MIDDELWATER EXPLORATION CO (PTY) LTD

PROSPECTING RIGHT

PROPOSED PROSPECTING OF BERYLLIUM, COBALT, COPPER, FELDSPAR, GOLD, IRON ORE, LEAD, LITHIUM, MANGANESE, MICA, NICKEL, SILVER, TANTALUM, TIN, TUNGSTEN, URANIUM AND ZINC ON THE FARM MIDDELWATER 18, PORTION 0 (ALSO KNOWN AS REMAINING EXTENT) SIYATHEMBA LOCAL MUNICIPALITY, PIXLEY KA SEME DISTRICT MUNICIPALITY, PRIESKA ADMINISTRATIVE DISTRICT, NORTHERN CAPE PROVINCE.

DRAFT BASIC ASSESSMENT REPORT

OCTOBER 2018

REFERENCE NUMBER: **NC 30/5/1/1/2/ 12268 PR**

PREPARED FOR:

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ABBREVIATIONS

BID	Background Information Document
DBAR	Draft Basic Assessment Report
DEAT	Department of Environment, Agriculture and Tourism
DMR	Department of Mineral and Resources
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPR	Environmental Management Programme
FBAR	Final Basic Assessment Report
GN	Government Notice
GNR	Government Notice Regulation
HIA	Heritage Impact Assessment
I&AP's	Interested and Affected Parties
LED	Local Economic Development
NEMA	National Environmental Management Act, 1998
NC	Northern Cape Province
MHSA	Mine Health and Safety Act
MPRDA	Minerals and Petroleum Resources Development Act, 2002
PPP	Public Participation Process
PPE	Personal Protective Equipment
Ptn.	Portion
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SHE	Safety, Health and Environmental
WMA	Water Management Area

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mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATION IN TERMS OF THE NATIONAL ENVIRONMENTAL 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).

NAME OF APPLICANT: *Middelwater Exploration Co(Pty) Ltd*
TEL NO: *083 701 3887*
FAX NO: 018 787 9904
POSTAL ADDRESS: *165 Main Road, Paarl, 7646*

FILE REFERENCE NUMBER SAMRAD: Ref No: NC 30/5/1/1/3/2/ PR

I. Important Notice

In terms of the Mineral and Petroleum Resources Development Act (Act 29 of 2002) as amended), the Minister must grant a 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 can 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, signification, 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) 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.

PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

3. Contact Person and correspondence address

a) Details of

i) Details of the EAP

Name of the Practitioner:	Greenmined Environmental
	Yolandie Coetzee
Tel No.:	011 966 4390 / 082 734 5113
Fax No.:	086 546 0579
E-mail address:	yolandie.c@greenmined.co.za

ii) Expertise of the EAP.

(1) The qualifications of the EAP

(with evidence).

Mrs. Yolandie Coetzee has a B.Sc. Degree in Microbiology and Biochemistry and an Honours Degree in Environmental Sciences. Please find full CV attached in **Error! Reference source not found.**.

(2) Summary of the EAP's past experience.

(In carrying out the Environmental Impact Assessment Procedure)

Yolandie Coetzee is an Environmental Consultant with 8 years' experience in the environmental sector. She specialized the last 5 years in the rehabilitation of mines where she conducted the conceptual rehabilitation and management designs and the closure plans and programs. She has also been involved in a number of other environmental projects including railway sidings, filling stations, abattoir's, logistics hub, prospecting and mining sites where she compiled environmental management plans, environmental impact assessments, environmental audits, due diligences, IWULA's/IWWMP's and alien invasive encroachment programs. She studied at the University of Potchefstroom where she has successfully completed her undergraduate degree in microbiology and biochemistry and her Honours degree in environmental sciences. See a list of past project attached as **Error! Reference source not found.**.

b) Location of the overall Activity.

Farm Name:	The farm Middelwater 18, portion 0 (also known as remaining extent) Siyathemba Local Municipality, Pixley Ka Seme District Municipality, Prieska Administrative District, Northern Cape Province..
Application area (Ha)	6821.1414 (Ha)
Magisterial district:	Prieska Administrative District
Distance and direction from the nearest town	The farm Middelwater 18 is situated approximately 33 km North-West of Prieska, Northern Cape Province, adjacent to the Orange River
21 digit Surveyor General Code for each farm portion	C06000000000001800000

c) Locality map

(show nearest town, scale not smaller than 1:250000).

The requested map is attached as Appendix B.

d) Description of the scope of the proposed overall activity.

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1:10 000 that shows the location, and area (hectares) of all aforesaid main and listed activities, and infrastructure to be placed on site

Middelwater Exploration Co (Pty) Ltd intends to apply for a prospecting right on the farm Middelwater 18 PR, portion 0 (also known as remaining extent), Siyathemba Local Municipality, Pixley Ka Seme District Municipality, Prieska Administrative District, Northern Cape Province. The farm Middelwater 18 is situated approximately 33 km North-West of Prieska, Northern Cape Province, adjacent to the Orange River. The commodity of interest is Beryllium, Cobalt, Copper, Feldspar, Gold, Iron Ore, Lead, Lithium, Manganese, Mica, Nickel, Silver, Tantalum, Tin, Tungsten, Uranium and Zinc.

The prospecting methods will entail exploration drilling of the proposed footprint area, and is described below:

Description of planned non-invasive activities:

(These activities do not disturb the land where prospecting will take place, e.g. aerial photography, desktop studies, aeromagnetic surveys, etc)

Phase 1 (Month 0 To 6), Phase 3 (Months 15 To 27) And Phase 4 (Months 30 To 36)

The non-invasive phase of the exploration study will consist of a data collection period, interpretation of the data and the definition of a specific exploration target for drilling (6 months). During this period all the information that is available and relates to the geology of the region will be collected. This will include maps, drilling information, borehole logs, geological articles. All this information will be studied, combined and re-interpreted if necessary.

As the mineralization presents a “deep” target this phase will also include the interpretation of any geophysical survey data that is available for the area. The outcome of this study will be to better understand, interpret and define the drilling target. The objective is to obtain the maximum chance of a successful first phase drilling program outcome.

- Desktop studies [Month 0 – 3]

Desktop studies form a very important preparatory step in a new iron ore exploration project, and as the name suggests, this task is executed mainly from an office environment. Desktop studies will be conducted by the project geologist as part of preliminary investigations into the prospecting area by looking at all relevant published literature, geological maps, mining maps and any available evidence or records of iron ore findings. The outcome of the desktop studies will be a geological report of the prospecting area with a particular emphasis on the prospectively of the area. This report will also inform other subsequent prospecting steps.

- Geological Field Mapping [Month 3 - 6]

All spatial information accessed and collected in the field will be standardized using the WGS84 datum. Field mapping will be focused on potential prospective area to improve understanding of the structure & geology in order to define targets for ground based geophysics as well as to be able to interpret geophysical results. Geological mapping will be on a scale suitable for the observed geological variability and will be conducted by an in house well trained and highly experience geologist.

During the geological field mapping activity soil and litho-sampling along with analysis (XRF & or assaying) may be conducted to determine prospective horizons.

- Ground Magnetic Survey [Month 3 - 6]

Both airborne and ground geophysical surveys may be undertaken for the prospecting right area, depending on the results of the desktop study. A small airborne magnetic / radiometric survey may be carried out over the prospect and surrounding areas to map the structural geology of the area. Follow up ground geophysical surveys will be carried out on coincident targets from the compilation of geological and geophysical data. These surveys may include ground gravity, ground electromagnetics, IP and controlled source audio magnetotellurics (csamt).

Field geological studies will follow after the desktop studies, and they typically include walking over the prospecting area making general observations of the geology and topography. Geological mapping activities, if terrain is suitable, may include detailed outcrop mapping, identification of iron ore hosting strata, iron ore seam outcrop mapping and sampling of exposed iron ore seams where available.

The 3D geological modelling and resource estimation step will follow after favourable exploration drilling results. This geological modelling step mainly entails geological interpretation of collected log sheet data and the subsequent geological domain. The geological model, which shows the physical continuity of the iron ore seams and the distribution of the iron ore qualities, is a critical input in iron ore resource estimation. The iron ore resource statement, which is an outcome of the resource estimation process, gives an indication of the amount of available iron ore resources in tonnage and associated qualities.

Description of Planned Invasive Activities:
(These activities result in land disturbances e.g. sampling, drilling, etc.)

Phase 2 (month 6 to 15) and phase 4 (months 27 to 30)

- Drilling:

The exact location where drilling will be carried out will be determined by the results of geophysical and geological work carried out in Phase 1 of the prospecting programme. It will be assumed that a drill hole will be located in intervals of 350 meters (measured resource as per SAMREC code) with no more than 1 holes being actively drilled at any given time. The initial holes will be drilled on the Prospecting area that forms part of this application. All drill holes will be approved by the team's environmental manager prior to approval thereof. The environmental management plan related to this project will consider environmental sensitivities and advise on the location of drilling holes. During this stage the defined target will be tested by a two phase drilling program with the second phase subject to a successful outcome of the first phase drilling program. It is suggested that the first phase drilling program will consist of 4 RC boreholes. It is expected that these boreholes will be between 100 m and 250 m deep. These boreholes will test the desktop model, target and mineralization. If the outcome is positive follow-up drilling will be implemented after the detailed interpretation of the drilling results.

Second phase drilling (6 – 15 months) will consist of 4 diamond boreholes in order to get detailed information regarding the geology and geological controls related to the mineralization. The diamond core will also provide for reliable samples and accurate mineralization thicknesses. The 4 diamond boreholes will be followed by another 10 RC boreholes that will define and determine the outer contacts of mineralization. The samples will be crushed and milled and then analysed at an accredited laboratory in for the copper and other commodities quality.

With successful results a third drilling program will be implemented during year 3 to determine resources volumes and grades for the deposit. The resultant drill holes will be cased and capped to make it safe for people and animals, and also allow for future access by the exploration team.

MAIN PROSPECTING ACTIVITIES:

- Drill site establishment:
  A drill site of approximately 400 m² will be established that will require:
  - Clearing of vegetation for sumps and the drill entrance point;

- Earth sumps for water recycling;
- Laydown area for drill rods, fuel and chemical storage;
- Chemical toilets.

- Drilling and removal of geological cores:
  Drilling a hole of approximately 110 mm in diameter and removing of rock core. Number of boreholes will be finalised once non-invasive prospecting is completed.

- Casing of boreholes:
  1 m² per borehole.

- Rehabilitation of drill sites.

Description of Pre-/Feasibility Studies:

(Activities in this section include but are not limited to: initial geological modelling, resource determination, possible future funding models, etc.)

The pre-/feasibility studies team will comprise of a diverse team of technical expertise in the field of mineral projects, including, geologists, mining engineers, metallurgical engineers, civil engineers, mechanical engineers, environmental scientists, marketing professionals and mineral project finance professionals. During this phase and infill drilling program will have to be completed in order to define the resources that supports the project.

The list of activities under pre-/feasibility studies includes the following:

- Geological modelling and iron ore resource estimation;
- Iron Ore reserve estimation;
- Mine design and scheduling;
- Mineralogy;
- Metallurgical processing;
- Market study;
- Infrastructure design (Roads, Power, Water and Housing);
- Plant design and processing;
- Engineering development;
- Human resourcing;
- Social Economic Impacts;
- Project development and operational costing; and
- Financial modelling.

The mining site will contain the following:

- Surveying Equipment;
- Drilling equipment;

- Magnetometer;
- Geophysical logging equipment;
- Field Vehicles;
- Sample Analysis equipment; and
- Other relevant field equipment.

Please refer to Appendix C for a copy of the plan and schematic indication of the proposed prospecting activities.

Phase	Activity (what are the activities that are planned to achieve optimal prospecting)	Skill(s) required (refers to the competent personnel that will be employed to achieve the required results)	Timeframe (in months) for the activity)	Outcome (What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome (deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g. geologist, mining engineer, surveyor, economist, etc)
1	**Non-Invasive Prospecting** Desktop study: Literature Review / Survey	Qualified Geologist (B.Sc. (Hons) a minimum qualification)	Month 0 - 3	Geological report based on literature survey (historical records and historical data) of records or evidence of findings in the Kathu / Sishen Iron Field.	Month 2 - 3	Geologist
1	**Non-invasive Prospecting** Geological Field Mapping	Geologist & Field Crew	Month 3 – 6	Geological report accompanied by maps & plans of ground truthing of initial geological targeting.	Month 5 - 6	Geologist
1	**Non-Invasive Prospecting** Ground Magnetic Survey	Geophysicist / Geologist / Field Crew	Month 3 – 6	Survey report detailing possible targets for further exploration, report supported by maps, plans & cross sections.	Month 5 - 6	Geologist
2	**Invasive Prospecting** Exploration Boreholes Drilling of the first three boreholes in optimal positions. Detailed geological logs and interpretations (combined with regional information).	Geologist, surveyor, field crew, laboratory technicians, geophysicist and drilling contractor	Month 6 -9 months	First phase exploration drilling for detailed information. Borehole cored data. Lithological logs, geophysical down hole surveys (if required), assays results for mineralized intercepts	Month 8-9	Geologist

Phase	Activity (what are the activities that are planned to achieve optimal prospecting)	Skill(s) required (refers to the competent personnel that will be employed to achieve the required results)	Timeframe (in months) for the activity)	Outcome (What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome (deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g. geologist, mining engineer, surveyor, economist, etc)
2	**Invasive Prospecting** Second phase drilling using diamond coring (4x) and additional RC drilling (10x). Laboratory test work on recovered core samples. Boreholes to confirm continuity of mineralisation & potential deposit size	Geologist, surveyor, geophysicist, drilling contractor and laboratory contractor	Month 9 - 15	Second phase exploration drilling report based on first phase interpretations, geological logs and geophysics. Optimal borehole placement, diamond drilling, collection of samples for analysis.	Month 14 - 15	Geologist
3	**Non-Invasive Prospecting** 3D geological modelling and resource estimation	Geologist / Geophysicist	Month 15 - 21	3D geological model and inferred resource statement. Generation & ranking of mineralised targets for further work.	Month 20-21	Geologist
3	**Non-Invasive Prospecting** Prefeasibility study	Geologist, Mining Engineer, Environmental practitioner, Metallurgist, Marketing specialist, Accountant	Month 21 - 27	Geological and Prefeasibility report, maps & plans	Month 26 - 27	Geologist and Mining Engineer
4	**Invasive Prospecting** Infill drilling for detailed resource definition and mine design	Geologist, surveyor, geophysicist, drilling contractor and laboratory contractor	Month 27 - 30	3D geological model and indicated to measured resource statement. Closely spaced borehole cored data: lithological lots, geophysical down hole surveys, assay results for mineralised intercepts, metallurgical test work. Resource estimation work producing an inferred mineral resource	Month 29 - 30	Geologist

Phase	Activity (what are the activities that are planned to achieve optimal prospecting)	Skill(s) required (refers to the competent personnel that will be employed to achieve the required results)	Timeframe (in months) for the activity)	Outcome (What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome (deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g. geologist, mining engineer, surveyor, economist, etc)
4	**Non-Invasive Prospecting** Bankable feasibility Study	Geologist, Mining Engineer, Environmental practitioner, Metallurgist, Marketing specialist, Accountant	Month 30 - 36	Bankable feasibility report	Month 35 - 36	Geologist and Mining Engineer

i) Listed and specified activities

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	LISTED ACTIVITY	APPLICABLE LISTING NOTICE
whether listed or not listed	**(volumes, tonnages and hectares or m^2)**	**Mark with an X where applicable or affected**	**(GNR 324, GNR 325, GNR 326 OR GNR 327)**
(E.g. Excavations, blasting, 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.)			
Site Visits By Various Specialist	6821.1414 (Ha)	N/A	Not Listed
Demarcation Of Site With Visible Beacons.	400 m^2	N/A	Not Listed
Establishment of Temporary Office and Ablution Infrastructure Within Boundaries of Site.	400 m^2	N/A	Not Listed
Stripping And Stockpiling Of Topsoil	400 m^2	X	GNR 327 Listing Notice 1: Activity 20
Drilling for continues resource evaluation	400 m^2	X	GNR 327 Listing Notice 1: Activity 20
General Activities	400 m^2	X	GNR 327 Listing Notice 1: Activity 20
Sloping, Landscaping and Replacement of topsoil over disturbed area (final rehabilitation)	400 m^2	X	GNR 327 Listing Notice 1: Activity 20

ii) Description of the activities to be undertaken

(Describe Methodology or technology to be employed, including the type of commodity to the prospected/mined and for a linear activity, a description of the rout of the activity)

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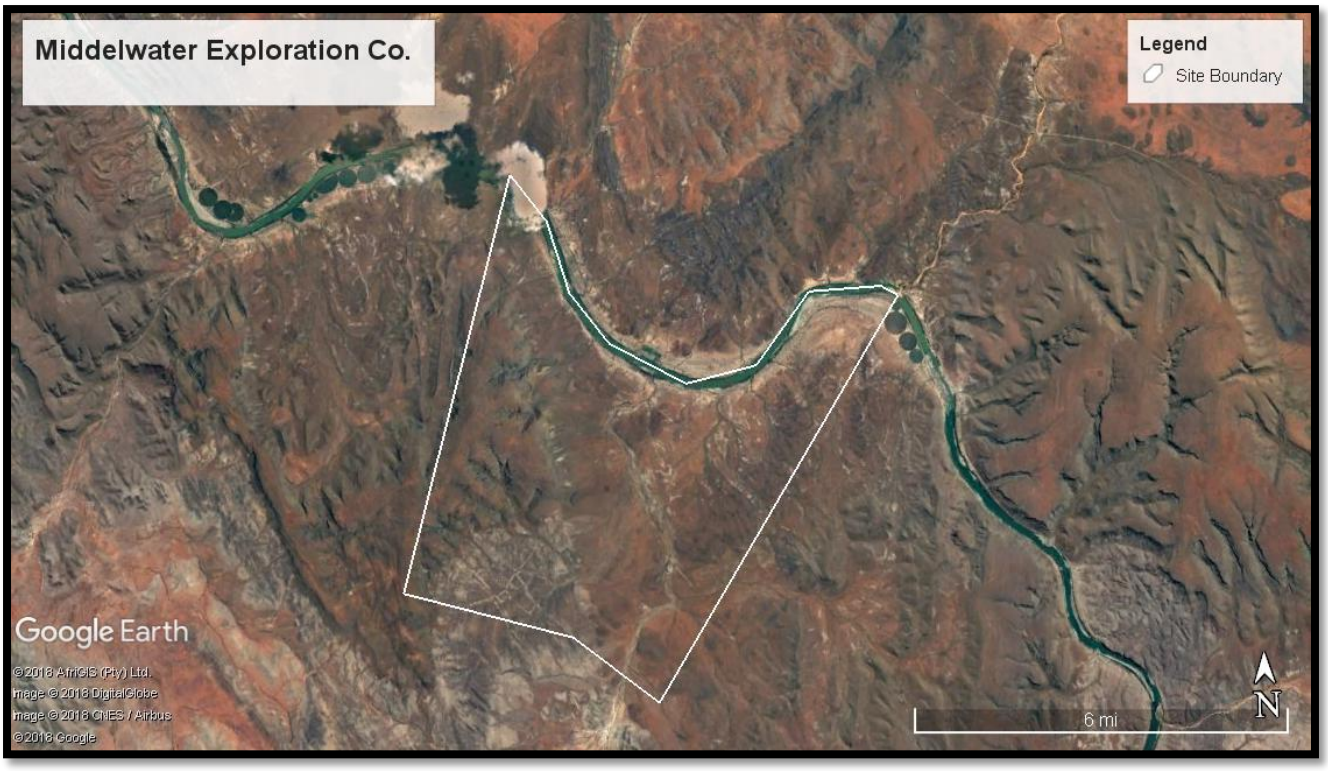

Figure 1: Google Earth Image of the proposed prospecting right area.

The GPS coordinates of the proposed prospecting area are as follow:

	East Degr	East Min	East Sec	North Degr	North Min	North Sec		Longitude	Latitude
A	22	29	25	29	23	59,45		22,4902777778	-29,3998472222
B	22	30	0,72	29	24	33,12		22,5002000000	-29,4092000000
C	22	30	20,77	29	25	34,92		22,5057694444	-29,4263666667
D	22	30	58,2	29	26	19,47		22,5161666667	-29,4387416667
E	22	32	12,21	29	26	55,79		22,5367250000	-29,4488305556
F	22	33	21,42	29	26	42,08		22,5559500000	-29,4450222222
G	22	34	15,56	29	25	40,41		22,5709888889	-29,4278916667
H	22	35	26,15	29	25	37,66		22,5905972222	-29,4271277778
I	22	35	42,59	29	25	45,89		22,5951638889	-29,4294138889
J	22	31	36,48	29	31	21,47		22,5268000000	-29,5226305556
K	22	30	15,62	29	30	25,44		22,5043388889	-29,5070666667
L	22	27	33,21	29	29	44,5		22,4592250000	-29,4956944444

The proposed borehole locations are provided in the figure below.

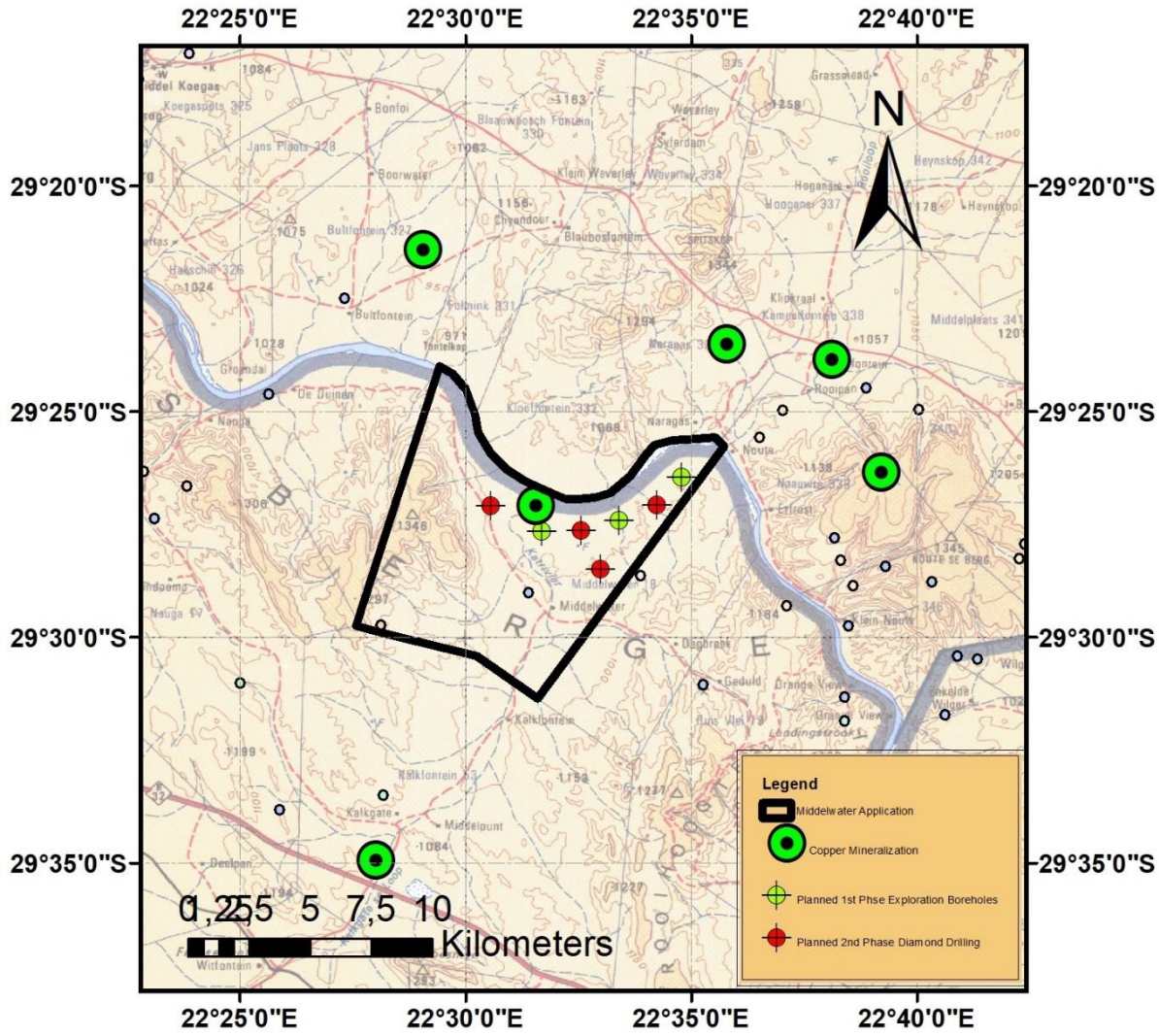

Figure 2: Proposed Exploration Boreholes

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- Geological Field Mapping [Month 3 - 6]

All spatial information accessed and collected in the field will be standardized using the WGS84 datum. Field mapping will be focused on potential prospective area to improve understanding of the structure & geology in order to define targets for ground based geophysics as well as to be able to interpret geophysical results. Geological mapping will be on a scale suitable for the observed geological variability and will be conducted by an in house well trained and highly experience geologist.

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Description of Planned Invasive Activities:

(These activities result in land disturbances e.g. sampling, drilling, etc.)

Phase 2 (month 6 to 15) and phase 4 (months 27 to 30)

- Drilling:

The exact location where drilling will be carried out will be determined by the results of geophysical and geological work carried out in Phase 1 of the prospecting programme. It will be assumed that a drill hole will be located in intervals of 350 meters (measured resource as per SAMREC code) with no more than 1 holes being actively drilled at any given time. The initial holes will be drilled on the Prospecting area that forms part of this application. All drill holes will be approved by the team's environmental manager prior to approval thereof. The environmental management plan related to this project will consider environmental sensitivities and advise on the location of drilling holes. During this stage the defined target will be tested by a two phase drilling program with the second phase subject to a successful outcome of the first phase drilling program. It is suggested that the first phase drilling program will consist of 4 RC boreholes. It is expected that these boreholes will be between 100 m and 250 m deep. These boreholes will test the desktop model, target and mineralization. If the outcome is positive follow-up drilling will be implemented after the detailed interpretation of the drilling results.

Second phase drilling (6 – 15 months) will consist of 4 diamond boreholes in order to get detailed information regarding the geology and geological controls related to the mineralization. The diamond core will also provide for reliable samples and accurate mineralization thicknesses. The 4 diamond boreholes will be followed by another 10 RC boreholes that will define and determine the outer contacts of mineralization. The samples will be crushed and milled and then analysed at an accredited laboratory in for the copper and other commodities quality.

With successful results a third drilling program will be implemented during year 3 to determine resources volumes and grades for the deposit. The resultant drill holes will be cased and capped to make it safe for people and animals, and also allow for future access by the exploration team.

MAIN PROSPECTING ACTIVITIES:

- Drill site establishment:

  A drill site of approximately 400 m² will be established that will require:
  - Clearing of vegetation for sumps and the drill entrance point;
  - Earth sumps for water recycling;
  - Laydown area for drill rods, fuel and chemical storage;
  - Chemical toilets.

- Drilling and removal of geological cores:

  Drilling a hole of approximately 110 mm in diameter and removing of rock core. Number of boreholes will be finalised once non-invasive prospecting is completed.

- Casing of boreholes:
  1 m² per borehole.

- Rehabilitation of drill sites.

Description of Pre-/Feasibility Studies:

(Activities in this section include but are not limited to: initial geological modelling, resource determination, possible future funding models, etc.)

The pre-/feasibility studies team will comprise of a diverse team of technical expertise in the field of mineral projects, including, geologists, mining engineers, metallurgical engineers, civil engineers, mechanical engineers, environmental scientists, marketing professionals and mineral project finance professionals. During this phase and infill drilling program will have to be completed in order to define the resources that supports the project.

The list of activities under pre-/feasibility studies includes the following:

- Geological modelling and copper and other commodities resource estimation;
- Copper and other commodities reserve estimation;
- Mine design and scheduling;
- Mineralogy;
- Metallurgical processing;
- Market study;
- Infrastructure design (Roads, Power, Water and Housing);
- Plant design and processing;
- Engineering development;
- Human resourcing;
- Social Economic Impacts;
- Project development and operational costing; and
- Financial modelling.

The mining site will contain the following:

- Surveying Equipment;
- Drilling equipment;
- Magnetometer;
- Geophysical logging equipment;
- Field Vehicles;
- Sample Analysis equipment; and
- Other relevant field equipment.

Please refer to Appendix C for a copy of the plan and schematic indication of the proposed prospecting activities.

A mobile site office, workshop and service area and chemical ablution facility will be present on the site. A generator will be used to supply power for the Temporary Infrastructure on site. Potable water will daily be transported to site. The solid waste produced during the operational phase of the project will be transported from site to the Prieska landfill site. Approximately 6 workers will be employed at the site. Prospecting will be done in daylight hours. From time to time it may be required to work an alternative Saturday.

Site vehicles will use the existing gravel farm roads that leads to the Middelwater farm.

The primary objective is to obtain a closure certificate at the end of the life of the mine at minimum cost and in as short a time period as possible whilst still complying with the requirements of the Minerals and Petroleum Resources Development Act. To realise this, the following objectives must be achieved:

- Remove all temporary infrastructure and waste from the site as per the requirements of this EMPR and of the Provincial Department of Mineral Regulation;
- Demolish / rehabilitate all roads with no post -prospecting use potential;
- Clear all carbonaceous material from site;
- Clear boulders form site;
- Remove all waste from site;
- Any wetlands in the area should not be compromised or destructed;
- Future public health and safety are not compromised;
- Ensure that no threat to surface and underground water quality remains;
- Ensure that all permanent changes in topography are sustainable and do not cause erosion or the damming up of runoff;
- Shape and contour all disturbed areas in compliance with the EMPR;
- The stockpiled topsoil will be spread over the disturbed area to a depth of at least 500 mm;
- Make safe any dangerous excavations or subsidence on the surface;
- Rehabilitate all disturbed areas in compliance with the EMPR and of the Provincial Department of Mineral Regulation;
- Ensure that all rehabilitated areas are safe, stable and self-sustaining in terms of vegetation;
- Control of weeds and alien invasive plant species is an important aspect after topsoil replacement and seeding has been done in an area;
- The applicant will comply with the minimum closure objectives as prescribed by DMR;
- Any adverse socio-economic impacts are minimised; and
- All socio-economic benefits are maximised.

e) Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
(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 are to be considered in the assessment process)		(E.g. in terms of the National Water Act a Water Use License has/has not been applied for)
Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) Section 16	Part A(d) Description of the scope of the proposed overall activity. Application for a prospecting Right Ref No: **NC 30/5/1/1/2/12268 PR**	Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) - Section 16 – Application for a prospecting right submitted to DMR-NC.
National Environmental Management Act 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2017, GNR 326 effective 7 April 2017) • GNR 327 Listing Notice 1 Activity 20	Part A(d)(i) Listing and specified activities. Application for environmental authorisation Ref No: **NC 30/5/1/1/2/12268 PR**	Application for environmental authorisation submitted to DMR-NC. GNR 327 Activity 20
National Environmental Management: Air Quality Control Act, 39 (Act No 39 of 2004) read together with applicable amendments and regulations thereto specifically the National Dust Control Regulations, GN No R827	Part A(iv)(1)(a) Type of environment affected by the proposed activity – *Air and Noise Quality.*	
National Water Act, 36 (Act No 36 of 1998) read together with applicable amendments and regulations thereto.	Part A(iv)(1)(a) Type of environment affected by the proposed activity – *Aquatic Features.*	No prospecting will be conducted within 100m from a watercourse.
National Environmental Management Act: Biodiversity Act, 2004 (Act No. 10 of 2004) and amendments	Biophysical Environment	Weed / Alien vegetation clearing. Should the proposed mitigation measures be implemented no aspects of the project could be identified that triggers the NEM:BA, 2004.
National Environmental Management: Waste Act, 59 (Act No 59 of 2008) read together with applicable amendments and regulations thereto. NEM:WA, 2008: National norms and standards for the storage of waste (GN 926)	Part A(ii) Description of the activities to be undertaken: *Operational phase – Waste Handling*	The mitigation measures proposed for the site take into account the NEM:WA.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
Mine Health and Safety Act, 1996 (Act No. 29 of 1996)	The mitigation measures proposed for the site includes specifications of the MHSA. Part A(iv)(1)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of Health and Safety Aspects.*	The operational phase of the site will trigger the MHSA. The mitigation measures proposed for the site includes specifications of the MHSA, 1996
National Heritage Resources Act No. 25 of 1999	Cultural and Heritage Environment. Part A(iv)(1)(a) Type of environment affected by the proposed activity – *Human Environment*	No aspects of the project could be identified that triggers the NHRA. A Notice of Intent to Develop in terms of Section 38(8) of the NHRA, 1999 was submitted to SAHRA on 3 August 2018 to determine the action required for the proposed project. SAHRA requested that a HIA and Palaeontological Study be conducted. The mitigation measures proposed for the site includes specifications of the NHRA, 1999.
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	Part A(iv)(1)(a) Type of environment affected by the proposed activity: *Physical Environment – Geology and Soil.* Part A(iv)(1)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of weeds- or invader plants*.	The mitigation measures proposed for the site includes specifications of the CARA, 1983.
Land Use Planning Ordinance (Ordinance 15 of 1985)	Land use zoning requirements	Land Use Planning Ordinance (Ordinance 15 of 1985)
Northern Cape Nature Conservation Ordinance 8 of 1969	Biophysical Environment	Protected trees and plants in the area have been identified. Relevant acts are complied with and the necessary permits and licences obtained.
Northern Cape Nature Conservation Act No. 9 of 2009		
Cape Nature and Environmental Conservation Ordinance 9 of 1974		
Siyathemba Local Municipality Spatial Planning and Land Use Management By-law 2015	Description of the current land uses	

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
Northern Cape Planning and Development Act No 7 of 1998		Land Rezoning will be conducted once the Prospecting Right application has been converted to a mining right application.
Northern Cape Spatial Planning and Land Use Management Bill 2012		
Siyathemba Local Municipality Integrated Development Plan		
Spatial Planning and Land Use Management Act, Act 16		
Public Participation Guideline in terms of the NEMA EIA Regulations	Part A(ii) Details of the Public Participation Process Followed Application for a prospecting Right Ref No: **NC 30/5/1/1/2/12268 PR** Application for a Environmental Authorisation Ref No: **NC 30/5/1/1/2/12268 PR**	Public Participation Guideline in terms of the NEMA EIA Regulations

f) Need and desirability of the proposed activities.

(Describe Methodology or technology to be employed, including the type of commodity to the prospected/mined and for a linear activity, a description of the rout of the activity)

The proposed prospecting will also contribute to the diversification of activities on the property, extending it from agriculture to include small scale mining. The need is to find Beryllium, Cobalt, Copper, Feldspar, Gold, Iron Ore, Lead, Lithium, Manganese, Mica, Nickel, Silver, Tantalum, Tin, Tungsten, Uranium and Zinc, qualify and quantify the Beryllium, Cobalt, Copper, Feldspar, Gold, Iron Ore, Lead, Lithium, Manganese, Mica, Nickel, Silver, Tantalum, Tin, Tungsten, Uranium and Zinc to develop a business model.

g) Motivation for the overall preferred site, activities and technology alternative.

Due to the remote location of the excavation area, the potential impacts on the surrounding environment associated with prospecting is deemed of low significance. It is proposed that all prospecting related temporary infrastructure will be contained within the boundary of the prospecting area. As no permanent buildings will be established on site the layout / position of the temporary infrastructure will be determined by the prospecting progress and available space within the ±6821.1414 (Ha) of prospecting area.

Middelwater Exploration Co (Pty) Ltd will make use of temporary infrastructure during the prospecting operations. Prospecting only to be done in gravel roads, where no flora will need to be removed or disturbed. Workers will be transported to and from the site daily.

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

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

i) Details of The Development Footprint Alternatives Considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Middelwater Exploration Co(Pty) Ltd intends to apply for a prospecting right on the farms Middelwater 18, portion 0 (also known as remaining extent), which falls in the Siyathemba Local Municipality, Pixley Ka Seme District Municipality, Prieska Administrative District, Northern Cape Province. The farms are situated approximately 53 km North-North- East of Prieska, Northern Cape Province. Please refer to **Error! Reference source not found.** for a copy of the plan and schematic indication of the proposed prospecting activities.

The land is currently utilised for grazing. No buildings will not be impacted by prospecting and are situated in the exclusion zones on the prospecting plan.

No alternatives sites where considered during this prospecting drilling. If drill sites where found unfeasible due to the natural environment, these drill sites will be relocated to a position possible with minimal impacts associated. Please refer to **Error! Reference source not found.** for the proposed exploration boreholes.
However, the applicant considered two activity alternatives during the planning phase of this project:

1. Temporary Infrastructure (Preferred Alternative) vs Permanent Temporary Infrastructure:
    a. The use of temporary Infrastructure will entail the use of machinery that is either track-based or can be removed without difficulty. Temporary Infrastructure to be used in the prospecting mining method will entail some temporary offices, storage facility and chemical toilet, with servicing of vehicles and equipment being done off-site at the existing workshop on the applicant's farm.

        i. **Positive Aspects**: The positive aspects associated with the use of temporary infrastructure firstly enable the applicant to move the temporary infrastructure within the boundaries of the prospecting mining area as prospecting mining of the mineral progresses. Secondly the decommissioning phase is facilitated as the removal of temporary infrastructure from the prospecting mining area during the rehabilitation of the site is easy and highly effective.

    b. The use of permanent infrastructure will entail the construction of an office building with ablution facilities, and installation of a permanent vehicle service area.

        i. The use of permanent Infrastructure will increase the impact of the proposed project on the environment as it will entail the establishment of more structures, lengthen the period required for rehabilitation as well as increase the rehabilitation amount as the permanent Infrastructure will either have to be decommissioned or be maintained after the closure of the site.
        ii. The construction of permanent Infrastructure at the site will also increase the visual impact of the proposed project on the surrounding environment and additional mitigation measures will have to be implemented to address the impact.

In the light of the above the use of temporary Infrastructure is deemed to be the most viable preferred alternative.

