social and environmental impacts;
- Provide sufficient information and guidance to plan the mining activities in a manner that will compliance; and
- Provide a management plan that is effective and practical for implementation.
- Through the implementation of the identified proposed mitigation measures, it is anticipated that the identified impacts can be managed and mitigated effectively. All the impacts were assessed to have significance ranging between medium and low without the implementation of mitigation measures. All the identified impacts will have a reduced significance of low when the mitigation measures have been implemented. Reduce impacts (social, physical and biological) as far as is practically possible;
- Ensure an approach that will provide the necessary confidence in terms of environmental

23 Aspects for inclusion as conditions of Authorisation

The following conditions should be included in the Environmental Authorisation:

- A minimum distance of 100 m from any dwellings or infrastructure must be kept;
- Surrounding communities as well as land occupiers must be re-consulted at least 30 days prior to any mining activities undertaken on their properties;
- A map detailing the mining area locations should be submitted to the relevant surrounding communities, the DWS and DMRE prior to the commencement of the mining activities;
- No activities may be undertaken within 500 m of riparian areas/wetland areas and/or within 32 m of watercourses without approval from the DWS;
- No relocation or destruction of heritage resources may be undertaken without the approval of SAHRA; and
- Mitigation measures contained in the HIA report must implemented during all project phases.

24 Description of any assumptions, uncertainties and gaps in knowledge

The following assumptions, uncertainties and gaps are applicable to this project:

- Water Use Licence not required for this application;
- No detailed site layout is currently available due to the nature of the mining activities. The impact assessment was undertaken as a holistic assessment for the overall site.

25 Reasoned opinion as to whether the proposed activity should or should not be authorised

25.1 Reasons why the activity should be authorized or not.

It is the considered opinion of the EAP that the activity may be authorised. The proposed mining area that KRD identified is located in an area where old Dumps bodies. The site is therefore regarded as the preferred site and alternatives are not considered.

The option of not approving the activities will result in a significant loss of valuable information regarding the mineral status (in terms Clay), present on the identified properties. In addition, should economical reserves be present and the applicant does not have the opportunity to mine the dumps the opportunity to utilize these reserves for future phases will be lost.

According to the impact assessment undertaken for the proposed project, the impacts of the project are considered to be of medium and low significance. The significance of the impacts can be reduced to low and very low when the mitigation measures are implemented.

The project will also have positive impacts due to the employment to be created although for a short term, as well as a short boost to local businesses.

The management of the impacts identified in the impact assessment for all phases of the proposed project will be undertaken through a range of programmes and plans contained in the EMPr. In consideration of the layout plan and the management and mitigation measures contained within the EMPr compiled for the project, which are expected to be effectively implemented, there will be significant reduction in the significance of potential impacts.

25.2 Conditions that must be included in the authorisation

See Section 23 of the BAR.

26 Period for which the Environmental Authorisation is required.

The mining permit has been applied for a period of two (2) years. The Environmental Authorisation should therefore be allowed for a period of 2.

27 Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic Assessment Report and the Environmental Management Programme report.

An undertaking by the EAP and the client is provided in Section 41 of the EMPr.

28 Financial Provision

The amount required to cover the rehabilitation is anticipated to be R 50 054.00 as shown in Table 28-1.

Table 28-1: Cost Estimate Expenditure

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CALCULATION OF THE QUANTUM

Applicant: **Lizuvax (Pty) Ltd**

DMR Ref No:

NC 10770PR

Evaluators: **Ndi Geological Consulting Service (Pty) Ltd**

Date:

2020/09/30

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	15.42	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	214.79	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	316.53	1	1	0
3	Rehabilitation of access roads	m2	0	38.44	1	1	0
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	373.05	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	203.48	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	429.57	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0	218629.41	0.52	1	0
7	Sealing of shafts adits and inclines	m3	0	115.31	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0	150124.02	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	186976.76	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	543069.13	1	1	0
9	Rehabilitation of subsided areas	ha	0	125706.26	1	1	0
10	General surface rehabilitation	ha	0.3	118923.55	1	1	35677.065

11	River diversions	ha	0	118923.55	1	1	0
12	Fencing	m	0	135.65	1	1	0
13	Water management	ha	0	45218.08	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0	15826.33	1	1	0
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
Sub Total 1							35677.065

1	Preliminary and General	4281.2478	weighting factor 2	4281.2478
			1	
2	Contingencies	3567.7065		3567.7065
Subtotal 2				43526.02

VAT (15%)	6528.90
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Grand Total	50055
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28.1 Explain how the aforesaid amount was derived.

The financial provision for the environmental rehabilitation and closure of any mine/mining and its associated operations forms an integral part of the MPRDA. Sections 41 (1) and, 41 (2), 41 (3) and 45 of the MPRDA deal with the financial provision for rehabilitation and closure. During 2012, the DMRE made updated rate available for the calculation of the closure costs, where contractor's costs are not available, these apply.

The "Guideline Document for the Evaluation of Financial Provision made by the Mining Industry" was developed by the DMRE in January 2005 in order to empower the personnel at Regional DMRE offices to review the quantum determination for the rehabilitation and closure of mining sites.

With the determination of the quantum for closure, it must be assumed that the infrastructure had no salvage value (clean closure). The closure cost estimate (clean closure) was determined in accordance with the DMRE guidelines.

28.2 Confirm that this amount can be provided from operating expenditure.

The amount required to cover the rehabilitation is anticipated to be R 50 054.00. LIZUVAX (Pty) Ltd will fund the operation.

29 Specific Information required by the competent Authority

29.1 Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the:

29.1.1 Impact on the socio-economic conditions of any directly affected person.

No specific report was generated for the purposes of the socio-economic conditions. Current land uses inside the mining area, such as mining, farming and grazing, may be temporarily impacted through the presence of the fenced areas where mining activities occurred. These areas will be rehabilitated post mining activities and the areas will once again become available for grazing purpose. Other potential socio-economic impacts will include:

- Nuisance noise due to on site mining activities;
- Poor access control resulting in impacts on cattle movement, breeding and grazing practises;
- Influx of jobseekers to site, which may result in an increase in opportunistic crime;
- Uncontrolled access to private property outside of the demarcated boundaries; and
- Visual impact as a result of the vegetation clearance.

Mining will be undertaken by specialist sub-contractors and it is anticipated that employment opportunities for local and/or regional communities will yield positive result from the mining activities.

Management and mitigation measures must be implemented to prevent environmental pollution which may impact on environmental resources utilised by communities, surrounding communities and other

stakeholders. Measures to manage the potential impacts on communities, individuals or competing land uses in close proximity include;

Noise due to haling and loading:

- Directly affected and adjacent surrounding communities and land occupiers must be informed of the planned dates of the mining activities and a grievance lodging mechanism must be made available to the stakeholders.

Poor access control resulting in impacts on cattle movement, breeding and grazing practices:

- Access control procedures must be agreed on with the farm owners and all on site personnel shall be trained on these procedures.

Influx of job seekers to the site which may result in increased opportunistic crime:

- Casual labour shall not be recruited at the site. This will eliminate the incentive for people to travel to site seeking employment. Where necessary, a recruitment centre may be established in the major town areas;
- The surrounding communities shall be notified on unauthorised persons encountered on site; and
- Where necessary, the South African Police Service (SAPS) will be notified of unauthorised persons encountered on site.

Visual Impact:

- Wet dust suppression will be undertaken to manage nuisance dust from construction vehicle movements and other construction activities as and when necessary;
- The portable ablution facilities and any other infrastructure will be acquired with a consideration for colour. Natural earth, green and mat black options which blend with the surrounding must be favoured;
- A waste management system will be implemented, and sufficient waste bins will be provided for on site. A fine system must be implemented to further prohibit littering and poor housekeeping practices; and

29.2 Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.

As outlined in Section 5 of this report, mining will be undertaken through Hauling and loading of debris.

In summary, the proposed mining is not expected to have a negative impact on the heritage resources of the area. Archaeologists should be granted access to the mining operation at any time to inspect sections and exposed areas at the base of the Hutton Sands.

29.3 Other matters required in terms of sections 24(4)(a) and (b) of the Act.

The rest of the farm is covered by Dumps. The site is also regarded as the preferred site and alternatives are not considered at this stage.

All infrastructure will be temporary and/or mobile no permanent structure will be erected on site.