No-go Alternative:

The 'No Go' option for development was considered. However, this was adjudged to not be the best land-use option for the following reasons: The grazing value of the land is at present considered to be extremely low due to the high level of disturbance, resulting in the area being characterized by non-palatable grasses and low biomass. The no-go alternative entails no change to the status quo and is therefore a real alternative that must be considered. In the event that the no-go alternative is implemented it will prevent the prospecting of the study area.

The proposed rehabilitation of the area that includes:

- The preservation of the topsoil to cover disturbed areas;
- Implementation of measures to monitor the natural establishment of plants growth and to re-vegetate with representative seed mixes in the case of poor plant establishment;
- The proposed program to combat invader weeds on a regular base; and
- Will ensure that the land use will remain almost the same when prospecting operations cease.

The no-go alternative was not deemed to be the preferred alternative as:

- The applicant will not be able to supply in the demand for copper and other commodities in the vicinity;
- The application, if approved, would allow the applicant to utilize the available copper and other commodities as well as provide employment opportunities to local employees. Should the no-go alternative be followed these opportunities will be lost to the applicant, potential employees and clients; and
- The applicant will not be able to diversify the income of the property.

Not proceeding with the proposed operation will entail that a mineral which if prospected will contribute towards the local and provincial social and economic structures of the area, will not be mined, and that this opportunity will be lost.

It is important to note that as previously discussed, that execution of the prospecting operation will not leave the land unproductive, so that the proposed prospecting operation can be considered to be a sustainable land-use option for the area. If the prospecting project does not go ahead the farm will be used for cultivating grazing and mixed farming. This is also the current use of the land in question.

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

An application for environmental authorisation will be submitted in terms of section 16 of The Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 Of 2002) And The National Environmental Management Act, 1998 (Act No. 107 Of 1998 NEMA) As Well as The Environmental Impact Assessment Regulations as Amended 2017.

Initial public participation process started on the 15th of August 2018. The stakeholders and I&AP's were informed of the project by means of I&AP comment / notification letters that were sent directly to the contact persons. A 30 days commenting period were allowed that ended on the 17th of September 2018.

A Draft Basic Assessment Report (DBAR), with reference number: **NC 30/5/1/1/2/12268 PR** will be distributed to the stakeholders and I&APs for their perusal over a 30 days commenting period ending on 9 December 2018.

All comments received on the DBAR during the commenting period will be incorporated into the Final Basic Assessment Report (FBAR) and subsequently compiled and distributed to all the registered I&AP's and stakeholders.

The following I&AP's and stakeholders were contacted to obtain their comments:

Table 1: Stakeholders

Department	Physical Address	Postal Address	Contact	Tel Number	Fax Number	Email	Notification
Siyathemba Local Municipality	Victoria Street, Prieska, 8940	PO Box 16, Prieska, 8940	Municipal manager Mr R Stadhouer PA / Hettie	053-353 5300		hettie@siyathemba.gov.za	13 August 2018
Siyathemba Local Municipality *Ward 5*	Victoria Street, Prieska, 8940	PO Box 16, Prieska, 8941	Cllr Pieter Willem Saaiman	083 2775400		hettie@siyathemba.co.za	13 August 2018
Pixley Ka Seme District Municipality	Pixley ka Seme District Municipality Private Bag x1012 De Aar 7000	Culvert Road Industrial Area De Aar 7000	Municipal Manager Mr. R. E. Pieterse PA/ Passie	0536310891		mm@pksdm.gov.za	13 August 2018
Department of Agriculture, Forestry and Fisheries (DAFF)	PO Box 2782, Upington, 8800		Jacoline Mans	054 338 5909		JacolineMa@daff.gov.za	13 August 2018
Department of Agriculture, Land Reform and Rural Development		Private Bag X5018 Kimberley 8300	Head of Department: Mr W D Mothibi	(053) 838 9102 083 448 9151	(053) 831 3635	fortunec@ncpg.gov.za	13 August 2018
Department of Environment and Nature Conservation	Sasko Building 90 Long Street Kimberley 8301	Private Bag X6102 Kimberley 8300	Director for Environmental Quality Management Mr B Fisher	053-8077431 0824630224	0866543050 0538321035	bfisher@ncpg.gov.za, tmakaudi@ncpg.gov.za	13 August 2018
Department of Economic Development and Tourism	Cnr Knight & Stead Street Market Square Post Office Building NetlifeTowers 13th Floor Room 1313 Kimberley 8300	Private Bag X6108 Kimberley 8300	Head of Department: Mrs H Samson	(053) 839 4002	(053) 832 6805	npaulse@ncpg.gov.za Nadia Paulse	13 August 2018
Department of Roads and Public Works	9-11 Stokroos Street, Squarehill Park, Kimberley 8301	PO Box 3132 Kimberley 8301	Head of Department: Mr Kholekile Nogwili	(053) 839 2241 (053) 839 2100	(053) 839 2291	KNogwili@ncpg.gov.za	13 August 2018

Department	Physical Address	Postal Address	Contact	Tel Number	Fax Number	Email	Notification
Water Quality Management: Orange Proto-CMA	Department Of Water and Sanitation Louisvale Road Upington 8801	Private Bag X 5912 Upington 8800	Melinda Mei	0543385847 054 334 0205	054 334 0205	Mei Melinda (UPN) <MeiM@dws.gov.za>	13 August 2018
Department of Labour	Labria House Cnr Pniel & Compound Road Kimberley 8301	Kimberley 8301	Head of Department Mr Albanie	(053) 838 1500	(053)832 9386	zolile.albanie@labour.gov.za	13 August 2018
Department of Rural Development and Land Reform (DRDLR) - Land Claims	4th Floor Old SARS Building, Old Main Road, Kimberley, 8300	PO Box 2458, Kimberley 8300	Ms Mangalane Du Toit	(053) 807 5700		Mangalane.DuToit@drdlr.gov.za	13 August 2018
Eskom	Distribution division Eskom Road Brackenfell 7560		Andrea Van Gensen	021 980 3919 0219803817		vGenseAL@eskom.co.za	13 August 2018
Transnet	Admin-First floor, room BV3 Transnet Road Bloemfontein		Nokukhanya Gabela	051 408 3242		Nokukhanya.gabela@transnet.net	13 August 2018
Sanral	1 Havenga Street Oakdale 7530	1 Havenga Street Oakdale 7530 0	Environmental Coordinator Ms Nicole Abrahams	062 215 8945 021 957 4600/2		AbrahamsN@nra.co.za	13 August 2018
South African Heritage Resource Agency Upload on System		PO Box 4637 Cape Town	Katie Smuts	021 462 4502	021 462 4509	ksmuts@sahra.org.za	13 August 2018

Table 2: Registered landowners and I&AP's

PROPERTY DESCRIPTION			I&AP	DESIGNATION		TITLE DEED	POSTAL ADDRESS	PHYSICAL ADDRESS	TELEPHONE	FAX	CELL	EMAIL	PUBLIC PARTICIPATION ACTION/STEPS
Cadastral Code	**FARM**	**PTN**											**NOTIFICATION**
LAND OWNERS, LAND USERS AND COMMUNITIES													
C06000000000001800000	Middelwater 18	**0**	Hart Petrus Jacobus De Trustees	**Elsie JJ C De Hart**			La Vie Singel Nommer 4, Groenleegte, Paarl; Cape Town	12 Pasteur Street, Hospitaalpark, Bloemfontein, 9305 Alana Laan 5B, Port Owen, 7365	053 353 3137 021 401 3082 022 783 0015			fatima.daniels@standardtrust.co.za	Email, Telephone Calls and Physical Letters by post.
Surrounding Landowners													
C06000000000001800001	Middelwater 18	**1**	Panagis Vervoer Pty Ltd	Pieter Barend Elardus En Cornelia Erasmus			Posbus 447, Douglas, 8730				Pieter 071 230 1669 Cornelia 082 466 2361	0712301669@gmail.com 0824662361@gmail.com	Email, Telephone Calls and Physical Letters by post.
C06000000000001800002	Middelwater 18	**2**	DB Lubbe Familie Trust / Danrika Boerdery Monterey Plaas	Daniel Barend Lubbe			Posbus 441, Prieska, 8940		053 004 0039		082 801 4846	db.prieska@gmail.com	Email, Telephone Calls and Physical Letters by post.
C06000000000001700002	Nauga 17	2	Hentiq 2338 PTY Ltd				Spitskop Farm, Prieska, Northern Cape, 8940						Physical Letters by post.
C06000000000001700004	Nauga 17	4	Hentiq 2338 PTY Ltd				Spitskop Farm, Prieska, Northern Cape, 8941						Physical Letters by post.
C03100000000032600000	Hakschin 326	0	DJ Cloete & Fourie Pty Ltd				P O Box 199, Prieska, 8940 Posbus 10, Koegasbrug, 8920 PO Box 73,Prieska, 8940 PO Box 102,Marydale. 8910		053 353 1768 / 541 825 321				Telephone Calls and Physical Letters by post.
C03100000000032700001	Bultfontein 327	1	Great Force Investments 3 Pty Ltd				PO Box 895, Robertson, 6705						Physical Letters by post.
C03100000000033100002	Folmink 331	2	Great Force Investments 3 Pty Ltd				PO Box 895, Robertson, 6705						Physical Letters by post.
C03100000000033100004	Folmink 331	4	K & G Vlok Trust				PO Box 7166, Flamwood, Klerksdorp, 2572						Physical Letters by post.

PROPERTY DESCRIPTION			I&AP	DESIGNATION		TITLE DEED	POSTAL ADDRESS	PHYSICAL ADDRESS	TELEPHONE	FAX	CELL	EMAIL	PUBLIC PARTICIPATION ACTION/STEPS
Cadastral Code	**FARM**	**PTN**											**NOTIFICATION**
C03100000000033100006	folmink 331	6	K & G Vlok Trust				PO Box 7166, Flamwood, Klerksdorp, 2573						Physical Letters by post.
C03100000000033200001	Klooffontein 332	1	K & G Vlok Trust				PO Box 7166, Flamwood, Klerksdorp, 2574						Physical Letters by post.
C03100000000033200002	Klooffontein 332	2	K & G Vlok Trust				PO Box 7166, Flamwood, Klerksdorp, 2575						Physical Letters by post.
C03100000000033200004	Klooffontein 332	4	GF Diamond Mining PTY Ltd				1 Noakes Ave, De Beers, Kimberley, Northern Cape, 8301						Physical Letters by post.
C03100000000033300000	Naragas 333	0	Naragas Farming CC				Posbus 32, Kimberley, 8300						Physical Letters by post.
C03100000000033900000	naauwte 339	0	Naauwte Boerdery CC				Posbus 73, Prieska, 8940						Physical Letters by post.
C03100000000059700000	Plaas 597	0	GF Diamond Mining PTY Ltd				1 Noakes Ave, De Beers, Kimberley, Northern Cape, 8301						Physical Letters by post.
			Lohan Faber					40 Bender Street, Kimberley, 8301					Physical Letters by post.
Non-Governmental Organisations													
			Orange Vaal River Users				PO Box 314, Douglas 8370						Physical Letters by post.

On-site notices were placed at the site entrance on the N10 and at Siyathemba Local Municipality in Prieska and at Niekerkshoop at the local shop on the 13th of August 2018. The project was also advertised in the Northern Cape Express on the 15th of August 2018. The stakeholders and I&AP's will be notified of the availability of the Draft Basic Assessment Report (DBAR) for their perusal. A 30 days commenting period will be allowed for the perusal of the document. Comments received on the document will be added to the Final Basic Assessment Report (FBAR) to be submitted to DMR for review. See attached as Appendix G proof that the stakeholders and I&AP's were contacted.

iii) Summary of issues raised by I&AP's

(Compile the table summarising comments and issues raised, and reaction to those responses)

Interested and Affected Parties List the name of persons 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 paragraph reference in this report where the issues and or response were incorporated.**
AFFECTED PARTIES				
Landowner/s				
Hart Petrus Jacobus De Trustees	N/A	N/A	N/A	N/A
Lawful occupier/s of the land				
N/A	N/A	N/A	N/A	N/A
Landowners or lawful occupiers on adjacent properties				

Panagis Vervoer Pty Ltd	27 August 2018 25 October 2018	N/A **OBJECTION AGAINST AN APPLICATION FOR A PROSPECTING RIGHT: MIDDELWATER EXPLORATION CO (PTY) LTD / MIDDELWATER 18** We confirm that we act on behalf of Panagis Vervoer (Pty) Ltd, who is the surface owner of Portion 1 (Dagbreek) of the farm Middelwater 18, Registration Division: Prieska, Northern Cape Province, Extent: 4282.6508 hectares, held under Title Deed: T62464/2009. Our client is a neighbour and thus an interested and affected party in the application for the prospecting right by Middelwater Exploration Co (Pty) Ltd ("the Applicant") on the Remaining Extent of the farm Middelwater 18, Registration Division: Prieska, Northern Cape Province, Extent: 6821.1414m, held under Title Deed: T11568/1967, by the Trustees of the Petrus Jacobus de Hart Trust, to prospect for Beryllium, Cobalt, Copper, Fieldspar, Gold, Iron Ore, Lead, Lithium, Manganese, Mica, Nickel, Silver, Tantalum, Tin, Tungsten, Uranium and Zinc. We request that all future correspondence is directed to our office for the attention of Japie van Zyl. In terms of Regulation 41(2)(b)(ii) of the National Environmental Management Act ("NEMA") a neighbour of a farm over which an application for a prospecting right is submitted is an interested and affected party who must be consulted with. Our client was not consulted with as interested and affected party. We have notified the Department of Mineral Resources ("DMR") that we object against the application for the prospecting right. The Constitutional Court has held in the Bengwenyama Minerals (Pty) Ltd case that consultation regarding a prospecting right, means: *(a) inform the landowner in writing that his application for prospecting rights on the owner's land has been accepted for consideration by the Regional Manager concerned;* *(b) inform the landowner in sufficient detail of what the prospecting operation will entail on the land, in order for the landowner to assess what impact the prospecting will have on the landowner's use of the land;* *(c) consult with the landowner with a view to reach an agreement to the satisfaction of both parties in regard to the impact of the proposed prospecting operations;"* As advised herein, the applicant has not fulfilled the duty to consult with our client as interested and affected party. As our client is entitled to the information relating to the application for the prospecting right permit we kindly as a matter of urgency request: a copy of the application for the prospecting right; 1. a copy of the prospecting work programme; 2. a copy of the environmental management plan (including but not limited to the scoping reports and the application for the environmental authorization); 3. proof of the applicants access to financial resources and technical ability to conduct 4. the prospecting operations optimally; 5. a copy of the financing plan; 6. reasons why the prospecting will not results in unacceptable pollution, ecological degradation or damage to the environment; 7. proof that the applicant has the ability to comply with the relevant visions of the Mine	N/A Dear Mr van Zyl, The above matter as well as your letter dated 23 October 2018 refers. Your client (Panagis Vervoer (Pty) Ltd) has indeed been registered as an interested and affected party and have been consulted with regards to this application. Please find attached hereto the background information document sent to your client, as well as proof that it was delivered. We would also like to confirm that your client, whilst registering as an I&AP indicated that they have no objections to the proposed prospecting right application. Please also find attached hereto the completed forms received from your client. Also attached hereto is the regulation 2.2 map, as requested. Therefore your correspondence came as quite a surprise to us as your client already indicated that there is no objection to this application. We would like to bring to your attention that your quoted case of Bengwenyama Minerals (Pty) Ltd refers to consultation with the landowner with regards to a prospecting right application. Your client is however not the landowner, but only a neighbour to the property on which the application is made. Please note that your client will continue to receive information on the progress of this application and will also be invited to a public participation meeting. We trust you will find this in order.	N/A N/A all information is provided with this DBAR.

Interested and Affected Parties List the name of persons 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 paragraph reference in this report where the issues and or response were incorporated.**
		Health and Safety Act; 8. a copy of the Regulation 2(2) map. We kindly also receive the following information: 1. When and where will the foreseen activities be undertaken? 2. How many people will be employed for the prospecting activities and be present while prospecting is conducted? 3. How the applicant foresees to get access to the Property? 4. We need full particulars of the rehabilitation plan. How rehabilitation will be conducted and the amount to be provided as a rehabilitation guarantee? 5. Where will water be obtained? 6. What will be done to comply with the Mine Health and Safety Act and to prevent damages and losses to and of animals, people, etc.? 7. How dust control will be undertaken? 8. How many earth moving machines will be brought to the Property? 9. Why will the prospecting activities not result in significant pollution, ecological degradation and damage to the environment? 10. Copies of all the specialist studies undertaken. 11. A copy of the technical and financial report submitted with the application for the prospecting right. 12. Copies of all the documents that makes up the public participation process. 13. Copy of the acceptance letter. 14. Copies of all the documents that made up the application for the prospecting right. Our client reserves her rights to amplify her objection once the information and documents as requested have been provided and our client had the opportunity to study these. All our client's rights are and remain reserved.		

Interested and Affected Parties List the name of persons 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 paragraph reference in this report where the issues and or response were incorporated.**
DB Lubbe Familie Trust / Danrika Boerdery Monterey Plaas	N/A	N/A	N/A	N/A
Hentiq 2338 PTY Ltd	N/A	N/A	N/A	N/A
DJ Cloete & Fourie Pty Ltd	N/A	N/A	N/A	N/A
Great Force Investments 3 Pty Ltd				
K & G Vlok Trust				
GF Diamond Mining PTY Ltd				
Naragas Farming CC				
Lohan Faber				

Interested and Affected Parties List the name of persons 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 paragraph reference in this report where the issues and or response were incorporated.**
Municipal councillor				
Siyathemba Local Municipality *Ward 5* PIETER WILLEM SAAIMAN	N/A	N/A	N/A	N/A
Municipality				
Siyathemba Local Municipality Municipal Manager GERT JOHANNES BESSIES	N/A	N/A	N/A	N/A
Pixley Ka Seme District Municipality Mr D Molaole PA/ Tembe	N/A	N/A	N/A	N/A
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWS				

Interested and Affected Parties List the name of persons 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 paragraph reference in this report where the issues and or response were incorporated.**
Department of Environment and Nature Conservation (DENC) Natalie Uys *Pr.Sci.Nat.* Production Scientist Grade B: Botanist	6 September 2018	Please take note provincial permits are needed for drilling at sites where any specially protected and protected plant and animal species are impacted / destroyed/ moved in terms of the Northern Cape Nature Conservation Act no 9 of 2009. Permits are also needed for instances where indigenous plant species are impacted up to 100m from middle of roads and rivers (regulation 51(1)) or for large scale clearing (regulation 51 (2)). An offset study is needed as the development falls in a CBA area. Please also consult the FEPA map and the Wetland offset guide as the one section in your map looks like it could be a possible drainage line. Wetland offset guide http://www.wrc.org.za/Knowledge%20Hub%20Documents/Research%20Reports/TT%20660%20-%20Jo_web.pdf	Thank you for the information regarding the provincial permits needed for the prospecting site. All prospecting activities will be taking place in the already existing gravel/farms roads and no areas will need to be opened for the proposed prospecting activities. If we need to open an area where protected plant or animal species occur, we will apply for the relevant permits. We are also in process of appointing a Botanical and Wetland Specialist to conduct studies on the farm.	N/A
Department Agriculture, Forest and Fisheries Mrs. Jacoline Mans	21 August 2018	The company is to not cut, disturb or destroy any protected tree. The company is not to possess, collect remove or transported any protected trees without any permissions form the minister. Licence needs to be obtained if any protected tree must be removed that would be valid for 2 years. protected trees are located in the area, where a buffer should be maintained. CBA of the Northern cape map must be overlayed to see if the site falls within in CBA area. DENC must be contacted.	No removal, destroying or cutting any protected trees as listed by the commenting letter. Map of the proposed prospecting site on the Northern Cape Critical Biodiversity Area (CBA) as requested in point 2.3. From this map, the proposed prospecting area does fall within a CBA and ESA and therefore Nature Conservation will be consulted.	

Interested and Affected Parties List the name of persons 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 paragraph reference in this report where the issues and or response were incorporated.**
Department of Economic Development and Tourism Head of Department: Mrs H Samson Nadia Paulse	N/A	N/A	N/A	N/A
Department of Roads and Public Works Head of Department: Mr Kholekile Nogwili	N/A	N/A	N/A	N/A
Water Quality Management: Orange Proto-CMA Department of Water and Sanitation Melinda Mei	N/A	N/A	N/A	N/A

Interested and Affected Parties List the name of persons 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 paragraph reference in this report where the issues and or response were incorporated.**
Department of Labour Head of Department Mr Albanie	N/A	N/A	N/A	N/A
Communities				
N/A	N/A	N/A	N/A	N/A
Dept. Land Affairs				
Department of Agriculture, Land Reform and Rural Development Head of Department: Mr W D Mothibi	N/A	N/A	N/A	N/A
Traditional Leaders				
N/A	N/A	N/A	N/A	
Dept. Environmental Affairs				
N/A	N/A	N/A	N/A	
Other Competent Authorities affected				

Interested and Affected Parties List the name of persons 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 paragraph reference in this report where the issues and or response were incorporated.**
South African Heritage Resource Agency Natasha Higgit	12 September	The developer is to ensure that a HIA is done together with a Palaeontological Assessment as the proposed prospecting right falls within a moderate to high sensitivity in terms of palaeontological resource area.	HIA and Palaeontological Assessment will be conducted.	Please refer to Section of the report
INTERESTED PARTIES				

iv) The Environmental attributes associated with the alternatives.

(The environmental attributes described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

(a) Type of environment affected by the proposed activity.

(Its current geographical, physical, biological, socio-economic, and cultural character)

(i) Climate

According to SA Explorer, Prieska normally receives about 132 mm of rain per year, with most rainfall occurring mainly during autumn. The Figure 1 below, the average rainfall values for Prieska per month. It receives the lowest rainfall (0 mm) in June and the highest (38 mm) in March. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Prieska range from 17.9 °C in June to 32.7 °C in January. The region is the coldest during July when the mercury drops to 1.3 °C on average during the night. Consult the Figure 1 below for an indication of the monthly variation of average minimum daily temperatures (Explorer, 2018)

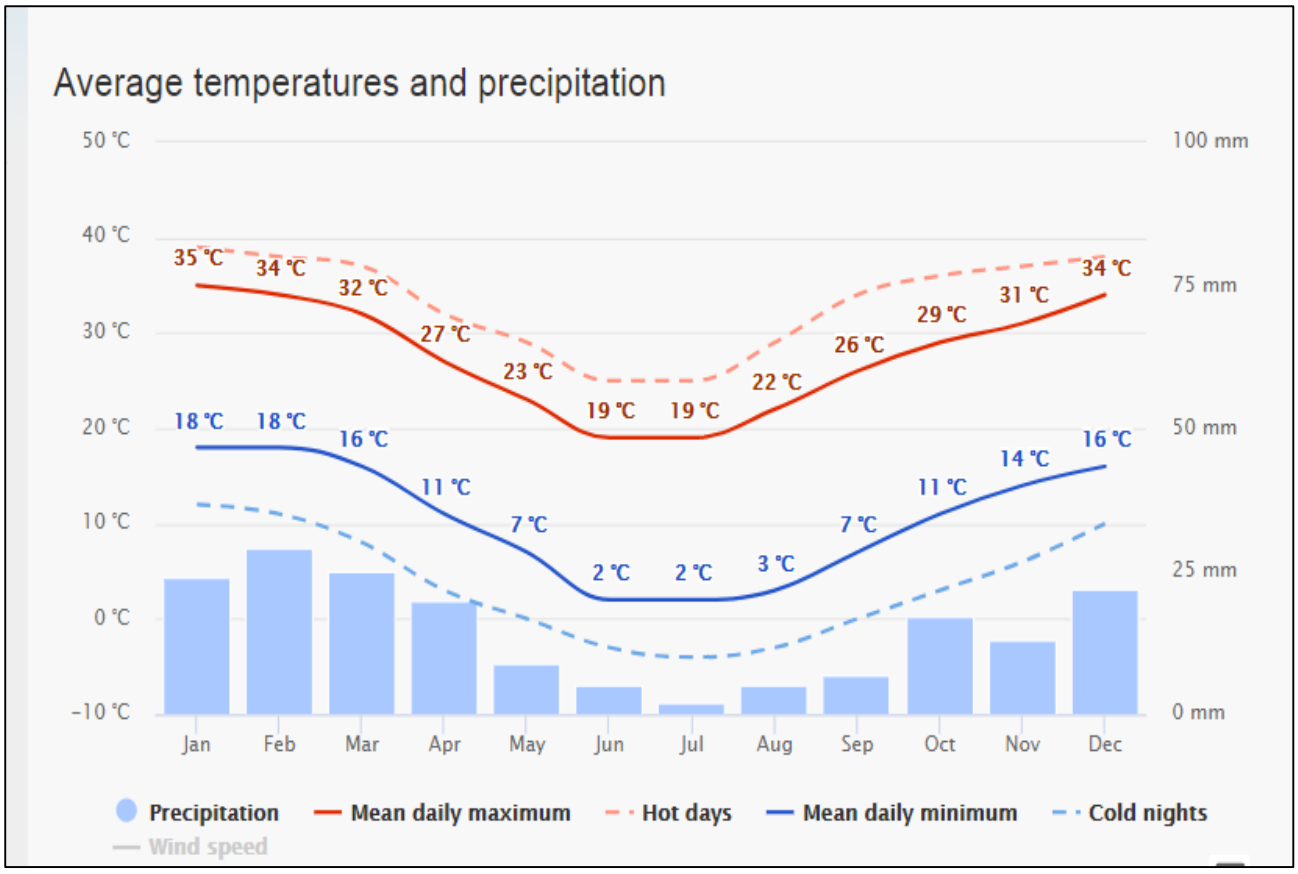

Figure 3: Average rainfall and Temperature for Prieska

Figure 4 shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast. As indicated in the figure below, sunny days are in June-July during winter, with overcast and precipitation days occurring in the summer season in March (Meteoblue, 2018).

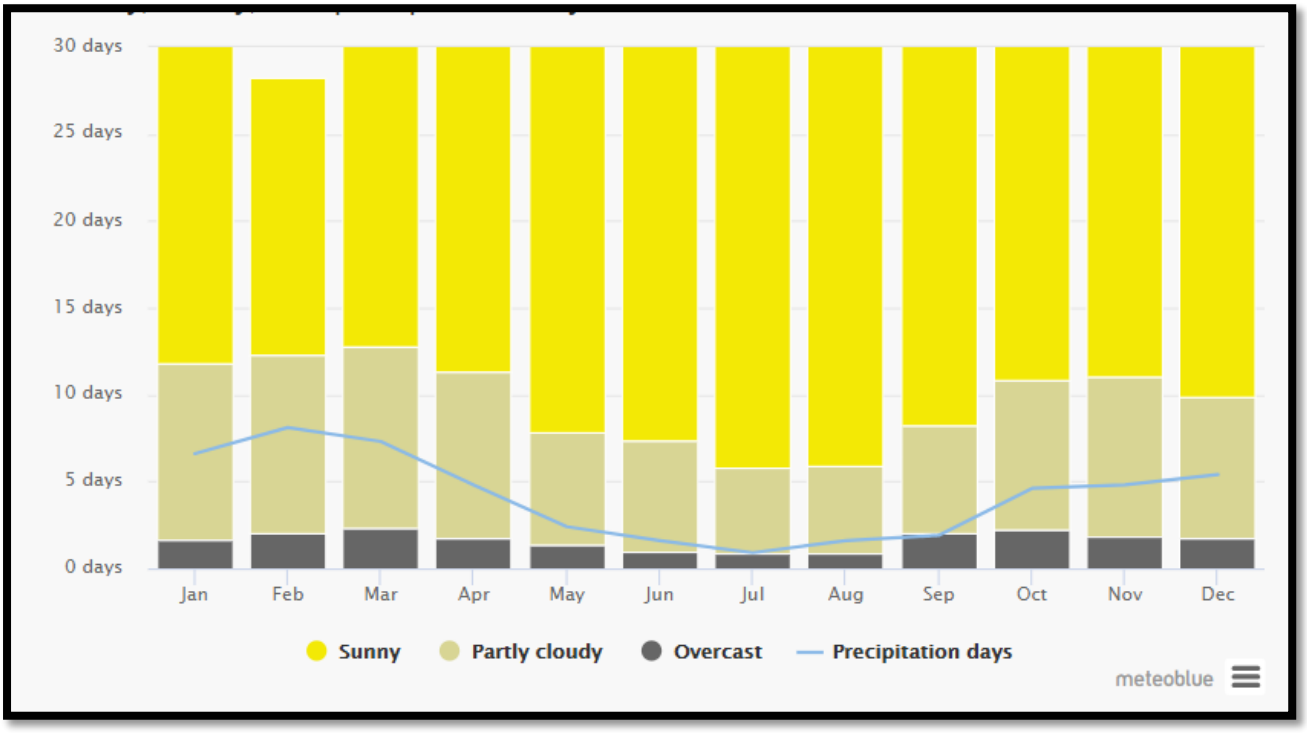

Figure 4: Cloudy, sunny and precipitation days of Prieska.

The maximum temperature diagram for Prieska displays how many days per month reach certain temperatures. As indicated in the figure below, the hottest temperatures occur during the summer season with temperatures reaching from 17.9 °C in June to 32.7 °C in January and the coldest during July when the mercury drops to 1.3 °C on average during the night when frost can occur. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Prieska range from 19.1 °C in June to 33.2 °C in January. The region is the coldest during July when the mercury drops to 1 °C on average during the night. Consult the figure below for an indication of the monthly variation of average minimum daily temperatures (Explorer, 2018) (Meteoblue, 2018).

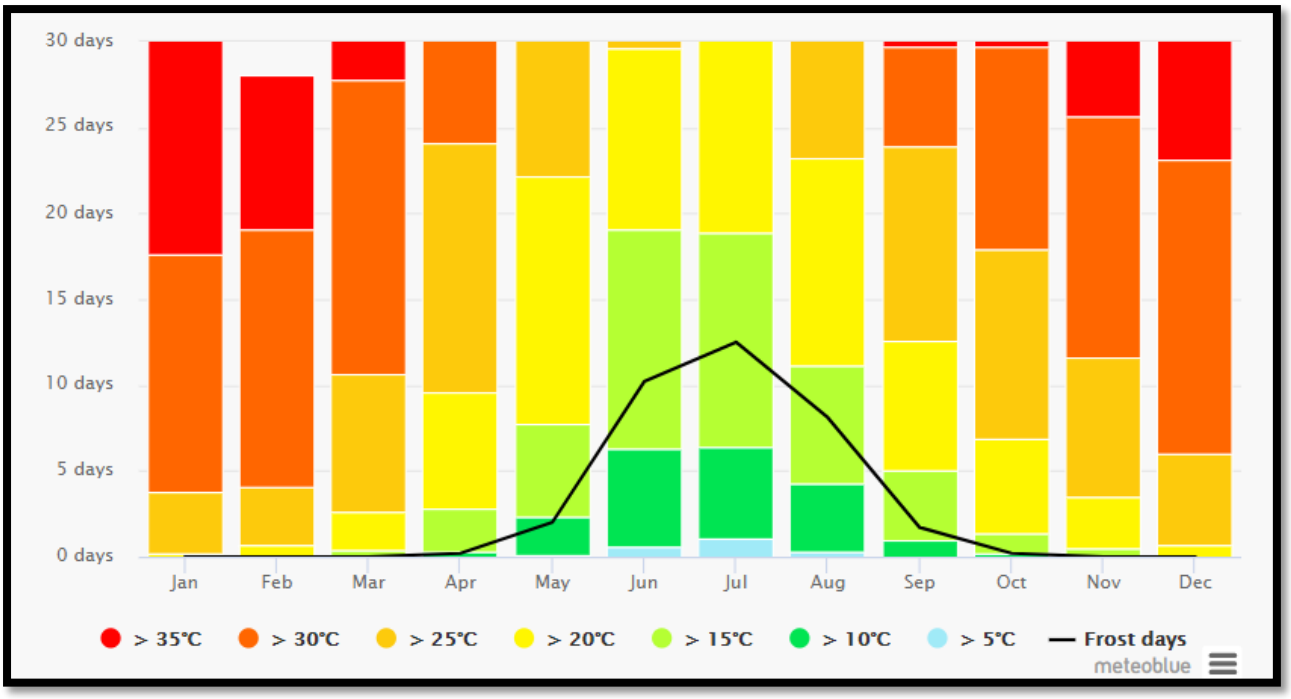

Figure 5: Maximum temperatures of Prieska.

The precipitation diagram for Prieska shows on how many days per month, certain precipitation amounts are reached. In tropical and monsoon climates, the amounts may be underestimated. Prieska normally receives about 132 mm of rain per year, with most rainfall occurring mainly during autumn. It receives the lowest rainfall in July and the highest in (38 mm) in March (Meteoblue, 2018) (Explorer, 2018).

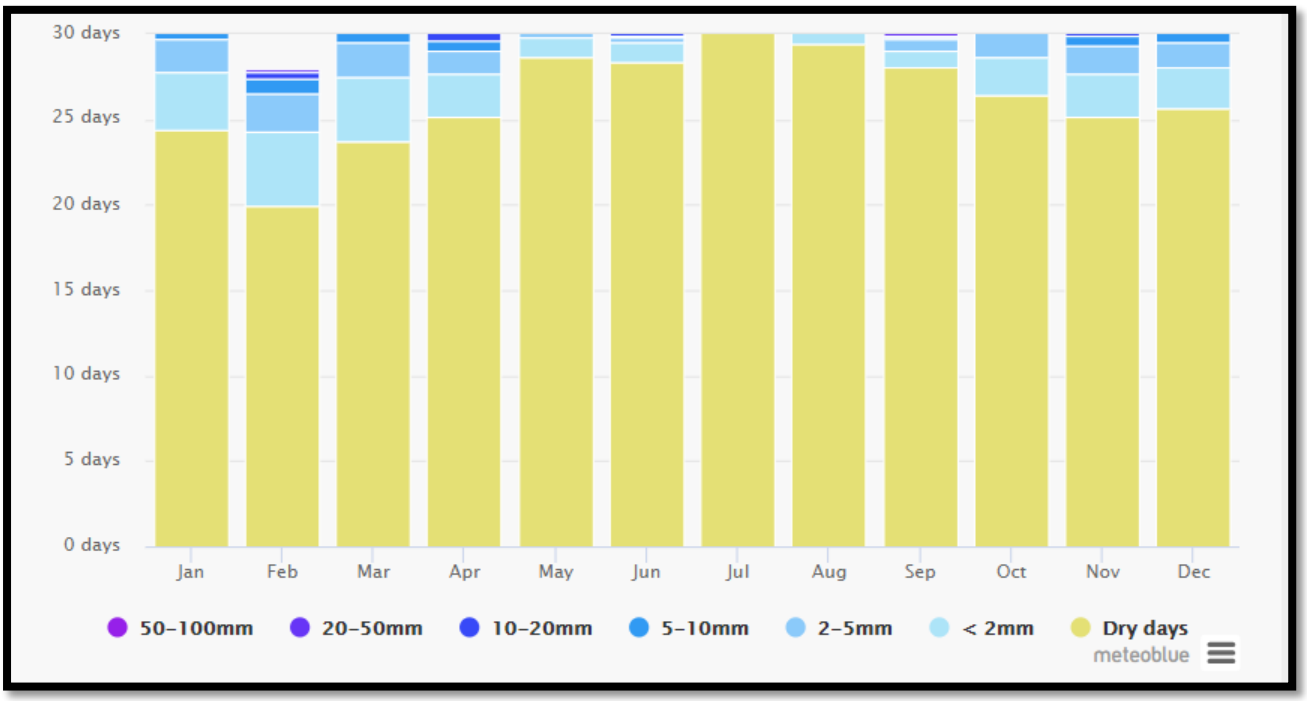

Figure 6: Precipitation amounts for Prieska.

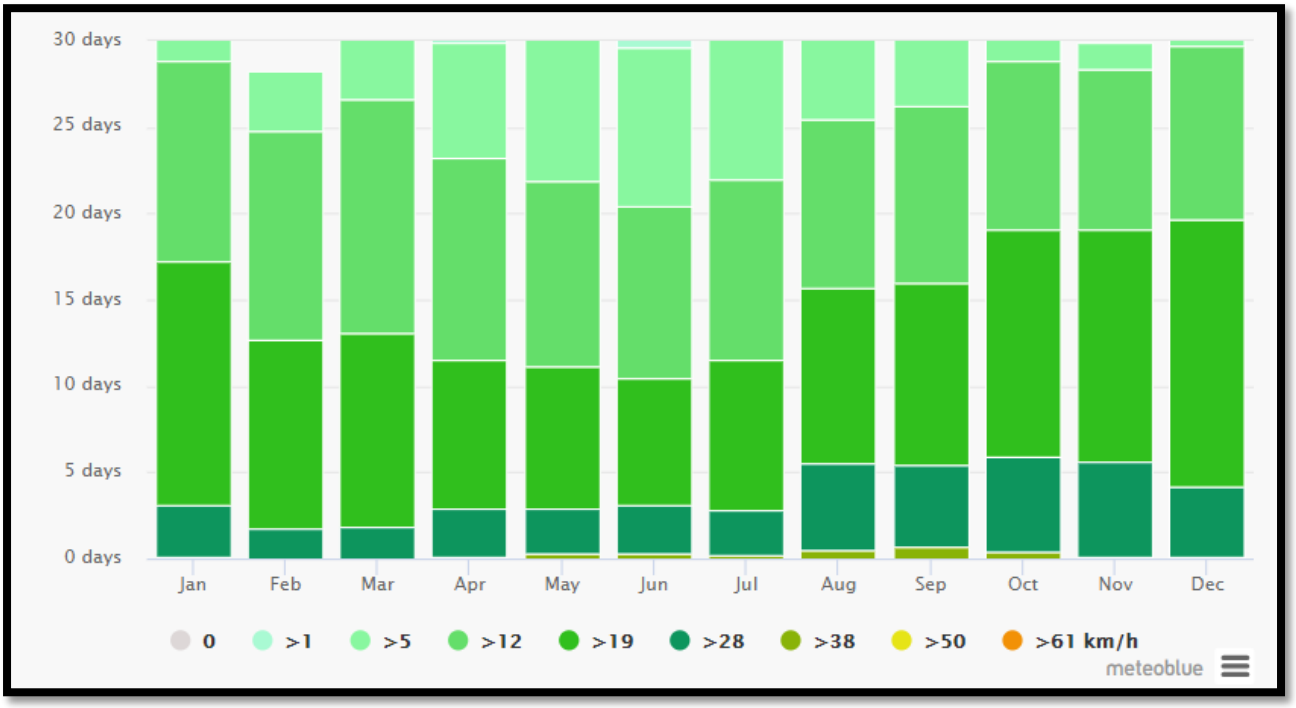

Figure 7: Average wind speeds in Prieska.