In addition, the proposed technologies have been chosen based on long term proven success in mining industries.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

30 Final environmental management programme

30.1 Details of the EAP

Details of the EAP are included in Part A Section 3

30.2 Description of the Aspects of the Activity

The EAP hereby confirms that the requirement to describe the aspects of the activity that are covered by the draft Environmental Management Programme is already included in Part A, Section 11 of this report as required.

30.3 Composite Map

Please refer to Appendix 7 for the composite map. No specific heritage sites have been identified and therefore have not been included in the preliminary composite map.

31 Description of Impact management objectives including management statements

31.1 Determination of closure objectives.

The rehabilitation plan was developed on the basis that the rehabilitated areas will be made safe, stable, non-polluting and will be able to support self-sustaining ecosystems, similar to surrounding natural ecosystems.

To ensure that the rehabilitation plan is aligned with the closure objective, high-level risk assessment of the mining components was undertaken to establish the potential risks associated with therewith.

The closure objectives are to:

- Remove and/or rehabilitate all pollution and pollution sources such as waste materials and spills;
- To establish rehabilitated areas to a state which with no susceptible to soil erosion which may result in loss of soil, pollution of water resources;
- Restore disturbed areas and re-vegetate these areas with plant species naturally occurring in the area to restore the ecological function of the affected areas as far as practicable; and
- Eliminate all alien invasive plant species from the disturbed areas.

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32 Volumes and rate of water use required for the operation.

The rates and volumes of water to be used are not available at this stage and water will be purchased from Sol Plaatje when mining activities commences.

33 Has a water use licence has been applied for?

At this stage it is not anticipated that abstraction of water will be required. Drinking water and water for dust suppression will be delivered to site from municipality.

34 Impacts to be mitigated in their respective phases

Table 34-1: Environmental Management Programme for the proposed LIZUVAX (Pty) Ltd (KRD Kimberly rehabilitation development) Mining project

NAME OF ACTIVITY		PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Data Collection and Assessment	Desktop Study	Planning	N/A	N/A	Control potential deviations from the approved EMPr through the effective implementation of the data acquisition and desktop study.	Throughout the planning phase
Geological Mapping			N/A	N/A		
Planning for mining			N/A	N/A		
Access Roads	Establishment of access roads, campsite, physical surveying	Construction	100 m ²	<u>Loss of soils, erosion of the soils and impacts on landowner's livelihood:</u> No soil stripping will be allowed during site establishment;	Implementation of mitigation measures will ensure that the activities in the development of the mining sites and associated infrastructure do not have detrimental impacts on the soils, land use and land capability.	During the construction phase
Temporary Soil Storage Area			0.001ha	Should it be necessary to conduct geophysical surveys and geological mapping, ensure minimal disturbance of soil; Any activity that may result into the disturbance of the soils must be rehabilitated immediately on discovery;		
Fence				Machinery to be used for the operation will be of good working conditions; Any hydrocarbon spill from the site establishment will be remediated as soon as possible;		
Hydrocarbon storage area			Less than 30 m ³	Use sites that are unused and that are in the degraded state for the proposed development. This must be done in agreement with the landowner. The siting of the boreholes must be conducted such that rocky ridges, sensitive grass lands, indigenous trees and shrubs, sites of geological importance and farmlands actively used for crop farming are avoided;		
Mobile office			0.0025 ha	Contaminated soil shall be removed and disposed of to an appropriate licensed landfill site in terms of NEMWA, or can be removed by a service provider that is qualified to clean the soil;		
Ablution Facility			0.0025 ha	The time in which soils are exposed during construction activities should remain as short as possible; Erosion control measures shall be implemented where deemed necessary; In general, all steep slopes steeper than 1:3 or where the soils are more prone to erosion must be stabilised; The time in which soils are exposed during construction activities; If stockpiles are not going to be used immediately the stockpiles shall be rehabilitated to prevent erosion and resulting in the increase in turbidity; Runoff from stockpiles shall be detained in order to support growth of vegetation; Runoff from the stockpiles shall be suitably managed to ensure that the runoff volumes and velocities are similar to pre disturbed levels; Vegetation shall be used to promote infiltration of water into the stockpile instead of increasing runoff; A monitoring programme will be implemented if the stockpiles are not used within the first year whereby the vegetation of the stockpiles is monitored in terms of basal cover and		

<p>Hauling,Loading</p>			<p>species diversity; If it is noticed that the vegetation on the stockpiles is not sustainable, appropriate corrective actions shall be taken to rectify the situation; Stockpiles shall be maintained until the topsoil is required for rehabilitation purposes; <u>Loss of natural vegetation in the affected areas:</u> Use sites with most disturbed vegetation cover for the development; No strip of topsoil and vegetation will be allowed during site establishment; Ensure minimal disturbance of vegetation when conducting geophysical surveys and geological mapping; Use existing track and roads in all instances as far as is practicable; As part of the Hauling and loading, no tracks will be cleared for once-off access to sampling sites; Avoid significant vegetation such as trees and large shrubs in the event that driving through the veld is required to access an identified sampling site; Any area that may result into the disturbance of the vegetation cover must be rehabilitated immediately on discovery; The Contractor shall be on the lookout for SCC and any floral SCC encountered within the development footprint, are to be relocated to areas with suitable habitat outside the disturbance footprint; Floral species of conservation concern, if encountered within the development footprint, are to be handled with care and the relocation of sensitive plant species to suitable similar habitat is to be overseen by a botanist; The proposed development footprint shall be kept to the minimum; All disturbed areas must be concurrently rehabilitated during construction; Prohibit the collection of any plant material for firewood or medicinal purposes; The existing integrity of flora surrounding the study area shall be upheld and no activities shall be carried out outside the footprint of the construction areas; Edge effect control shall be implemented to avoid further habitat degradation outside of the proposed footprint area; All sensitive open space areas will be demarcated and access into these areas shall be prohibited; Protected floral species occurring within the vicinity of the study area, but outside the disturbance footprint shall be fenced for the duration of the construction activities;</p>	<p>The implementation of mitigation measures will ensure that the establishment of the mining site and associated infrastructure/equipment do not have detrimental impact on the area's flora, in particular indigenous species and species that are of conservation importance.</p>	
			<p>Construction vehicles shall only be allowed on designated roadways to limit the ecological footprint of the project; Implementation of an Alien Invasive Plant Species Management plan; Edge effects of activities including erosion and alien/ weed control will be strictly managed in the affected areas; All sites disturbed by construction activities shall be monitored for colonisation by exotic or invasive plants; Exotic or invasive plants shall be controlled as they emerge; An alien vegetation control program must be developed and implemented within all disturbed areas; <u>Migration of animal life due to disturbance caused proposed project:</u> The proposed development footprint areas shall remain as small as possible and where possible be confined to already disturbed areas; Vehicle speed will be reduced, particularly in highly vegetated areas to avoid deaths by vehicle impacts; No trapping or hunting of fauna is shall be permitted; Edge effects of all construction and operational activities, such as erosion and alien plant species proliferation, which may affect faunal habitat, need to be strictly managed; Should any faunal SCC be encountered within the study area, these species will be relocated to similar habitat within or in the vicinity of the study area with the assistance of a suitably qualified specialist; No informal fires in the vicinity of construction areas shall be permitted; An alien vegetation control plan must be developed and implemented in order to manage alien plant species occurring within the study area, and to prevent further faunal habitat loss;</p>	<p>Mitigation measures will ensure that the animal life within in the project is not affected by the proposed project.</p>	