The diagram for Prieska shows the days per month, during which the wind reaches a certain speed. As seen from the figure above, the average wind speeds over the summer season is calculated to be about 19 km/h whereas in the winter season in drops to 12 km/h.

The wind rose for Prieska shows how many hours per year the wind blows from the indicated direction. As seen from the figure below, the average wind rose in Priska is a West, South Westerly wind, as well as a North-North Easterly wind, this can be during winter and summer times.

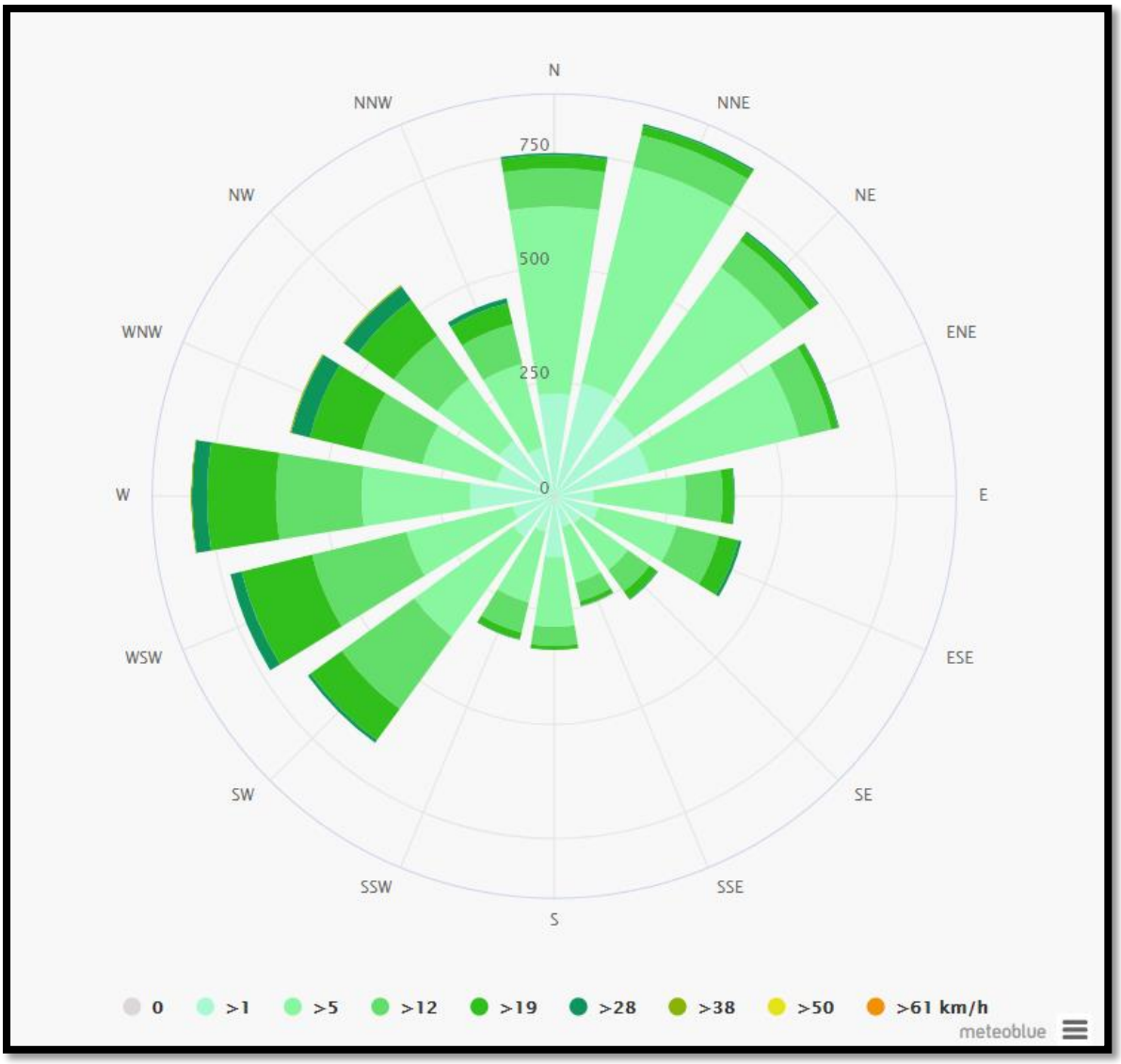

Figure 8: Wind rose for Prieska.

(ii) Geology

The Prieska/Marydale region is historically known for copper mineralization. The area includes the Copperton deposit that was discovered during the 1960's. This deposit was explored by Anglovaal and proved to have an ore reserve of 47 Mt (to a depth of 900m). The ore body was exploited between 1972 and 1991 and an average grade of 1,11% Cu and 2,62% zinc was extracted during this period.

A number of other copper deposits, including the Witkop (Cu-Zn-Ag-Au) property to the southwest of Marydale, is also present in the area. This specific deposit was explored and was subsequently purchased by the Australian company Orion Gold (Marydale Project).

Within this metallogenic terrain with a high density of copper occurrences, a copper gossan was discovered during a regional diamond exploration program that was conducted in the area during the 1990's. At the time, base metal mineralization was of no interest and the only reason for the identification of the copper mineralization was the fact that the gossan was visible below an alluvial diamond sequence sidewall cutting. Out of curiosity a grab sample was taken of this material and the sample subsequently returned an exceptionally high copper content of 35%. Because of the diamond priority of the program this result was never followed up.

Although the mineralised outcrop is small (1m x 2m), this occurrence is exceptional in that it is only exposed within a vertical river cutting, but also overlain by extensive fluvial gravels that blankets the lateral extent of the mineralization. Even though geological uncertainty exists the potential monetary value at such a high-grade occurrence is substantial.

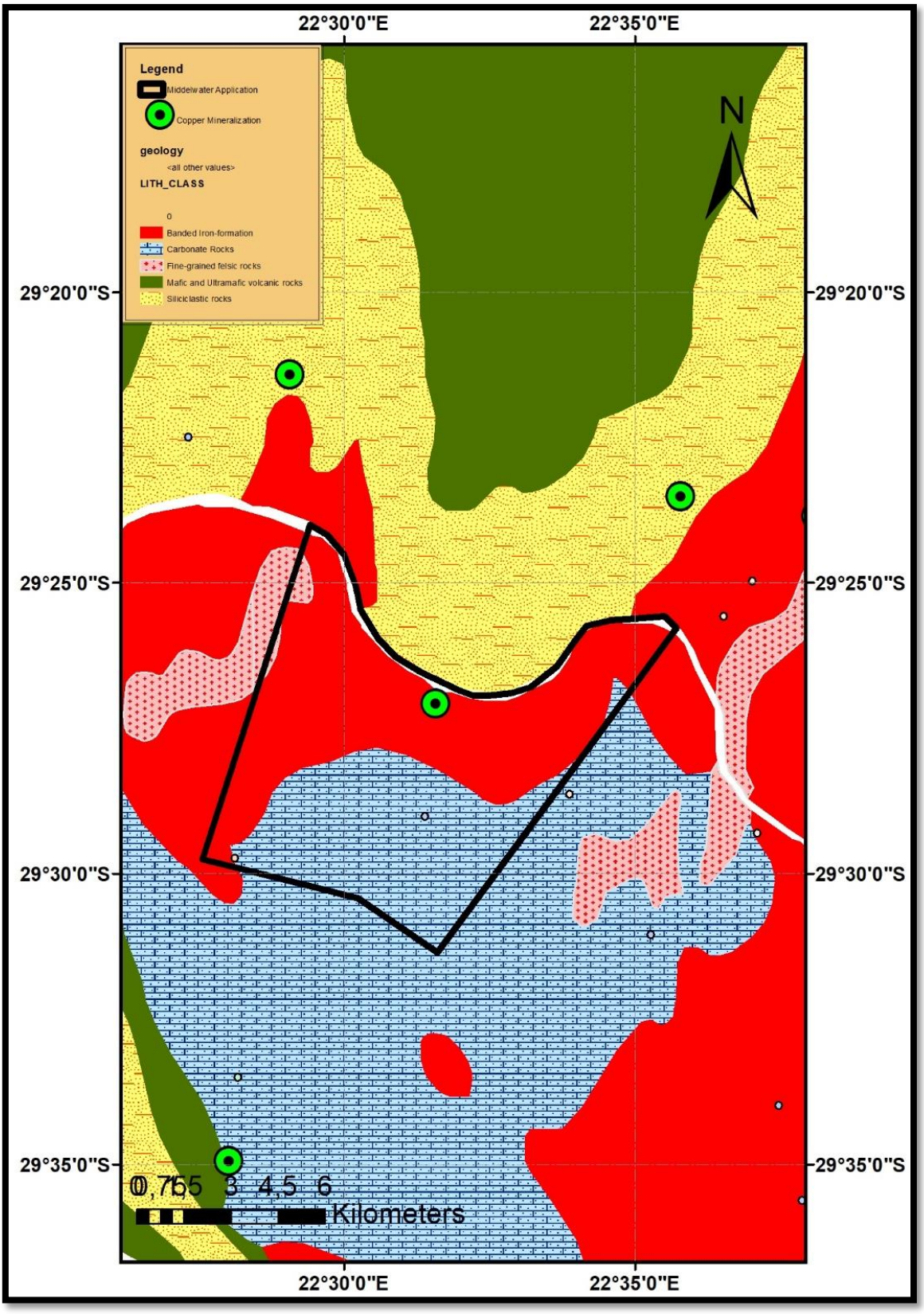

Figure 9: Geology map of the proposed prospecting right area

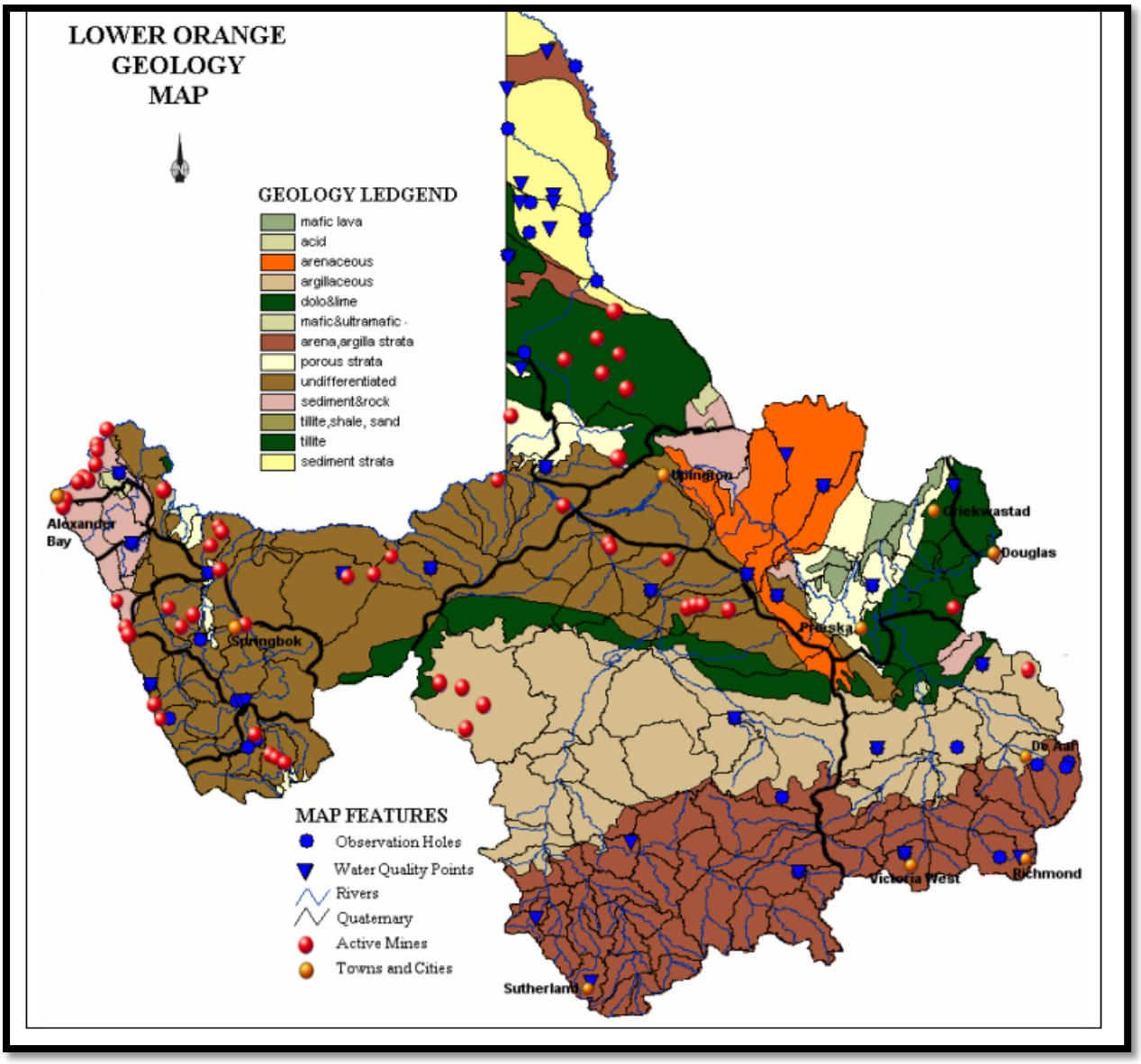

Figure 10: Simplified Geology of the WMA

(iii) Topography

The North Eastern, Eastern and South Eastern parts to the property are relatively flat, sloping from East to West. On the North Western, South Western and Western areas of the property, a 4.5 km long slope sloping steeply from West to East runs from the North Western border of the property towards the centre. The steep slope leads up to two peaks on the West and subsides gently towards the South. Flat to gently sloping, with isolated hills of upper karoo hardeveld in the south and vaalbos rocky shrub land in the northeast and with many interspersed pans.

The altitude in the area varies from 1000-1500 m.

(iv) Soil, land use and land capability

The area was initially populated by Bushmen hunters and more recently by sheep-herding Khoikois. Minerals and water from the Orange River were the key elements for economic development in the region, and still remain so. Copper was discovered near Springbok in 1850, which led to the first commercial mine in South Africa. The first diamond in the country was discovered in 1866, when a young boy found a transparent stone on the south bank of the Orange River. The first irrigation scheme of note was built at Upington, which was originally established as a trading station for items such as copper, iron, assegais, ivory, skins and tobacco. Construction of the weir at Boegoeberg for irrigation purposes began in 1906, and in 1914 the first hydro-electric plant on the Orange River was built near Kakamas (DWAF, ISP Lower Orange WMA, 2004).

Great expansion of irrigation was made possible along the Orange River by the construction of Gariep and Vanderkloof Dams (in the Upper Orange water management area) during the 1970's. Since the early explorations large mining operations, related to the diamonds and other minerals have been established. From a land use perspective, the water management area still remains almost totally under natural vegetation. Sheep and goat farming is practised over most of the area. Large parts of the WMA also include conservation areas. Cultivation is restricted to isolated patches where somewhat higher rainfall occurs, and irrigation in the narrow ribbon of fertile alluvial soils along the Orange River valley.

Large mining operations occur in various parts of the water management area (some of the diamond mining activities along the coast are not reflected on the map). There are no large urban developments or power stations in the water management area. Due to the arid climate, no afforestation occurs. Invading alien vegetation is found along some tributary water courses and on the banks of the Orange River and is a problem in some localised areas (DWAF, 2003b). The main activities in the WMA are therefore mining and irrigation. Extensive irrigation is practised along the Orange River. This irrigation is supplied with releases from the Vanderkloof and Gariep dams. It is not expected that there will be any significant growth in the water requirements in the WMA.

The water availability along the main stem of the Orange depends on releases from upstream, as the WMA itself generates very little runoff. Groundwater plays a major role in meeting the water requirements of the towns and rural settlements along the tributaries of the Orange although the volumes are not large. The water balance for the WMA shows that supply and demand are currently almost in balance. Through its interdependence with other water management areas, it is essential that water resource management in the Lower Orange WMA should be well co-ordinated with these water management areas, particularly in the Orange/Vaal Basin, and that it should be viewed in an integrated systems context (See Orange River System Overarching ISP; DWAF, 2004a).(DWAF, ISP Lower Orange WMA, 2004)

Pre- prospecting Land Capability

Most of the land is used for grazing, by sheep (for mutton, wool and pelts) and goats, which can be commensurate with conservation. However, under conditions of overgrazing, many indigenous species may proliferate, including *Threethorn Rhigozum trichotomum, BitterbosChrysocoma ciliata* and Sweet Thorn Acacia karroo, and many grasses and other palatable species may be lost. There are very few rare or Red Data Book plant species in the Nama Karoo Biome.

Land use

The current land use can be identified as for grazing. Woodland/Open bush is scattered throughout the site covering Low shrub land which covers majority of the site, there is also evidence of isolated Grasslands.

There are sections of isolated Bare or none vegetated land.

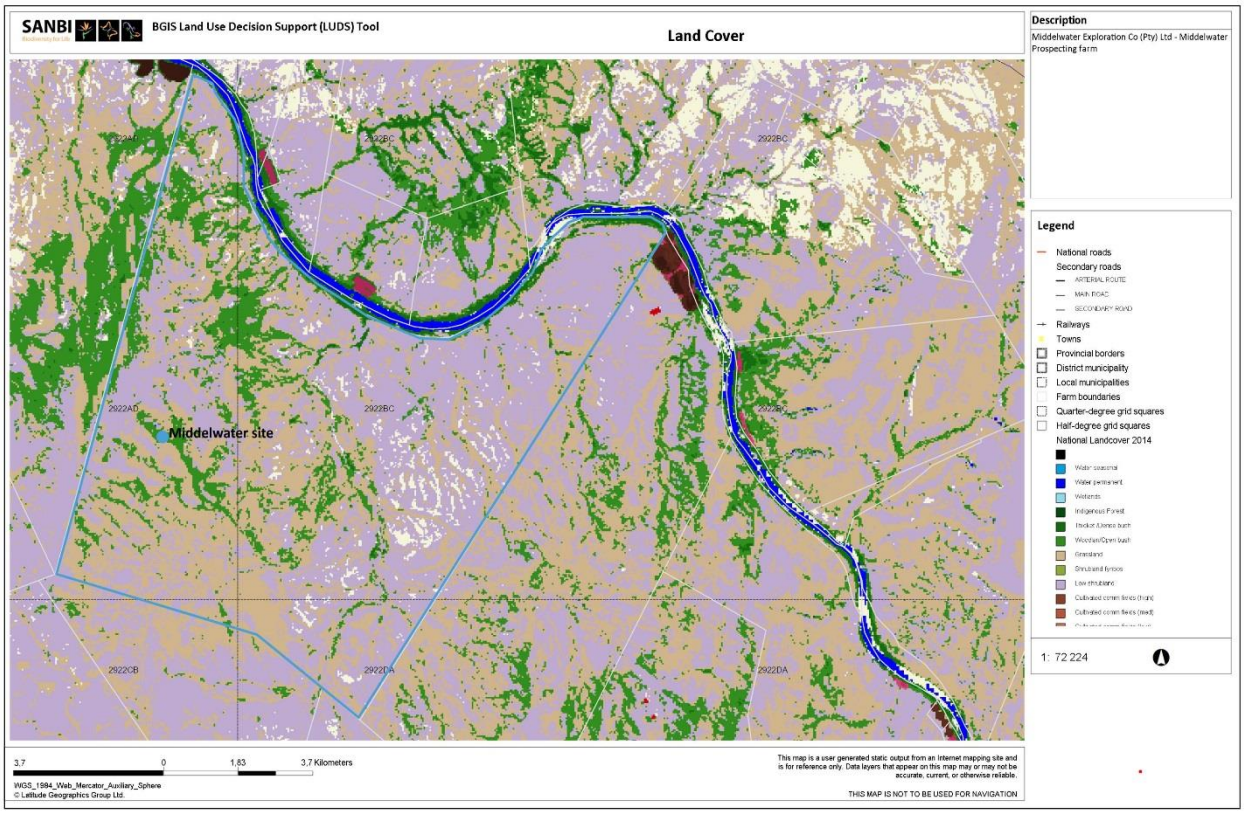

Figure 2: Land Cover of the Proposed Prospecting Right Area

Soil

Two different soil types are found on the property, the first soil type found near to the Western border of the property can be described as soil with minimal development, usually shallow, on hard or weathering rock, with or without intermittent diverse soils. Lime generally present in part or most of the landscape. The second group of second type of soils found on the Eastern half of the property is described as rock with limited soils.

Soils can be identified as lithosols, shallow soils on hard weathering rock. Soils are variable from shallow to dep, red-yellow apedal, freely drained soils to very shallow Glenrosa and Mispah forms. Mainly from the Ae, Ag, and Fc land types (19, 2006).

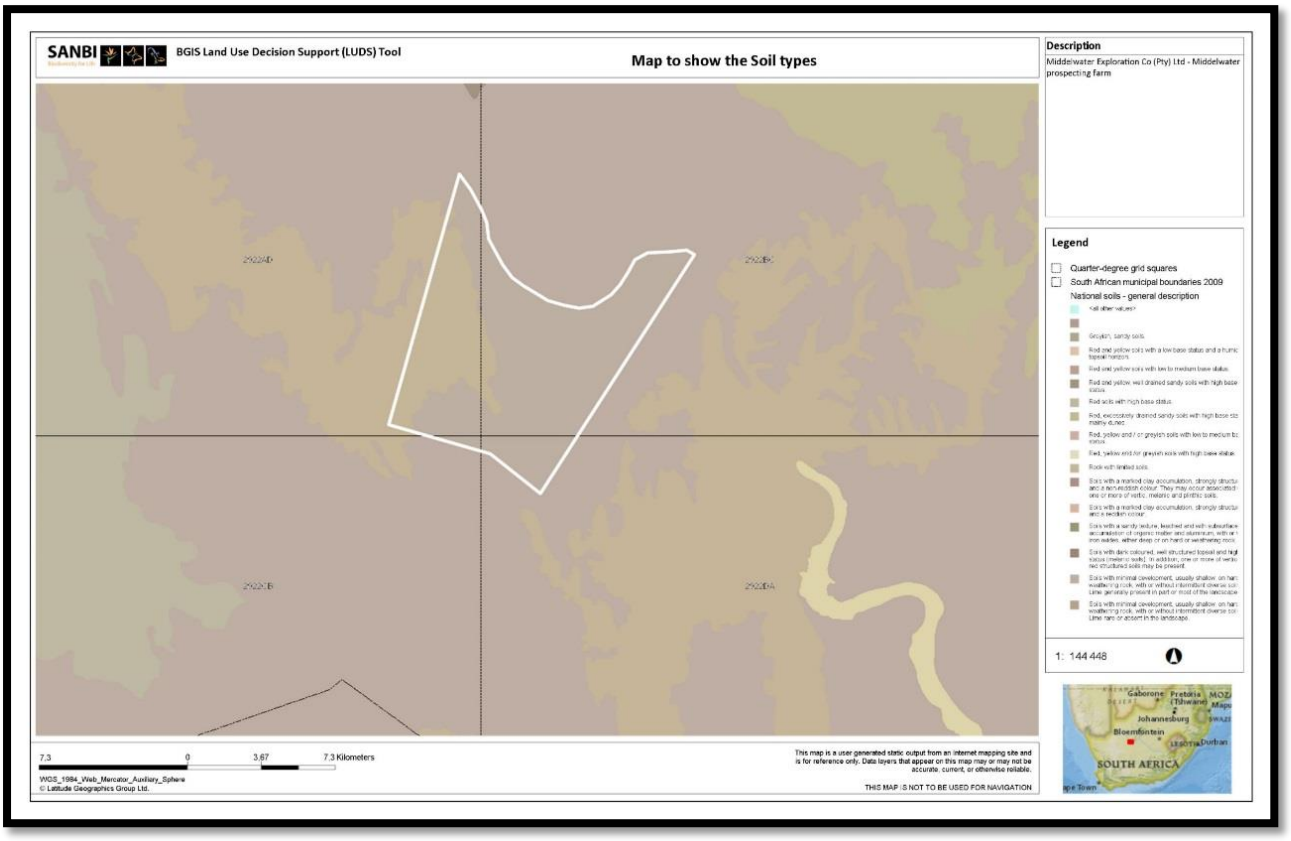

Figure 11: Soil Patterns of the Proposed Prospecting Right Area

Soil

The soil, derived in the study under arid conditions from sedimentary rock, igneous intrusions (mainly Jurassic dolerite) and lime rich evaporative, are generally base-rich, weakly structured and skeletal. The Nama-Karoo biome s divided into several soil regions. In the north from Bushman land to Prieska, the most common soils are red and yellow sands to no –swelling clays, generally freely drained in / the A horizon is orthic as a typical of arid areas in south Africa. Durbibank areas are widespread and the course associated with them may be high in most plan nutrients, especially potassium. In dune areas, such as the Koa River, the soil is deep, uniform, coarse textured sand poor plant nutrients (19, 2006).

(v) Flora

The foremost part of the prospecting area comprises of natural vegetated areas representative of the Nama Karoo Biome, specifically the Northern Upper Karoo (NKu3). Shrubland dominated by dwarf karoo shrubs, grasses and *Accacia melifera* subsp . *detinens* and some other low trees (especially on sandy soils in the north parts and vicinity of the orange river). Flat to gently sloping, with isolated hills of upper karoo hardeveld in the south and vaalbos rocky shrub land in the northeast and with many interspersed pans.

The dominant vegetation is a grassy, dwarf shrubland. Grasses tend to be more common in depressions and on sandy soils, and less abundant on clayey soils. Grazing rapidly increases the relative abundance of shrubs. Most of the grasses are of the C4 type and, like the shrubs, are deciduous in response to rainfall events.
Less than 1% of the biome is conserved in formal areas. The Prickly Pear *Opuntia aurantiaca* and Mesquite *Prosopis glandulosa* are the major alien invader species. Urbanization and agriculture are minimal, and irrigation is confined to the Orange River valley and some pans.

Most of the land is used for grazing, by sheep (for mutton, wool and pelts) and goats, which can be commensurate with conservation. However, under conditions of overgrazing, many indigenous species may proliferate, including Threethorn *Rhigozum trichotomum, BitterbosChrysocoma ciliata* and Sweet Thorn *Acacia karroo*, and many grasses and other palatable species may be lost. There are very few rare or Red Data Book plant species in the Nama Karoo Biome.

As mentioned above the affected vegetation type is the Northern Upper Karoo (NKu3). Protected trees such as *Boscia albitura* is known to occur in the vicinity of Prieska. During vegetation disturbance (i.e drilling and sampling), Middelwater Exploration should note that no protected tree may be damaged or disturbed without a valid protected plants permit. The upper Gariep alluvial vegetation type is classified as vulnerable and impacts on this vegetation must be avoided as far as possible. Protected trees such as *Vachellia erioloba* is often found in this riparian vegetation type. Please refer to Figure 12 below regarding the critical biodiversity areas and ecological support areas of the ESA.

The drill sites will necessitate the removal of small amounts of indigenous vegetation per site. The environmental impact assessment will investigate the presence of sensitive vegetated areas within the proposed prospecting footprint, and advise on the position of the drill sites in order to minimise the impact of the activity on the receiving natural environment.

Conservation Areas

Least threatened. Target 21%. None conserved is stationary covered conservation areas. About 4% has been cleared for cultivation (the highest proportion of any type the Nama-Karoo) or irreversibly transformed by building of dams (Houtwater Kalkfontein, and Smart syndicate dams). Areas of human settlements are increasing in the northeaster part of this vegetation types.

Erosion is moderate (42.6%), very low (32%) and low (20%). Prosopis occurs in generally isolated patches with densities ranging from very scattered to medium (associated in the owner Vaal drainage system and the confluence with the orange river) to localised woodland on the western order of the unit with Busmansland basic shrubland.

Table 3: Important Taxa of the area.

Important taxa		
Small Trees		
Acacia melifera subsp detinens	Boscia albitrunca	
Tall Shrubs		
Lycium cinerium (d)	*Lycium horridum*	*Lycium oxycarpum*
Lycium schizocalyx	*Rhigozum trichotomum*	
Herbs		
Chamasyce inaequilatera	*Convovulus saffitatus*	*Dicoma capensis*
Gazania krebsiana	*Hermanniacomosa*	*Indigofera alterans*
Lessertua pauciflora	*Radyera urnes*	*Sesam capens*
Sutera pinnatifida		
Low Shrubs		
Chrysocoma ciliate (d)	*Gnidia polycephala*	*Pentzia calcarea*
Pentzia globsa	*Pentzia incana*	*Pentzia spinescens*
Rosenia humilis	*Amphiglossa triflora*	*Apotisum marlothii*
Apotisum spinescens	*Asparagu glaucus*	*Barelia rigida*
Berkeheya annectens	*Eriocephalus ericoides subs ericoides*	*Eriocephalus glandulous*
Eriocephalus spinescnes	*Eryops asparagoides*	*Felicia muricata*
Helichyrum luciliodes	*Hermannia sponisa*	*Leucas capensis*
Limeum aethiopicum	*Melolobium candicans*	*Microloma armatum*
Osteospermum leptoblum	*Osteospermum spinescens*	*Pegolettia retrofracta*
Pentzia lanata	*Phyllanthus madaspatensis*	*Plinthus karooicus*
Pternonia glauca	*Pteronia sorida*	*Selago geniculata*
Selago sacatilis	*Tetragonia arbuscula*	*Zygophyllum flexuosum*
Succulent herbs		
Hertia pallens	*Salsola calluna*	*Salsola glabrescebs*
Salsola rabieana	*Salsolatuberculata*	*Zygophyllum flexuisum*
Psilocaulon coriarium		
Semi parasitic Shrub		
Thesium hystrix		
Geophytic Herb		
Morea pallida		
Graminoids		
Aristida adscensionis	*A. Congesta*	*A. diffusa*
Enneapogon desvauxii	*Eragrostis lehmanniana*	*E. Obusta*
E. truncata	*Sporobulus fimbriatus*	*Stipagrostis obtusa*
Eragrostis biclour	*E. Porosa*	*Fingerhuhisa africana*
Herteropogn cotorurus	*Stipagrostis ciliata*	*Themenda Trianrda*
Tragus berteronianus	*Tragus koelerioudes*	*Tragus racemosus*

Table 4: Biographically Important Taxa

Biogeographically Important Taxa:		
Tall Shrub		
Gymmospria szyszylowiczii		
Herb (wester distribution limit)		
Convolvulysboedeckerarianus		

Endemic Taxon

Biogeographically Important Taxa:		
Succultent Shrub		
Lipthops hookeri	Stomatium pluridens	
Low Shrub		
Atripex spongoisa	*Galeniaexgua*	
Herb		
Manulea deserticola		

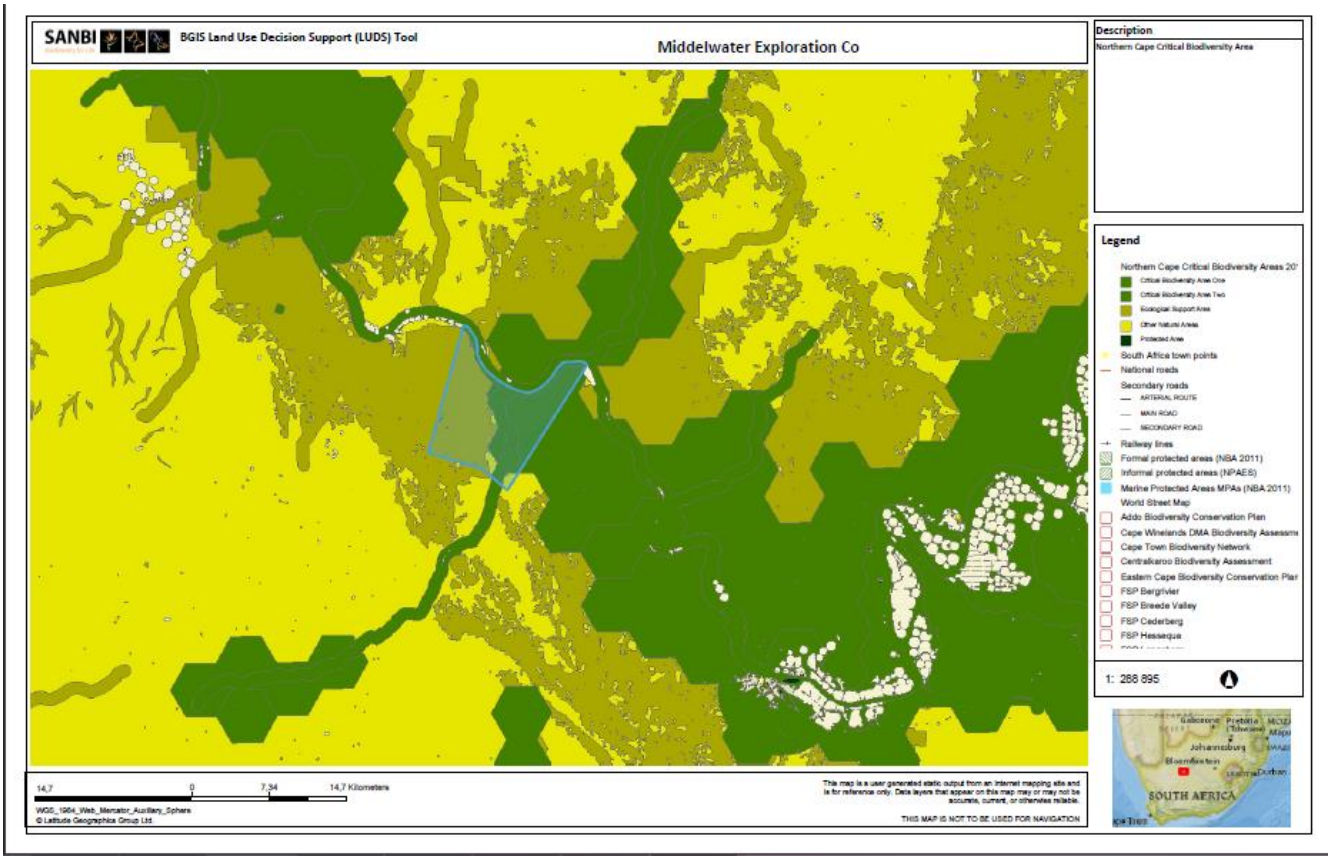

Figure 12: CBA map of Middelwater Exploration

From the response received from DENC, provincial permits needs to be obtained for drilling at sites where any specially protected and protected plant and animal species are impacted / destroyed/ moved in terms of the Northern Cape Nature Conservation Act no 9 of 2009. Permits are also needed for instances where indigenous plant species are impacted up to 100m from middle of roads and rivers (regulation 51(1)) or for large scale clearing (regulation 51 (2)).

An offset study is needed as the development falls in a CBA area. From this it has been concluded that an Ecological and Wetland Specialist needs to be consulted. his report will be included into the Final BAR.

(vi) Fauna

The large historical herds of Springbok and other game no longer exist. Like the many bird species in the area - mainly larks - the game was probably nomadic between patches of rainfall events within the biome. The Brown Locust and Karoo Caterpillar exhibit eruptions under similarly favourable, local rainfall events, and attract large numbers of bird and mammal predators. The fauna at the site will not be impacted by the proposed mining activity as they will be able to move away or through the site, without being harmed. Workers should be educated and managed to ensure that no fauna at the site is harmed.

The Savannahs of Africa are occupied by the earths richest and most spectacular large mammal fauna. Farming practices, prospecting and mining activities within and surrounding the proposed project area, have disturbed the local faunal population. No animals where spotted during the site inspection. The fauna at the site will not be impacted by the proposed mining activity as they will be able to move away through the site, without being harmed. Workers must be educated and managed to ensure that no fauna at the site is harmed.

Aquatic Environment.

The Orange river flows along the northern boundary of the proposed prospecting right area.

(vii) Surface water

The proposed site falls within the Lower Orange Water Management Area (WMA), specifically in the Orange Sub Water Management Area (Boegoeberg Sub Catchment), in the D72B quaternary catchment area.

The Lower Orange WMA is the lowest WMA in the Orange River Basin and as such is affected by upstream activities. The area is arid with rainfall varying from 400 mm in the east to 50 mm on the west coast. The topography of the area is flat with large pans or (endoreic areas that do not contribute runoff to the Orange River system.

The Orange River, which forms a green strip in an otherwise arid landscape, also forms the border between South Africa and Namibia over about 550 km to the west of the 20-degree longitude. The Vaal River, the main tributary to the Orange River, has its confluence with the Orange River about 13 km west of Douglas. Other tributaries are the Ongers and Hartebeest Rivers from the south, and the Molopo River and Fish River (Namibia) from the north. There are a number of highly intermittent water courses along the coast which drain directly to the ocean.

Sheep and goat farming is practised over most of the area. Large parts of the WMA also include conservation areas. Cultivation is restricted to isolated patches where somewhat higher rainfall occurs, and extensive irrigation is practised in the narrow ribbon of fertile alluvial soils along the Orange River valley. This irrigation is supplied by releases from the Vanderkloof Dam. Large mining operations occur in various parts of the water management area. There are no large urban developments or power stations. Groundwater plays a major role in meeting the water requirements of the towns and rural settlements along the tributaries of the Orange.

Less than 1% of the Gross Domestic Product (GDP) of South Africa originates from the Lower Orange WMA. The largest economic sectors (in 1997) in the water management, in terms of GGP, were:

- Government 19,4%
- Mining 17,4%
- Agriculture 15,9%
- Trade 15,1%

Economic activity is largely concentrated along the Orange River, with several towns located on the banks of the river, and at mining developments. The two major storage dams Gariep and Vanderkloof, which are both used to supply all the irrigation, urban, mining and environmental requirements along the Lower Orange River are located in the Upper Orange WMA, but are of vital importance to the Lower Orange. There are no large storage dams in the WMA, with only a few smaller dams on some of the main tributaries.
These include:

- Smartt Syndicate Dam on the Ongers River.
- Van Wyksvlei on the Carnarvonleegte.

There are also several diversion weirs of which Boegoeberg is the largest.

The Lower Orange WMA is the lowest WMA in the Orange/Vaal River Basin and as such is affected by upstream activities, both in terms of the Upper Orange and the Vaal System. The area is arid with rainfall varying from 400 mm in the east to 50 mm on the west coast. The topography of the area is flat with large pans or endoreic areas that do not contribute runoff to the Orange River system. The Orange River, which forms a green strip in an otherwise arid landscape, also forms the border between South Africa and Namibia over about 550 km to the west of 20 degrees' longitude. The Vaal River, the main tributary to the Orange River, has its confluence with the Orange River about 13 km west of Douglas. Other tributaries are the Ongers and Hartebeest Rivers from the south, and the Molopo River and Fish River (Namibia) from the north. There are a number of highly intermittent water courses along the coast which drain directly to the ocean. Refer to Figure C1 in Appendix C for the location and general layout of the water management area.

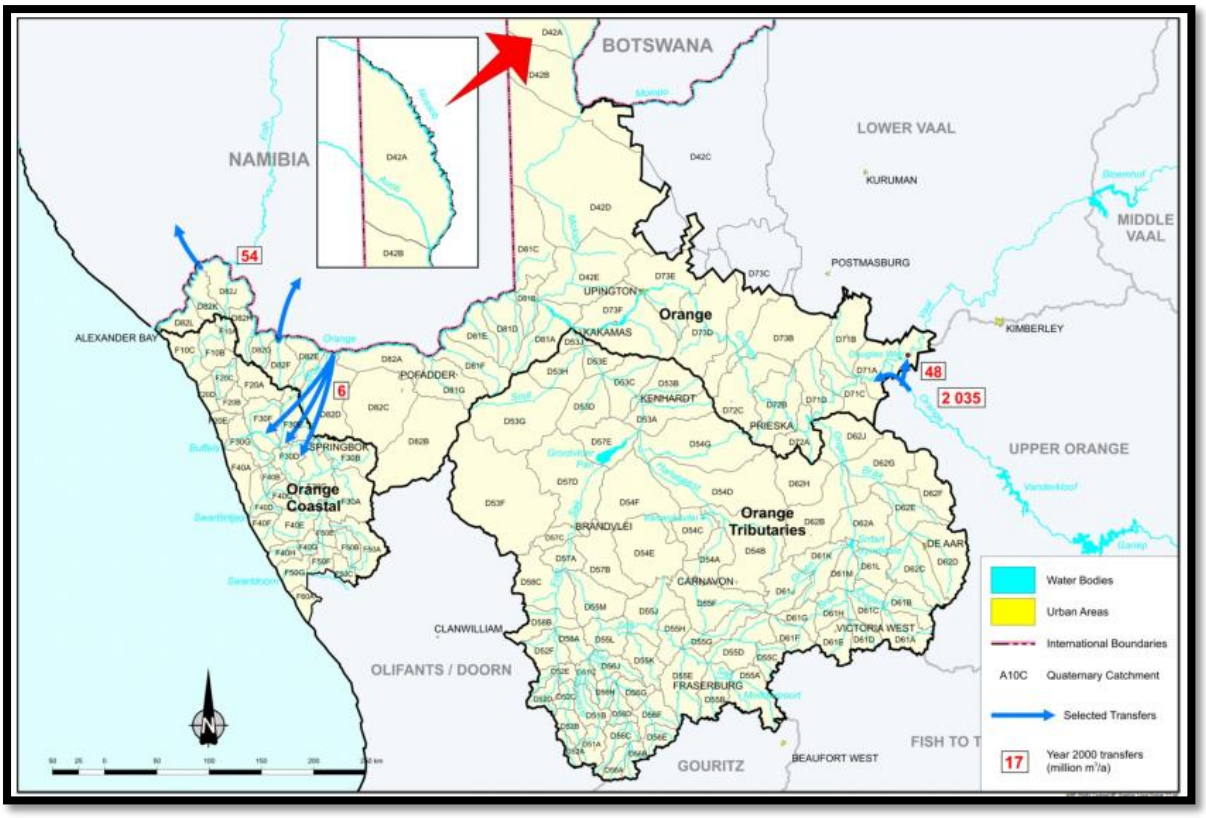

Figure 13: Lower Orange transfers

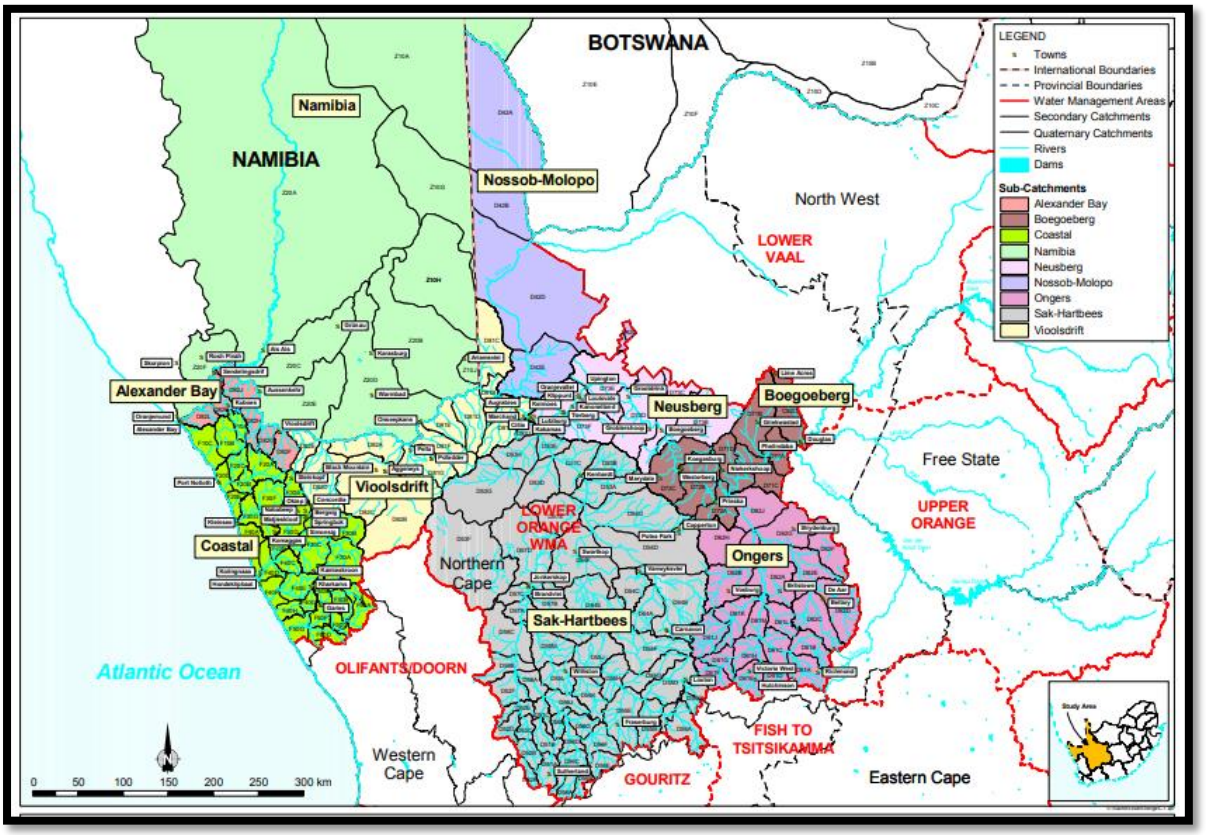

Figure 14: Sub Catchments in the WMA

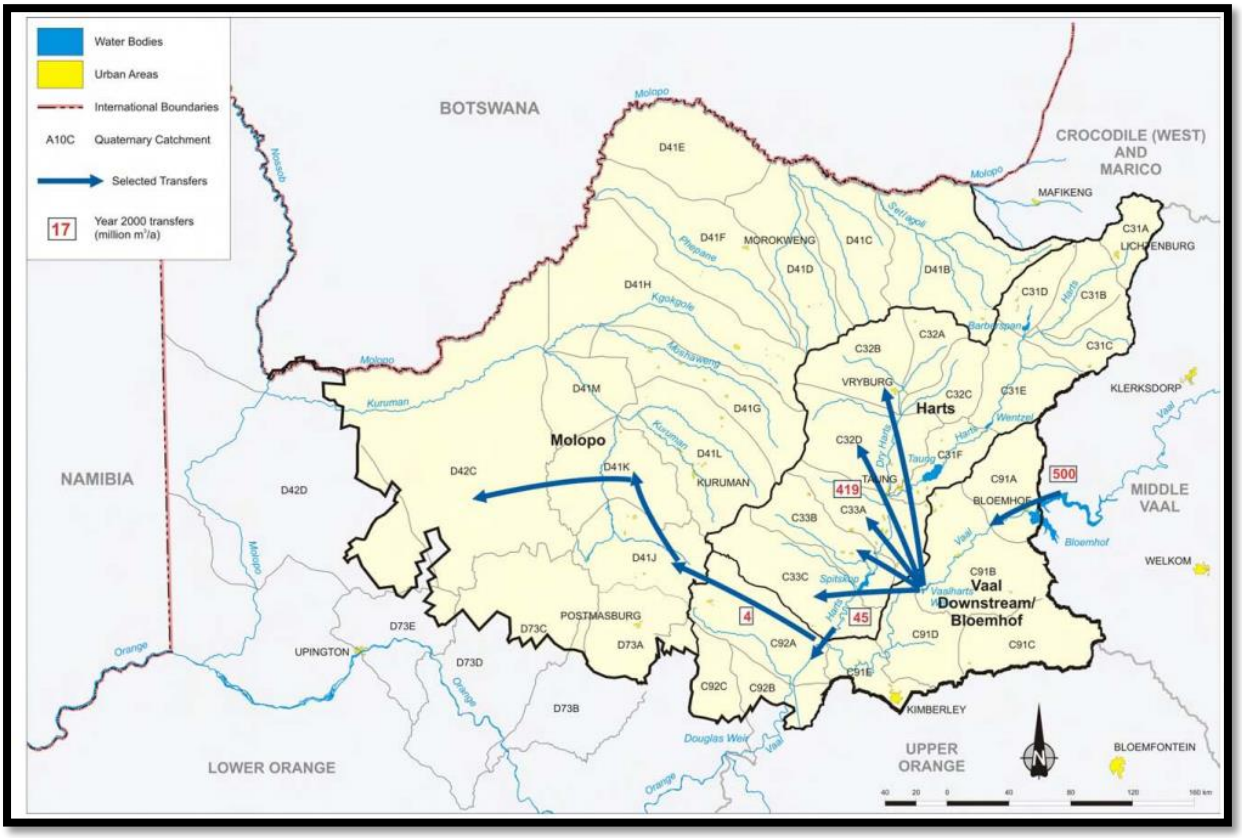

Figure 15: Layout and location of the Lower Vaal WMA

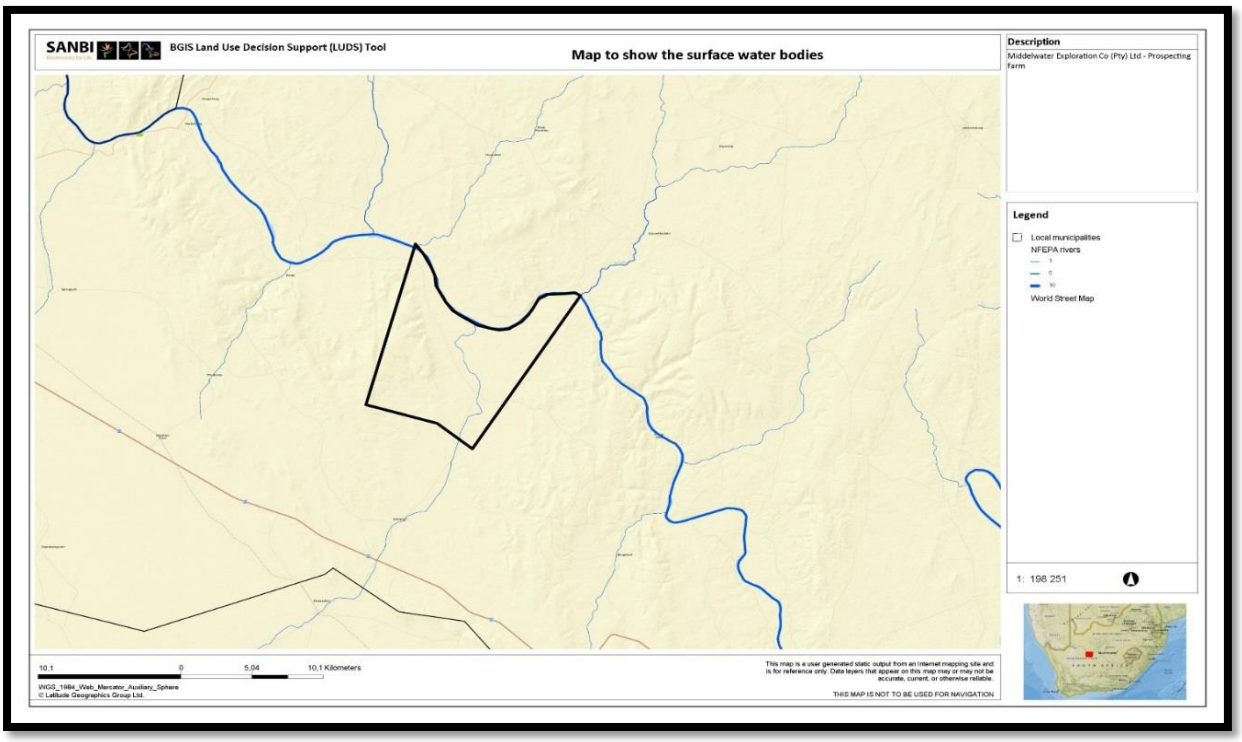

Figure 16: Map showing rivers in relation to the proposed prospecting area.

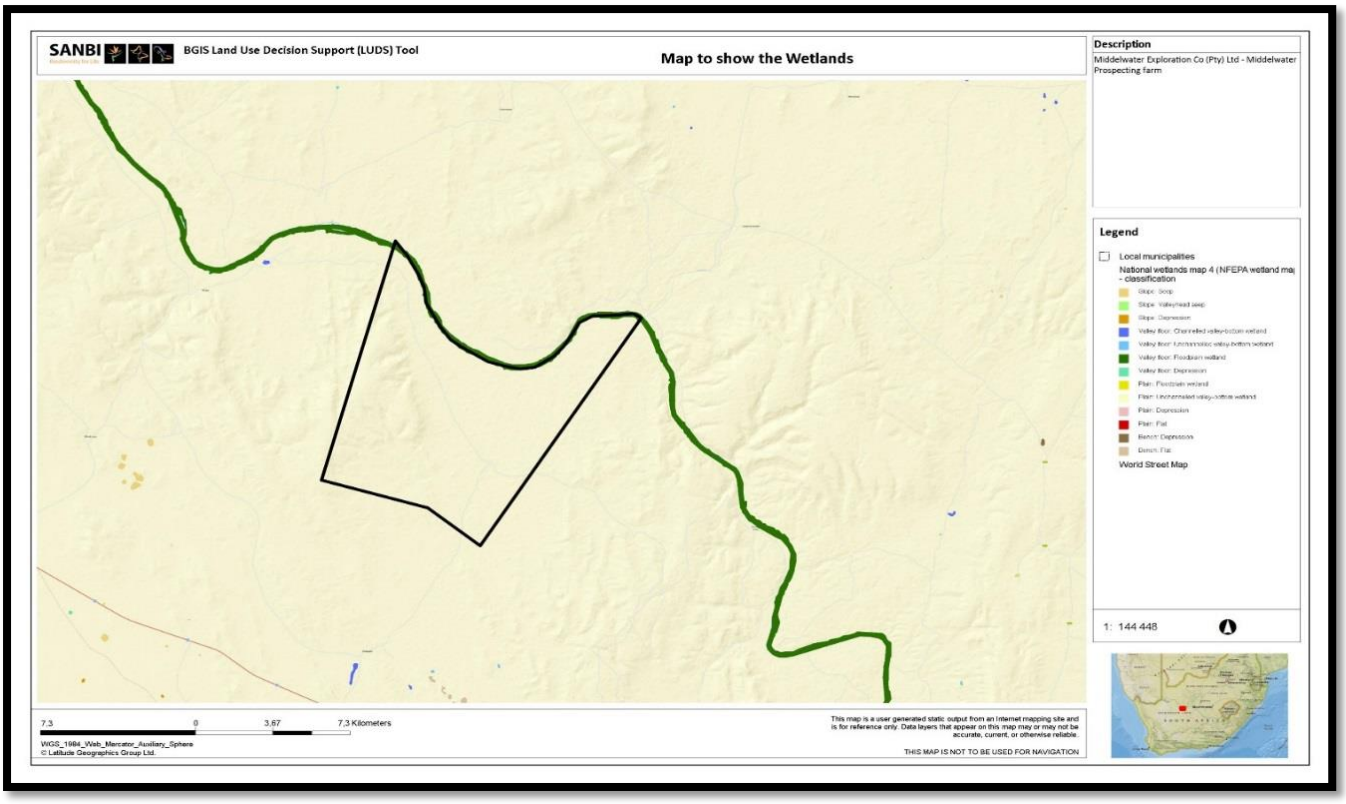

Figure 17: Map showing Wetlands in the vicinity of the study area.

As seen in the figure above, there is evidence of Floodplain wetland which straddles the Orange river and borders the proposed site. Precautions do however need to be taken when working in close proximity to the Orange River. The subsidiary to the orange river which flows from the orange river southwards was inspected during the site inspection and was found dry.

In its historical natural state, the quality of water in the Orange River was good, although of high turbidity during flood flows. Water from the tributary streams tends to be of high salinity. Both the flow regime and water quality in the Orange River has, however, been severely impacted upon by extensive upstream developments. Salinity in the Orange River has increased due to the transfer of high quality water out of the Orange River (in Lesotho and the Upper Orange WMA) and as a result of high salinity irrigation return flows along the Orange River. Poor quality water from the Vaal River, which contains a high proportion of irrigation return flows as well as treated urban effluent, also enters the Orange River. Salinity is at present still moderate and acceptable along the main stem of the Orange River. Deterioration can be expected with increased upstream irrigation and the situation must be closely monitored. There are algal blooms experienced in the main stem due largely to irrigation return flows, diffuse sources and poor quality water from the upstream Vaal WMAs. The algal blooms are of particular concern as they are potentially toxic. An algal monitoring programme along the Orange River as well as management and communication protocols have been developed by DWAF if the algal blooms are identified as toxic. Studies and monitoring programmes are underway to understand the current algae behaviour. (DWAF, ISP Lower Orange WMA, 2004)

Ninety percent of the runoff generated in the two Orange River WMAs is generated in the Upper Orange WMA. The bulk of the runoff generated in the Lower Orange comes from the Fish River in Namibia (approximately 60% of the Lower Orange runoff) but this only enters the main Orange River close to the river mouth. The bulk of the surface water in the Lower Orange Water Management Area is therefore found in the main stem of the Orange River, with virtually all the surface water flowing into the Orange River from the Upper Orange and Lower Vaal WMAs.

The two major storage dams, Gariep and Vanderkloof, which are both used to supply all the irrigation, urban, mining and environmental requirements along the Lower Orange River, are located in the Upper Orange WMA, but both are of vital importance to the Lower Orange. There are no large storage dams in the WMA, with only a few smaller dams on some of the main tributaries. These include:

- Smartt Syndicate Dam (101 million m³ gross storage) on the Ongers River.
- Van Wyksvlei (143 million m³ storage) on the Carnarvonleegte.

There are also several diversion weirs in the Orange River of which Boegoeberg (20 million m³ storage) is the largest. Reliable estimates of the surface water resources in the Upper Orange and Vaal River catchment are therefore of extreme importance for the Lower Orange. There is a fairly high confidence in the yield estimates of the surface water in the main system although some of the hydrology is relatively old. The hydrology for the Lower Orange is however not at an acceptable level for the planning or operation of any local water supply schemes outside the Orange River. For more detail the reader is also referred to the Upper Orange ISP (DWAF, 2004b) and Orange River Overarching ISP (DWAF, 2004a) documents.

The total water available for use in the Lower Orange water management area at the year 2000 development levels summarised in Table 5.

Table 5: Available water in year 2000 (million m³/a)

Sub-area	Natural resource		Usable return flow			Total local yield (1)	Transfers in	Grand Total
	Surface water	Ground-water	Irrigation	Urban	Mining and bulk			
Orange	(1 092)	9	96	1	0	(986)	2 083	1 097
Orange Tributaries	9	13	0	0	0	22	0	22
Orange Coastal	0	3	0	0	0	3	6	9
Total	**(1 083)**	**25**	**96**	**1**	**0**	**(961)**	**2 083**	**1 122**

The negative yield for the Orange River within the Lower Orange water management area, as shown in Table 5, is as a result of evaporation losses and evapotranspiration by riparian vegetation along this reach of the river, which by far exceed the run-of-river yield contributed by local inflows. It also includes a component for losses associated with insufficient management of releases from Vanderkloof Dam.

Potential for a dam in the Lower Orange River has been identified for the re-regulation of releases from Vanderkloof Dam as well as the storage of flood flows mainly from the Upper Orange and Vaal Rivers and to a lesser extent also from the flows generated in the Lower Orange. This would contribute to the improved management of the Orange/Vaal River System, and facilitate more water being made available for use.

No meaningful potential for surface water regulation exists in the Orange Coastal sub-area. Factors that could have a significant impact on the available surface water resources include:

- Saving in operational losses with regards to releases from Vanderkloof Dam (See Orange River Overarching ISP; DWAF, 2004a).
- Implementation of the Reserve on the Orange River (See Orange River Overarching ISP; DWAF, 2004a). Indications are that the reserve can vary significantly from the current environmental flows released from Vanderkloof and will therefore significantly impact on the current surplus available in the system.
- Utilising inflows from the Vaal River.
- Irrigation Return Flows. Very little data is available but return flows commonly amount to 10% of irrigation water. Yield analysis assessments for local surface water resources beyond the Orange River main stem can, with the current available hydrology, only be undertaken on a cursory level (using WR90 data).

This should be carried out only when the need exists and will be the responsibility of the specific towns or towns in need. (DWAF, ISP Lower Orange WMA, 2004)

(viii) Ground water

The prospecting processes should not have any influence on the quality or quantity of ground water. A negative impact on groundwater usually occurs where subsurface water is pumped out of an excavation pit. This can lower the water table in the immediate surroundings of the excavation, which can negatively impact upon surrounding wetlands (specifically hill slope or seepage wetlands) and boreholes. The proposed method of prospecting will not entail deep excavations from which groundwater will need to be removed and there are no known wetlands on the farm.

Groundwater quality is one of the main factors affecting the development of available groundwater resources. Although there are numerous problems associated with water quality, some of which are easily corrected, total dissolved solids (TDS), nitrates (NO3 as N) and flourides (F) are thought to represent the majority of serious water quality problems. The water quality was evaluated in terms of TDS and potability.

The information was obtained from DWAF Geohydrology. The potability evaluation done was based on the evaluation of chloride, fluoride, magnesium, nitrate, potassium, sodium, sulfate and calcium using the Quality of Domestic Water Supplies, Volume 1 (DWAF, 1998). The portion of the groundwater resources considered to be potable has been calculated as the portion classified as ideal, good and marginal (Class 0 -blue, 1- green and 2 - yellow). Water classified as poor and unacceptable (Class 3 - red and 4 - purple) is considered not to be potable (See Point and diffusive pollution Agricultural activities are a source of diffuse water contamination.

The contribution of each farm on a local scale is often fairly small but the contribution on a catchment scale needs to be included in assessing any pollution situation. Most findings regarding this issue can only be assessed in a generic way due to the lack of data in the WMA. Nitrates are the contaminant of most concern, since they are very soluble and do not bind to soils, nitrates have a high potential to migrate to groundwater. Because they do not evaporate, nitrates/nitrites are likely to remain in water until consumed by plants or other organisms.

Generally, on a local scale the areas of intense cultivation are the major contributors in terms of inorganic nitrates. The primary inorganic nitrates, which may contaminate drinking water, are potassium nitrate and ammonium nitrate both of which are widely used as fertilizers. Where feedlots are operated the contribution of organic nitrates to groundwater contamination can be far more problematic. For most farming activities organic nitrate is not a severe problem in South Africa. High-density cultivation at surface water irrigation schemes along the Orange River contributes to the nitrate load of localized aquifers in the WMA. Other contaminants of concern are pesticides and herbicides. The contribution of these to groundwater contamination is very difficult to quantify on catchment scale. Site-specific data relating to likely loading/application volumes and history, soil profile and local geohydrology are required. The mineralogical groundwater quality in the Lower Orange Water Management Area is not particularly good in terms of its TDS rating.

In general the groundwater quality is rated as class 2 to class 4, marginal to completely unacceptable. The southern portion of the inland region, De Aar, Victoria West and Sutherland has a class 2 rating, together with the areas surrounding Prieska, Griekwastad, Upington and Springbok. The rest of the WMA, particularly north of Brandvlei and Carnarvon and the coastal strip are rated as class 3 and 4. The Sutherland, De Aar, Upington belt has a varying range of potable groundwater from a moderate 50% to approximately 90%. The balance of the WMA, has a predominant potable usage of less than 4 30%, with the occasional improvement to 50% (V3, 2002).

See Figure 18 for average TDS values for the area under investigation as mapped by Simonic (1999). Natural occurring radioactivity is found in some of the groundwater resources associated with geological formations such as granites and gneisses. Fortunately, the values are mostly low except at Kotzerus, Kharkams, Bulletrap, Fonteintjie, Kenhardt and Riemvasmaak, which fall into Class 2 according to the potable water classification (Van Dyk, 2003).

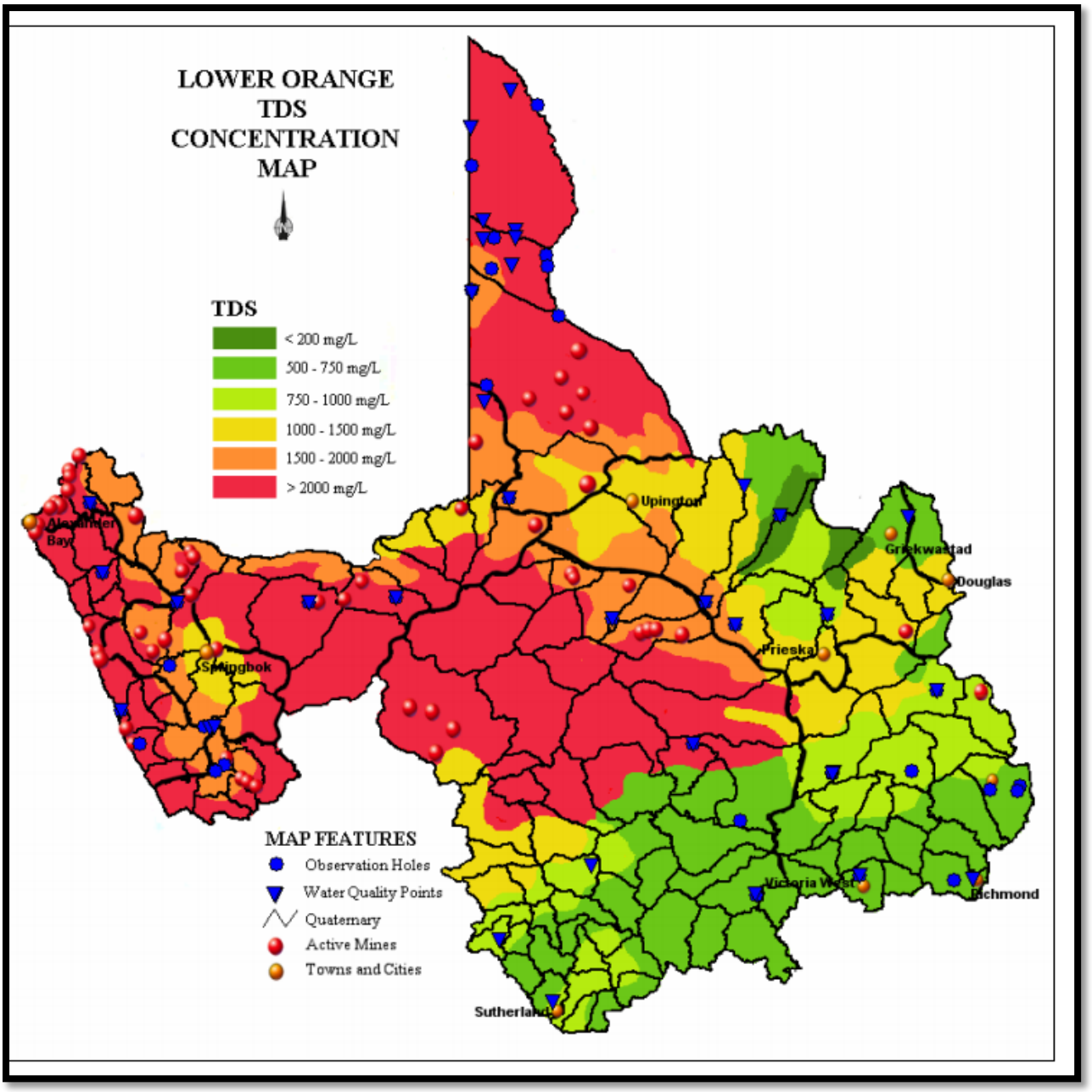

Figure 18: Total dissolved solids for the WMA with main abstraction and water quality monitoring points (DWAF, ISP Lower Orange WMA, 2004).

Agricultural activities are a source of diffuse water contamination. The contribution of each farm on a local scale is often fairly small but the contribution on a catchment scale needs to be included in assessing any pollution situation. Most findings regarding this issue can only be assessed in a generic way due to the lack of data in the WMA. Nitrates are the contaminant of most concern, since they are very soluble and do not bind to soils, nitrates have a high potential to migrate to groundwater. Because they do not evaporate, nitrates/nitrites are likely to remain in water until consumed by plants or other organisms.

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Activities related to urban areas can also result in localized or even diffuse pollution of groundwater. Poor management of sewage treatment works can contribute to the groundwater pollution as can landfill sites, on-site sanitation (especially in informal settlements) and spills resulting from accidents or leaking underground tanks. Uncontrolled dumping and accidents related to the transport industry also contribute to localized pollution in the WMA. Often goods that contain hazardous substances or perishables are confiscated by authorities and these are then dump at illegal sites. A need for incinerators has been identified. Mining activities that impact on the groundwater quality include the Okiep Copper mine and the Black Mountain lead, zinc, copper and silver mine. 8 Mineralisation in the O'okiep area tends to occur in basic rocks intruded in the form of 'steep structures' into granitic terrain of the Namaqualand Metamorphic Complex, and may extend to depths of over 1000 m (www.metorexgroup.com/Ookiep.htm). The major copper minerals are bornite (Cu5 FeS4) with 62% copper, and chalcopyrite (CuFeS2) with 32.5% copper. Open stoping is employed at the mine, together with backfilling at times at O'okiep. Ore is concentrated by flotation and transported to the nearest available smelter. O'okiep smelts its own concentrates. The Black Mountain Mine is situated in the Northern cape near Aggeneys. The facility produces zinc concentrate together with lead and copper concentrates, from which silver is also recovered.

Development of the nearby Gamsberg zinc deposit, is currently under consideration (http://www.dwaf.gov.za/orange). There are many impacts on the environment dealing with the water quality and waste disposal from copper mining. These adverse water quality impacts are caused primarily by land disposal practices that fail to contain wastes, by run-on and run-off controls that are inadequate to prevent surface water from flowing through impoundments, or by groundwater infiltrating surface impoundments. These open-pit mining methods also can cause disturbances that can lower the water table in an area, causing water shortages, land subsidence, and fracturing.

However due to the low rainfall in area the impacts on the groundwater quality are less than expected and very localized. Acid Mine Drainage, elevated TDS, SO4, and low pH with associated higher trace metal concentrations have been found at tailings dumps. A radioactive waste disposal site for low- and intermediate level waste generated at the Koeberg Nuclear Power Plant, is located north of Springbok on the flat plains of the Bushmanland plateau. Waste is buried in metal drums and solidified in concrete in the trenches. Up to date no significant contamination of the groundwater has occurred (Van Blerk, 2000). Sprinkbok Hard Chrome is an industry located in Springbok, an incident has occurred where Cr+6 was released into the environment but no data is available on the impact the incident had on the groundwater resource. As discussed impacts on groundwater quality from the diamond mining industry in the WMA is negligible.

The Lower Orange WMA, is underlain by very diverse lithologies. Several broad lithostratigraphic units fall within the boundaries. A simplified geological map of the WMA is presented in Figure 10.
From oldest to youngest these units comprise the following (V3, 2002):

- Namaqualand-Natal Basement Complex. Rock of this complex, ranges from homogenous granites through to migmatites and gneisses. The area underlain by the Namaqualand-Natal Complex is situated in the vicinity of the Orange River between Upington and Springbok. The area is an assembly of compact sedimentary, extrusive and intrusive rocks.
- Ventersdorp Supergroup, represented by andesitic lavas and occasional sedimentary rocks related to post extensive erosion, are encountered in very small 2-5 isolated inliers between Prieska and Douglas.
- Dolomitic and related carbonate rocks of the Postmasberg Group, Campbell and Griquatown Sequence, all forming part of the Griqualand West Sequence, occupy the north-eastern lobe of the WMA. Dolomites, limestones and related sedimentary rocks (often iron or manganiferous ore bearing) make up this broad lithostratigraphic unit.
- Abbabis and Kheis Groups are represented by relatively small inliers of diverse sedimentary successions consisting of shales, sandstones, banded iron formations and conglomerates. These rocks are encountered in the vicinity of Upington and are not widespread.
- Damara Sequence encountered in the immediate vicinity of Alexander Bay and Port Nolloth, is represented by the Fish River, Schwarzrand, Kuibis, Malmesbury, Gariep, Swakop, Otavi, Nosib, Rehoboth and Sinclair Groups. Lithologies in these various groups are very diverse, ranging from shales, sandstones, diamictites, banded iron formation through to limestones and calcareous sedimentary formations.
- Karoo Sequence represented by the Ecca Group and Dwyka Formation, and to a lesser extent the Beaufort Group, occupy the southern lobe of the WMA, and comprises thick successions of sedimentary rocks. Sedimentary rocks range from mudrocks through coarser varieties (sandstones, conglomerates) to diamictites and rhythmites (pleistocene deposits). Karoo or Jurassic dolerite is fairly common throughout the sequence and also frequently intrudes older rocks.
- Quaternary and Tertiary dune deposits, consisting of “Kalahari red sands”, occupy the extreme northern part of the WMA bordering on Namibia. These dune deposits are of considerable thickness and comprise fine aeolian sands with occasional coarser gravel deposits.

The geohydrology is just as complex as the geology in the area but can be simplified to four main aquifers namely the Karoo sediments, the weathered granites and gneisses from the Basement complex, dolomites and associated formations and the primary aquifers such as the Kalahari sands and the alluvial deposits along streams and rivers and the coastal plains north of the Buffelsrivier. The first three of these aquifer types are typical dual porosity or secondary aquifers water associated with weathering and fracturing of the matrix. Primary aquifers are found in Kalahari sands and alluvial deposits associated with rivers and coastal plains.

At small scale a number of these aquifers are utilized mostly along dry riverbeds, Buffelsriver, Saaipoort along Carnarvon leegte, along Gamagara river, Driekop Kanhardt. In the drier west almost all abstractions from boreholes associated with a proximate riverbed. Along the Orange River some abstraction along riverbeds is also taking place (Van Dyk, 2003).

General characteristics of riverbed aquifers can be summarized as:

- Coarse gravels and sands are more typical of alluvial deposits. However, flood plains consist mainly of fine silt. Towards the end of a river's course, the river slows down dumping some of the heavier materials on these flood plains. Boreholes drilled into these types of formations normally have higher yields. It is important to note that borehole design is plays an important role in the yield of boreholes drilled into riverbed aquifers.
- Alluvial deposits grain size varies considerably, fine and coarse materials are intermixed. The hydraulic conductivities vary between 10-3 to 103 m/d and their porosities vary 12 between 25 – 70%. However, flood plain porosities usually range 35 – 50% and the hydraulic conductivities vary between 10-8 – 10-1 m/d.
- In general riverbed aquifers are high recharge areas and often recharge deeper underlying aquifers and are unconfined in nature. The surface-water groundwater interaction is often intermittent (depending on the elevation of the water level, groundwater may recharge the surface water body or the surface water may recharge groundwater). This is normally dependent on the rainfall cycle. Therefore, boreholes drilled into these aquifers are almost always successful.

<u>Groundwater-Surface Water Linkage</u>

Groundwater-surface water interaction has not been studied sufficiently in the Northern Cape due to the limited surface water. According to records documented by Van Tonder and Dennis (2003), under natural conditions there is seldom a connection between surface water and groundwater. However, observed surface water recharge in normally dry riverbeds. Current quality problems experienced in the Vaal and Orange rivers, waterlogging experienced with irrigation along these riverbanks indicate interaction. Therefore, a study is currently motivated by DWAF Geohydrology to investigate Groundwater-surface water interaction in the Vaal and Orange rivers (Van Dyk, 2003).

Groundwater quality varies from good to unacceptable in terms of potable standards. The groundwater quality is one of the main factors affecting the development of available groundwater resources. Although there are numerous problems associated with water quality, some of which are easily corrected, total dissolved solids (TDS), nitrates (NO3 as N) and fluorides (F) represent the majority of serious water quality problems that occur (DWAF, ISP Lower Orange WMA, 2004)

Summarised information on groundwater is given in this section. Groundwater utilisation is of major importance across wide areas in the Lower Orange WMA and often constitutes the only source of water. It is mainly used for rural domestic supplies, stock watering and water supplies to towns off the main stem of the Orange. These resources must be properly managed and developed.