			<p>Poaching will be prohibited at the mining site;</p> <p><u>Deterioration of water quality in in the nearby streams and within the groundwater regime:</u></p> <p>No construction activities shall be permitted within 100 meters of water courses and/or drainage lines and within 500 m of riparian zones without consent from the DWS;</p> <p>Avoid stripping of areas within the construction sites;</p> <p>Rehabilitate areas that may have been mistakenly stripped;</p> <p>Proper waste management facilities will be put in place at the campsite and excavated area. Any hydrocarbon spill from the site establishment will be remediated as soon as possible;</p> <p>No washing of vehicles shall be allowed outside demarcated areas. Washing bays for vehicles and other equipment shall be provided with appropriate soakaways, will be clearly demarcated and will not be allowed to contaminate any surface runoff;</p> <p>Sufficient areas shall be provided for the maintenance and washing of vehicles;</p> <p>Refuelling of vehicles will only be allowed in designated areas;</p> <p>All construction equipment shall be parked in a demarcated area Drip trays shall be used when equipment is used for some time;</p> <p>On surface bulk storage of hydrocarbons must be situated in a dedicated area which will include a bund or a drain where necessary to contain any spillages during the use, loading and off-loading of the material;</p> <p>Bunded areas shall contain 110% of the stored volume;</p> <p>Bund areas must be impermeable;</p> <p>Bund area must have a facility such as a valve/sump to drain or remove clean stormwater,</p> <p>Contaminated water shall be pumped into a container for removal by an approved service provider;</p> <p>Regular inspections shall be carried out to ensure the integrity of the bundwalls;</p> <p>All preventative servicing of earth moving equipment and construction vehicles shall conducted off site;</p> <p>Runoff from this area shall be contained;</p> <p>Spill kits shall be made available and all personnel shall be trained and training records shall be made available on request;</p> <p>Ensure that topsoil is properly stored, away from the streams and drainage areas;</p> <p>Vehicle and personnel movement within watercourses and riparian areas shall be strictly prohibited;</p> <p>Adequate stormwater management must be incorporated into the design of the project in order to prevent contamination of water courses from dirty water;</p> <p><u>Water abstraction:</u></p> <p>Any abstraction of water for construction purposes must be approved by DWS'</p> <p><u>Riparian and Aquatic Ecosystem Ecology destruction and loss of habitat:</u></p> <p>Construction activities will be limited to be more than 500 m from the edge of the riparian areas without consent from the DWS;</p> <p>Adequate stormwater management must be incorporated into the design of the project in order to prevent erosion and the associated sedimentation of the aquatic system;</p> <p>No vehicles may be allowed to indiscriminately drive through the riparian areas or within the active stream channels;</p> <p>All disturbed areas shall be re-vegetated with indigenous species;</p> <p>All construction materials shall be kept out of the riparian areas;</p> <p>All vehicles shall be regularly inspected for leaks. Re-fuelling must take place outside the project area, on a sealed surface area to prevent ingress of hydrocarbons into topsoil and aquatic ecosystem;</p> <p><u>Air pollution through air pollutants' emissions, from the construction site:</u></p> <p>Wet suppression using will be conducted at areas with excessive dust emissions;</p>	<p>Implementation of the mitigation measures will ensure that the quality of streams and groundwater within the site will comply with the target DWS target water quality objective and construction will be in Compliance with the regulations under the GN704.</p> <p>Water abstraction will not be permitted unless authorisation is granted by DWS. Obtain all necessary authorisations in terms of Section 21 of the National Water Act (No.36 of 1998).</p> <p>Implementation of mitigation measures will assist with maintaining the current state of the sensitive landscapes within the project area and will enable the project to comply with the requirements of the NWA</p>	
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			<p>on the residents;</p> <p>Where possible, rehabilitation of the work areas shall be undertaken in tandem with construction to ensure that areas stripped of vegetation are kept to a minimum;</p> <p><u>Damage or destruction of sites with archaeological and cultural significance:</u></p> <p>Prior to the site establishment, a heritage impact assessment must be undertaken and mitigation and /or management measures for the protection of such resources must be implemented</p> <p>If archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made;</p> <p>The establishment of the sites will be away from any identified grave site or heritage sites. A buffer of 50 m will be created between the sites and the proposed mining area;</p> <p><u>Impact from the influx of job seekers and employment of farm labourers:</u></p> <p>Recruitment will not be undertaken on site;</p> <p>Recruitment process shall favour locals, but farm labourers will not be employed unless agreed to with the farm owners;</p> <p>Where required, liaise with the SAPD to ensure safety of surrounding communities in the areas;</p> <p><u>Waste Management:</u></p> <p><i>Separation of waste</i></p> <p>All waste shall be separated into general waste and hazardous waste;</p> <p>Hazardous waste shall not be mixed with general waste and in doing so increase the quantities of hazardous waste to be managed;</p> <p>General waste can further be separated in waste that can be recycled and or reused;</p> <p>No littering shall be allowed in and around the site, a sufficient number of bins shall be provided for the disposal of waste;</p> <p>Where necessary dedicate a storage area on site for collection of construction waste.</p> <p><i>Storage of waste:</i></p> <p>No stockpiling of material shall be permitted within 100 m of water courses and/or drainage lines, or within 500 m of riparian areas;</p> <p>General waste will be collected in an adequate number of litter bins located throughout the construction site Bins shall be located no more than 50 m from construction sites;</p> <p>Bins must have lids in order to keep rainwater out;</p> <p>Bins shall be emptied regularly to prevent the bins from overflowing;</p> <p>All work areas shall be kept clean and tidy at all times;</p> <p>All waste management facilities will be maintained in good working order;</p> <p>Waste shall be stored in demarcated areas according to type of waste;</p> <p>Runoff from any area demarcated for waste will be contained, treated and reused;</p> <p>Flammable substances must be kept away from sources of ignition and from oxidizing agents;</p> <p>Waste shall not be buried or burned on site; and</p> <p>The maximum retention time for temporary storage of waste generated shall not exceed 30 days, provided the waste does not present a health hazard or risk of odour;</p> <p><i>Disposal of hazardous waste:</i></p> <p>No dumping shall be allowed in or near the construction site;</p> <p>Hazardous containers shall be disposed of at an appropriate licensed site;</p> <p>Hazardous waste will be removed and managed by an approved service provider;</p> <p>A safe disposal certificate will be provided by the approved service provider as proof of responsible disposal of hazardous waste; and</p> <p>The safe disposal certificate shall be stored and provided on request;</p> <p><i>Disposal of general waste:</i></p> <p>No dumping shall take place in or near the construction site;</p> <p>All general waste shall be disposed of to the nearest licensed landfill site;</p> <p>The necessary permissions must be obtained to dispose of waste to a registered landfill site;</p>	<p>from the site are complying with the relevant visual standards and objectives and ensure that all operations during the construction phase do not result in detrimental visual impacts on surrounding properties, communities and road users.</p> <p>The construction will be undertaken in compliance with the requirements of the National Heritage Resources Act, 1999 (Act 25 of 1999) and recommendations from the specialist. The mitigation measures will ensure that the construction activities does not have detrimental impacts on the heritage sites</p> <p>The identified mitigation measures will result in minimal influx of job seekers to the site</p> <p>The mitigation measures will result in reduced the amounts of waste produced, will encourage re-use of material where possible and recycling of the material where possible. Disposal will be utilised as the last resort. The mitigation measures will also ensure that the management of waste will be in accordance with the National Environmental Management: Waste Act, 2008 (Act 51 of 2008)</p>	
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Data Analysis	Feasibility Studies		N/A	N/A	N/A	N/A
Feasibility Studies Report			N/A	N/A	N/A	N/A
Removal of equipment and infrastructure						

35 Impact Management Outcomes

Table 35-1: Impact Management

NAME OF ACTIVITY		POTENTIAL IMPACT (Including the potential impacts for cumulative impacts)	ASPECTS AFFECTED	PHASE In which impact is anticipated	MITIGATION TYPE	Standard to be achieved
Data Collection and Assessment	Desktop Study	None	N/A	Planning	Control potential deviations from the approved EMPr through the effective implementation of the data acquisition and desktop study.	Remain within the ambits of the EMPr and Environmental Authorisation.
Geological Mapping		None	N/A	Planning	Control potential deviations from the approved EMPr through the effective implementation of the data acquisition and desktop study.	Remain within the ambits of the EMPr and Environmental Authorisation.
Planning for mining		None	N/A	Planning	Control potential deviations from the approved EMPr through the effective implementation of the data acquisition and desktop study.	Remain within the ambits of the EMPr and Environmental Authorisation.
Access Roads	Establishment of access roads, campsite, physical surveying of the site and pegging of dumps	Loss of soils, erosion of the soils and impacts on surrounding communities' livelihood.	Soils, Land capability and Land use	Construction	Rehabilitation of areas cleared of vegetation and dust control	Retain topsoil integrity for the reuse in rehabilitation Vegetation clearance shall be kept to a minimum. No clearance of vegetation outside demarcated areas
Temporary Soil Storage Area		Contamination of surface water due to erosion of soils which will lead to increased turbidity as well as contamination from hydrocarbon spillages	Surface water	Construction	Monitoring through rehabilitation and management of spoil sites	Retain topsoil integrity for the reuse in rehabilitation Comply with the requirements of the NWA: no construction activities within 100 m of water courses and 500m of riparian zones without consent from the DWS.
Fence		Riparian area contamination, destruction and loss of habitat	Aquatic ecosystems	Construction	Control of access to riparian areas and within the regulated 500 m buffer.	National Water Act, 1998 (Act 36 of 1998) No construction activities may be conducted within 500 m of riparian zones without approval from the DWS.
Hydrocarbon storage area		Destruction of graves and cultural heritage sites	Heritage and archaeological resources	Construction	Control through clear demarcation of mining areas to ensure avoidance of graves and other heritage sites	No destruction/loss of heritage resources
Mobile office		Destruction of fossils	Palaeontological resources	Construction	Management of mining site. Should any fossils be discovered, operations must cease and SAHRA must be notified	No destruction/loss of fossils
Ablution Facility		Loss of natural vegetation in the affected areas	Flora	Construction	Rehabilitation of areas cleared of vegetation. Control of alien invasive plant species	Comply with existing legislation National Environmental Management: Biodiversity Act 2004 (Act No 10 of 2004) and Alien and Invasive Species Regulations, 2014. No vegetation clearance outside of demarcated areas
		Migration of fauna due to disturbance caused by the proposed project	Fauna	Construction	Relocation of affected species of conservation importance	Remain within the designated area demarcated for mining activities. Ensure minimal clearance of vegetation
		Air pollution through nuisance dust, PM 10 and PM2.5 as well as emissions from construction vehicles and machinery.	Air Quality	Construction	Dust control measures	Comply with the requirements of the National Environmental Management: Air Quality Act, 2004: Dust Regulation guidelines for rural communities. Comply with the requirements of the Minimum Emission Standards
	Increase in ambient noise due to movement of construction vehicles and machinery	Noise	Construction	Management and maintenance of construction vehicles. Management through the use of noise dissipating technologies eg noise mufflers Control through the limiting of the activities to the	Remain within the Noise Regulation Standards for Rural Areas.	

NAME OF ACTIVITY		POTENTIAL IMPACT (Including the potential impacts for cumulative impacts)	ASPECTS AFFECTED	PHASE In which impact is anticipated	MITIGATION TYPE	Standard to be achieved
					day time and the implementation of an open and transparent channel of communication	
		Visual impacts as a result of vegetation clearance	Visual	Construction	Rehabilitation of areas cleared of vegetation	Vegetation clearance must be limited to demarcated areas only
		Increased traffic on the roads due to additional construction vehicles	Traffic, Socio-economic	Construction	Speed control and limitation of the times when construction vehicles may be on the roads	Minimise the number of vehicles used during construction Movement of construction vehicles shall be limited to outside of busy hours
		Impact of carbon dioxide (GHG) produced by construction vehicles on the local climate	Climate Change	Construction	Control and keep to a minimal the number of vehicles used for construction. Vehicles must be maintained to ensure efficient use of fuel.	Comply with the EMPr Minimise the number of vehicles used during construction Regular maintenance of vehicles and machinery to improve fuel efficiency Comply with requirements of the National Environmental Management: Air Quality Act, 2004
Hauling and loading of debris	Mining activities	The use of vehicles during rehabilitation of period may result in the spillages of hydrocarbons from vehicles and machinery. This will result in the contamination of soils and groundwater.	Groundwater	Operation	Rehabilitation of affected areas and control using bunds	No soil contamination as a result of hydrocarbon spillages Rehabilitation and disposal of contaminated soils conducted in terms of the NEM:WA
		Hauling and loading of debris may result in the generation of surface water runoff should spillage occur. The sedimentation and possible contamination with carbonaceous material will have negative impacts on the water quality due to increase turbidity and an increase in acidity of the water in the streams. This will have an impact on aquatic habitats.	Surface Water	Operation	Control through management and monitoring of surface runoff	Retain topsoil integrity for the reuse in rehabilitation. No dirty runoff/stormwater entering water courses. The NWA: No activities within 100 m of watercourses and drainage without consent from the DWS. No soil contamination as a result of hydrocarbon spillages Rehabilitation and disposal of contaminated soils conducted in terms of the NEM:WA
		Uncontrolled movement within riparian zones may have an impact on the aquatic ecological habitat, ecological functioning and structure.	Aquatic Ecosystems	Operation	Avoidance of riparian areas	NWA: No activities shall be permitted within 500 m of riparian areas without prior approval from the DWS Comply with requirements of the NWA
		The project may result in the following impacts on the floral environment during the operation phase: Destruction of potential floral habitats as a result of continual disturbance of soil, leading to altered floral habitats, erosion and sedimentation; Impact on floral diversity as a result of possible uncontrolled fires; Potential spreading of alien invasive species as a result of floral disturbance; and Failure to initiate a rehabilitation plan and alien control plan during the construction phase may lead to further impacts during the operation phase	Flora	Operation	Rehabilitation of affected areas Monitoring of rehabilitated areas to ensure success.	No invasive plant species in rehabilitated areas No removal of vegetation outside of demarcated areas. Ensure successful rehabilitation and/or removal of contaminated soils
		The project may result in the following impacts on the faunal environment during the operation phase:	Fauna	Operation	Rehabilitation of affected areas	No removal of vegetation outside of demarcated areas.

NAME OF ACTIVITY	POTENTIAL IMPACT (Including the potential impacts for cumulative impacts)	ASPECTS AFFECTED	PHASE In which impact is anticipated	MITIGATION TYPE	Standard to be achieved
	<p>Migration of fauna from the mining area due to noise as a resulting of Mining activities;</p> <p>Loss of faunal due to collisions with vehicles and machinery;</p> <p>Loss of faunal diversity and ecological integrity as a result of poaching and faunal species trapping;</p> <p>Failure to initiate a rehabilitation plan and alien control plan during the construction phase may lead to further impacts during the operation phase.</p>				
	<p>The use of vehicles during rehabilitation of period may result in the spillages of hydrocarbons from the vehicles and machinery. This will result in the contamination of soils. The materials removed from the mine will contain carbonaceous material, which has potential for contamination should it not be managed properly.</p>	Soils Land use and Land Capability	Operation	Rehabilitation of affected areas	Retain topsoil integrity for the reuse in rehabilitation.
	<p>The movement of vehicles and earthmoving machinery will likely result in an increase in nuisance dust, PM10 and PM2.5.</p> <p>There is also potential for increase in carbon emissions and ambient air pollution due to the movement of vehicles and construction machinery.</p>	Air Quality	Operation	Dust control measures	Remain within the National Environmental Management: Air Quality Act, 2004: Dust Regulation guidelines for rural as well as Minimum Air Emissions Standards
	<p>The Hauling and loading of debris may result in the destruction of graves and other heritage resources.</p>	Heritage Resources	Operation	Control through clear demarcation of mining areas to ensure avoidance of graves and other heritage sites	No destruction/loss of heritage resources Comply with requirements of the SAHRA
	<p>Earth moving activities may result in the destruction of fossils (if any).</p>	Palaeontological Resources	Operation	Management of mine site. Should any fossils be discovered, operations must cease and SAHRA must be notified	No destruction/loss of fossils Comply with requirements of the SAHRA
	<p>The use of vehicles and machinery may result in an increase in noise in the immediate vicinity of the project.</p>	Noise	Operation	Management and maintenance of construction vehicles. Management through the use of noise dissipating technologies e.g. noise mufflers	Remain within the Noise Regulation Standards for Rural Areas. National Noise Control Regulations, SANS10103:2008 guidelines.
	<p>The movement of vehicles in the project area will result in an increase in traffic on the roads.</p>	Traffic	Operation	Speed control and limitation of the times when construction vehicles may be on the roads	Minimise the number of vehicles on the roads and movement of vehicles shall be kept to outside busy times
	<p>The movement of vehicles and machinery may result in the production of carbon dioxide (Green House Gas), which may have an impact on the climate in the area.</p>	Climate	Operation	Control and keep to a minimal the number of vehicles used for operations. Vehicles must be maintained to ensure efficient use of fuel.	Remain within the National Environmental Management: Air Quality Act, 2004: Dust Regulation guidelines for rural as well as Minimum Air Emissions Standards Minimise the number of vehicles
	<p>Positive impacts will result due to the reduction in areas of disturbance and the return of land use of the affected areas and making available an area that was covered by the dumps.</p>	Land Use	Decommissioning and Closure	N/A	No removal of vegetation outside of demarcated areas. Ensure successful rehabilitation of contaminated soils. Rehabilitation of land to a state it was before mining activities.
	<p>The use of vehicles/machinery during the rehabilitation may result compaction of soils and in the spillages of hydrocarbon liquids from the vehicles and machinery. This will result in the contamination and destruction of the vegetation cover and soils.</p>	Soils and Vegetation	Decommissioning and Closure	Control and prohibit access of vehicles and machinery to areas outside of established access tracks Control through the clear delineation of the mining area. Control through the implementation of	Vehicle movement shall be limited to areas demarcated as access tracks Comply with the requirements of the EMP