As a result of the low rainfall, recharge of groundwater is limited and only small quantities can be abstracted on a sustainable basis. Artificial recharge of groundwater is practised in some areas where water from small dams is transferred through pipelines into boreholes located in the area of recharge of the main production boreholes. Aquifer characteristics (borehole yields and storage of groundwater) are also typically unfavourable because of the hard geological formation underlying most of the water management area. In the Orange Tributaries sub-area 60% to 70% of the available water is supplied from groundwater sources.

Groundwater also constitutes an important source of water for rural water supplies in the Orange River, although only a small proportion of the total available water. Much of the groundwater abstracted near the river (Orange sub-area), is actually recharged from the river and could also be accounted for as surface water. Groundwater availability in the coastal region is extremely limited as a result of the lack of rainfall. Close to the sea there is a strong risk of seawater intrusion into coastal aquifers.

The interaction between the mining activity and groundwater is managed through the EMPR and the water use licensing process. Some impacts do exist with regard to localized dewatering of aquifers. These impacts are however localized and very little data exist in this regard. The information from the compliance monitoring systems at the mines needs to be integrated into the DWAF monitoring systems and regularly reviewed. Mines utilise the groundwater available but are still largely dependent on surface water, which is in most cases supplied from the Orange River. Boreholes and abstraction from boreholes are seldom managed properly and therefore the failure of boreholes is experienced. Borehole siting needs to be based on proper geo-technical work to limit the drilling of unsuccessful boreholes. As result of this some towns have drilled many boreholes without much success.

From the list of towns and related water resources given it is evident that shortages in the supply from groundwater are experienced at Vanwyksvlei, Strydenburg, Carnarvon and Garies. Proper management and monitoring of groundwater sources by municipalities and other users are of vital importance. There is a need to provide groundwater information and to create an improved understanding of groundwater at a local level.

Municipalities should also investigate groundwater potential outside town boundaries as a possible source. Groundwater monitoring and data on the availability of groundwater in general is insufficient (DWAF, ISP Lower Orange WMA, 2004)

(ix) Air quality

The background air quality of the surrounding area is highly impacted on by vehicles travelling along the road. Given the surrounding extent of mostly covered vegetated areas, no extreme dust generation under windy conditions is experienced.

Emission into the atmosphere is controlled by the National Management: Air Quality Act, 2004. The proposed activity at the site will however not trigger an application in terms of the Air Quality Act as the emissions to be produced at the prospecting site will only entail dust generation due to the disturbance of soil. Dust will be generated by the movement of earthmoving equipment, the loading of material and transporting of material from site.

The trucks driving on site has to comply with the speed limits. Loads will be flattened to ensure that minimal spillage of the material takes place during transportation. Topsoil stockpiles will be planted with indigenous grass species to ensure that exposed surface areas are minimised, reducing windblown dust from the site. The vegetation will also assist in capturing wind born dust and minimising the spread of dust from the site.

Dust generation on the access and haul roads as well as mechanical excavation can be managed through the implementation of dust suppression measures via water carts and a sprinkler system. The applicant has to conduct formal dust monitoring on site to provide management with an effective management tool for mitigating the impact of the prospecting activity on the surrounding environment with regard to dust pollution.

(x) Noise

The background noise level of the surrounding area is impacted on by traffic travelling along the N10 (Prieska –Upington). Due to the nature of the proposed activity, noise will be generated as a result of mechanical excavation. The nuisance value of noise generated by heavy earthmoving equipment for residence in the near vicinity is deemed to be of low – medium significance, as the mine is expected to be operational only during daylight hours, and when necessary during the night. All prospecting vehicles will also be equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996 (Act No. 93 of 1996). Noise levels will be compared against those described in Table 6.

Table 6: Typical rating levels for ambient noise in districts (extracted from the sans cop 10103:2003)

Type of District	Equivalent Continuous Rating Level, LReq.T For Noise					
	Outdoors			Indoors, with Open Windows		
	Daynight	Day time 06:00 to	Night time	Daynight	Day time 06:00 to	Night time

		22:00	**22:00 to 06:00**		**22:00**	**22:00 to 06:00**
Residential Districts/ Rural Districts	45	45	35	35	35	25
Industrial districts	70	70	60	60	60	50

(xi) Archaeological and cultural interest

During the field investigation, no archaeological and cultural interesting sites have been observed. A specialist study has been commissioned to identify and manage any archaeological or cultural sites if found or identified.

(xii) Visual exposure

The mining area was identified to constitute the lowest possible visual impact on the surrounding environment. Please note that prospecting will be done, so the sites of interest will be small and will be viewable from different areas.

Due to the current prospecting disturbance nearby the area the site has a low aesthetic value. The proposed prospecting area will visible from the surrounding farms and will therefore have a visual impact on the immediate surrounding area.

The applicant should ensure that housekeeping is managed to standard, as this will mitigate the visual impacts during the operational phase of the stockpile area. Upon closure of the prospecting area and decommissioning of the site, the area should be fully rehabilitated and all exposed areas should be seeded to enhance vegetation recovery should natural vegetation not establish within six months of completion of rehabilitation.

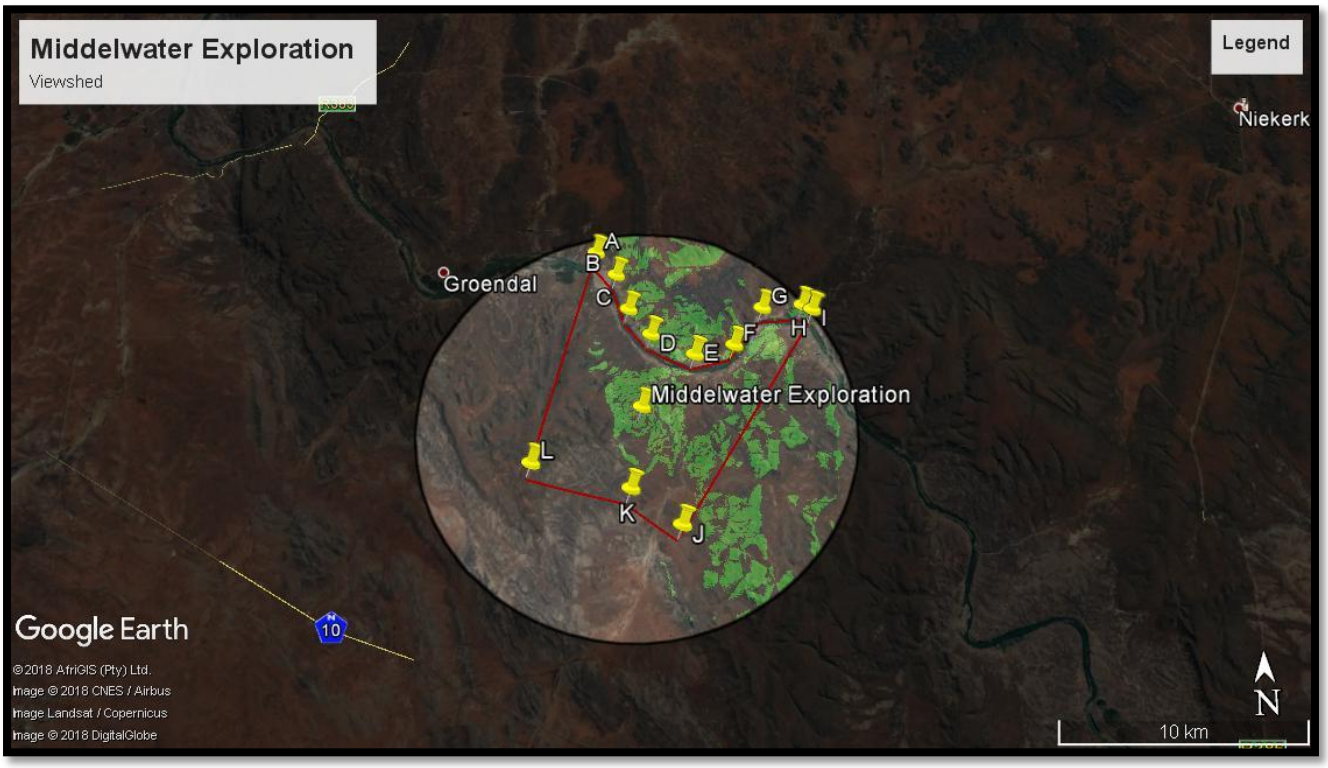

Figure 19: View shed of the proposed prospecting area.

From the above figure, the green areas indicated the areas that can see the prospecting area location. The purple areas indicate the areas that cannot be seen by the surrounding landowners.

(xiii) Regional Socio Economic Structure

Siyathemba Municipality is a Category B Municipality (NC077), established in 2001, in accordance with the demarcation process. The Municipality is located within the central eastern parts of the Northern Cape Province on the banks of the Orange River, and falls within the boundaries of the Pixley Ka Seme District. The nearest business centre is Kimberley, which is about 220km away. Siyathemba Municipality was initially made up of three entities, namely, Prieska, Marydale and Niekerkshoop. After demarcation the area was extended to include not only the towns and surrounding suburbs of Marydale, Niekerkshoop and Prieska but also Copperton. Copperton is an old mining town that was sold to a private owner after the closing of the Mine. The town is currently on a long term lease by the Request Trust. Some of the houses were initially demolished and after the lease agreement was signed with the Request Trust, an agreement was reached that the rest of the houses could be retained. An agreement was reached between the Lessee and Alkantpan (Armscore) for the delivery of water, sanitation, and electricity services. Armscore also maintained one of the main roads. The municipal area encompasses a geographic area of approximately 8,200km², which implies that Siyathemba Municipality accounts for 8% of the total district surface area and approximately 3% of the provincial area. The Municipality is divided into 5 Wards (Municipality S. , 2018/2019).

(a) Education and Employment

Obtaining some form of income generating employment has become increasingly difficult in recent years. This is accentuated by the lack of education with the poorly educated being the ones that experience the highest incidence of poverty. There has been an 8,3% increase in the number of learners that have accessed education between 1996 and 2001. There has been a 27,1% increase in the number of learners that have matriculated. Approximately 3% of persons in the Pixley ka Seme district have an educational qualification higher than a matriculation certificate. Of these, approximately one third have a tertiary qualification. The percentage of the population in the formal education system is 66,5% whilst 19,7% of the population received no formal schooling. Table 7 below is a comparison between Census 2001 and 2011 regarding the number of persons between the ages of 5-24 that attend school (Municipality S. , 2018/2019):

Table 7: Schooling in the Municipalities (Municipality S. , 2018/2019)

	NC071: Ubuntu	NC072: Umsobomvu	NC073: Emthanjeni	NC074: Kareeberg	NC075: Renosterberg	NC076: Thembelihle	NC077: Siyathemba	NC078: Siyancuma	Grand Total
Grade 12 / Std 10 / Form 5	2100	4050	6396	1314	1506	1926	2433	3861	23586
NTC I / N1/ NIC/ V Level 2	6	18	42	3	6	3	9	18	105
NTC II / N2/ NIC/ V Level 3	6	15	33	6	15	9	12	12	108
NTC III /N3/ NIC/ V Level 4	9	15	54	9	12	9	9	30	147
N4 / NTC 4	6	15	39	9	12	27	18	21	147
N5 /NTC 5	12	12	36	6	6	6	9	36	123
N6 / NTC 6	12	9	51	12	9	21	18	30	162
Certificate with less than Grade 12 / Std 10	3	24	30	6	9	12	6	21	111
Diploma with less than Grade 12 / Std 10	15	24	51	18	15	15	12	24	174
Certificate with Grade 12 / Std 10	66	87	141	36	69	54	84	138	675
Diploma with Grade 12 / Std 10	138	243	381	114	102	90	135	195	1398
Higher Diploma	210	297	363	93	78	153	195	315	1704
Post Higher Diploma Masters; Doctoral Diploma	18	36	30	15	12	27	24	30	192
Bachelors Degree	75	177	261	51	63	114	90	165	996
Bachelors Degree and Post graduate Diploma	42	66	84	18	27	45	27	60	369
Honours degree	30	48	99	15	30	42	48	99	411
Higher Degree Masters / PhD	24	27	69	18	6	18	27	33	222
Grand Total	2772	5163	8160	1743	1977	2571	3156	5088	30630

Source: Stats SA Census 2011

Persons having no schooling did never enjoy formal education, not even some primary education. Implying illiteracy in most cases, these persons are limited to perform manual labour and cannot adequately participate in society. Over the last 15 years the rates of no-schooling have been halved across the country. The percentage of persons 20 years and older who have no schooling decreased from 19,1% in 1996 to 8,7% in 2011. This almost halved since 2001 when 19% aged 20+ had no schooling Northern Cape, went from around 22% to around 11%. Whereas in PKS Education (aged 20+) No Schooling is 14.60%, Higher Education is 6.10% and Matric 20.50%. The literacy efforts for adults and the increasing influx of 20 years old with proper levels of education are expected to drive these proportions further down in the years to come (Municipality S. , 2018/2019).

The above table presents the level of education of PKS Municipality's labour force; the statistics for theNorthernCapeProvinceandSouthAfricaareincludedforcomparison.Thelevelofprimary schooling is overall higher than the primary level of schooling for South Africa. Secondary education completed is overall lower than both the province and national level of education. The tertiary levels of education are the lowest, with just above 3% (Municipality S. , 2018/2019).

UNEMPLOYMENT

There has been a decrease in the number of people employed and a concomitant increase in the number of unemployed in the district between these the 2001 and 2011 censuses. This is directly related to the number of businesses that has closed in the region during the period reflected and indicates the need for a retention or wholesale and retail strategy regarding these businesses. Unemployment reaching approximately 28.3% 2011 and Youth unemployment reaching 35.4% in 2011 as per Stats SA 2011 Census (Municipality S. , 2018/2019).

Table 8: Employment status per LM (Municipality S. , 2018/2019)

	Employed	Total%	Unemployed	Total%	Discouraged work-seeker	Total%	Other not economically active
Ubuntu	5028	27	2064	11	507	3	3774
Umsobomvu	6117	22	3018	11	1188	4	7491
Emthanjeni	9864	23	3831	9	1203	3	11559
Kareeberg	2856	24	951	8	456	4	3030
Renosterberg	2616	24	957	9	324	3	2796
Thembelihle	3861	25	1533	10	687	4	3777
Siyathemba	5370	25	1728	8	765	4	5787
Siyancuma	7947	21	3120	8	1422	4	10575
Total	43659	192	17202	75	6552	30	48789

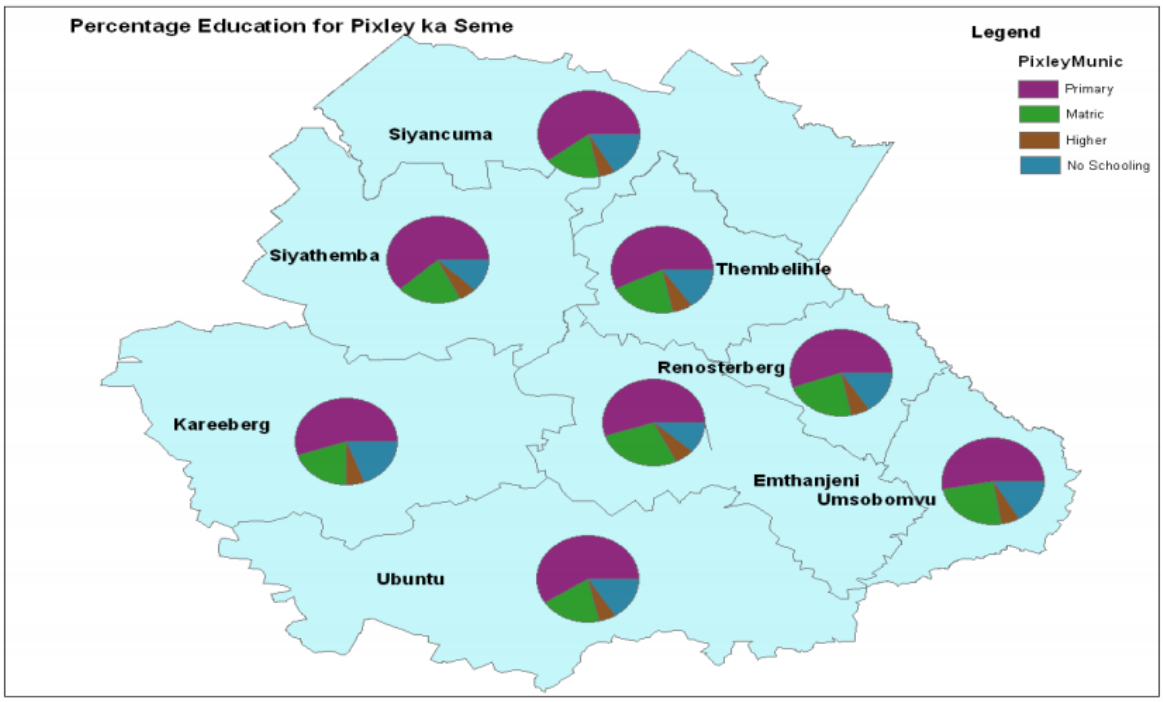

Figure 20: Schooling available in the area (Municipality S. , 2018/2019)

There has been a decrease in the number of people employed and a concomitant increase in the number of unemployed in the district between these the 2001 and 2011 censuses. This is directly related to the number of businesses that has closed in the region during the period reflected and indicates the need for a retention or wholesale and retail strategy regarding these businesses. Unemployment reaching approximately 28.3% 2011 and Youth unemployment reaching 35.4% in 2011 as per Stats SA 2011 Census (Municipality S. , 2018/2019).

Table 9: Employment Status per Local Municipality (Municipality S. , 2018/2019)

	Employed	Total%	Unemployed	Total%	Discouraged work-seeker	Total%	Other not economically active
Ubuntu	5028	27	2064	11	507	3	3774
Umsobomvu	6117	22	3018	11	1188	4	7491
Emthanjeni	9864	23	3831	9	1203	3	11559
Kareeberg	2856	24	951	8	456	4	3030
Renosterberg	2616	24	957	9	324	3	2796
Thembelihle	3861	25	1533	10	687	4	3777
Siyathemba	5370	25	1728	8	765	4	5787
Siyancuma	7947	21	3120	8	1422	4	10575
Total	43659	192	17202	75	6552	30	48789

(b) Racial Makeup

Table 10: Racial make up for the Siyathemba Municipality (Municipality S. , 2018/2019)

Municipality	Black African		Coloured		Indian or Asian		White		Other	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Ubuntu	2073	1890	6288	6690	51	45	702	708	114	42
Umsobomvu	8532	9222	4161	4512	96	57	780	825	120	66
Emthanjeni	6879	7179	11865	12573	153	81	1653	1734	171	66
Kareeberg	348	210	4830	5106	27	27	510	555	39	18
Renosterberg	1758	1857	3072	3225	36	21	462	480	42	21
Thembelihle	1245	1143	5508	5601	69	12	1101	954	54	15
Siyathemba	2076	1974	7659	7863	66	45	891	936	69	9
Siyancuma	6147	6075	10581	10719	144	105	1395	1383	303	222

(c) Population Density, Growth and Location

In regional context, this meant that the Siyathemba Municipality contributed 11.9% to the District population (i.e. the second largest Local Municipality in the District by population) and 1.9% to the population of the Northern Cape. The most dominant population group is Coloured. This group represents 80% of the total population in the municipal area. The other groups are black (12%) and white (8%). Afrikaans is the most widely spoken language (78%). There are an insignificant number of people which speaks other languages. A total of 824 people indicated that IsiNdebele is their first language and 91 people speak Setswana (Municipality S. , 2018/2019).

Table 11: Population (Municipality S. , 2018/2019)

		Population		Age Structure					
				Less than 15		15- 64		65 plus	
		2001	2011	2001	2011	2001	2011	2001	2011
DC 07	Pixley ka Seme DM	166547	186351	32.6	31.6	61.5	62.4	5.9	6.1
NC 071	Ubuntu	16375	18601	33.2	33.3	61.1	61.1	5.7	5.6
NC 072	Umsobomvu	23641	28376	33.7	31.4	61	62.8	5.3	5.8
NC 073	Emthanjeni	35785	42356	31.6	31.7	62.4	62.5	6	5.8
NC 074	Kareeberg	9488	11673	32.6	29.4	59	62.5	8.4	8.1
NC 075	Renosterberg	9070	10978	32.9	32.8	60.6	61	6.5	6.2
NC 076	Thembelihle	14467	15701	32.1	30.9	61.9	62.8	5.9	6.4
NC 077	Siyathemba	18445	21591	33.7	30.8	60.4	63.2	5.9	6
NC 078	Siyancuma	39275	37076	32.3	32.2	62.1	62.2	5.6	6

	2004	2006	2008	2010	2011
South Africa	46,745,940	47,827,370	48,911,245	49,991,472	-
Northern Cape	1,088,672	1,089,227	1,093,823	1,103,918	-
Pixley Ka Seme	190,396	185,334	180,082	179,507	186,351
Siyathemba	21,441	21,312	21,239	21,333	21,591

Source: Statistics South Africa 2011

(d) Households

All local municipalities are composed of various residential components varying from formal housing units to informal dwelling units as indicated in the table above. Within the District, 82, 8% of households live in formal housing, 10,8% in informal housing and only 2% in traditional houses. Households in the whole PKSD is about 49 193 in respect to the Census 2011, where the average Household Size is about 3.70%, female headed households is about 36.90%, formal dwellings at 86.30% and the housing owned is at 52.00% (Municipality S. , 2018/2019)

(e) Water and Power Supply

Significant progress has been made regarding the provision of water but backlogs still exist. 95% of the households in the district are provided with free basic water (FBW) which is above the provincial average of 87, 7%. Only 3% of households had NO access to piped water 46% had piped water inside dwelling by 2011. Piped Water inside Dwelling is about 47.00%. The table below indicates the provisioning of FBW for all municipalities in the district (Municipality S. , 2018/2019)

Table 12: Access to water by households (Municipality S. , 2018/2019)

	Regional/local water scheme (operated by municipality or other water services provider)	Borehole	Spring	Rain water tank	Dam/pool /stagnant water	River/ stream	Water vendor	Water tanker	Other	Grand Total
Ubuntu	3477	1215	36	24	210	6	3	117	30	5118
Umsobomvu	6546	831	12	12	147	39	33	153	57	7830
Emthanjeni	9183	1068	15	21	33	3	33	51	36	10443
Kareeberg	2298	774	3	18	24	-	9	81	12	3219
Renosterberg	2394	450	6	3	69	48	-	15	9	2994
Thembelihle	3117	831	3	6	21	114	3	42	3	4140
Siyathemba	4539	762	-	3	66	336	6	75	30	5817
Siyancuma	6348	1677	72	18	135	780	48	408	93	9579
Grand Total	37902	7608	147	105	705	1326	135	942	270	49140

Source: Statistics South Africa 2011

Table 13: Piped water to dwellings

	Piped (tap) water inside dwelling/institution	Piped (tap) water inside yard	Piped (tap) water on community stand: distance less than 200m from dwelling/institution	Piped (tap) water on community stand: distance between 200m and 500m from dwelling/institution	Piped (tap) water on community stand: distance between 500m and 1000m (1km) from dwelling /institution	Piped (tap) water on community stand: distance greater than 1000m (1km) from dwelling/institution	No access to piped (tap) water	Grand Total
Ubuntu	2526	2217	282	36	9	3	48	5121
Umsobomvu	3531	3702	381	108	6	6	93	7827
Emthanjeni	6249	3741	243	108	21	6	78	10446
Kareeberg	1338	1521	225	93	9	3	33	3222
Renosterberg	1599	1233	81	51	6	6	21	2997
Thembelihle	1389	1815	471	291	63	99	15	4143
Siyathemba	2508	2958	264	21	3	3	60	5817
Siyancuma	3957	3354	1227	483	213	18	327	9579
Grand Total	23097	20541	3174	1191	330	144	675	49152

Source: Statistics South Africa 2011

The table below gives a comparative indication of the access to the source of energy in the district as captured during the 2011 censuses. The proportion of households using electricity for lighting has increased from 57% in 1996 to 84% in 2011. South Africa aims to ensure that by 2030 at least 90% of people have access to grid electricity. Increase in both demand and tariffs may slow down this last effort. Households using electricity as a source of energy for cooking increased from 47,5% in 1993 to 73,9% in Census 2011.

Table 14: Energy for heating per LM

	Electricity	Gas	Paraffin	Wood	Coal	Animal dung	Solar
Ubuntu	3180	111	219	1356	81	3	18
Umsobomvu	2709	216	2721	1182	297	12	15
Emthanjeni	6921	258	1026	1131	402	36	42
Kareeberg	1617	141	63	1062	114	3	24
Renosterberg	1998	45	183	531	6	-	9
Thembelihle	1818	120	96	1362	9	-	24
Siyathemba	3057	69	51	2298	18	-	18
Siyancuma	5112	126	57	3480	93	3	21
Total	26412	1086	4416	12402	1020	57	171

Source: Statistics South Africa 2011

(f) Sanitation services

Sewerage and sanitation are basic needs of communities which can pose serious health and hygiene risks for communities and the environment at large if not properly managed and monitored. According to the White Paper on Basic Household Sanitation, 2001, basic sanitation is defined as: “The minimum acceptable basic level of sanitation is:

- Appropriate health and hygiene awareness and behaviour
- A system for disposing of human excreta, household waste water ad refuse, which is acceptable and affordable to the users, safe, hygienic and easily accessible and which does not have an unacceptable impact on the environmental and
- A toilet facility for each household”

Table 15 below provides an indication of the types as well as those without sanitation in the district:

Table 15: Sanitation per Local Municipality

	Flush toilet (connected to sewerage system)	Flush toilet (with septic tank)	Chemical toilet	Pit toilet with ventilation (VIP)	Pit toilet without ventilation	Bucket toilet
Ubuntu	3300	513	33	180	111	402
Umsobomvu	5388	414	222	852	75	117
Emthanjeni	8319	576	24	336	141	627
Kareeberg	1794	414	6	453	141	96
Renosterberg	2145	342	3	189	51	57
Thembelihle	2484	225	18	456	483	9
Siyathemba	3786	369	6	681	297	213
Siyancuma	5115	651	24	777	618	1152
Total	32331	3504	336	3924	1917	2673

Source: Statistics South Africa 2011

The table and the Map above shows that, Pixley Ka Seme has Flush Toilet Connected to Sewerage at 65.70% households, Emthanjeni being the highest with 85.06% and Thembelihle being the east with 64.41%. However, it must be mentioned that a project is currently in progress through funds from the Pixley Ka Seme District Municipality to replace buckets with the UDS system. The final 68 toilets have been finalised during this current financial year in Campbell. Full water borne sanitation is currently being constructed in Schmidtsdrift and the sanitation system will be completed with the completion of the house structures.

(g) Refuse Removal

Weekly Refuse Removal in PKSD is about 72.60%. The number of households that are not provided with a refuse removal service in each municipality is indicated in the table below.

Table 16: Refuse removal

	Removed by local authority/private company at least once a week	Removed by local authority/private company less often	Communal refuse dump	Own refuse dump	No rubbish disposal	Other	Grand Total
Ubuntu	3417	39	108	1191	309	60	5124
Umsobomvu	5982	273	174	1245	132	24	7830
Emthanjeni	8709	216	90	1038	141	249	10443
Kareeberg	2283	15	15	762	111	33	3219
Renosterberg	2226	48	48	582	81	9	2994
Thembelihle	2832	33	189	564	483	39	4140
Siyathemba	4305	60	144	1062	234	15	5820
Siyancuma	5964	111	111	2568	741	84	9579
Grand Total	35718	795	879	9012	2232	513	49149

Source: Statistics South Africa 2011

(h) Waste management

An Integrated Waste Management Plan was compiled for Siyathemba Municipality during 2007 and the document was finalised during October 2007. The services which the Municipality is delivering are categorised as follows:

- Refuse removal
- Street cleansing
- Landfill sites, transfer stations and bulk containers

The Municipality is rendering this service internally and it is coordinated from Prieska. The service delivery for the various towns is managed from the Local Service Delivery Centres due to the distance of the towns from each other. There are also no private waste contractors active within the municipal area. The Siyathemba Municipality does not have a set of Bylaws which comprehensively address the Council's responsibility for the removal of refuse, management of disposal facilities, waste minimisation, illegal activities, payment of fees and penalties. There are currently no formal Municipal driven waste minimisation activities taking place in the Siyathemba Municipality. However, the Municipality is assisting one individual to recycle glass bottles from the landfills. The Municipality is also currently not offering any recycling incentives to private people or businesses.

(i) Social/community services

Siyathemba Municipality is the Water Services Authority (WSA) and Water Services Provider (WSP) for the 3 towns within their area of jurisdiction. The Municipality strives to fulfil all the WSA and WSP functions, as stipulated in National Legislation. As WSA, the Municipality needs to ensure access to services, develop a WSDP, compile Policies and Bylaws and put in place institutional arrangements for the delivery of services. As WSP, the Municipality needs to ensure that services are rendered in an effective, efficient and sustainable manner according to the Legislative and Planning Documents developed by the WSA. Operation and maintenance, asset management and customer care are therefore important.

(j) Racial Makeup

Table 17: Age and Gender Profile

Municipality	Black African		Coloured		Indian or Asian		White		Other	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Ubuntu	2073	1890	6288	6690	51	45	702	708	114	42
Umsobomvu	8532	9222	4161	4512	96	57	780	825	120	66
Emthanjeni	6879	7179	11865	12573	153	81	1653	1734	171	66
Kareeberg	348	210	4830	5106	27	27	510	555	39	18
Renosterberg	1758	1857	3072	3225	36	21	462	480	42	21
Thembelihle	1245	1143	5508	5601	69	12	1101	954	54	15
Siyathemba	2076	1974	7659	7863	66	45	891	936	69	9
Siyancuma	6147	6075	10581	10719	144	105	1395	1383	303	222

There were slightly more females (51.4%) than males (48.6%) among the local population during 2010. It was, however, noted that the population became slightly less female dominant since 2000, when 52.4% of the population were female.

- The working age group (15 to 64) contributed 64.4% to the local population in 2010. This age group has increased proportionately (from 58.6% to 64.4%) in relation to the other age groups. Since 2000, this group increased by approximately 1,210 people.
- The working age population is slightly male dominant. Since 2000, male working age population increased by around 928 men in absolute terms whiles the number of women increased by about 282.
- The age dependency ratio declined from 0.7 in 2000 to 0.6 dependents (children & the elderly) in 2010 for every working age adult.
- Since 2000, the proportion of children under the age of 15 declined by 6.7%. This means that he ages profile of the local population is becoming older. The number of children in the area also declined from around 14,700 during 2000 to just above 12,000 in 2010. The population of Siyathemba declined from just over 21,370 people in 2000 to about 21,330 in 2010 (see Figure 2.2). This implies that the population contracted by 0.4% on average per annum. This growth rate is slightly lower in the Pixley Ka Seme District Municipality, which contracted 0.7% p.a. The decline of the Siyathemba population was mainly driven by lower fertility rates.

(k) Housing

All local municipalities are composed of various residential components varying from formal housing units to informal dwelling units as indicated in the table above. Within the District, 82,8% of households live in formal housing, 10,8% in informal housing and only 2% in traditional houses. Households in the whole PKSD is about 49 193 in respect to the Census 2011, where the average Household Size is about 3.70%, female headed households are about 36.90%, formal dwellings at 86.30% and the housing owned is at 52.00%

Table 18: Households in the Municipality

	Formal residential	Informal residential	Traditional residential	Farms	Parks and recreation	Collective living quarters	Industrial	Small holdings	Vacant	Commercial
Ubuntu	13926	339	-	3729	-	-	444	-	54	105
Umsobomvu	23361	1890	-	2451	45	264	222	-	96	45
Emthanjeni	39306	-	-	2499	9	3	6	483	39	9
Kareeberg	9450	-	-	2118	-	-	102	-	3	-
Renosterberg	8934	801	-	1173	-	-	-	57	15	-
Thembelihle	13989	-	-	1626	-	12	-	-	75	-
Siyathemba	18555	-	-	2763	-	-	24	162	90	-
Siyancuma	26061	2697	-	7125	-	-	486	594	114	-

Source: Statistics South Africa 2011 Census

(l) Telephones

According to the table below most households in the district, approximately 66.2% do not have telephones at their homes although many of them have expressed need for the service. The existing situation results in many households still depending on public phones and other means of telecommunication. The public telephones according to Telkom authorities are vandalised frequently. The situation calls for a need to protect these facilities as they will be of help to the residents who depend on them. It is perhaps interesting to note, as the table indicates, that only in Emthanjeni Municipal Area that a substantial number of the households have telephones at their homes and Cell phones (Municipality S. , 2018/2019)

Table 19: Telephone and Cell phone access

CELL PHONE ACCESS								
	Ubuntu	Umsobomvu	Emthanjeni	Kareeberg	Renosterberg	Thembelihle	Siyathemba	Siyancuma
Yes	3651	5775	8103	2211	2169	2991	4239	7296
No	1479	2064	2352	1011	825	1152	1593	2280
TELEPHONE ACCES								
Yes	708	849	1434	504	453	585	708	1026
No	4422	6993	9024	2718	2541	3555	5124	8550

(b) Description of the current land uses.

The current land use can be identified as for grazing. Woodland/Open bush is scattered throughout the site covering Low shrub land which covers majority of the site, there is also evidence of isolated Grasslands.

There are sections of isolated Bare or none vegetated land. There are no tourism destinations in the immediate vicinity of the farm.

(c) Description of specific environmental features and infrastructure on the site.

Middelwater Exploration Co(Pty) Ltd intends to apply for a prospecting right on the Remaining Extent and Portion 1 of farm The farms Middelwater 18, portion 0 (also known as remaining extent) (6821.1414 (Ha)which falls in the Siyathemba Local Municipality, Pixley Ka Seme District Municipality, Prieska Administrative District, Northern Cape Province.

The farm Middelwater 18 is situated approximately 33 km North-West of Prieska, Northern Cape Province, adjacent to the Orange River.

The existing infrastructure on the proposed farms includes houses. There is telephone lines running across the farm. No infrastructure or telephone lines will be affected during prospecting activities.

The impact of the proposed prospecting activities on the infrastructural features of the surrounding area is deemed to be of low significance as the impact of the mining activity will be concentrated to the 400 m^2 footprint of the proposed drill sites.

(d) Environmental and current land use map.

(Show all environmental and current land use features)

The environmental and current land use map is attached as Appendix D.

v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated.)

The following potential impacts were identified of each main activity in each phase. The significance rating was determined using the methodology as explained under *vi) Methodology Used in Determining and Ranking the Significance*. The impact rating listed below was determined for each impact **prior** to bringing the proposed mitigation measures into consideration. The degree of mitigation indicates the possibility of partial, full or no mitigation of the identified impact.

Table 20: Impact Assessment of Middelwater Exploration Co (Pty) Ltd												
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
SITE ESTABLISHMENT PHASE/ CONSTRUCTION PHASE												
ACTIVITY:	**SITE VISITS BY VARIOUS SPECIALIST**											
Air Quality	Dust Generation	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Air Quality	Emissions	Neg	Reversible	1	2	1	1,3	5	5	5	7	Low-Med
Archaeological & cultural sites	Loss and disturbance to surface archaeological sites	Neg	Irreversible	1	1	5	2,3	5	5	5	12	Med
Archaeological & cultural sites	Potential disruption to grave sites	Neg	Irreversible	1	1	5	2,3	5	5	5	12	Med
Groundwater	Potential hydrocarbon contamination from leeching into the water table	Neg	Reversible	2	3	2	2,3	3	2	2,5	6	Low-Med
Fauna	loss of food, nest sites and refugia	Neg	Reversible	1	1	3	1,7	5	3	4	7	Low-Med
Fauna	Potential damage to or destruction of sensitive faunal habitats: Pans & Watering Points	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Flora	Loss of biodiversity.	Neg	Reversible	1	3	4	2,7	3	3	3	8	Low-Med
Noise	Increased noise levels	Neg	Reversible	1	2	4	2,3	3	4	3,5	8	Low-Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination	Neg	Reversible	1	2	1	1,3	3	3	3	4	Low
Sensitive Landscape	Potential for damage or destruction of sensitive faunal habitats: Pans and watering points	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Surface Water	Potential hydro carbonation contamination form leaks or spills which may reach downstream surface water bodies	Neg	Reversible	3	3	1	2,3	3	5	4	9	Low-Med
Traffic and Safety	Road degradation. Increased potential for road incidences Potential distraction to road users	Neg	Reversible	2	2	1	1,7	2	5	3,5	6	Low-Med
ACTIVITY:	**DEMARCATION OF SITE WITH VISIBLE BEACONS.**											
	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	Neg	Reversible									Low
ACTIVITY:	**ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.**											
	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	Neg										Low

Table 20: Impact Assessment of Middelwater Exploration Co (Pty) Ltd												
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Social & Safety	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Neg	Reversible	1	3	5	3	3	5	4	12	Med
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Med -High
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	2	4	2,3	3	5	4	9	Low-Med
Topography	Alteration of topography	Neg	Irreversible	1	2	5	2,7	2	5	3,5	9	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	1,7	3	5	4	7	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	3,7	1	5	3	11	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	2	2	4	2,7	3	5	4	11	Med

Table 20: Impact Assessment of Middelwater Exploration Co (Pty) Ltd												
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	11	Med
SUB ACTIVITY: ABLUTION FACILITIES												
Groundwater	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	2	3	5	3,3	3	5	4	13	Med
Surface water	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	2	3	5	3,3	3	5	4	13	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Soils	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	1	3	5	3	3	5	4	12	Med
SUB ACTIVITY: ACCESS ROADS												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med

Table 20: Impact Assessment of Middelwater Exploration Co (Pty) Ltd												
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	11	Med
SUB ACTIVITY: SITE OFFICES												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	11	Med
SUB ACTIVITY: VEHICLE SERVICE AREA												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med

Table 20: Impact Assessment of Middelwater Exploration Co (Pty) Ltd												
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	11	Med
SUB ACTIVITY: WASH BAY												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	11	Med
SUB ACTIVITY: WORKSHOP												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med

Table 20: Impact Assessment of Middelwater Exploration Co (Pty) Ltd												
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	2	4	2,3	3	5	4	9	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	11	Med
SUB ACTIVITY: SALVAGE YARD												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	11	Med
SUB ACTIVITY: BUNDED DIESEL AND OIL STORAGE FACILITIES												

Table 20: Impact Assessment of Middelwater Exploration Co (Pty) Ltd												
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	11	Med
SUB ACTIVITY: GENERATOR AREA (BUNDED)												
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	11	Med
SUB ACTIVITY: WEIGH BRIDGE												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med

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Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	11	Med
SUB ACTIVITY: PARKING AREA												
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
SUB ACTIVITY: WASTE AREA												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med

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Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	2	2	4	2,7	3	5	4	11	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	11	Med
ACTIVITY:	**STRIPPING AND STOCKPILING OF TOPSOIL**											
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Med -High
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	2	4	2,3	3	5	4	9	Low-Med
Topography	Alteration of topography	Neg	Irreversible	1	2	5	2,7	2	5	3,5	9	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	1,7	3	5	4	7	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med

Table 20: Impact Assessment of Middelwater Exploration Co (Pty) Ltd												
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	3,7	1	5	3	11	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Air quality	Dust generation	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	2	2	4	2,7	3	5	4	11	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	11	Med
OPERATIONAL PHASE												
ACTIVITY:	**DRILLING FOR CONTINUED RESOURCE EVALUATION**											
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Noise	Noise nuisance generated by drilling equipment	Neg	Reversible	2	2	1	1,7	1	3	2	3	Low
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	4	2	2,3	2	5	3,5	8	Low-Med

Table 20: Impact Assessment of Middelwater Exploration Co (Pty) Ltd

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Topography	Alteration of topography	Neg	Irreversible	1	2	5	2,7	2	5	3,5	9	Low-Med
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	1,7	3	5	4	7	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	5	5	3,7	1	5	3	11	Med
Noise	Noise nuisance generated by drilling equipment	Neg	Reversible	2	2	1	1,7	1	3	2	3	Low
Air quality	Dust generation	Neg	Reversible	1	2	1	1,3	1	3	2	3	Low
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	2	2	4	2,7	3	5	4	11	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	1	2	1,7	2	5	3,5	6	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Social & Safety	Health and Safety Risk by Prospecting Activities. Potential danger to surrounding communities	Neg	Reversible	1	3	1	1,7	1	3	2	3	Low
ACTIVITY: GENERAL ACTIVITIES												
SUB ACTIVITY: CREATION OF JOBS												
Social & Safety	Potential for more employment	Pos	Reversible	2	2	1	1,7	4	5	4,5	8	Low-Med
SUB ACTIVITY: ABLUTION FACILITIES												

Table 20: Impact Assessment of Middelwater Exploration Co (Pty) Ltd												
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Groundwater	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	2	3	5	3,3	3	5	4	13	Med
Surface water	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	2	3	5	3,3	3	5	4	13	Med
Noise	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	1	2	4	2,3	5	5	5	12	Med
Visual aspect	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Soils	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	1	3	5	3	3	5	4	12	Med
SUB ACTIVITY: WASTE GENERATION												
Fauna	Potential harm through littering	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
GROUNDWATER	Potential contamination through littering	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
soils	Potential contamination through littering	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Sensitive Landscape	Potential contamination through littering	Neg	Reversible	2	2	4	2,7	3	5	4	11	Med
Surface water	Potential contamination through littering	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential contamination through littering	Neg	Reversible	2	3	3	2,7	3	5	4	11	Med
DECOMMISSIONING PHASE												
ACTIVITY:	**SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**											
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Soils	Soils replaced and ameliorated	Pos	Reversible	1	3	4	2,7	3	5	4	11	Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	4	2	2,3	2	5	3,5	8	Low-Med

Table 20: Impact Assessment of Middelwater Exploration Co (Pty) Ltd												
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Flora	Area revegetated with indigenous plants	Pos	Reversible	1	2	1	1,3	3	5	4	5	Low-Med
Topography	Alteration of topography	Neg	Irreversible	1	2	5	2,7	2	5	3,5	9	Low-Med
Topography	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Pos	Irreversible	1	2	5	2,7	2	5	3,5	9	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	1,7	3	5	4	7	Low-Med
Visual aspect	Improved aesthetics through rehabilitation	Pos	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery	Neg	Reversible	2	2	4	2,7	4	3	3,5	9	Low-Med
Air quality	Dust nuisance caused during landscaping activities	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Air quality	Emission Monitoring: • The emissions generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Neg	Reversible	1	2	1	1,3	5	5	5	7	Low-Med
Fauna	Reintroduction of fauna attracted to flora to the area	Pos	Reversible	1	2	4	2,3	3	5	4	9	Low-Med
Social & Safety	Health and safety risk posed by un-sloped areas	Neg	Reversible	1	3	4	2,7	3	3	3	8	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	1	2	1,7	2	5	3,5	6	Low-Med
Surface water	Containment of dirty water. Improve response to issues relating to deterioration of surface water quality or quantity. free drainage resorted to area. Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Pos	Reversible	3	3	2	2,7	5	1	3	8	Low-Med
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	11	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	2	2,3	2	5	3,5	8	Low-Med
Groundwater	Improve response to issues relating to deterioration of groundwater quality or quantity	Pos	Reversible	2	1	2	1,7	2	5	3,5	6	Low-Med
ACTIVITY: Application for Closure Certificate												

(1) Cumulative Impacts

Table 21: Cumulative Impact Assessment of Middelwater Exploration Co Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
CONSTRUCTION AND OPERATIONAL PHASES												
ACTIVITY: Utilization of haul and access roads within the prospecting right area												
SUB ACTIVITY: Truck and heavy machinery operations												
Traffic & Safety	Road degradation	Neg	Reversible	1	3	1	4.3	2	5	4	15.17	Med

Cumulative effects are caused by the accumulation and interaction of multiple stresses affecting the parts and the functions of ecosystems. Of particular concern is the knowledge that ecological system sometimes changes abruptly and unexpectedly in response to apparently small incremental stresses. For purposes of this report, cumulative impacts have been defined as **"the changes to the environment caused by an activity in combination with other past, present, and reasonably foreseeable human activities".**

Generally, as the sites are in non-existence and no major additional environmental impacts are expected, the cumulative impacts will generally be of medium significance.

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision.)

A “significant impact” is defined as it is defined in the EIA Regulations (2014): “an impact that may have a notable effect on one or more aspects of the environment or may result non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as by its duration, magnitude, intensity or probability of occurrence”. The objective of this EIA methodology is to serve as framework for accurately evaluating impacts associated with current or proposed activities in the biophysical, social and socio-economical spheres. It aims to ensure that all legal requirements and environmental considerations are met in order to have a complete and integrated environmental framework for impact evaluations.

The process of determining impacts to be assessed is one of the most important parts of the environmental impact assessment process. It is of such high importance because the environmental impacts identified can and are often linked to the same impact stream.

In this method all impacts on the biophysical environment are assessed in terms of the overall integrity of ecosystems, habitats, populations and individuals affected. The Environmental Impact Assessment (EIA) 2014 Regulations promulgated in terms of Sections 24 (5), 24M and 44 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998) [as amended] requires that all identified potential impacts associated with the proposed project be assessed in terms of their overall potential significance on the natural, social and economic environments.

The criteria identified in the EIA Regulations (2014) include the following:

- Nature of the impact;
- Extent of the impact;
- Duration of the impact;
- Probability of the impact occurring;
- Degree to which impact can be reversed;
- Degree to which impact may cause irreplaceable loss of resources;
- Degree to which the impact can be mitigated; and
- Cumulative impacts.

Greenmined Environmental has developed an impact assessment methodology (as defined below) whereby the significance of a potential impact is determined through the assessment of the relevant temporal and spatial scales determined of the extent, magnitude and duration criteria associated with a particular impact.
This method does not explicitly define each of the criteria but rather combines them and results in an indication of the overall significance.

DEFINITIONS AND CONCEPTS:

Environmental significance:

The concept of significance is at the core of impact identification, evaluation and decision-making. The concept remains largely undefined and there is no international consensus on a single definition. The following common elements are recognised from the various interpretations:

- Environmental significance is a value judgement;
- The degree of environmental significance depends on the nature of the impact;
- The importance is rated in terms of both biophysical and socio-economic values; and
- Determining significance involves the amount of change to the environment perceived to be acceptable to affected communities.

Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of acceptability) (DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5).

The concept of risk has two dimensions, namely the consequence of an event or set of circumstances, and the likelihood of particular consequences being realised (Environment Australia (1999) Environmental Risk Management).

(1) Methodology that will be used

(a) Nature of the impact

The nature of an impact can be defined as “a brief description of the impact being assessed, in terms of the proposed activity or project, including the socio-economic or environmental aspect affected by this impact”.

(b) Extent of the impact

The extent of an impact can be defined as “a brief description of the spatial influence of the impact or the area that will be affected by the impact”.

Table 22: Determining the extent of an impact

EXTENT Extent or spatial influence of impact	**Footprint**	Only as far as the activity, such as footprint occurring within the total site area
	Site	Only the site and/or 500m radius from the site will be affected
	Local	Local area / district (neighbouring properties, transport routes and adjacent towns) is affected
	Region	Entire region / province is affected
	National	Country is affected

(c) Severity of the impact

Severity relates to the nature of the event, aspect or impact to the environment and describes how severe the aspects impact on the biophysical and socio-economic environment.

Table 23: Rating of Severity

Type of criteria	Rating				
	1	**2**	**3**	**4**	**5**
Quantitative	0-20%	21-40%	41-60%	61-80%	81-100%
Qualitative	Insignificant / Non-harmful	Small / Potentially harmful	Significant/ Harmful	Great/ Very harmful	Disastrous Extremely harmful
Social/ Community response	Acceptable / I&AP satisfied	Slightly tolerable / Possible objections	Intolerable/ Sporadic complaints	Unacceptable / Widespread complaints	Totally unacceptable / Possible legal action
Irreversibility	Very low cost to mitigate/ High potential to mitigate impacts to level of insignificance/ Easily reversible	Low cost to mitigate	Substantial cost to mitigate/ Potential to mitigate impacts/ Potential to reverse impact	High cost to mitigate	Prohibitive cost to mitigate/ Little or no mechanism to mitigate impact Irreversible
Biophysical (Air quality, water quantity and quality, waste production, fauna and flora)	Insignificant change / deterioration or disturbance	Moderate change / deterioration or disturbance	Significant change / deterioration or disturbance	Very significant change / deterioration or disturbance	Disastrous change / deterioration or disturbance

(d) Duration of the impact

Duration refers to the amount of time that the environment will be affected by the event, risk or impact, if no intervention e.g. remedial action takes place.

Table 24: Rating of Duration

Rating		Description
1	Very Short Term	Up to three months (quarter) after construction
2	Short Term	Three months to one year after construction
3	Medium Term	One year to six years after construction
4	Long Term	Six to ten years after construction
5	Permanent	Beyond ten years after construction

(e) Probability of the impact occurring

The probability of an impact can be defined as "the estimated chance of the impact happening". Probability refers to how often the activity or aspect has an impact on the environment.

Table 25: Determining the probability of an impact

PROBABILITY	**1**	Almost never / almost impossible	*Impossible* to occur (0 – 20% probability of occurring)
	2	Very seldom / highly unlikely	*Unlikely* to occur (20 -40% probability of occurring)
	3	Infrequent / unlikely / seldom	*May* occur (40-60% chance of occurring)
	4	Often / regularly / likely / possible	*Likely* to occur (60-80% chance of occurring)
	5	Daily / highly likely / definitely	Will *certainly* occur (80-100% chance of occurring)

(f) Degree to which impact can be reversed

The reversibility of an impact can be defined as "the ability of an impact to be changed from a state of affecting aspects to a state of not affecting aspects".

Table 26: Determining the reversibility of an impact

REVERSIBILITY	**Reversible**	Impacts can be reversed through the implementation of mitigation measures
	Irreversible	Impacts are permanent and can't be reversed by the implementation of mitigation measures

(g) Determination of Likelihood

The irreplaceability (likelihood) of an impact can be defined as "the amount of resources that can/can't be replaced". The determination of likelihood is a combination of Duration and Probability. Each factor is assigned a rating of 1 to 5, as described below and in tables 6 and 7.

Overall Likelihood

Overall likelihood is calculated by adding the factors determined above and summarised below, and then dividing the sum by 2.

Example of calculating Overall Likelihood

Consequence	Rating
Duration	Example 4
Probability	Example 2
SUBTOTAL	**6**
TOTAL LIKELIHOOD (Subtotal divided by 2)	**3**

(h) Determination of Overall Environmental Significance:

The environmental significance assessment methodology is based on the following determination:

Environmental Significance = Overall Consequence X Overall Likelihood

The multiplication of overall consequence with overall likelihood will provide the environmental significance, which is a number that will then fall into a range of **LOW**, **LOW-MEDIUM**, **MEDIUM**, **MEDIUM-HIGH** or **HIGH**, as shown in the table below.

Significance or Risk	Low	Low-Medium	Medium	Medium-High	High
Overall Consequence X Overall Likelihood	1 - 4.9	5 - 9.9	10 - 14.9	15 – 19.9	20 - 25

Based on the above, the significance rating scale has been determined as follows:

High	Of the highest order possible within the bounds of impacts which could occur. In the case of negative impacts, there would be no possible mitigation and / or remedial activity to offset the impact at the spatial or time scale for which it was predicted. In the case of positive impacts, there is no real alternative to achieving the benefit.
Medium-High	Impacts of a substantial order. In the case of negative impacts, mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. In the case of positive impacts, other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
Medium	Impact would be real but not substantial within the bounds of those, which could occur. In the case of negative impacts, mitigation and / or remedial activity would be both feasible and fairly easily possible, in case of positive impacts; other means of achieving these benefits would be about equal in time, cost and effort.

Low-Medium	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and / or remedial activity would be either easily achieved of little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.
Low	Impact would be negligible. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap and simple. In the case of positive impacts, alternative means would almost all likely be better, in one or a number of ways, than this means of achieving the benefit
Insignificant	There would be a no impact at all – not even a very low impact on the system or any of its parts.

(i) Determination of Overall Consequence

Consequence analysis is a mixture of quantitative and qualitative information and the outcome can be positive or negative. Several factors can be used to determine consequence. For the purpose of determining the environmental significance in terms of consequence, the following factors were chosen: ***Severity/Intensity, and Extent/Spatial Scale***. Each factor is assigned a rating of 1 to 5, as described in the tables above.

(j) Degree to which the impact can be mitigated

The degree to which an impact can be mitigated can be defined as “the effect of mitigation measures on the impact and its degree of effectiveness”.

Table 27: Determining the mitigation rating of an impact

MITIGATION RATING	**MITIGATED Degree impact can be mitigated**	High	*Impact 100% mitigated*
		Medium	*Impact >50% mitigated*
		Low	*Impact <50% mitigated*

(k) Cumulative Impacts

The effect of cumulative impacts can be described as “the effect the combination of past, present and “reasonably foreseeable” future actions have on aspects”.

Table 28: Determining the confidence rating of an impact

CUMULATIVE RATING	**CUMULATIVE EFFECTS**	Low	*Minor* cumulative effects
		Medium	*Moderate* cumulative effects
		High	*Significant* cumulative effects

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

No alternatives sites where considered during this prospecting drilling. If drill sites where found unfeasible due to the natural environment, these drill sites will be relocated to a position possible with minimal impacts associated.

However, the applicant considered two activity alternatives during the planning phase of this project:

1. Temporary Infrastructure (Preferred Alternative) vs Permanent Temporary Infrastructure:

    a. The use of temporary Infrastructure will entail the use of machinery that is either track-based or can be removed without difficulty. Temporary Infrastructure to be used in the prospecting mining method will entail some temporary offices, storage facility and chemical toilet, with servicing of vehicles and equipment being done off-site at the existing workshop on the applicant's farm.

        i. **Positive Aspects**: The positive aspects associated with the use of temporary infrastructure firstly enable the applicant to move the temporary infrastructure within the boundaries of the prospecting mining area as prospecting mining of the mineral progresses. Secondly the decommissioning phase is facilitated as the removal of temporary infrastructure from the prospecting mining area during the rehabilitation of the site is easy and highly effective.

    b. The use of permanent infrastructure will entail the construction of an office building with ablution facilities, and installation of a permanent vehicle service area.

        i. The use of permanent Infrastructure will increase the impact of the proposed project on the environment as it will entail the establishment of more structures, lengthen the period required for rehabilitation as well as increase the rehabilitation amount as the permanent Infrastructure will either have to be decommissioned or be maintained after the closure of the site.
        ii. The construction of permanent Infrastructure at the site will also increase the visual impact of the proposed project on the surrounding environment and additional mitigation measures will have to be implemented to address the impact.

In the light of the above the use of temporary Infrastructure is deemed to be the most viable preferred alternative.

No-go Alternative:

The 'No Go' option for development was considered. However, this was adjudged to not be the best land-use option for the following reasons: The grazing value of the land is at present considered to be extremely low due to the high level of disturbance, resulting in the area being characterized by non-palatable grasses and low biomass.

The proposed rehabilitation of the area that includes:

- The preservation of the topsoil to cover disturbed areas;
- Implementation of measures to monitor the natural establishment of plants growth and to re-vegetate with representative seed mixes in the case of poor plant establishment;
- The proposed program to combat invader weeds on a regular base; and
- Will ensure that the land use will remain almost the same when prospecting operations cease.

The no-go alternative entails no change to the status quo and is therefore a real alternative that needs to be considered. The 'No Go' option for development was considered. However, this was adjudged to not be the best land-use option for the following reasons: The grazing value of the land is at present considered to be extremely low due to the high level of disturbance, resulting in the area being characterized by non-palatable grasses and low biomass.

The no-go alternative was not deemed to be the preferred alternative as:

- The applicant will not be able to supply in the demand for iron ore in the vicinity;
- The application, if approved, would allow the applicant to utilize the available iron ore as well as provide employment opportunities to local employees. Should the no-go alternative be followed these opportunities will be lost to the applicant, potential employees and clients; and
- The applicant will not be able to diversify the income of the property.

Not proceeding with the proposed operation will entail that a mineral which if mined will contribute towards the local and provincial social and economic structures of the area, will not be mined, and that this opportunity will be lost.

It is important to note that as previously discussed, that execution of the prospecting operation will not leave the land unproductive, so that the proposed prospecting operation can be considered to be a sustainable land-use option for the area. If the prospecting project does not go ahead the farm will be used for cultivating grazing and mixed farming. This is also the current use of the land in question.

<u>Positive Impacts:</u>

- The prospecting site offers the mineral sought after;
- The site is located within neighbouring sand mines, and will minimally affect the community with regards to dust and noise;
- The prospecting area can be reached by an existing farm access roads. No new road infrastructure need to be constructed;

- Due to the small size of the activity and the remote location of the prospecting area the potential impacts on the surrounding environment, associated with prospecting is deemed to be of low significance; and
- No residual waste as a result of the prospecting activity will be produced that needs to be treated on site. Any general waste that may be produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site (Prieska/Prieska / Kuruman). The amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental leakage. Contaminated soil will be removed to the depth of the spillage and contained in sealed bins until removed from site by a hazardous waste handling contractor to be disposed of at a registered hazardous waste handling site.

Negative Impacts:

- Due to the remote location of the prospecting area very little negative impacts on the community could be identified that were deemed to be of significant importance. The dust and noise impacts that may emanate from the prospecting area during the operational phase could have a negative impact on the surrounding community if the mitigation measures proposed in this document is not implemented and managed on-site; and
- Negative impacts with regard to the environment include potential contamination of the area due to spillage of hydrocarbon products.

The land is currently under cultivated grazing and mixed farming.

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

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/discussion of the mitigation or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered)

Visual Mitigation:

The risk of the proposed mining activity having a negative impact on the aesthetic quality of the surrounding environment can be reduced to a low – medium risk through the implementation of the mitigation measures listed below:

- The site needs to have a neat appearance and be kept in good condition at all times.
- Upon closure the site needs to be rehabilitated to insure that the visual impact on the aesthetic value of the area is kept to a minimum.

Dust Handling:

The risk of dust, generated from the proposed prospecting activity, having a negative impact on the surrounding environment can be reduced to being low through the implementation of the mitigation measures listed below:

- The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents.
- The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression.
- Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust.
- All roads will be sprayed with water or an environmental friendly dust-allaying agent that contained PCB's (e.g. DAS products/ Pro/base) at regular intervals to ensure that dust is adequately suppressed in the prospecting of roads.
- All disturbed or exposed areas will be re-vegetated as soon as possible during the prospecting to prevent any dust source from being created.
- A fall out and nuisance dust monitoring programme could be submitted to the principle inspector of mines (DMR-Northern Cape) on an annual basis if required. If any complaint is received form the public or state department regarding dust levels, the fall-out and nuisance dust levels will again be monitored at prescribed monitoring points. The result will then be compiled into monthly reports and forwarded to the Director-Occupational Hygiene.
- Fallout dust will be monitored via a fallout dust bucket system on the boundaries of the prospecting area.

Noise Handling:

The risk of noise, generated from the proposed mining activity, having a negative impact on the surrounding environment can be reduced to being low-medium through the implementation of the mitigation measures listed below:

- The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours.
- No loud music may be permitted at the mining area.
- All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.

Management of weed or invader plants:

The risk of weeds or invader plants invading the disturbed area can be reduced to being low through the implementation of the mitigation measures listed below:

- A weed and invader plant control management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure.
- Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used:
  - "The plants can be uprooted, felled or cut off and can be destroyed completely."
  - "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide."

- The temporary topsoil stockpiles need to be kept free of weeds.

Storm water Handling:

The risk of contamination through dirty storm water escaping from work areas, or erosion or loss of stockpiled topsoil caused due to uncontrolled storm water flowing through the prospecting area can be reduced to being low through the implementation of the mitigation measures listed below:

- Storm water must be diverted around the topsoil heaps, and access roads to prevent erosion and loss of material.
- Prospecting must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose:
- Runoff water should be diverted around the site areas with trenches and contour structures to prevent erosion of the work areas.
- Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems.
- Dirty water must be collected and contained in a system separate from the clean water system.
- Dirty water must be prevented from spilling or seeping into clean water systems.
- The storm water management plan must apply for the entire life cycle of the mining activity and over different hydrological cycles (rainfall patterns).
- The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the management plan.

Handling of Hazardous Materials and Substances:

- All hazardous materials or substances should be stored in a closed storage facility with an impermeable floor.
- The storage area should meet the following conditions:
    - The storage area should be constructed on a level area to prevent offsite migration of any spilled product.
    - The floor of the storage area should be impermeable to prevent seepage of spilled products into the ground or ground water.
    - The storage area should be out of the 1:100-year flood line or further than 100m from the edge of a watercourse, whichever is greatest.
    - The facility should be such that access to the materials/substances can only take place with the prior notification of an appropriate staff member.

- All fuel storage tanks should have secondary containment in the form of an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. This bund capacity should be sufficient to contain 110% of the tank's maximum capacity.
- The distance and height of the bund wall relative to that of the tank should also be taken into consideration to ensure that any spillage does not result in oil spouting beyond the confines of the bund.
- The site manager should establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. The bund area should be inspected at least weekly and any accumulated rainwater removed. All valves and outlets should be checked to ensure that they are intact and closed securely.
- The bund base must slope towards a rainwater sump of sufficient size.
- Contaminated water may not be allowed to mix with clean water, and contained until it can be collected by a registered hazardous waste handling contractor or be disposed of at a registered hazardous waste handling facility.
- Drip trays should be available to be place underneath all stationary equipment or vehicles.
- The layer of material at the vehicle service area should be removed and if contaminated with hazardous substances such as hydrocarbons should be disposed of as hazardous waste by an appropriately qualified waste handling contractor. The compacted areas should be ripped and the topsoil returned over the area.
- The site should be cleared of all hazardous substances once decommissioning has been completed and should be disposed of by an appropriately qualified waste handling contractor.

Waste Management:

The risk of waste generation having a negative impact on the surrounding environment can be reduced to being low through the implementation of the mitigation measures listed below:

- No waste stockpile area may be established outside the boundaries of the mining area.
- Vehicle maintenance may only take place within the service bay area of the off-site workshop.
- The diesel bowser needs to be equipped with a drip tray at all times. Drip trays have to be used during each and every refuelling event.
- The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling.
- Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site.
- Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility.
- Spills must be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing it at a recognised facility. Proof should be filed.
- Suitable covered receptacles should be available at all times and conveniently placed for the disposal of waste.

- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc, should be stored in a container with a closable lid at a collecting point and collected on a regular basis and disposed of at a recognised landfill site. Specific precautions should be taken to prevent refuse from being dumped on or in the vicinity of the mine area.
- Biodegradable refuse generated should be handled as indicated above.
- Water from the wash bay should drain into the oil sump from where it should be removed by an approved contractor.
- Drip trays should be available to be place underneath all stationary equipment or vehicles.
- Waste material of any description, including receptacles, scrap, rubble and tyres, should be removed entirely from the mining area and disposed of at a recognized landfill facility once decommissioning has been completed. It will not be permitted to be buried or burned on the site.

Management of Health and Safety Risks:

The health and safety risk, posed by the proposed prospecting activity can be reduced to being low through the implementation of the mitigation measures listed below:

- Workers must have access to the correct personal protection equipment (PPE) as required by law.
- All operations must comply with the Occupational Health and Safety Act.

Protection of fauna and flora:

The risk on the fauna and flora of the footprint area as well as the surrounding environment, as a result of the proposed mining activity, can be reduced to being low through the implementation of the mitigation measures listed below:

- The site manager should ensure that no fauna is caught, killed, harmed, sold or played with.
- Workers should be instructed to report any animals that may be trapped in the working area.
- No snares may be set or nests raided for eggs or young.
- No plants or trees may be removed without the approval of the ECO.
- Clearing of vegetation has to be restricted to the smallest possible area.

Management of Access Roads:

The risk on the condition of the roads, as a result of the proposed prospecting activities, can be reduced to being low-medium through the implementation of the mitigation measures listed below:

- Storm water should be diverted around the access roads to prevent erosion.
- Erosion of access road: Vehicular movement must be restricted to existing access routes to prevent crisscrossing of tracks through undisturbed areas. Rutting and erosion of the access road caused as a result of the mining activity should be repaired by the applicant.
- On completion of prospecting operations, the surface of these areas, if compacted due to hauling and dumping operations, should be scarified to a depth of at least 300mm and graded to an even surface condition and the previously stored topsoil should be returned to its original depth over the area.

Topsoil Handling:

The risk of loss of topsoil can be reduced to being low through the implementation of the mitigation measures listed below:

- Where applicable the first 300 mm of topsoil should be removed in strips and stored along the boundary of the mining area. Stockpiling of topsoil must be done to protect it from erosion, mixing with overburden or other material. The topsoil must be used to cover the rehabilitated area and improve the establishment of natural vegetation.
- The temporary topsoil stockpiles should be kept free of weeds.
- Topsoil stockpiles should be placed on a levelled area and measures should be implemented to safeguard the piles from being washed away in the event of heavy rains/storm water.
- Topsoil heaps should not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.
- Should natural vegetation not establish on the heaps within 6 months of stockpiling it should be planted with an indigenous grass species.
- Storm- and runoff water should be diverted around the topsoil stockpiles and access roads to prevent erosion.

ix) Motivation where no alternative sites were considered.

Not applicable.

x) Statement motivating the alternative development location within the overall site.

(Provide a statement motivating the final site layout that is proposed)

Middelwater Exploration Co (Pty) Ltd identified the need for iron ore in the area. The prospecting right application area of (±6821.1414 (Ha)) within the boundaries of the farms Middelwater 18, portion 0 (also known as remaining extent), which falls in the Siyathemba Local Municipality, Pixley Ka Seme District Municipality, Prieska Administrative District, Northern Cape Province, for iron ore. Due to the remote location of the excavation area the potential impacts on the surrounding environment, associated with prospecting drilling, is deemed to be of low significance. It is proposed that all prospecting drilling related temporary infrastructure will be contained within the boundary of the prospecting mining area.

i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.

(Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) 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)

During the impact assessment process the following potential impacts were identified of each main activity in each phase. An initial significance rating (listed under *v) Impacts and Risks Identified*) was determined for each potential impact should the mitigation measures proposed in this document not be implemented on-site. The impact assessment process then continued in identifying mitigation measures to address the impact that the proposed prospecting activity may have on the surrounding environment.

The significance rating was again determined for each impact using the methodology as explained under *vi) Methodology Used in Determining and Ranking the Significance*. The impact ratings listed below was determined for each impact **after** bringing the proposed mitigation measures into consideration and therefore represents the final layout/activity proposal.

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
SITE ESTABLISHMENT PHASE/ CONSTRUCTION PHASE													
ACTIVITY:	**SITE VISITS BY VARIOUS SPECIALIST**												
Air Quality	Dust Generation	Neg	Reversible	Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	2	1	3	2	5	3	4	8	Low-Med
Air Quality	Emissions	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	1	1	1	1	5	3	4	4	Low
Archaeological & cultural sites	Loss and disturbance to surface archaeological sites	Neg	Irreversible	Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. Should graves be observed on site during activity progress then all activity should be ceased and the area demarcated as a no-go zone. A specialists will need to be consulted and responsible action considered, whether grave relocation or ceasing activity	1	1	5	2,3	5	1	3	7	Low-Med
Archaeological & cultural sites	Potential disruption to grave sites	Neg	Irreversible	Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. Should graves be observed on site during activity progress then all activity should be ceased and the area demarcated as a no-go zone. A specialists will need to be consulted and responsible action considered, whether grave relocation or ceasing activity	1	1	5	2,3	5	1	3	7	Low-Med
Groundwater	Potential hydrocarbon contamination from leeching into the water table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in.	2	2	2	2	2	2	2	4	Low

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Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Fauna	loss of food, nest sites and refugia	Neg	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	1	2	5	2,7	2	5	3,5	9	Low-Med
Fauna	Potential damage to or destruction of sensitive faunal habitats: Pans & Watering Points	Neg	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	1	2	3	2	2	3	2,5	5	Low-Med
Flora	Loss of biodiversity.	Neg	Reversible	All vehicles will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks will be cleaned up immediately using an absorbent material.	1	2	3	2	2	2	2	4	Low

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Noise	Increased noise levels	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	2	1	1,3	1	3	2	3	Low

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	2	1	1	1	1	1	1	Low

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Sensitive Landscape	Potential for damage or destruction of sensitive faunal habitats: Pans and watering points	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	3	1	2,3	2	2	2	5	Low-Med
Surface Water	Potential hydro carbonation contamination form leaks or spills which may reach downstream surface water bodies	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	3	1	2,3	2	5	3,5	8	Low-Med
Traffic and Safety	Road degradation. Increased potential for road incidences Potential distraction to road users	Neg	Reversible	All intersections with main tarred roads will be clearly signposted. drivers will be enforced to keep to set speed limits. Trucks will be road-worthy condition. A fund will be set aside to maintain the serviceability of the road verge where the trucks approach or depart from the main road. Ensure directional floodlights are utilized that focus light on the necessary areas and reduce light pollution to surrounding environment.	1	2	1	1,3	2	5	3,5	5	Low-Med
ACTIVITY:	**DEMARCATION OF SITE WITH VISIBLE BEACONS.**												
	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	Neg	Reversible	Demarcation of the site will ensure that all employees are aware of the boundaries of the processing area and that work stay within approved area.									Low
ACTIVITY:	**ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.**												
	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	Neg		None.									Low

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Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Social & Safety	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Neg	Reversible	Ensure advertising is limited to local and regional areas, and only specifically advertise for Jobs nationally if skills are not available. Ensure that all power-related structures are adequately marked with relevant signs and warnings and fenced off.	1	2	5	2,7	2	5	3,5	9	Low-Med
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9	Low-Med
Geology	Disturbance of geological strata	Neg	Irreversible	None.	1	3	5	3	5	5	5	15	Med-High

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	1	4	2	2,3	2	3	2,5	6	Low-Med
Topography	Alteration of topography	Neg	Irreversible	Keep mining in footprint	1	2	5	2,7	2	3	2,5	7	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	1	2	2	1,7	3	3	3	5	Low-Med

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Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity.	1	5	5	3,7	1	3	2	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4	Low

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	2	2	1	1,7	2	3	2,5	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4	Low
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	2	2	4	2,7	2	5	3,5	9	Low-Med

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4	Low
SUB ACTIVITY: ABLUTION FACILITIES													
Groundwater	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	Portable toilets will be managed by reputable contractors and inspected daily for potential leaks	1	2	3	2	2	5	3,5	7	Low-Med
Surface water	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	Portable toilets will be managed by reputable contractors and inspected daily for potential leaks	1	2	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4	Low

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Soils	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	Portable toilets will be managed by reputable contractors and inspected daily for potential leaks	1	2	5	2,7	2	5	3,5	9	Low-Med
SUB ACTIVITY: ACCESS ROADS													
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9	Low-Med

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4	Low
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	2	2	1	1,7	2	3	2,5	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low

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Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4	Low
SUB ACTIVITY: SITE OFFICES													
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9	Low-Med

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low

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Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4	Low
SUB ACTIVITY: VEHICLE SERVICE AREA													
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9	Low-Med

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Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low

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Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4	Low
SUB ACTIVITY: WASH BAY													
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9	Low-Med

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right														
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4	Low

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4	Low
SUB ACTIVITY: WORKSHOP													
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9	Low-Med

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	1	4	2	2,3	2	3	2,5	6	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4	Low
SUB ACTIVITY: SALVAGE YARD													

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9	Low-Med

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

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Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4	Low

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Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4	Low
SUB ACTIVITY: BUNDED DIESEL AND OIL STORAGE FACILITIES														

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Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4	Low
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SUB ACTIVITY: GENERATOR AREA (BUNDED)														

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4	Low
SUB ACTIVITY: WEIGH BRIDGE													

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9	Low-Med

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right														
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4	Low
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	2	2	1	1,7	2	3	2,5	4	Low

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	2	1	2	1,7	2	3	2,5	4	Low
SUB ACTIVITY: PARKING AREA													

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right														
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4	Low
SUB ACTIVITY: WASTE AREA													
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9	Low-Med

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right														
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	2	2	4	2,7	2	5	3,5	9	Low-Med

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right														
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	2	1	2	1,7	2	3	2,5	4	Low
ACTIVITY:	**STRIPPING AND STOCKPILING OF TOPSOIL**													
Geology	Disturbance of geological strata	Neg	Irreversible	None.	1	3	5	3	5	5	5	15	Med-High

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9	Low-Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	4	3	8	Low-Med

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	1	4	2	2,3	2	3	2,5	6	Low-Med
Topography	Alteration of topography	Neg	Irreversible	Keep mining in footprint	1	2	5	2,7	2	3	2,5	7	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	1	2	2	1,7	3	3	3	5	Low-Med

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity.	1	5	5	3,7	1	3	2	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4	Low

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Air quality	Dust generation	Neg	Reversible	Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	2	2	1	1,7	2	3	2,5	4	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4	Low
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	2	2	4	2,7	2	5	3,5	9	Low-Med

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Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	2	1	2	1,7	2	3	2,5	4	Low
OPERATIONAL PHASE														
ACTIVITY:	**DRILLING FOR CONTINUED RESOURCE EVALUATION**													

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Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	3	2,5	7	Low-Med
Noise	Noise nuisance generated by drilling equipment	Neg	Reversible	Prospecting alternatives will be considered to reduce noise and associated vibrations	2	1	1	1,3	1	3	2	3	Low

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9	Low-Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	1	4	2	2,3	2	3	2,5	6	Low-Med
Topography	Alteration of topography	Neg	Irreversible	Keep mining in footprint	1	2	5	2,7	2	3	2,5	7	Low-Med
Geology	Disturbance of geological strata	Neg	Irreversible	None.	1	3	5	3	5	1	3	9	Low-Med

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	1	2	2	1,7	3	3	3	5	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity.	1	5	5	3,7	1	3	2	7	Low-Med
Noise	Noise nuisance generated by drilling equipment	Neg	Reversible	Prospecting alternatives will be considered to reduce noise and associated vibrations	1	1	1	1	1	3	2	2	Low
Air quality	Dust generation	Neg	Reversible	Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	1	1	1	1	1	3	2	2	Low

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	2	2	4	2,7	2	5	3,5	9	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	2	1	2	1,7	2	3	2,5	4	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	3	3	4	3,3	1	1	1	3	Low

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Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Social & Safety	Health and Safety Risk by Prospecting Activities. Potential danger to surrounding communities	Neg	Reversible	Ensure procedures in place to compensate for damage. Ensure that all power-related structures are adequately marked with relevant signs and warnings and fenced off.	1	3	1	1,7	1	3	2	3	Low
ACTIVITY: GENERAL ACTIVITIES													
SUB ACTIVITY: CREATION OF JOBS													
Social & Safety	**Potential for more employment**	Pos	Reversible	N/A	2	1	2	1,7	2	3	2,5	4	Low
SUB ACTIVITY: ABLUTION FACILITIES													
Groundwater	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	Portable toilets will be managed by reputable contractors and inspected daily for potential leaks	1	2	3	2	2	5	3,5	7	Low-Med
Surface water	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	Portable toilets will be managed by reputable contractors and inspected daily for potential leaks	1	2	3	2	2	5	3,5	7	Low-Med
Noise	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	Portable toilets will be managed by reputable contractors and inspected daily for potential leaks	1	1	3	1,7	2	3	2,5	4	Low
Visual aspect	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	Portable toilets are to be emptied and cleaned regularly. Ensure reputable contractors are utilize for management of facilities. Portable toilets will be managed by a reputable contractor and inspected daily for any potential leaks. Water should not be released into the surrounding environment unless relevant permission obtained from DWS	2	1	3	2	2	3	2,5	5	Low-Med
Soils	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	Portable toilets will be managed by reputable contractors and inspected daily for potential leaks	1	2	5	2,7	2	5	3,5	9	Low-Med
SUB ACTIVITY: WASTE GENERATION													
Fauna	Potential harm through littering	Neg	Reversible	Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality.	1	3	4	2,7	2	5	3,5	9	Low-Med
GROUNDWATER	Potential contamination through littering	Neg	Reversible	Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality.	1	3	4	2,7	2	4	3	8	Low-Med

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Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Soils	Potential contamination through littering	Neg	Reversible	Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Sensitive Landscape	Potential contamination through littering	Neg	Reversible	Pans and artificial watering points must be cordoned off with at least 100m horizontal distance buffer zones and no activity is too take place within these areas. Consideration should be given to create alternative watering point if existing artificial water point will be disturbed.	2	2	4	2,7	2	5	3,5	9	Low-Med
Surface water	Potential contamination through littering	Neg	Reversible	Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential contamination through littering	Neg	Reversible	Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality.	2	1	2	1,7	2	3	2,5	4	Low
DECOMMISSIONING PHASE														
ACTIVITY:	**SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**													

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	2	1	1,3	2	3	2,5	3	Low
Soils	Soils replaced and ameliorated	Pos	Reversible	Ensure activities occur only within the designated areas and stockpile and revegetated soil as soon as possible. Topsoil will be removed before mining activities commence and stored outside of the active mining cell.	1	3	4	2,7	2	3	2,5	7	Low-Med

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Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	1	4	2	2,3	2	3	2,5	6	Low-Med
Flora	Area revegetated with indigenous plants	Pos	Reversible	Rehabilitate disturbed areas with natural indigenous flora. Monitor for cover abundance.	1	2	2	1,7	3	4	3,5	6	Low-Med
Topography	Alteration of topography	Neg	Irreversible	Keep mining in footprint. Excavation areas will be sloped during rehabilitation to even out depressions.	1	2	5	2,7	2	3	2,5	7	Low-Med
Topography	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Pos	Irreversible	Monitor, especially after first heavy rain falls to ensure adequate surface water drainage	1	2	5	2,7	2	3	2,5	7	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	1	2	2	1,7	3	3	3	5	Low-Med

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Improved aesthetics through rehabilitation	Pos	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Noise	Noise nuisance caused by machinery	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	2	1	4	2,3	3	3	3	7	Low-Med
Air quality	Dust nuisance caused during landscaping activities	Neg	Reversible	Dust will be contained within the property boundaries and will therefore affect only the landowner.	2	2	1	1,7	2	3	2,5	4	Low
Air quality	Emission Monitoring: • The emissions generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4	Low
Fauna	Reintroduction of fauna attracted to flora to the area	Pos	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Conduct annual surveys to monitor faunal biodiversity.	1	2	3	2	1	3	2	4	Low
Social & Safety	Health and safety risk posed by un-sloped areas	Neg	Reversible	Ensure that all stuff are made aware of all working conditions on site	2	1	3	2	1	3	2	4	Low

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	2	1	2	1,7	2	3	2,5	4	Low
Surface water	Containment of dirty water. Improve response to issues relating to deterioration of surface water quality or quantity. free drainage resorted to area. Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Pos	Reversible	Monitor area for erosion and pooling and rehabilitate if necessary. Continue with Surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season.	2	1	2	1,7	2	3	2,5	4	Low
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	1	3	4	2,7	2	5	3,5	9	Low-Med

Table 29: Impact Assessment of Middelwater Exploration Co (Pty) Ltd Prospecting Right														
Nature of Impact	**Impact**	**Positive/Negative/ Neutral Impact**	**Reversibility**	**Mitigation**	**Extent**	**Severity**	**Duration**	**Consequence**	**Probability**	**Frequency**	**Likelihood**	**Significance**	**Mitigation Rating**
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	2	1	2	1,7	2	3	2,5	4	Low
Groundwater	Improve response to issues relating to deterioration of groundwater quality or quantity	Pos	Reversible	Specialist must be consulted f issues with groundwater are observed and qualities do not fall within the DWS target qualities or water qualities for livestock watering. Any affected registered water user must be compensated if levels an quality are impacted by the mining activities	2	1	2	1,7	2	5	3,5	6	Low-Med
ACTIVITY: Application for Closure Certificate														

j) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons and not only those that were raised by registered interested and affected parties).