NAME OF ACTIVITY		POTENTIAL IMPACT (Including the potential impacts for cumulative impacts)	ASPECTS AFFECTED	PHASE In which impact is anticipated	MITIGATION TYPE	Standard to be achieved
					environmental induction and toolbox talks, as well as the implementation of a fine system. Control through the implementation of a soil management programme in terms of the correct tops oil removal, stockpiling and rehabilitation practices as discussed in the EMPr.	
		During the decommissioning and closure phases equipment will be removed, G5 material will be used for rehabilitation, top soiled and the area re-seeded. During the process of rehabilitation surface water runoff from the rehabilitation site may have elevated silt load, which may cause pollution of the nearby water environment.	Surface Water	Decommissioning and Closure	Control through the clear delineation of the mining area. Control through the implementation of environmental induction and toolbox talks, as well as the implementation of a fine system. Control through the implementation of the NWA GN 704 water management principles.	Maintain the water quality of water course in the project area Ensure that dirty stormwater and runoff is diverted from the water courses and riparian areas Comply with the requirements of GN704
Removal of equipment and infrastructure	Closure and Rehabilitation of pits/trenches and infrastructure sites	Rehabilitation and removal of the mining sites and equipment will require vehicular movement. This will result in the generation of dust by movement of vehicles and due to blowing winds. Vehicles and machinery will also generate diesel or petrol fumes. Generated dust will migrate towards the predominant wind direction and may settle on surrounding properties including nearby vegetation.	Air Quality	Decommissioning and Closure	Dust control measures and rehabilitation of areas stripped of vegetation	Comply with the requirements of the National Environmental Management Air Quality Act, 2004 Dust Regulation guidelines for rural communities.
		Noise will be generated during the removal of equipment and rehabilitation of the sites. This noise is not expected to exceed occupational noise limits and will be short lived.	Noise	Decommissioning and Closure	Management and maintenance of construction vehicles. Management through the use of noise dissipating technologies e.g. noise mufflers	Comply with the Noise Regulation Standards for Rural Areas.

36 Impact Management Actions

Table 36-1: Impact management actions

NAME OF ACTIVITY		POTENTIAL IMPACT (Including the potential impacts for cumulative impacts)	MITIGATION TYPE	Time Period for Implementation	Compliance with standards
Data Collection and Assessment	Desktop Study	None	Control potential deviations from the approved Mining Works Programme through the effective implementation of the data acquisition and desktop study.	Planning	Remain within the ambits of the EMPr and Environmental Authorisation.
Geological Mapping		None	Control potential deviations from the approved Mining Works Programme through the effective implementation of the data acquisition and desktop study.	Planning	Remain within the ambits of the EMPr and Environmental Authorisation.
Planning for Mining		None	Control potential deviations from the approved Mining Works Programme through the effective implementation of the data acquisition and desktop study.	Planning	Remain within the ambits of the EMPr and Environmental Authorisation.
Access Roads	Establishment of access roads, campsite, physical surveying of the site and pegging of Mining	Loss of soils, erosion of the soils and impacts on surrounding communities' livelihood.	Rehabilitation of areas cleared of vegetation and dust control	Construction	Retain topsoil integrity for the reuse in rehabilitation Vegetation clearance shall be kept to a minimum. No clearance of vegetation outside demarcated areas
Mining activities		Contamination of groundwater from hydrocarbon spillages	Control through management and monitoring of spillages. Where spillages occur, the soil must be stripped and disposed of as stipulated in the EMPr.	Construction	Comply with the EMPr. Retain topsoil integrity for the reuse in rehabilitation. Where required, disposal of contaminated soils shall be undertaken in terms of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEM: WA)
Temporary Soil Storage Area		Contamination of surface water due to erosion of soils which will lead to increased turbidity as well as contamination from hydrocarbon spillages	Monitoring through rehabilitation and management of spoil sites	Construction	Retain topsoil integrity for the reuse in rehabilitation Comply with the requirements of the NWA: no construction activities within 100 m of water courses and 500m of riparian zones without consent from the DWS.
Fence		Riparian Zone contamination, destruction and loss of habitat	Control of access to riparian areas and within the regulated 500 m buffer.	Construction	National Water Act, 1998 (Act 36 of 1998) No construction activities may be conducted within 500 m of riparian zones without approval from the DWS.
Hydrocarbon storage area		Destruction of graves and cultural heritage sites	Control through clear demarcation of mining areas to ensure avoidance of graves and other heritage sites	Construction	No destruction/loss of heritage resources
Mobile office		Destruction of fossils	Management of Mining site. Should any fossils be discovered, operations must cease and SAHRA must be notified	Construction	No destruction/loss of fossils
Ablution Facility		Loss of natural vegetation in the affected areas	Rehabilitation of areas cleared of vegetation. Control of alien invasive plant species	Construction	Comply with existing legislation National Environmental Management: Biodiversity Act 2004 (Act No 10 of 2004) and Alien and Invasive Species Regulations, 2014. No vegetation clearance outside of demarcated areas
		Migration of fauna due to disturbance caused by the proposed project	Relocation of affected species of conservation importance	Construction	Remain within the designated area demarcated for mining activities. Ensure minimal clearance of vegetation
		Air pollution through nuisance dust, PM 10 and PM 2.5 as well as emissions from construction vehicles and machinery.	Dust control measures	Construction	Comply with the requirements of the National Environmental Management: Air Quality Act, 2004: Dust Regulation guidelines for rural communities. Comply with the requirements of the Minimum Emission Standards

NAME OF ACTIVITY	POTENTIAL IMPACT (Including the potential impacts for cumulative impacts)	MITIGATION TYPE	Time Period for Implementation	Compliance with standards
	Increase in ambient noise due to movement of construction vehicles and machinery	Management and maintenance of construction vehicles. Management through the use of noise dissipating technologies eg noise mufflers Control through the limiting of the activities to the day time and the implementation of an open and transparent channel of communication	Construction	Remain within the Noise Regulation Standards for Rural Areas.
	Visual impacts as a result of vegetation clearance	Rehabilitation of areas cleared of vegetation	Construction	Vegetation clearance must be limited to demarcated areas only
	Increased traffic on the roads due to additional construction vehicles	Speed control and limitation of the times when construction vehicles may be on the roads	Construction	Minimise the number of vehicles used during construction Movement of construction vehicles shall be limited to outside of busy hours
	Impact of carbon dioxide (GHG) produced by construction vehicles on the local climate	Control and keep to a minimal the number of vehicles used for construction. Vehicles must be maintained to ensure efficient use of fuel.	Construction	Comply with the EMPr Minimise the number of vehicles used during construction Regular maintenance of vehicles and machinery to improve fuel efficiency Comply with requirements of the National Environmental Management: Air Quality Act, 2004
Hauling and loading	The project may result in the following impacts on the floral environment during the operation phase: Destruction of potential floral habitats as a result of continual disturbance of soil, leading to altered floral habitats, erosion and sedimentation; Impact on floral diversity as a result of possible uncontrolled fires; Potential spreading of alien invasive species as a result of floral disturbance; and Failure to initiate a rehabilitation plan and alien control plan during the construction phase may lead to further impacts during the operation phase	Rehabilitation of affected areas Monitoring of rehabilitated areas to ensure success.	Operation	No invasive plant species in rehabilitated areas No removal of vegetation outside of demarcated areas. Ensure successful rehabilitation and/or removal of contaminated soils
	The project may result in the following impacts on the faunal environment during the operation phase: Migration of fauna from the mining area due to noise as a result of hauling and loading activities; Loss of faunal due to collisions with vehicles and machinery; Loss of faunal diversity and ecological integrity as a result of poaching and faunal species trapping; Failure to initiate a rehabilitation plan and alien control plan during the construction phase may lead to further impacts during the operation phase.	Rehabilitation of affected areas	Operation	Retain topsoil integrity for the reuse in rehabilitation.
	The use of vehicles during rehabilitation of Mining period may result in the spillages of hydrocarbons from the vehicles and machinery. This will result in the contamination of soils. The materials removed from the Mining will contain carbonaceous material, which has potential for contamination should it not be managed properly. The material from the excavated area may result in the contamination of soils, which may render the land not usable after backfilling operation.	Dust control measures	Operation	Remain within the National Environmental Management: Air Quality Act, 2004: Dust Regulation guidelines for rural as well as Minimum Air Emissions Standards