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
whether listed or not listed	(Including the potential impacts for cumulative impacts)		In which impact is anticipated	if not mitigated	(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)	if mitigated
(E.g. Excavations, blasting, 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.)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)		(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))		E.g. Modify through alternative method. Control through noise control. Control through management and monitoring. Remedy through rehabilitation.	
SITE VISITS BY VARIOUS SPECIALIST	Dust Generation	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Construction / Site Establishment phase	Med	<u>Control:</u> Dust suppression	Low-Med
	Emissions	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Low-Med	<u>Control:</u> Emissions	Low-Med
	Loss and disturbance to surface archaeological sites	Archaeological and Cultural Sites		Med	**<u>Control:</u>** Survey area before site clearance	Low
	Potential disruption to grave sites	Archaeological and Cultural Sites		Med	**<u>Control:</u>** Survey area before site clearance	Low
	Potential hydrocarbon contamination from leeching into the water table	Surface Water		Low-Med	Control through proper site management	Low
	Loss of food, nest sites and refugia	Flora		Low-Med	<u>Control:</u> Implementation of fauna protection measures	Low-Med
	Potential damage to or destruction of sensitive faunal habitats: Pans & Watering Points	Surface Water		Med	<u>Control:</u> Implementation of fauna protection measures	Low-Med
	Loss of biodiversity.	Flora		Low-Med		Low-Med
	Increased noise levels	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Low-Med	**<u>Control:</u>** Noise control measures	Low
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		Low	**<u>Control:</u>** Storm water management Site Management Soil Management	Low
SITE VISITS BY VARIOUS SPECIALIST	Potential hydrocarbon contamination to soils	Soils	Construction / Site	Med	**<u>Control:</u>** Storm water management Site Management Soil Management	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	increased risk of erosion	Soils		Low-Med	**Control:** Storm water management Site Management Soil Management	Low
	Potential for damage or destruction of sensitive faunal habitats: Pans and watering points	Surface Water Bodies		Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low-Med
	Potential hydro carbonation contamination form leaks or spills which may reach downstream surface water bodies	Surface Water		Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low-Med
	Road degradation. Increased potential for road incidences Potential distraction to road users	All road users will be affected	Operational phase	Low	Control & Remedy: Road management	Medium-High
DEMARCATION OF SITE WITH VISIBLE BEACONS.	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	N/A	Construction / Site Establishment phase	Low	N/A	Low
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	N/A		N/A	N/A	N/A
	Portable Toilets Potential harm through sewage leaks	Groundwater		Med	Control through proper site management	Low-Med
	Portable Toilets Potential harm through sewage leaks	Surface Water		Med	Control through proper site management	Low-Med
	Portable Toilets Potential harm through sewage leaks	Soils		Med	Control through proper site management	Low-Med
	Portable Toilets Potential harm through sewage leaks	Social		Med	Control through proper site management	Low-Med
	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.	Operational phase	Low-Med	Control: Implementation of proper housekeeping	Low-Med
	Dust nuisance caused by the disturbance of soil.	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Med	Control: Dust suppression	Low
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Med	Control: Emissions	Low
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Med	**Control:** Noise control measures	Low
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		Low-Med	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Low-Med

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		Med Med	**Control:** Storm water management Site Management Soil Management	Low – Medium
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Med Med	Control: Waste management	Low-Med
	Alteration of topography	Topography		Medium -High	Control: Surface water Monitoring	Medium-High
	Loss of and disturbance to surface archaeological sites	Artefacts or graves		Med	**Control:** Survey area before site clearance	Low-Med
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Med	Control: Proper site management.	Low
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away	Operational phase	Med	Control: Implementation of fauna protection measures	Low-Med
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Low-Med	Control: Fire	Low-Med
	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Social	Construction / Site Establishment phase	Med	Control through proper site management	Low-Med
STRIPPING AND STOCKPILING OF TOPSOIL	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.	Operational phase	Low-Med	Control: Implementation of proper housekeeping	Low-Med
	Dust nuisance caused by the disturbance of soil.	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Med	Control: Dust suppression	Low
STRIPPING AND STOCKPILING	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.	Operation	Med	Control: Emissions	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Med	**Control:** Noise control measures	Low
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		Low-Med	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Low-Med
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		Med	**Control:** Storm water management Site Management Soil Management	Low – Medium
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Low-Medium	Control: Waste management	Low-Med
	Alteration of topography	Topography		Low-Med	Control: Surface water Monitoring	Low-Med
	Loss of and disturbance to surface archaeological sites	Artefacts or graves		Med	**Control:** Survey area before site clearance	Low-Med
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Med	Control: Proper site management.	Low
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Med	Control: Implementation of fauna protection measures	Low-Med
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Low-Med	Control: Fire	Low-Med
	Disturbance of geological strata	Geology		Med - High	N/A	Medi - High
DRILLING FOR CONTINUED	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.	Operational	Low-Med	Control: Implementation of proper housekeeping	Low-Med

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	Dust nuisance due to excavation activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Low	Control: Dust Suppression	Low
	Noise nuisance generated by drilling equipment	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Low	Control: Noise Control Measures	Low
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Low-Med	Control: Proper site management.	Low
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		Med	**Control:** Storm water management Site Management Soil Management	Low-Med
	Health and Safety Risk by drilling Activities. Potential danger to surrounding communities	The Unsafe working conditions should only impact the applicant. Safety measures will be implemented		Low	Control: Implementation of safety control measures	Low
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Low-Med	Control: Implementation of fauna protection measures	Low
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		Low-Med	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Low-Med
	Alteration of topography	Topography		Low-Med	Control: Surface water Monitoring	Low-Med
	Disturbance of geological strata	Geology		Low-Med	N/A	Low-Med
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Low-Med	Control: Fire	Low-Med
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Med	Control: Waste management	Low-Med
	Loss of and disturbance to surface archaeological sites	Artefacts or graves		Med	**Control:** Survey area before site clearance	Low-Med

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
DRILLING FOR CONTINUED RESOURCE EVALUATION	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies	Operational phase	Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
GENERAL ACTIVITIES	Potential for more employment	Social	Operational phase	Med	Control through proper site management	Low-Med
	Portable Toilets Potential harm through sewage leaks	Groundwater		Med	Control through proper site management	Low-Med
	Portable Toilets Potential harm through sewage leaks	Surface Water		Med	Control through proper site management	Low-Med
	Portable Toilets Potential harm through sewage leaks	Soils		Med	Control through proper site management	Low
	Portable Toilets Potential harm through sewage leaks	Social		Low-Med	Control through proper site management	Low
	Potential harm through littering	Fauna		Med	Control: Implementation of fauna protection measures	Low-Med
	Potential contamination through littering	Surface Water		Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low-Med
	Potential contamination through littering	Soil		Low-Med	Control through proper site management	Low-Med
	Potential contamination through littering	Groundwater		Med	Control: Implementation of proper housekeeping	Low-Med
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Decommissioning phase	Med	**Control:** Storm water management Site Management Soil Management	Low
	Soils replaced and ameliorated	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		Med	**Control:** Storm water management Site Management Soil Management	Low-Med
	Dust nuisance caused during landscaping activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Med	Control: Dust Suppression	Low
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Low-Med	Control: Emissions	Low
	Noise nuisance caused by machinery	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Low-Med	Control: Noise Management	Low-Med
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Low-Med	Control: Proper site management.	Low
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Medium	Control: Waste management	#REF!

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		Low-Med	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Low-Med
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Area revegetated with indigenous plants	Flora	Decommissioning phase	Low-Med	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Low-Med
	Improve response to issues relating to deterioration of groundwater quality or quantity	Groundwater improvement		Low-Med	Control: Proper site management.	Low-Med
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
	Containment of dirty water. Improve response to issues relating to deterioration of surface water quality or quantity. free drainage resorted to area. Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Surface water Bodies		Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
	Health and safety risk posed by un-sloped areas	The impact on health and safety due to un-sloped areas will be contained within the site boundary.		Medium	Control: Sloping of areas upon decommission	Low-Med
	Reintroduction of fauna attracted to flora to the area	Fauna returning to area		Low-Med	Control: Implementation of fauna protection measures	Low-Med
	Alteration of topography	Topography		Low-Med	Control: Surface water Monitoring	Low-Med
	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Topography		Low-Med	Control: Surface water Monitoring	Low-Med
	Improved aesthetics through rehabilitation	The visual impact may affect the aesthetics of the landscape.		Low-Med	Control: Implementation of proper housekeeping	Low-Med
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Low-Med	Control: Fire	Low-Med

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

k) Summary of specialist reports.

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form): -

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 Impact Assessment	•		Please refer to: Part A h) iv) (1) (a); and Part A t) i)
Ecological Assessment	•		Please refer to: Part A h) iv) (1) (a); and Part A t) i)
No other specialist studies were deemed necessary for this project as the project entails the establishment of the prospecting area over an area previously used for grazing and urban developments.			

l) Environmental impact statement

xi) Summary of the key findings of the environmental impact assessment;

Please refer to the Environmental Impact Assessment in Appendix H. The key findings of the environmental impact assessment entail the following:

Project Proposal:

Middelwater Exploration Co (Pty) Ltd intends to apply for a prospecting right on the Remaining Extent and Portion 1 of farm The farms Middelwater 18, portion 0 (also known as remaining extent) (6821.1414 (Ha)), Siyathemba Local Municipality, Pixley Ka Seme District Municipality, Prieska Administrative District, Northern Cape Province. The prospecting methods will entail exploration drilling of the proposed footprint area. A mobile site office, workshop and service area and chemical ablution facility will be present on the site. A generator will be used to supply power for the temporary infrastructure on site. Potable water will daily be transported to site. The solid waste produced during the operational phase of the project will be transported from site to the Prieska / Kuruman landfill site. Approximately 6 workers will be employed at the Prospecting site. Prospecting will be done in daylight hours. From time to time it may be required to work an alternative Saturday.

Site vehicles will use the existing gravel farm roads on the proposed farms where the prospect drilling will also be conducted. To access the site, take the R31 towards Prieska, take the off ramp towards Bathlaro and continue towards Loopeng.

LAND USE

Middelwater Exploration will not have to compete with other land uses at the site. Upon closure of the prospecting area, the land will revert back to grazing land.

Due to the remote location of the proposed project very little to no negative impacts on the community could be identified that were deemed to be of significant importance. The dust and noise impacts that may emanate from the prospecting area during the operational phase could have a negative impact on the surrounding community if the mitigation measures proposed in this document is not implemented and managed on-site.

FLORA

Most of the land is used for grazing, by sheep (for mutton, wool and pelts) and goats, which can be commensurate with conservation. However, under conditions of overgrazing, many indigenous species may proliferate, including Threethorn *Rhigozum trichotomum, BitterbosChrysocoma ciliata* and Sweet Thorn *Acacia karroo*, and many grasses and other palatable species may be lost. There are very few rare or Red Data Book plant species in the Nama Karoo Biome. Protected trees such as *Boscia albitura* is known to occur in the vicinity of Prieska. During vegetation disturbance (i.e drilling and sampling),

Middelwater Exploration should note that no protected tree may be damaged or disturbed without a valid protected plants permit. The upper Gariep alluvial vegetation type is classified as vulnerable and impacts on this vegetation must be avoided as far as possible. Protected trees such as *Vachellia erioloba* is often found in this riparian vegetation type. Please refer to Figure 12 below regarding the critical biodiversity areas and ecological support areas of the ESA. Middelwater Exploration would remove as little vegetation as possible by drilling in the current access roads.This will lessen the area to be managed for erosion and weed invasion purposes. Topsoil management must be implemented to ensure that topsoil is available upon rehabilitation of the area.

FAUNA

The fauna at the site will not be impacted by the proposed prospecting activity as they will be able to move away or through the site, without being harmed. Workers must be informed and managed to ensure that no fauna at the site is harmed. Upon commencement of the proposed prospecting activities, the fence surrounding the property must be maintained to prevent large animals such as goats entering the site.

AIR QUALITY

The background air quality of the surrounding area is relatively good due to low industrial activity. Factors contributing to air pollution are the burning of veld, and agriculture in the area. Given the surrounding extent of mostly covered areas, no extreme dust generation under windy conditions is experienced.

Dust will be generated by the proposed operation through the movement of machinery and vehicles. Dust suppression measures must be implemented to prevent excessive dust on site. Due to the remote setting of the proposed prospecting area the potential impact of dust nuisance on the surrounding environment is deemed to be of low significance.

NOISE

The surrounding areas are characterised by an agricultural setting in which vehicles and farm equipment operate. The traffic on the public roads surrounding the property contributes to the ambient noise of the area.

The noise to be generated at the proposed prospecting operation is expected to temporarily increase the noise levels of the area. Loading and transportation of the material will generate noise daily. The significance of noise on the surrounding environment is therefore deemed to be of low significance. Mitigation measures must be implemented to ensure employees conduct them in an acceptable manner while on site in order to lessen the noise impact of the proposed activity on the surrounding environment.

ARCHAEOLOGICAL AND CULTURAL CHARACTER

A specialist will conduct and HIA and Palaeontological assessment on the proposed prospecting farms. Middelwater Exploration Co (Pty) Ltd will make use of temporary infrastructure during the prospecting operations. Workers will be transported to and from the site daily.

EXISTING INFRASTRUCTURE

It is expected that the proposed processing activity will have a very low impact on the surrounding environment as activities will be contained within the boundaries of the site. The proposed footprint area will not require the building of any permanent structures. The proposed production of aggregate on the property will also reduce the amount of trucks delivering aggregate, from outside sources. This will have a direct positive impact on the traffic volumes of the surrounding roads and price of the aggregate.

VISUAL EXPOSURE

The prospecting area was identified to constitute the lowest possible visual impact on the surrounding environment. The surrounding area has previously been disturbed by agricultural activities. The applicant must however ensure that housekeeping is managed to standard, as this will mitigate the visual impacts during the operational phase of the mine.

Upon closure the site will be rehabilitated and sloped to insure that the visual impact on the aesthetic value of the area is kept to a minimum. The site will have a neat appearance and be kept in good condition at all times.

xii) Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structure and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers. Attach as Appendix.

See the map indicating site activities attached as Appendix C.

xiii) Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

Associated Positive Impacts – Temporary Infrastructure:

- Low intensity site establishment;
- Easy movement of infrastructure as processing progress; and
- Complete removal of infrastructure at closure of the mine.

The negative impacts associated with the project that was deemed to have a Low-Medium or Medium significance includes:

- Disturbance of the geological strata **Med-High**
- Dust nuisance stemming from proposed project **Low-Med**
- Loss of and disturbance of surface archaeological sites **Low-Med**

- Contamination of area with hydrocarbons or hazardous waste materials **Low-Med**
- Potential for loss of soil and damage to soil characteristics **Low -Med**
- Potential for erosion, loss of soil characteristics, Compaction of soil & degradation through stockpiling **Low-Med**
- Loss of biodiversity **Low-Med**
- Alteration of topography **Low-Med**
- Visual intrusion due to the proposed project **Low – Med**
- Emissions from vehicles and drilling equipment on site **Low-Med**
- Potential disruption to graves (if found) Med
- Potential hydrocarbon contamination from leaks or spills leaching into the wat table **Low-Med**
- Loss of food, nest sites and refugia for fauna **Low-Med**
- Potential hydrocarbon contamination which may reach downstream surface water bodies **Low-Med**
- Potential damage to or destruction of sensitive faunal habitats **Low-Med**
- Pans & watering points **Low-Med**

m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPR as well as for inclusion as condition of authorisation.

Management Objectives	Role	Management Outcomes
Visual Aspect	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.
Dust Handling	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. Dust monitoring consultant to check dust results and provide guidelines.	• Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. • Assess effectiveness of dust suppression equipment. • Re-vegetate all disturbed or exposed areas as soon as possible to prevent any dust source from being created. • Thoroughly soak all stockpiles to ensure dust suppression on the site. • Conduct formal dust monitoring on a monthly basis.
Noise Handling	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. Compliance to be monitored by the Noise Monitoring Specialist.	• Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the prospecting area. • Ensure that all prospecting vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. • Compliance with the appropriate legislation with respect to noise will be mandatory. • Implement formal noise monitoring on a quarterly basis.
Management of weed/invader plants	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Implement a weed and invader plant control management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds.

Management Objectives	Role	Management Outcomes
Surface and Storm water Handling	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Divert storm water around the topsoil heaps and access roads to prevent erosion and loss of material. • Divert runoff water around the stockpile areas with trenches and contour structures to prevent erosion of the work areas.
Topsoil management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Place topsoil stockpiles along the northern and western boundaries of the site. Topsoil heaps may not exceed 1.5m in order to preserve microorganism within the topsoil.
Protection of natural vegetation	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Contain all activities within the boundaries of the approved prospecting area. • Demarcate, signpost and manage the 20m buffer area as no-go area around areas with natural vegetation.
Fauna Management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.

Management Objectives	Role	Management Outcomes
Management of health and safety risks	Site Manager to ensure compliance with the guidelines as stipulated in the EMP. Compliance to be monitored by the Environmental Control Officer.	• Ensure that workers have access to the correct PPE as required by law. • Ensure all operations comply with the Occupational Health and Safety Act.
Handling of Hazardous Materials and Substance	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer	• Store all hazardous materials or substances in a closed storage facility with an impermeable floor. • Storage area to meet the following conditions: • Construct storage area on a level area. • Floor of the storage area should be impermeable. • Storage area should be outside the 1:100-year flood line or further than 100m from the edge of a watercourse, whichever is greatest. • Access to the materials/substances may only take place with the prior notification of the site manager. • Fuel storage tanks should have an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. The bund capacity should be sufficient to contain 110% of the tank's maximum capacity. • Consider the distance and height of the bund wall relative to that of the tank to ensure that oil does not spout beyond the confines of the bund. • Establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. Inspection should be at least weekly and any accumulated rainwater should be removed. • All valves and outlets should be checked to ensure that they are intact and closed securely. • Slope the bund base towards a rainwater sump of sufficient size. • Contain contaminated water until it can be collected by a registered hazardous waste handling contractor or be disposed of at a registered hazardous waste handling facility. • Ensure availability of drip trays underneath all stationary equipment or vehicles.

Management Objectives	Role	Management Outcomes
Waste management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Ensure no waste storage area is established outside the boundaries of the prospecting area. • Ensure vehicle maintenance only take place within the service bay area of the off-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litre closed container/bin inside the emergency service area. • Ensure diesel bowser is equipped with a drip tray at all times. • Use drip trays during each and every refuelling event. • Ensure the nozzle of the bowser rests in a sleeve to prevent dripping after refuelling. • Keep drip trays clean. No dirty drip trays may be used on site. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognised facility. File proof on site. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Place all used oils, grease or hydraulic fluids therein and remove these receptacles from the site on a regular basis for disposal at a registered or licensed hazardous disposal facility. • Store non-biodegradable refuse such as glass bottles, plastic bags etc., in a container with a closable lid at a collecting point. Collection should take place on a regular basis and disposed of at the recognised landfill site. Prevent refuse from being dumped on or in the vicinity of the prospecting area. • Biodegradable refuse to be handled as indicated above.
Management of access roads	Site Manager to ensure compliance with the guidelines as stipulated in the EMP. Compliance to be monitored by the Environmental Control Officer.	• Maintain newly constructed access roads so as to minimise dust, erosion or undue surface damage. • Divert storm water around the access roads to prevent erosion. • Erosion of access road: Restrict vehicular movement to existing access routes to prevent crisscrossing of tracks through undisturbed areas. • Repair rutting and erosion of the access roads caused by the proposed activities.

Management Objectives	Role	Management Outcomes
Protection of Cultural or Heritage Artefacts	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage and the ECO immediately.
After care on rehabilitated areas	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Control run-off water via temporary banks to ensure that accumulation of run-off does not cause down-slope erosion. • Only do topsoil spreading at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal. • Plant a cover crop immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. Fertilize the cover crop for optimum production. • Ensure rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation must not be considered complete until the first cover crop is well established. • Monitor all rehabilitated areas for erosion, and appropriately stabilized if any erosion occurs.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

The management objectives listed in this report under Point m above should be considered for inclusion in the environmental authorisation.

o) Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

The assumptions made in this document which relate to the assessment and mitigation measures proposed, stem from site specific information gathered from the property owner, as well as site inspections, and background information gathering.

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

i) Reasons why the activity should be authorised or not.

Should the mitigation measures and monitoring programmes proposed in this document be implemented on site, no fatal flaws could be identified that were deemed as severe as to prevent the activity continuing.

ii) Conditions that must be included in the authorisation

The management objectives listed in this report under Point m should be considered for inclusion in the environmental authorisation.

q) Period for which the Environmental Authorisation is required.

The applicant requests the Environmental Authorisation to be valid for a three (3)-year period to correspond with the maximum validity of the Prospecting Right.

r) 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.

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.

s) Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

i) Explain how the aforesaid amount was derived

The annual amount required to manage and rehabilitate the environment was estimated to be R 8 575.94

Please see the explanation as to how this amount was derived at attached as **Error! Reference source not found.**. A Bank Guarantee will be provided for the proposed site.

ii) Confirm that this amount can be provided from operating expenditure.

(Confirm that the amount is anticipated to be an operating cost and is provided for as such in the prospecting Work Programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

The prospecting operation will be self-funded through income generated Middelwater Exploration Co (Pty) Ltd. A bank guarantee will be ceded to the DMR for the required amount.

t) Specific Information required by the competent Authority

iii) 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: -

(1) Impact on the socio-economic conditions of any directly affected person. (Provide the results of investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an Appendix)

The following potential impacts were identified that may impact on socio-economic conditions of directly affected persons:

Visual exposure:

The prospecting area was identified to constitute the lowest possible visual impact on the surrounding environment. The surrounding areas have previously been disturbed by prospecting activities and surrounding mines in the area. The applicant should however ensure that housekeeping is managed to standard, as this will mitigate the visual impacts during the operational phase of the mine.

Upon closure the site will be rehabilitated and sloped to insure that the visual impact on the aesthetic value of the area is kept to a minimum. The site will have a neat appearance and be kept in good condition at all times.

Air Quality:

The background air quality of the surrounding area is relatively good due to low industrial activity. Factors contributing to air pollution are the burning of veld and agriculture in the area. Given the surrounding extent of mostly covered areas, no extreme dust generation under windy conditions is experienced.

Dust will be generated by the movement of machinery and vehicles. Dust suppression measures should be implemented to prevent excessive dust on site. Due to the remote setting of the proposed prospecting area the potential impact of dust nuisance on the surrounding environment is deemed to be of low significance.

Noise:

The surrounding areas are characterised by an agricultural setting in which vehicles and farm equipment operate. The traffic on the roads surrounding the property contributes to the ambient noise of the area. The noise to be generated at the proposed site operation is expected to temporarily increase the noise levels of the area. Drilling, Loading and transportation of the material will generate noise daily. The significance of noise on the surrounding environment is therefore deemed to be of low significance. Mitigation measures should be implemented to ensure employees conduct them in an acceptable manner while on site in order to lessen the noise impact of the proposed activity on the surrounding environment.

Existing Infrastructure:

It is expected that the proposed processing activity will have a very low impact on the surrounding environment as activities will be contained within the boundaries of the site. The proposed footprint area will not require the building of any permanent structures. The proposed prospecting on the property will also reduce the amount of trucks delivering materials, from outside sources. This will have a direct positive impact on the traffic volumes of the surrounding roads and price of the aggregate.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act. (Provide the results of investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of the Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12 herein).

A Heritage Impact Assessment Report will be conducted by a qualified specialist and will be included in the FBAR report.

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

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix 4)

No alternatives sites where considered during this prospecting drilling. If drill sites where found unfeasible due to the natural environment, these drill sites will be relocated to a position possible with minimal impacts associated. Please refer to Figure 2 for the proposed exploration boreholes

However, the applicant considered two activity alternatives during the planning phase of this project:

1. Temporary Infrastructure (Preferred Alternative) vs Permanent Temporary Infrastructure:
    a. The use of temporary Infrastructure will entail the use of machinery that is either track-based or can be removed without difficulty. Temporary Infrastructure to be used in the prospecting mining method will entail some temporary offices, storage facility and chemical toilet, with servicing of vehicles and equipment being done off-site at the existing workshop on the applicant's farm.

Positive Aspects: The positive aspects associated with the use of temporary infrastructure firstly enable the applicant to move the temporary infrastructure within the boundaries of the prospecting mining area as prospecting mining of the mineral progresses. Secondly the decommissioning phase is facilitated as the removal of temporary infrastructure from the prospecting mining area during the rehabilitation of the site is easy and highly effective.

The use of permanent infrastructure will entail the construction of an office building with ablution facilities, and installation of a permanent vehicle service area.

i. The use of permanent Infrastructure will increase the impact of the proposed project on the environment as it will entail the establishment of more structures, lengthen the period required for rehabilitation as well as increase the rehabilitation amount as the permanent Infrastructure will either have to be decommissioned or be maintained after the closure of the site.
ii. The construction of permanent Infrastructure at the site will also increase the visual impact of the proposed project on the surrounding environment and additional mitigation measures will have to be implemented to address the impact.

In the light of the above the use of temporary Infrastructure is deemed to be the most viable preferred alternative.

No-go Alternative:

The ‘No Go’ option for development was considered. However, this was adjudged to not be the best land-use option for the following reasons: The grazing value of the land is at present considered to be extremely low due to the high level of disturbance, resulting in the area being characterized by non-palatable grasses and low biomass. The no-go alternative entails no change to the status quo and is therefore a real alternative that must be considered. In the event that the no-go alternative is implemented it will prevent the prospecting of the study area.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft Environmental Management Programme.

a) Details of the EAP, (Confirm that the requirements for the provision of the details and expertise of the EAP are already included in Part A, section 1(a) herein as required).

The details and expertise of Yolandie Coetzee of Greenmined Environmental that acts as EAP on this project has been included in Part A Section 1(a) as well as Appendix J as required.

b) Description of the Aspects of the Activity (Confirm that the requirements to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

The aspects of the activity that are covered by the draft environmental management programme has been described and included in Part A, section (1)(h).

c) Composite Map

(Provide a map (Attached as an Appendix) 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)

As mentioned under Part A, section (1)(L)(ii) this map has been compiled and is attached as Appendix C to this document.

d) Description of impact management objectives including management statements

i) Determination of closure objectives. (Ensure that the closure objectives are informed by the type of environment described)

Prospecting activities are to be undertaken in a manner which facilitates site rehabilitation and the restoration of existing land capabilities. The primary objectives for rehabilitation includes:

a) The facilitation of the re-establishment of the land use and capability to as close as reasonably to the original conditions;
b) Removal of all infrastructure and material introduced to site
c) Removal of all wastes and their and their related disposal; and
d) And promotion of the rapid re-establishment of natural vegetation and the restoration of site ecology.

The disturbed areas shall be rehabilitated to ensure that:

- The biodiversity habitat is encouraged by the new land use after the prospecting;
- Future public health and safety are not compromised;
- The site is reversed to almost its original state;

- Environmental and resources are not subject to physical and chemical deterioration;
- The after-use of the site is beneficial and sustainable in the long term;
- Any adverse socio-economic impacts are minimized; and
- All socio-economic benefits are maximized.

This will be done by complying with the conditions in the environmental management program below, and relevant statuary requirements. The contractor and employee will be made aware of their environmental responsibilities and will be empowered to executed the work program in compliance with the requirements of this EMPR.

The following closure objectives are proposed with regard to rehabilitation of the prospecting area:

- On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):
  - Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
  - The topsoil will be placed back as a growth medium and the sides of the excavation will be sloped with acceptable contours to prevent soil erosion.
- No trees to be removed over areas where prospecting is required.
- Rehabilitation will be conducted after the prospect drilling is complete.
- Rehabilitation will be ongoing and conform to 400 m^2 being stripped of topsoil and 400 m^2 being rehabilitated after the oversized and processed soil is worked back into the excavation.
- Thus there will only be 400 m^2 of land open for rehabilitation in operational times.
- Fill and topsoil could be placed over the slopes to provide a suitable medium for the establishment of vegetation.
- No waste will be permitted to be deposited in the excavations.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the prospecting mining operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.
- Photographs of the camp and office sites, before and during the prospecting mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.
- Prior to replacing the topsoil, the material that was removed from these areas will be replaced in the same order as it originally occurred.
- All Temporary Infrastructures, equipment, plant, temporary housing and other items used during the prospecting mining period will be removed from the site.
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the prospecting mining area and disposed of at a recognized landfill facility, proof of this removal will be kept on file at the applicant's office. It will not be permitted to be buried or burned on the site.

- Weed / Alien clearing will be done in a sporadic manner during the life of the prospecting activities. Species regarded as the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure. Final rehabilitation shall be completed within a period specified by the Regional Manager.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.

ii) Volume and rate of water use required for the operation

It is proposed that the prospecting activities will require approximately 2 5000L of water per drill site.

iii) Has a water use licence has been applied for?

N/A. Water will be brought to site every day for use on site. Diamond drilling does not require water, as the RC drilling works with air pressure. Potable water would be bought locally and supplied to site.

iv) Impacts to be mitigated in their respective phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
whether listed or not listed	(volumes, tonnages and hectares or m^2)	In which impact is anticipated			
(E.g. Excavations, blasting, 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.)		(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))			
SITE VISITS BY VARIOUS SPECIALIST	6 821.1414 Ha	Construction / Site Establishment phase	**Dust Handling:** • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Construction / Site Establishment phase
			Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	
			Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. Should graves be observed on site during activity progress then all activity should be ceased and the area demarcated as a no-go zone. A specialists will need to be consulted and responsible action considered, whether grave relocation or ceasing activity	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999	
			Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. Should graves be observed on site during activity progress then all activity should be ceased and the area demarcated as a no-go zone. A specialists will need to be consulted and responsible action considered, whether grave relocation or ceasing activity	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999	
			Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in.	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
SITE VISITS BY VARIOUS SPECIALIST	6 821.1414 Ha	Construction / Site Establishment phase	Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	<u>Negative impact on fauna that may enter the area:</u> • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational and decommissioning phases
			All vehicles will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks will be cleaned up immediately using an absorbent material.		
			<u>Noise Handling:</u> The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	**<u>Noise Handling:</u>** NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	
			Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
SITE VISITS BY VARIOUS SPECIALIST		Construction / Site Establishment phase	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	<u>NWA, 1998</u>	Throughout operational and decommissioning phases
		Operational phase	All intersections with main tarred roads will be clearly signposted. drivers will be enforced to keep to set speed limits. Trucks will be road-worthy condition. A fund will be set aside to maintain the serviceability of the road verge where the trucks approach or depart from the main road. Ensure directional floodlights are utilized that focus light on the necessary areas and reduce light pollution to surrounding environment.	<u>Degradation of the gravel access road:</u> • NRTA, 1996 The gravel access road needs to be monitored for signs of degradation. Should any signs become apparent immediate rectification actions must be implemented.	
DEMARCATION OF SITE WITH VISIBLE BEACONS.		Construction / Site Establishment phase	Demarcation of the site will ensure that all employees are aware of the boundaries of the processing area and that work stay within approved area.	Processing of the waste rock/stone is only allowed within the boundaries of the approved processing area. • MHSA, 1996 • OHSA, 1993	Beacons need to be in place throughout the life of the activity.
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	400 m^2		N/A	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	Construction / Site Establishment phase Throughout operational and decommissioning phases
			Portable toilets are to be emptied and cleaned regularly. Ensure reputable contractors are utilize for management of facilities. Portable toilets will be managed by a reputable contractor and inspected daily for any potential leaks. Water should not be released into the surrounding environment unless relevant permission obtained from DWS	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	
		Operational phase	<u>Visual Mitigation:</u> • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	<u>Land use zoning:</u> • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	
			<u>Dust Handling:</u> • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	<u>Dust Handling:</u> • NEM:AQA, 2004 Regulation 6(1)	

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ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	400 m^2	Operational phase	**Emission Handling:** All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
			Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	**Noise Handling:** NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	
			Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	400 m^2	Operational phase	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
			Keep mining in footprint		
			Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. Should graves be observed on site during activity progress then all activity should be ceased and the area demarcated as a no-go zone. A specialists will need to be consulted and responsible action considered, whether grave relocation or ceasing activity	<u>Loss of Artefacts and Graves:</u> National Heritage Resources Act No. 25 of 1999	

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			Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	Contamination of surface or groundwater due to hazardous spills not cleaned:	
			Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	NWA, 1998	
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	400 m^2	Construction / Site Establishment phase	Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational and decommissioning phases
			Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.	
			Ensure advertising is limited to local and regional areas, and only specifically advertise for Jobs nationally if skills are not available. Ensure that all power-related structures are adequately marked with relevant signs and warnings and fenced off.	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	
STRIPPING AND STOCKPILING OF TOPSOIL		Operational phase	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	Land use zoning: • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	

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			Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	
			Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	
STRIPPING AND STOCKPILING OF TOPSOIL	400 m^2	Operational phase	**Noise Handling:** The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	**Noise Handling:** NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases
			Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	Throughout operational and decommissioning phases

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			Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases
STRIPPING AND STOCKPILING OF TOPSOIL	400 m^2	Operational phase	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
			Keep mining in footprint		
			Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. Should graves be observed on site during activity progress then all activity should be ceased and the area demarcated as a no-go zone. A specialists will need to be consulted and responsible action considered, whether grave relocation or ceasing activity	<u>Loss of Artefacts and Graves:</u> National Heritage Resources Act No. 25 of 1999	

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			Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	<u>NWA, 1998</u>	
			Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	<u>Negative impact on fauna that may enter the area:</u> • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	
STRIPPING AND STOCKPILING OF TOPSOIL DRILLING FOR CONTINUED RESOURCE EVALUATION	400 m^2	Operational phase	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	<u>• Every precaution must be taken to prevent contamination. The precautionary principal must apply.</u>	Throughout operational and decommissioning phases
			<u>Visual Mitigation:</u> • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	<u>Land use zoning:</u> • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	
			drilling alternatives will be considered to reduce noise and associated vibrations	Noise Handling: _NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	
			Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	NWA, 1998	
			Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	Contamination of surface or groundwater due to hazardous spills not cleaned:	

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
DRILLING FOR CONTINUED RESOURCE EVALUATION	400 m^2	Operational phase	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational and decommissioning phases
			Ensure baseline photographs are taken of all structures which may be impacted for photographic evidence prior to any drilling Ensure procedures in place to compensate for damage. Ensure that all power-related structures are adequately marked with relevant signs and warnings and fenced off.	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993	
			Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	<u>Negative impact on fauna that may enter the area:</u> • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
DRILLING FOR CONTINUED RESOURCE EVALUATION	400 m^2	Operational phase	Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	Throughout operational and decommissioning phases
			Keep mining in footprint		
			Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	<u>• Every precaution must be taken to prevent contamination. The precautionary principal must apply.</u>	
			Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	
			Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. Should graves be observed on site during activity progress then all activity should be ceased and the area demarcated as a no-go zone. A specialists will need to be consulted and responsible action considered, whether grave relocation or ceasing activity	<u>Loss of Artefacts and Graves:</u> National Heritage Resources Act No. 25 of 1999	
			Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	<u>NWA, 1998</u>	
GENERAL ACTIVITIES		Operational phase	Portable toilets are to be emptied and cleaned regularly. Ensure reputable contractors are utilize for management of facilities. Portable toilets will be managed by a reputable contractor and inspected daily for any potential leaks. Water should not be released into the surrounding environment unless relevant permission obtained from DWS	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	Construction / Site Establishment phase and Operational Phase

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
GENERAL ACTIVITIES		Operational phase	Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality.	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational phases Throughout operational and decommissioning phases
			Pans and artificial watering points must be cordoned off with at least 100m horizontal distance buffer zones and no activity is too take place within these areas. Consideration should be given to create alternative watering point if existing artificial water point will be disturbed.	NWA, 1998	
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	400 m^2	Decommissioning phase	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	400 m^2	Decommissioning phase	Ensure soils are replaced to an adequate depth and ensure soil quality is adequate.	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout decommission phase
			<u>Dust Handling:</u> • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	<u>Dust Handling:</u> • NEM:AQA, 2004 Regulation 6(1)	
			<u>Emission Handling:</u> All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	<u>Dust Handling:</u> • NEM:AQA, 2004 Regulation 6(1)	
			Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	<u>Noise Handling:</u> _NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	
			Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u>	

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	400 m^2	Decommissioning phase	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout decommissioning phase
			Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	
			Rehabilitate disturbed areas with natural indigenous flora. Monitor for cover abundance.	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	
			Specialist must be consulted f issues with groundwater are observed and qualities do not fall within the DWS target qualities or water qualities for livestock watering. Any affected registered water user must be compensated if levels an quality are impacted by the mining activities	Contamination of surface or groundwater due to hazardous spills not cleaned: NWA, 1998	
			Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.		