NAME OF ACTIVITY		POTENTIAL IMPACT (Including the potential impacts for cumulative impacts)	MITIGATION TYPE	Time Period for Implementation	Compliance with standards
		The movement of vehicles and earthmoving machinery will likely result in an increase in nuisance dust, PM10 and PM2.5. There is also potential for increase in carbon emissions and ambient air pollution due to the movement of vehicles and construction machinery.	Strategic location of rigs and towers to areas where there may be some tree cover, as far as practicable	Operation	No removal of vegetation outside de of demarcated area to ensure as much vegetation cover for the rigs, as possible Make use of rigs that have earthy cover to minimise the visual impact
		The equipment used during the Mining operation phase will be visible from nearby locations and will have visual impact on the local communities in close proximity to the mining area.	Control through clear demarcation of mining areas to ensure avoidance of graves and other heritage sites	Operation	No destruction/loss of heritage resources Comply with requirements of the SAHRA
		The Hauling and loading of debris may result in the destruction of graves and other heritage resources.	Management of Mining site. Should any fossils be discovered, operations must cease and SAHRA must be notified	Operation	No destruction/loss of fossils Comply with requirements of the SAHRA
		Earth moving activities may result in the destruction of fossils (if any).	Management and maintenance of construction vehicles. Management through the use of noise dissipating technologies eg noise mufflers	Operation	Remain within the Noise Regulation Standards for Rural Areas. National Noise Control Regulations, SANS10103:2008 guidelines.
		The use of vehicles and machinery may result in an increase in noise in the immediate vicinity of the project. The Mining activities will also result in an increase in noise in the vicinity of the project.	Speed control and limitation of the times when construction vehicles may be on the roads	Operation	Minimise the number of vehicles on the roads and movement of vehicles shall be kept to outside busy times
		The movement of vehicles in the project area will result in an increase in traffic on the roads.	Control and keep to a minimal the number of vehicles used for operations. Vehicles must be maintained to ensure efficient use of fuel.	Operation	Remain within the National Environmental Management: Air Quality Act, 2004: Dust Regulation guidelines for rural as well as Minimum Air Emissions Standards Minimise the number of vehicles
		The movement of vehicles and machinery may result in the production of carbon dioxide (Green House Gas), which may have an impact on the climate in the area.	Mining site must be located as far from infrastructure as is possible to avoid damage to infrastructure	Operation	No private infrastructure shall be damaged/lost due to Mining vibrations
		Mining may result in possible damage to infrastructure.	N/A	Operation	N/A
		None	N/A	Operation	N/A
Data Analysis	Feasibility Studies	None	N/A	Decommissioning and Closure	No removal of vegetation outside of demarcated areas. Ensure successful rehabilitation of contaminated soils Rehabilitation of land to a state it was before mining activities
Feasibility Report	Studies	The removal of the campsite equipment and the rehabilitation of the Mining and associated access infrastructure will result in the affected soil and land use being restored. This will also result in the resumption of the use of the land since the infrastructure would have been removed.	N/A	Decommissioning and Closure	No removal of vegetation outside of demarcated areas. Ensure successful rehabilitation of contaminated soils Rehabilitation of land to a state it was before mining activities

NAME OF ACTIVITY		POTENTIAL IMPACT (Including the potential impacts for cumulative impacts)	MITIGATION TYPE	Time Period for Implementation	Compliance with standards
	Closure and Rehabilitation of Mining and infrastructure sites	Positive impacts will result due to the reduction in areas of disturbance and the return of land use of the affected areas and making available an area that was covered by the campsite and Mining.	Control and prohibit access of vehicles and machinery to areas outside of established access tracks Control through the clear delineation of the mining area. Control through the implementation of environmental induction and toolbox talks, as well as the implementation of a fine system. Control through the implementation of a soil management programme in terms of the correct topsoil removal, stockpiling and rehabilitation practices as discussed in the EMPr.	Decommissioning and Closure	Vehicle movement shall be limited to areas demarcated as access tracks Comply with the requirements of the EMPr
Removal of equipment and infrastructure		The use of vehicles/machinery during the rehabilitation may result in compaction of soils and in the spillages of hydrocarbon liquids from the vehicles and machinery. This will result in the contamination and destruction of the vegetation cover and soils.	Dust control measures and rehabilitation of areas stripped of vegetation	Decommissioning and Closure	Comply with the requirements of the National Environmental Management Air Quality Act, 2004 Dust Regulation guidelines for rural communities.
		Rehabilitation and removal of the mining sites and equipment will require vehicular movement. This will result in the generation of dust by movement of vehicles and due to blowing winds. Vehicles and machinery will also generate diesel or petrol fumes. Generated dust will migrate towards the predominant wind direction and may settle on surrounding properties including nearby vegetation.	Management and maintenance of construction vehicles. Management through the use of noise dissipating technologies e.g. noise mufflers	Decommissioning and Closure	Comply with the Noise Regulation Standards for Rural Areas.
		Noise will be generated during the removal of equipment and rehabilitation of the sites. This noise is not expected to exceed occupational noise limits and will be short lived.			

37 Financial Provision

37.1 Determination of the amount of Financial Provision.

37.1.1 Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

The rehabilitation plan was developed on the basis that the rehabilitated areas will be left safe, stable, non-polluting and able to support a self-sustaining ecosystem similar to the surrounding natural environment. To ensure that the rehabilitation plan is aligned with the closure objective, a high-level risk assessment of the mining components was undertaken to establish the potential risks associated therewith.

The closure objectives are to:

- Remove and/or rehabilitate all pollution and pollution sources such as waste materials and spills;
- To establish a rehabilitated area that is not susceptible to soil erosion which may result in the loss of soil, degradation of water resources and aquatic environments;
- Restore disturbed areas and re-vegetate these areas with plant species naturally occurring the area to restore the ecological function of such areas, as far as is practicable; and
- To eradicate all alien invasive plant species that may colonise the areas that have been cleared of vegetation.

37.1.2 Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

The final BAR and EMPr was made available to all registered I&APs for a 30-day review and comment period. All comments received and responses provided to the stakeholders have been incorporated into the final BAR and EMPr.

37.1.3 Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

Due to the nature of the activities, the potential impacts will be limited in spatial extent and will be of short duration. The management plan is provided in such a manner as to ensure concurrent rehabilitation. The impacts will be temporary in nature, and a detailed management plan has been provided to address the potential impacts associated with these activities.

The only rehabilitation that will specifically be required is backfilling of the pit and revegetation:

- Re-vegetation: A suitably qualified ecologist will be appointed to determine the appropriate species that may be used for re-vegetating the area.
- Re-vegetation efforts will be monitored every second month for a period of 6 months after the initial seeding. An effective vegetation cover of 45% must be achieved. Re-seeding will be undertaken if the vegetation cover has not been achieved after 6 months.

37.1.4 Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

Due to the nature of the activities, the impacts will be very limited and of short duration. The management plan is in such a manner as to ensure concurrent rehabilitation. The impacts of the mining activities will be temporary in nature and a detailed management plan has been provided to address potential impacts.

37.1.5 Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

The financial provision for the environmental rehabilitation and closure of any mine/mining and its associated operations forms an integral part of the MPRDA. Sections 41 (1) and, 41 (2), 41 (3) and 45 of the MPRDA deal with the financial provision for rehabilitation and closure. During 2012, the DMRE made updated rate available for the calculation of the closure costs, where contractor's costs are not available, these apply.

The "Guideline Document for the Evaluation of Financial Provision made by the Mining Industry" was developed by the DMRE in January 2005 in order to empower the personnel at Regional DMRE offices to review the quantum determination for the rehabilitation and closure for mining sites.

With the determination of the quantum for closure, it must be assumed that the infrastructure had no salvage value (clean closure). The closure cost estimate (clean closure) was determined in accordance with the DMRE guidelines.

The amount required to cover the rehabilitation is anticipated to be R 50 054.00 at this stage as shown in Table 37-1.

Table 37-1: Cost Estimate Expenditure

0

CALCULATION OF THE QUANTUMApplicant: **Lizuvax (Pty) Ltd**

DMR Ref No:

NC 10770PREvaluators: **Ndi Geological Consulting Service (Pty) Ltd**

Date:

2020/09/30

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	15.42	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	214.79	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	316.53	1	1	0
3	Rehabilitation of access roads	m2	0	38.44	1	1	0
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	373.05	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	203.48	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	429.57	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0	218629.41	0.52	1	0
7	Sealing of shafts adits and inclines	m3	0	115.31	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0	150124.02	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	186976.76	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	543069.13	1	1	0
9	Rehabilitation of subsided areas	ha	0	125706.26	1	1	0
10	General surface rehabilitation	ha	0.3	118923.55	1	1	35677.065
11	River diversions	ha	0	118923.55	1	1	0
12	Fencing	m	0	135.65	1	1	0

13	Water management	ha	0	45218.08	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0	15826.33	1	1	0
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
Sub Total 1							35677.065

1	Preliminary and General	4281.2478	weighting factor 2	4281.2478
			1	
2	Contingencies	3567.7065		3567.7065
Subtotal 2				43526.02

VAT (15%)	6528.90
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Grand Total	50055
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37.1.6 Confirm that the financial provision will be provided as determined.

The amount required to cover the rehabilitation is estimated to be R 50 054.92 .00 at this stage as provided in Table 37-1.

KRD will fund the operation and hereby undertakes to fund the operations and to manage the operations. The applicant Lizuvax (Pty) Ltd (KRD Kimberly rehabilitation development) hereby confirms that the financial provision will be provided as determined in Table 37-1.

38 Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

38.1 Monitoring of Impact Management Actions

Please refer to Table 38-1.

38.2 Monitoring and Reporting Frequency

Please refer to Table 38-1.

38.3 Responsible Persons (Roles and Responsibilities)

Generic roles that require to be defines for the project include:

- Project Developer;
- Environmental Control Officer;
- Environmental Health and Safety (EHS) Manager; and
- Site Manager.

The typical requirements of each of the roles are provided in the following sections.

38.3.1 Project Developer

The Project Developer is the 'owner' of the project and as such is responsible for ensuring that the conditions of the Environmental Authorisation issued in terms of NEMA (should the project receive such authorisation) are fully complied with, as well as ensuring that any other necessary permits or licenses are obtained and complied with. It is expected that Kimberly rehabilitation development will appoint the Environmental Control Officer, EHS Manager and Site Manager.

38.3.2 Environmental Control Officer

An independent Environmental Control Officer (ECO) must be appointed to monitor the compliance of the proposed project with the conditions of Environmental Authorisation (should such authorisation be granted by DMRE) during the construction phase (and possibly the operational phase, depending on the requirements of DMRE). The ECO must also monitor compliance of the proposed project with environmental legislation and conditions of the EMPr. The roles and responsibilities of the ECO should include the following:

- The ECO must undertake periodic environmental audits during the relevant phases of the proposed project in order to monitor and record environmental impacts and non-conformances. It is recommended that weekly or bi-weekly environmental audits be undertaken by the ECO during the construction phase.

- Environmental compliance reports must be submitted by the ECO to the DMRE on an annual basis or as stipulated by the DMRE.
- The ECO must maintain a diary of site visits and audits, a copy of the Environmental Authorisation (should such authorisation be granted by DMRE) and relevant permits for reference purposes, a non-conformance register, a public complaint register, and a copy of previous environmental audits undertaken.
- Prior to the commencement of construction, the ECO must meet on site with the Site Manager to confirm the construction procedure and designated construction areas.

38.3.3 Environmental Health and Safety (EHS) Manager

The EHS Manager will be appointed to fulfil the roles of the Environmental Officer during the construction phase and the Environmental Manager during the operational phase. The responsibility of the EHS Manager include overseeing the implementation of the EMPr during the construction and operational phases, monitoring environmental impacts, record-keeping and updating of the EMPr as and when necessary. The EHS Manager is also responsible for monitoring compliance with the conditions of the Environmental Authorisation that may be issued to KRD.

The lead contractor and sub-contractors may have their own Environmental Officers or designate Environmental Officer functions to certain personnel.

During construction, the EHS Manager will be responsible for the following:

- Meeting on site with the Site Manager prior to the commencement of construction activities to confirm the construction procedure and sites allocated for the Mining site and infrastructure required for the project.
- Daily or weekly monitoring of site activities during construction to ensure adherence to the specifications contained in the EMPr and Environmental Authorisation (should such authorisation be granted by DMRE), using a monitoring checklist that is to be prepared at the start of the construction phase.

38.3.4 Site Manager

The site manager will be responsible for the following:

- Overall construction programme, project delivery and quality control for the construction of the facility.
- Overseeing compliance with the Health, Safety and Environmental Responsibilities specific to the project construction.
- Promoting total job safety and environmental awareness by employees, contractors and sub-contractors and ensuring that all employees and contractors and sub-contractors are aware of the importance that the project proponent attaches to safety and the environment.

- Ensuring that each subcontractor employ an Environmental Officer (or have a designated Environmental Officer function) to monitor and report on the daily activities on-site during the construction period.
- Ensuring that safe, environmentally acceptable working methods and practices are implemented, and that sufficient plant and equipment is made available, is properly operated and maintained in order to facilitate proper access and enable any operation to be carried out safely.
- Meeting on site with the EHS Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones.
- Ensuring that all appointed contractors and sub-contractors are aware of this EMPr and their responsibilities in relation to the programme.
- Ensuring that all appointed contractors and sub-contractors repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in the EMPr, to the satisfaction of the EHS Manager.

38.4 Time Period for Implementing Impact Management Actions

Please refer to Table 38-1.

38.5 Mechanism for Monitoring Compliance

Please refer to Table 38-1.

Table 38-1: Mechanisms for Monitoring

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Site Clearance and removal of vegetation Discarding material from Mining site Rehabilitation of Mining Construction of temp/mobile site infrastructure and access routes Stormwater management Storage of diesel and vehicle/machinery maintenance equipment. Water extraction from municipality and/or tank. Waste generation and management. Demolition and/or removal of temporary infrastructure/equipment Rehabilitation and restoration of disturbed areas	Soil Erosion	Management and monitoring of soil stockpiles. Soils must be stored properly and revegetated to prevent erosion and to enable re-use during rehabilitation. Stockpiles must be visually inspected daily to ensure that no erosion is taking place	ECO, Site Manager	Daily Monitoring and Monthly Reporting
	Loss of Indigenous plant Species	A suitably ecologist or horticulturist will be required to make recommendations regarding the collection, propagation/storage and transplantation of plants is advised.	ECO, Site Manager	Monthly monitoring and reporting. Monitoring will be required at all the construction and operational activities until such time that rehabilitation is completed, and sustainability of vegetation cover is achieved.
	Faunal Habitat Loss	Adhere to law and best practice guidelines regarding the displacement and relocation of CI fauna Where required fauna shall be relocated to an area with a similar habitat as the project area Time construction activities to minimise faunal mortality Poaching of fauna shall be prohibited Uncontrolled fires shall not be permitted on site and persecution or hunting of fauna	ECO, Site Manager	Monthly monitoring and reporting. Monitoring will be required at all the construction and operational activities until such time that rehabilitation is completed, and sustainability of vegetation cover is achieved.
	Proliferation of alien invasive species	Declared weeds and alien invasive species must be eradicated. Management of alien invasive plant shall be undertaken throughout the	ECO, Site Manager	Monthly monitoring and reporting. Monitoring will be required at all the construction and operational activities until such time that rehabilitation is completed and sustainable.
	Nuisance dust and air emissions generation	During dry seasons, ensure that cleared (excavated) areas and unpaved surfaces are sprayed with water obtained from an approved source to minimise dust generation. Set up PM 2.5 and PM10 Monitoring sites in the area to monitor dust fall.	ECO, Site Manager	Monthly monitoring and reporting
	Loss of arable land/land for grazing	Ensure proper rehabilitation measures are adhered to in order to return the soil quality to its natural state.	ECO, Site Manager	Monitor monthly and report on an annual basis. Monitoring will be required until such time that rehabilitation is completed.
	Soil and groundwater contamination	Manage through the EMPr and develop a groundwater management programme. Collection of baseline hydrochemistry samples for analysis.	ECO, Site Manager	Monthly monitoring and reporting
	Groundwater extractions	Ensure that no groundwater extraction is undertaken without approval from the DWS Monitoring water levels of the boreholes found in close proximity to the proposed mining site, through a flow meter and water level data logger.	ECO, Site Manager	Monthly monitoring and reporting
	Visual Intrusion and loss of sense of place	Ensure that infrastructure is kept to its most "natural" state and keep a tidy visually ordered site. Rubble/litter/waste removal and disposal to be monitored throughout construction. Complaints about night lights should be investigated and documented in a register	ECO, Site Manager	Monthly monitoring and reporting
	Increased pressure on the road network	Speed control and limitation of the times when construction vehicles may be on the roads	ECO, Site Manager	Monthly monitoring and reporting
Soil disturbance resulting in the spread of alien	Alien invasive vegetation monitoring and control through Alien Invasive Management Plan	ECO, Site Manager	Monthly monitoring and reporting	

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	Surface water contamination	Monitor surface water quality upstream and downstream of the mining area to ensure that the mining activities are not contamination to water resources	ECO, Site Manager	Monthly monitoring and reporting
	Riparian Area and Aquatic Ecosystem Loss	Ensure that there are construction activities that will be located within any riparian and aquatic ecosystem areas.	ECO, Site Manager	Monthly monitoring and reporting
	Destruction of graves and cultural resources	No Mining shall impact graves and sites of heritage or cultural importance	ECO, Site Manager	Monthly monitoring and reporting
	Water Use	No water may be sources from rivers and streams without approval from the DWS. No clean water shall be used for dust suppression		
	Nuisance Noise	Measure noise levels routinely to ensure the noise levels are being kept within the acceptable ISO standards.	ECO, Site Manager	Monthly monitoring and reporting
	Health and safety of personnel	Routine safety checks, safety training and Inspections to be carried out during the construction and operation phase to enforce the use of Personnel Protective Equipment (PPE). This must also be included in the safety requirements of the Contract.	ECO, Site Manager	Routine inspection and Quarterly reporting
	Waste Management	Maintain a waste manifest book to record volumes of waste leaving the site, including recyclables. Keep safe disposal certificates on file on site for Hazardous waste. Way Bridge slips must be obtained for all other waste streams and kept on file on site	ECO, Site Manager	Monthly daily and report on a monthly basis
	Stormwater Management	Visual monitoring based on sediment Clean water must be kept separate from contaminated water emanating from the project sites	ECO, Site Manager	Monthly daily and report on a monthly basis
	Rehabilitation	Monitoring of the following: <ul style="list-style-type: none"> • Basal Cover • Arial Cover • Species diversity 	ECO, Site Manager	Rehabilitation will be undertaken throughout all the project phases. The final rehabilitation will be undertaken when the mining activities have been finalised. The ECO shall inspect the affected areas 6 months after finalisation of rehabilitation to assess the success of the rehabilitation.

39 Indicate the frequency of the submission of the performance assessment/ environmental audit report.

Annual environmental audits must be undertaken to ensure compliance with the EMPr and EA. The environmental audit reports must also include the reviewed financial provision. The reports must be submitted to the DMRE annually as stated.

40 Environmental Awareness Plan

40.1 Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

An Environmental Awareness and Risk Assessment Schedule has been developed and is outlined in Table 40-1. The purpose of this schedule is to ensure that onsite employees are not only trained, but that the principles are continuously re-enforced.

Table 40-1: Environmental Training and Awareness Schedule

Frequency	Time allocation	Objective
Induction (all staff and workers)	1-hour training on environmental awareness training as part of site induction	Develop an understanding of what is meant by the natural environmental and social environment and establish a common language as it relates to environmental, health, safety and community aspects. Establish a basic knowledge of the environmental legal framework and consequences of non-compliance. Clarify the content and required actions for the implementation of the Environmental Management Plan. Confirm the spatial extent of areas regarded as sensitive and clarify restrictions. Provide a detailed understanding of the definition, the method for identification and required response to emergency incidents.
Monthly Awareness Talks (all staff and workers)	30 awareness talks minutes	Based on actual identified risks and incidents (if occurred) reinforce legal requirements, appropriate responses and measures for the adaptation of mitigation and/or management practices.
Risk Assessments (supervisor and workers involved in task)	Daily task-based risk assessment	Establish an understanding of the risks associated with a specific task and the required mitigation and management measures on a daily basis as part of daily toolbox talks.

40.2 Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

As prescribed in Table 40-1, Task/Issue based Risk Assessments must be undertaken with all workers involved in the specific tasks in order to establish an understanding of the risks associated with a specific task and the required mitigation and management measures contained in this report.

Environmental Awareness Training Content- Induction Training: The following environmental awareness training will be provided to all staff and workers who will be involved in mining activities:

- Description of the approved mining activities and content of the mining permit;
- An overview of the applicable legislation and regulations as they relate to environmental, health, safety and community;

Content and implementation of the approved EMPr specifically:

- Allocated roles and responsibilities;
- Management and mitigation measures; and
- Identification of risks and requirements adaptation.

Sensitive environments and features:

- Description of environmentally sensitive areas and features; and
- Prohibitions as it relates to activities in or in proximity to such areas.

Emergency Situations and Remediation:

- Methodology for the identification of areas where accidents and emergencies may occur, communities and individuals that may be affected;
- An overview of the response procedure;
- Equipment and resources;
- Designate of responsibilities;
- Communication, including communication with the potentially affected communities and responsible authorities; and
- Training schedule to ensure effective response.

Development of procedures and checklists: The following procedures will be developed, and all staff and workers will be adequately trained on the content and implementation thereof:

Emergency Preparedness and Response: The procedure will be developed to specifically include risk identification, preparedness, response measures and reporting. The procedure will specifically include spill and fire risk, preparedness and response measures. The appropriate emergency control centres (fire department, hospitals etc.) will be identified and the contact numbers obtained and made available on site. The procedure must be developed in consultation will potentially affected surrounding communities.

In the even that risks are identified, which may affect adjacent surrounding communities (or other persons), the procedure will include appropriate communication strategy to inform such persons and provide response measures to minimize the impact.

Incident Reporting Procedure: Incident reporting will be undertaken in accordance with an established incident reporting procedure to:

- Provide details of the responsible person, including any person who
- Is responsible for the incident;
- Owns any hazardous substance involved in the incident;
- Was in control when the incident occurred.
- Provide details of the incident (time, date, location);
- The details of the cause of incident;

- Identify aspects of the environment affected;
- The details of corrective action taken; and
- The identification of any potential residual or secondary risks that must be monitored and corrected or managed.

Environmental and Social Audit Checklist: An environmental audit checklist will be established to include the environmental and social mitigation and management measures as developed and approved as part of the EMPr. Non-conformances will be identified, and corrective action taken where required.

40.3 Specific information required by the Competent Authority

No specific information was required by the Competent Authority.

41 UNDERTAKING

The EAP herewith confirms

- a) the correctness of the information provided in the reports;
- b) the inclusion of comments and inputs from stakeholders and I&APs ;
- c) the inclusion of inputs and recommendations from the specialist reports where relevant;
and
- d) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected. parties are correctly reflected herein.



Signature of the environmental assessment practitioner:

Ndi Geological

Name of company:

29 September 2020

Date:

-END-

Appendices

Appendix 1: The Qualifications of the Environmental Assessment Practitioner

Appendix 2: Curriculum Vitae of the EAP

Appendix 3: Locality and Layout Maps

Appendix 4: Stakeholder Engagement Documents

Appendix 5: Supporting Impact Assessment

Appendix 9: Specialist Studies Reports