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	400 m^2	Decommissioning phase	Monitor area for erosion and pooling and rehabilitate if necessary. Continue with Surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season.	NWA, 1998	Throughout decommissioning phase
			Ensure that all stuff are made aware of all working conditions on site	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993	
			Inform staff, contractors and visitors to not harm fauna in the area. Conduct annual surveys to monitor faunal biodiversity.	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	
			Keep mining in footprint. Excavation areas will be sloped during rehabilitation to even out depressions.		
			Monitor, especially after first heavy rain falls to ensure adequate surface water drainage		
			Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	Land use zoning: • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	
			Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.	

e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph ();

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
whether listed or not listed	(Including the potential impacts for cumulative impacts)		In which impact is anticipated	(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)	
(E.g. Excavations, blasting, 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.)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)		(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))	E.g. Modify through alternative method. Control through noise control. Control through management and monitoring. Remedy through rehabilitation.	
SITE VISITS BY VARIOUS SPECIALIST	Dust Generation	Air Quality	Construction / Site Establishment phase	Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Emissions	Air Quality		Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Loss and disturbance to surface archaeological sites	Archaeological and Cultural Resources		**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999
	Potential disruption to grave sites	Archaeological and Cultural Resources		**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999
	Potential hydrocarbon contamination from leeching into the water table	Surface Water		Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	loss of food, nest sites and refugia	Fauna		Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.
	Potential damage to or destruction of sensitive faunal habitats: Pans & Watering Points	Surface Water		Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.
	Loss of biodiversity.	Flora		Control: Implementation of flora protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004
	Increased noise levels	Noise		**Control:** Noise control measures	**Noise Handling:** NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
SITE VISITS BY VARIOUS SPECIALIST	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination	Soils	Construction / Site Establishment phase	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
	Potential hydrocarbon contamination to soils	Soils		**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
	increased risk of erosion	Soils		**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
	Potential for damage or destruction of sensitive faunal habitats: Pans and watering points	SurfaceWater		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998
	Potential hydro carbonation contamination form leaks or spills which may reach downstream surface water bodies	Surface Water		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	Road degradation. Increased potential for road incidences Potential distraction to road users	All road users will be affected	Operational phase	Control & Remedy: Road management	Degradation of the gravel access road: • NRTA, 1996 The gravel access road needs to be monitored for signs of degradation. Should any signs become apparent immediate rectification actions must be implemented.
DEMARCATION OF SITE WITH VISIBLE BEACONS.	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	N/A	Construction / Site Establishment phase	N/A	Processing of the waste rock/stone is only allowed within the boundaries of the approved processing area. • MHSA, 1996 • OHSA, 1993
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	N/A	Construction / Site Establishment phase	N/A	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	Portable Toilets Potential harm through sewage leaks	Groundwater		Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	Portable Toilets Potential harm through sewage leaks	Surface Water		Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	Portable Toilets Potential harm through sewage leaks	Soils		Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	Portable Toilets Potential harm through sewage leaks	Social		Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.	Operational phase	Control: Implementation of proper housekeeping	Land use zoning: • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.
	Dust nuisance caused by the disturbance of soil.	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		**Control:** Noise control measures	**Noise Handling:** NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Alteration of topography	Topography		Control: Surface water Monitoring	
	Loss of and disturbance to surface archaeological sites	Artefacts or graves		**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Social	Construction / Site Establishment	Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
STRIPPING AND STOCKPILING OF TOPSOIL	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.	Operational phase	Control: Implementation of proper housekeeping	Land use zoning: • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.
	Dust nuisance caused by the disturbance of soil.	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		**Control:** Noise control measures	**Noise Handling:** NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Alteration of topography	Topography		Control: Surface water Monitoring	

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
STRIPPING AND STOCKPILING OF TOPSOIL	Loss of and disturbance to surface archaeological sites	Artefacts or graves		**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Disturbance of geological strata	Geology		N/A	-
DRILLING FOR CONTINUED RESOURCE EVALUATION	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.		Control: Implementation of proper housekeeping	Land use zoning: • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.
	Dust nuisance due to excavation activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Control: Dust Suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance generated by drilling equipment	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Control: Noise Control Measures	Noise Handling: _NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies	Operational phase	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
DRILLING FOR CONTINUED RESOURCE EVALUATION	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution	Operational phase	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
	Health and Safety Risk by Drilling Activities. Potential danger to surrounding communities	The Unsafe working conditions should only impact the applicant. Safety measures will be implemented		Control: Implementation of safety control measures	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004
	Alteration of topography	Topography		Control: Surface water Monitoring	
	Disturbance of geological strata	Geology		N/A	-
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
DRILLING FOR CONTINUED RESOURCE EVALUATION	Loss of and disturbance to surface archaeological sites	Artefacts or graves	Operational phase	**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998
GENERAL ACTIVITIES	Potential for more employment	Social		Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	Portable Toilets Potential harm through sewage leaks	Groundwater		Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	Potential harm through littering	Fauna		Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.
	Potential contamination through littering	Surface Water		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998
	Potential contamination through littering	Soils		Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	Potential contamination through littering	Soils		Control: Implementation of proper housekeeping	Land use zoning: • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Decommissioning phase	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	Soils replaced and ameliorated	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Dust nuisance caused during landscaping activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Decommissioning phase	Control: Dust Suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by machinery	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Control: Noise Management	Noise Handling: _NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	Area revegetated with indigenous plants	Flora		**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004
	Improve response to issues relating to deterioration of groundwater quality or quantity	Groundwater improvement		Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned: NWA, 1998
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Containment of dirty water. Improve response to issues relating to deterioration of surface water quality or quantity. free drainage resorted to area. Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Surface water Bodies	Decommissioning phase	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998
	Health and safety risk posed by un-sloped areas	The impact on health and safety due to un-sloped areas will be contained within the site boundary.		Control: Sloping of areas upon decommission	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993
	Reintroduction of fauna attracted to flora to the area	Fauna returning to area		Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.
	Alteration of topography	Topography		Control: Surface water Monitoring	
	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Topography		Control: Surface water Monitoring	
	Improved aesthetics through rehabilitation	The visual impact may affect the aesthetics of the landscape.		Control: Implementation of proper housekeeping	Land use zoning: • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes in paragraph (c) and (d) will be achieved)

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
whether listed or not listed	(Including the potential impacts for cumulative impacts)	(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)		
(E.g. Excavations, blasting, 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.)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	E.g. Modify through alternative method. Control through noise control. Control through management and monitoring. Remedy through rehabilitation.		
SITE VISITS BY VARIOUS SPECIALIST	Dust Generation	Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Emissions	Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	
	Loss and disturbance to surface archaeological sites	**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999	
	Potential disruption to grave sites	**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999	
	Potential hydrocarbon contamination from leeching into the water table	Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	
	loss of food, nest sites and refugia	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	
	Potential damage to or destruction of sensitive faunal habitats: Pans & Watering Points	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	
	Loss of biodiversity.			
	Increased noise levels	**Control:** Noise control measures	**Noise Handling:** NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
SITE VISITS BY VARIOUS SPECIALIST	Potential hydrocarbon contamination topsoil's	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational and decommissioning phases
	increased risk of erosion	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	
	Potential for damage or destruction of sensitive faunal habitats: Pans and watering points	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	
	Potential hydro carbonation contamination form leaks or spills which may reach downstream surface water bodies	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	
	Road degradation. Increased potential for road incidences Potential distraction to road users	Control & Remedy: Road management	Degradation of the gravel access road: • NRTA, 1996 The gravel access road needs to be monitored for signs of degradation. Should any signs become apparent immediate rectification actions must be implemented.	
DEMARCATION OF SITE WITH VISIBLE BEACONS.	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	N/A	Processing of the waste rock/stone is only allowed within the boundaries of the approved processing area. • MHSA, 1996 • OHSA, 1993	Beacons need to be in place throughout the life of the activity.
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF PORTABLE BUILDINGS.	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	N/A	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	Construction / Site Establishment phase
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF PORTABLE BUILDINGS.	Portable Toilets Potential harm through sewage leaks	Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
	Deterioration in visual aesthetics of the area	Control: Implementation of proper housekeeping	Land use zoning: • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Construction / Site Establishment phase and Operational Phase
	Dust nuisance caused by the disturbance of soil.	Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	
	Emissions caused by vehicles and equipment	Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	**Control:** Noise control measures	**Noise Handling:** NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	
	Contamination of area with hydrocarbons or hazardous waste materials	Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	
	Alteration of topography	Control: Surface water Monitoring		
	Loss of and disturbance to surface archaeological sites	**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999	
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:	
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
STRIPPING AND STOCKPILING OF TOPSOIL	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.	
	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	
	Deterioration in visual aesthetics of the area	Control: Implementation of proper housekeeping	Land use zoning: • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	
	Dust nuisance caused by the disturbance of soil.	Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	
	Emissions caused by vehicles and equipment	Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	**Control:** Noise control measures	**Noise Handling:** NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
STRIPPING AND STOCKPILING OF TOPSOIL	Contamination of area with hydrocarbons or hazardous waste materials	Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
	Alteration of topography	Control: Surface water Monitoring		
	Loss of and disturbance to surface archaeological sites	**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999	
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:	
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.	
	Disturbance of geological strata	N/A		
DRILLING FOR CONTINUED RESOURCE EVALUATION	Deterioration in visual aesthetics of the area	Control: Implementation of proper housekeeping	Land use zoning: • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	
	Dust nuisance due to excavation activities	Control: Dust Suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	
	Noise nuisance generated by drilling equipment	Control: Noise Control Measures	Noise Handling: NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
DRILLING FOR CONTINUED RESOURCE EVALUATION	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	Throughout operational and decommissioning phases
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:	
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	
	Health and Safety Risk by Drilling Activities. Potential danger to surrounding communities	Control: Implementation of safety control measures	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993	
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	
	Alteration of topography	Control: Surface water Monitoring		
	Disturbance of geological strata	N/A	-	
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.	

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
DRILLING FOR CONTINUED RESOURCE EVALUATION DRILLING FOR CONTINUED RESOURCE EVALUATION DRILLING FOR CONTINUED RESOURCE EVALUATION	Contamination of area with hydrocarbons or hazardous waste materials	Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
	Loss of and disturbance to surface archaeological sites	**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999	Throughout operational and decommissioning phases
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	Throughout operational and decommissioning phases
GENERAL ACTIVITIES	Potential for more employment	Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	Throughout operational phases
	Portable Toilets Potential harm through sewage leaks	Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	
	Potential harm through littering	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	
	Potential contamination through littering	Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	
	Potential contamination through littering	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	
	Potential contamination through littering	Control: Implementation of proper housekeeping	Land use zoning: • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Potential compaction of soils in neighboring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
	Soils replaced and ameliorated	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Dust nuisance caused during landscaping activities	Control: Dust Suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Emissions caused by vehicles and equipment	Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	
	Noise nuisance caused by machinery	Control: Noise Management	Noise Handling: _NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:	
	Contamination of area with hydrocarbons or hazardous waste materials	Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	
	Area revegetated with indigenous plants	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	
	Improve response to issues relating to deterioration of groundwater quality or quantity	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:	

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Containment of dirty water. Improve response to issues relating to deterioration of surface water quality or quantity. free drainage resorted to area. Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	Throughout operational and decommissioning phases
	Health and safety risk posed by un-sloped areas	Control: Sloping of areas upon decommission	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993	
	Reintroduction of fauna attracted to flora to the area	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	
	Alteration of topography	Control: Surface water Monitoring		
	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Control: Surface water Monitoring		
	Improved aesthetics through rehabilitation	Control: Implementation of proper housekeeping	Land use zoning: • Northern Cape LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.	

i) Financial Provision

(1) Determination of the amount of Financial Provision.

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

The primary objective is to obtain a closure certificate at the end of the life of the prospecting at minimum cost and in as short a time period as possible whilst still complying with the requirements of the Minerals and Petroleum Resources Development Act. To realise this, the following objectives must be achieved:

- Remove all temporary infrastructure and waste from the site as per the requirements of this EMPR and of the Provincial Department of Mineral Regulation;
- Demolish / rehabilitate all roads with no post -prospecting use potential;
- Clear all carbonaceous material from site;
- Clear boulders form site;
- Remove all waste from site;
- Any wetlands in the area should not be compromised or destructed;
- Future public health and safety are not compromised;
- Ensure that no threat to surface and underground water quality remains;
- Ensure that all permanent changes in topography are sustainable and do not cause erosion or the damming up of runoff;
- Shape and contour all disturbed areas in compliance with the EMPR;
- The stockpiled topsoil will be spread over the disturbed area to a depth of at least 500 mm;
- Make safe any dangerous excavations or subsidence on the surface;
- Rehabilitate all disturbed areas in compliance with the EMPR and of the Provincial Department of Mineral Regulation;
- Ensure that all rehabilitated areas are safe, stable and self-sustaining in terms of vegetation;
- Control of weeds and alien invasive plant species is an important aspect after topsoil replacement and seeding has been done in an area;
- The applicant will comply with the minimum closure objectives as prescribed by DMR;
- Any adverse socio-economic impacts are minimised; and
- All socio-economic benefits are maximised.

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

This report, the Draft Basic Assessment Report, includes all the environmental objectives in relation to closure and will be made available for perusal of I&AP's and stakeholders. Any additional comments received during the commenting period will be added to the Final Basic Assessment Report to be submitted to DMR for approval.

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main prospecting activities, including the anticipated prospecting area at the time of closure.

The requested rehabilitation plan is attached in Appendix E. Upon closure of the prospecting activity all infrastructure will be removed. The compacted areas will be ripped and levelled upon which the topsoil will be replaced. No permanent structures will remain upon closure of the site. The rehabilitation plan shall entail removal of all generated waste, infrastructures and materials, re-vegetation of disturbed and cleared areas, rehabilitation of access roads, ensuring the growth of the existing grasses and plants species and cleaning of spillages etc.

A magnetic survey will be conducted, upon approval, to give an overview of the physical properties of the property, drilling will commence as soon as equipment can be secured and moved to the site. The drilling process is determined by the local conditions but can generally be based on 25 m deep per rig per day for a week. A number of diamond drill holes will be drilled in the strategic locations to fill the gaps and confirm existing holes and information derived from the magnetic field survey.

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

The rehabilitation of the prospecting area as indicated on the rehabilitation plan attached as Appendix E will comply with the minimum closure objectives as prescribed by DMR and detailed below, and therefore is deemed to be compatible:

The following closure objectives are proposed with regard to rehabilitation of the processing area:

- Rehabilitation will be ongoing and conform to 400 m^2 being stripped of topsoil and 400 m^2 being rehabilitated after the oversized and processed soil is worked back into the excavation.
- Thus there will only be 400 m^2 of land open for rehabilitation in operational times. One excavator will be used to excavate the alluvial soil.
- Fill and topsoil could be placed over the slopes to provide a suitable medium for the establishment of vegetation.
- No waste will be permitted to be deposited in the excavations.
- On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):
    - Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
    - The topsoil will be placed back as a growth medium and the sides of the excavation will be sloped with acceptable contours to prevent soil erosion.
    - The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.

- Photographs of the camp and office sites, before and during the prospecting mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.
- Prior to replacing the topsoil, the material that was removed from these areas will be replaced in the same order as it originally occurred.

Final rehabilitation:

- Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding and maintenance, and weed / alien clearing.
- All Temporary Infrastructures, equipment, plant, temporary housing and other items used during the prospecting mining period will be removed from the site.
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the prospecting mining area and disposed of at a recognized landfill facility, proof of this removal will be kept on file at the applicant's office. It will not be permitted to be buried or burned on the site.
- Weed / Alien clearing will be done in a sporadic manner during the life of the prospecting activities. Species regarded as the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure. Final rehabilitation shall be completed within a period specified by the Regional Manager.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.

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

The calculation of the quantum for financial provision was according to Section B of the working manual.

Mine type and saleable mineral by-product

According to Tables B.12, B.13 and B.14

Mine type	Beryllium, Cobalt, Copper, Feldspar, Gold, Iron Ore, Lead, Lithium, Manganese, Mica, Nickel, Silver, Tantalum, Tin, Tungsten, Uranium and Zinc
Saleable mineral by-product	N/A

Primary Risk Class

According to Tables B.12 or B.13

Primary risk ranking	Class C
Revised risk ranking	N/A

Environmental sensitivity of the mine area

According to Table B.4

Environmental sensitivity of the mine	Low

Level of information

According to Step 4.1

Level of information available	Limited

Identification of closure components

According to Table B.5 and site-specific conditions

Component No.	**Main description**	**Applicability of closure components (Circle Yes or No)**	
		Prospecting	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	-	**NO**
2(A)	Demolition of steel buildings and structures	-	**NO**
2(B)	Demolition of reinforced concrete buildings and structures	-	**NO**
3	Rehabilitation of access roads		**NO**
4(A)	Demolition and rehabilitation of electrified railway lines	-	**NO**
4(B)	Demolition and rehabilitation of non-electrified railway lines	**-**	**NO**
5	Demolition of housing and facilities	**-**	**NO**
6	Opencast rehabilitation including final voids and ramps	-	**NO**
7	Sealing of shafts, adits and inclines	**YES**	**-**
8(A)	Rehabilitation of overburden and spoils	-	**NO**
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing)	-	**NO**
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich)	-	**NO**
9	Rehabilitation of subsided areas	-	**NO**
10	General surface rehabilitation, including grassing of all denuded areas	**YES**	**-**
11	River diversions	-	**NO**
12	Fencing	-	**NO**
13	Water management (Separating clean and dirty water, managing polluted water and managing the impact on groundwater)	-	**NO**
14	2 to 3 years of maintenance and aftercare	**-**	**NO**

Unit rates for closure components

According to Table B.6 master rates and multiplication factors for applicable closure components. The master rate from the DMR Master Rates table for financial provision of 2018 has been used.

Component No.	Main description	Master rate	Multiplication factor
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	-	-
2(A)	Demolition of steel buildings and structures	-	-
2(B)	Demolition of reinforced concrete buildings and structures	-	-
3	Rehabilitation of access roads	-	-
4(A)	Demolition and rehabilitation of electrified railway lines	-	-
4(B)	Demolition and rehabilitation of non-electrified railway lines	-	-
5	Demolition of housing and facilities	-	-
6	Opencast rehabilitation including final voids and ramps	-	-
7	Sealing of shafts, adits and inclines	R 115	-
8(A)	Rehabilitation of overburden and spoils	-	-
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing)	-	-
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich)	-	-
9	Rehabilitation of subsided areas	-	-
10	General surface rehabilitation, including grassing of all denuded areas	R 118 924	-
11	River diversions	-	-
12	Fencing	-	-
13	Water management (Separating clean and dirty water, managing polluted water and managing the impact on groundwater)	-	-
14	2 to 3 years of maintenance and aftercare	-	-

Determine weighting factors

According to Tables B.7 and B.8

Weighting factor 1: Nature of terrain/accessibility	1.20 (Rugged)
Weighting factor 2: Proximity to urban area where goods and services are to be supplied	1.10 (Remote)

Calculation of closure costs

The amount that will be necessary for the rehabilitation of damages caused by the operation, both sudden closures during the normal operation of the project and at final, planned closure gives a sum total of **R 8 575.94.** Prospecting will be conducted one drill site at a time. Not more than 1 site will be drilled at a time**.**

(f) Confirm that the financial provision will be provided as determined.

Herewith I, the person, whose name is stated below confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application. I herewith confirm that the company will provide the amount that will be determined by the Regional Manager in accordance with the prescribed guidelines.

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

(g) Monitoring of Impact Management Actions

(h) Monitoring and reporting frequency

(i) Responsible persons

(j) Time period for implementing impact management actions

(k) Mechanisms for monitoring compliance

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
whether listed or not listed			(FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	
(E.g. Excavations, blasting, 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.)				
SITE VISITS BY VARIOUS SPECIALIST	Dust Monitoring: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. Dust Monitoring will also be conducted on site on a monthly basis.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Emission Monitoring: • The emissions generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Emission Handling and Monitoring: • Emissions will be monitored	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • All vehicles in good working order to reduce risk of emissions	
	Archaeological & cultural sites	Should any artefacts be discovered the area needs to be demarcated and work needs to be stopped.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Northern Cape and the ECO immediately. • Work may only commence once the area was cleared by Heritage Northern Cape.	

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
SITE VISITS BY VARIOUS SPECIALIST	Groundwater	**Groundwater Monitoring:** Equipment's needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of hydrocarbon spills be discovered during the execution of the activities. • Notify DWS and the ECO immediately. • Clean waterbody immediate with the proper mitigation measures. • Conduct the activity in terms of the Best Practice Guidelines for small scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Protection of fauna	Monitor any ecologically sensitive species should they be observed on site.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. • Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	
	Management of weed or invader plants • The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed. Loss of natural vegetation.	Inspect progress of construction & ensure activity is in designated areas. Inspect area for damage to flora species. Establish alien invasive monitoring programme Management of weed or invader plants: • Removal of weeds must be manually or by the use of an approved herbicide. Management of buffer areas: • Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. Protection of fauna: • Site management has to protect fauna that enters the processing area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Implement a weed and invader plant management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds.	
	Noise Monitoring • The noise impact should be contained within the boundaries of the property, as it will represent the current activities.	**Noise Handling and Monitoring:** • Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. • Compliance with the appropriate legislation with respect to noise will be mandatory.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	Soils	**Soil Handling:** • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. **Erosion monitoring:** • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	
SITE VISITS BY VARIOUS SPECIALIST	Surface Water and Sensitive Landscapes	**Surface water Monitoring:** Ensure no litter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of hydrocarbon spills be discovered during the execution of the activities. • Notify DWS and the ECO immediately. • Clean waterbody immediate with the proper mitigation measures. • Conduct the activity in terms of the Best Practice Guidelines for small scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Officer.
	Management of Access Roads • The condition of the access road must be continuously monitored.	Management of Access Roads: • Dust suppression equipment such as a water car and dispenser. • Grader to restore the road surface when needed. Inspect intersections and roads will be clearly signposted. Drivers will be enforced to keep to set speed limits. Trucks will be in worthy condition with reflective strips	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Divert storm water around the access roads to prevent erosion. • Restrict vehicular movement to existing access routes to prevent crisscrossing of tracks through undisturbed areas. • Repair rutting and erosion of the access roads caused by the processing activities	
DEMARCATION OF SITE WITH VISIBLE BEACONS.	Maintenance of beacons	• Visible beacons need to be established at the corners of the processing area. • A 20m buffer area (if applicable) from any natural areas need to be demarcated. • A 30m buffer area from a watercourse needs to be demarcated if applicable.	Role: • Ensure beacons are in place throughout the life of the activity. Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer.	
ESTABLISHMENT OF TEMPORARY SANITATION	Groundwater	Monitor portable toilets for any leaks		
	Surface Water	Monitor portable toilets for any leaks		
	Soils	Monitor portable toilets for any leaks		
	Social	Monitor portable toilets for any leaks		

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	Monitoring of visual impacts. Inspect area for illegal littering and dumping	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR • Compliance to be monitored by the Environmental Control Officer. Role: Minimize the visual impact of the activity on the surrounding environment	
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Dust Monitoring: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. Dust Monitoring will also be conducted on site on a monthly basis.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Emission Monitoring: • The emissions generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Emission Handling and Monitoring: • Emissions will be monitored	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • All vehicles in good working order to reduce risk of emissions	
	<u>Noise Monitoring</u> • The noise impact should be contained within the boundaries of the property, as it will represent the current activities.	**<u>Noise Handling and Monitoring:</u>** • Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. • Compliance with the appropriate legislation with respect to noise will be mandatory.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	
	Management of weed or invader plants • The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed. Loss of natural vegetation.	Inspect progress of construction & ensure activity is in designated areas. Inspect area for damage to flora species. Establish alien invasive monitoring programme Management of weed or invader plants: • Removal of weeds must be manually or by the use of an approved herbicide. Management of buffer areas: • Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. Protection of fauna: • Site management has to protect fauna that enters the processing area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Implement a weed and invader plant management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds.	

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Soil Management Topsoil Management **Soil erosion:** • Loss of reinstated topsoil after rehabilitation.	**Soil Handling:** • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. **Erosion monitoring:** • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental •
	Waste Management: • Management of waste must be a daily monitoring activity. • Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily.	Waste Management: • Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. • A hydrocarbon spill kit to enable sufficient clean-up of contaminated areas. • Drip trays must be available to place underneath equipment parked for the night. • Should a vehicle have a break down, it must be decommissioned immediately and removed from site to be serviced. • Waste disposal register and file for the keeping of safe disposal records. • Ensure that hazardous substances if any are stored within a securely fenced area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the recognized landfill site at Robertson. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	
	N/A	Inspect area for erosion and pooling.		
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Protection of Cultural and Heritage Artefacts	Should any artefacts be discovered the area needs to be demarcated and work needs to be stopped.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Northern Cape and the ECO immediately. • Work may only commence once the area was cleared by Heritage Northern Cape.	
	Groundwater	**Groundwater Monitoring:** Equipment's needs to be monitored to prevent any hydrocarbon spills.		

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STRIPPING AND STOCKPILING OF TOPSOIL	Surface water Bodies	**Surface water Monitoring:** Ensure no litter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of hydrocarbon spills be discovered during the execution of the activities. • Notify DWS and the ECO immediately. • Clean waterbody immediate with the proper mitigation measures. Conduct the activity in terms of the Best Practice Guidelines for small scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Protection of fauna	Monitor any ecologically sensitive species should they be observed on site.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. • Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	
	Fire Management	Fire Management	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Do not collect fire wood • In the event of a fire an alarm will be activated to alert all employees and contractors; • Identify the type of fire and the appropriate extinguishing material. For example, water for a grass fire, and mono ammonium phosphate based fire extinguisher for chemical and electrical fires; • In the event of a small fire the fire extinguishers placed around the mine will be used to contain and extinguish the fire; • In the event of a large fire, the fire department will be notified and must react timeously; • A Fire Association will be set up with the mine and surrounding land owners to facilitate communication during fire events and assist in fighting fires, where necessary; Report all fires	
	Social	Ensure employment is in line with SLP initiatives. Inspect all complaints received and compare against photographic evidence. Inspect areas and ensue fences haven't been tampered with and no illegal connections have been added to lines	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure beacons are in place throughout the life of the activity.	

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	Management of weed or invader plants • The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed. Loss of natural vegetation.	Inspect progress of construction & ensure activity is in designated areas. Inspect area for damage to flora species. Establish alien invasive monitoring programme Management of weed or invader plants: • Removal of weeds must be manually or by the use of an approved herbicide. Management of buffer areas: • Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. Protection of fauna: • Site management has to protect fauna that enters the processing area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Implement a weed and invader plant management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds.	

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STRIPPING AND STOCKPILING OF TOPSOIL	Soil Management Topsoil Management **Soil erosion:** • Loss of reinstated topsoil after rehabilitation.	**Soil Handling:** • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. **Erosion monitoring:** • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Waste Management: • Management of waste must be a daily monitoring activity. • Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily.	Waste Management: • Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. • A hydrocarbon spill kit to enable sufficient clean-up of contaminated areas. • Drip trays must be available to place underneath equipment parked for the night. • Should a vehicle have a break down, it must be decommissioned immediately and removed from site to be serviced. • Waste disposal register and file for the keeping of safe disposal records. • Ensure that hazardous substances if any are stored within a securely fenced area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the recognized landfill site at Robertson. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
STRIPPING AND STOCKPILING OF TOPSOIL	N/A	Inspect area for erosion and pooling.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the recognized landfill site at Robertson. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Protection of Cultural and Heritage Artefacts	Should any artefacts be discovered the area needs to be demarcated and work needs to be stopped.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Northern Cape and the ECO immediately. • Work may only commence once the area was cleared by Heritage Northern Cape.	
	Groundwater	**Groundwater Monitoring:** Equipment's needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of hydrocarbon spills be discovered during the execution of the activities. • Notify DWS and the ECO immediately. • Clean waterbody immediate with the proper mitigation measures. Conduct the activity in terms of the Best Practice Guidelines for small scale mining as stipulated by DWS.	
	Surface water Bodies	**Surface water Monitoring:** Ensure no litter or contaminants lie on the ground.		

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
STRIPPING AND STOCKPILING OF TOPSOIL DRILLING FOR CONTINUED RESOURCE EVALUATION	Protection of fauna	Monitor any ecologically sensitive species should they be observed on site.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. • Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Fire Management	Fire Management	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Do not collect fire wood • In the event of a fire an alarm will be activated to alert all employees and contractors; • Identify the type of fire and the appropriate extinguishing material. For example, water for a grass fire, and mono ammonium phosphate based fire extinguisher for chemical and electrical fires; • In the event of a small fire the fire extinguishers placed around the mine will be used to contain and extinguish the fire; • In the event of a large fire, the fire department will be notified and must react timeously; • A Fire Association will be set up with the mine and surrounding land owners to facilitate communication during fire events and assist in fighting fires, where necessary; Report all fires	
	N/A	N/A	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	
	Monitoring of visual impacts. Inspect area for illegal littering and dumping	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR • Compliance to be monitored by the Environmental Control Officer. Role: Minimize the visual impact of the activity on the surrounding environment	
	Dust Monitoring: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. Dust Monitoring will also be conducted on site on a monthly basis.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
DRILLING FOR CONTINUED RESOURCE EVALUATION	Noise Monitoring • The noise impact should be contained within the boundaries of the property, as it will represent the current activities.	Noise Handling and Monitoring: • Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. • Compliance with the appropriate legislation with respect to noise will be mandatory.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental •
	Surface water Bodies	**<u>Surface water Monitoring:</u>** Ensure no litter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of hydrocarbon spills be discovered during the execution of the activities. • Notify DWS and the ECO immediately. • Clean waterbody immediate with the proper mitigation measures. Conduct the activity in terms of the Best Practice Guidelines for small scale mining as stipulated by DWS.	
	Groundwater	**<u>Groundwater Monitoring:</u>** Equipment's needs to be monitored to prevent any hydrocarbon spills.		
	Soil Management Topsoil Management **<u>Soil erosion:</u>** • Loss of reinstated topsoil after rehabilitation.	**<u>Soil Handling:</u>** • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. **<u>Erosion monitoring:</u>** • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	
	Social Health and Safety Risk	Health and Safety Management	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure workers have access to the correct personal protection equipment (PPE) as required by law. • Manage all operations in compliance with the Occupational Health and Safety Act as well as the Mine Health and Safety Act.	

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
DRILLING FOR CONTINUED RESOURCE EVALUATION	Protection of fauna	Monitor any ecologically sensitive species should they be observed on site.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. • Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	
	Management of weed or invader plants • The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed. Loss of natural vegetation.	Inspect progress of construction & ensure activity is in designated areas. Inspect area for damage to flora species. Establish alien invasive monitoring programme Management of weed or invader plants: • Removal of weeds must be manually or by the use of an approved herbicide. Management of buffer areas: • Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. Protection of fauna: • Site management has to protect fauna that enters the processing area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Implement a weed and invader plant management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	N/A	Inspect area for erosion and pooling.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the recognized landfill site at Robertson. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	
	N/A	N/A	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	Fire Management	Fire Management	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Do not collect fire wood • In the event of a fire an alarm will be activated to alert all employees and contractors; • Identify the type of fire and the appropriate extinguishing material. For example, water for a grass fire, and mono ammonium phosphate based fire extinguisher for chemical and electrical fires; • In the event of a small fire the fire extinguishers placed around the mine will be used to contain and extinguish the fire; • In the event of a large fire, the fire department will be notified and must react timeously; • A Fire Association will be set up with the mine and surrounding land owners to facilitate communication during fire events and assist in fighting fires, where necessary; Report all fires	
DRILLING FOR CONTINUED RESOURCE EVALUATION	Waste Management: • Management of waste must be a daily monitoring activity. • Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily.	Waste Management: • Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. • A hydrocarbon spill kit to enable sufficient clean-up of contaminated areas. • Drip trays must be available to place underneath equipment parked for the night. • Should a vehicle have a break down, it must be decommissioned immediately and removed from site to be serviced. • Waste disposal register and file for the keeping of safe disposal records. • Ensure that hazardous substances if any are stored within a securely fenced area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the recognized landfill site at Robertson. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Protection of Cultural and Heritage Artefacts	Should any artefacts be discovered the area needs to be demarcated and work needs to be stopped.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Northern Cape and the ECO immediately. • Work may only commence once the area was cleared by Heritage Northern Cape.	

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	Surface water Bodies	**<u>Surface water Monitoring:</u>** Ensure no liter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of hydrocarbon spills be discovered during the execution of the activities. • Notify DWS and the ECO immediately. • Clean waterbody immediate with the proper mitigation measures. Conduct the activity in terms of the Best Practice Guidelines for small scale mining as stipulated by DWS.	
GENERAL ACTIVITIES	Social	Monitor portable toilets for any leaks	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of hydrocarbon spills be discovered during the execution of the activities. • Notify DWS and the ECO immediately. • Clean waterbody immediate with the proper mitigation measures. Conduct the activity in terms of the Best Practice Guidelines for small scale mining as stipulated by DWS.	
	Groundwater	Monitor portable toilets for any leaks		
	Surface Water	Monitor portable toilets for any leaks		
GENERAL ACTIVITIES	Soils	Monitor portable toilets for any leaks	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure beacons are in place throughout the life of the activity.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Social	Monitor portable toilets for any leaks	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure beacons are in place throughout the life of the activity.	
	Fauna	Monitor portable toilets for any leaks	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. • Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	

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GENERAL ACTIVITIES	Groundwater	Monitor portable toilets for any leaks	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of hydrocarbon spills be discovered during the execution of the activities. • Notify DWS and the ECO immediately. • Clean waterbody immediate with the proper mitigation measures. Conduct the activity in terms of the Best Practice Guidelines for small scale mining as stipulated by DWS.	
	Soils	Monitor portable toilets for any leaks	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure beacons are in place throughout the life of the activity.	
	Sensitive Landscapes	Monitor portable toilets for any leaks	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of hydrocarbon spills be discovered during the execution of the activities. • Notify DWS and the ECO immediately. • Clean waterbody immediate with the proper mitigation measures. Conduct the activity in terms of the Best Practice Guidelines for small scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Surface Water	Monitor portable toilets for any leaks	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure beacons are in place throughout the life of the activity.	
	Monitoring of visual impacts. Inspect area for illegal littering and dumping	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR • Compliance to be monitored by the Environmental Control Officer. Role: Minimize the visual impact of the activity on the surrounding environment	

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SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Soil Management Topsoil Management **Soil erosion:** • Loss of reinstated topsoil after rehabilitation.	**Soil Handling:** • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. **Erosion monitoring:** • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	
	Dust Monitoring: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. Dust Monitoring will also be conducted on site on a monthly basis.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Emission Monitoring: • The emissions generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Emission Handling and Monitoring: • Emissions will be monitored	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	
	Noise Monitoring • The noise impact should be contained within the boundaries of the property, as it will represent the current activities.	Noise Handling and Monitoring: • Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. • Compliance with the appropriate legislation with respect to noise will be mandatory.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	

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	Groundwater	**Groundwater Monitoring:** Equipment's needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of hydrocarbon spills be discovered during the execution of the activities. • Notify DWS and the ECO immediately. • Clean waterbody immediate with the proper mitigation measures. Conduct the activity in terms of the Best Practice Guidelines for small scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Waste Management: • Management of waste must be a daily monitoring activity. • Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily.	Waste Management: • Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. • A hydrocarbon spill kit to enable sufficient clean-up of contaminated areas. • Drip trays must be available to place underneath equipment parked for the night. • Should a vehicle have a break down, it must be decommissioned immediately and removed from site to be serviced. • Waste disposal register and file for the keeping of safe disposal records. • Ensure that hazardous substances if any are stored within a securely fenced area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the recognized landfill site at Robertson. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Management of weed or invader plants • The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed. Loss of natural vegetation.	Inspect progress of construction & ensure activity is in designated areas. Inspect area for damage to flora species. Establish alien invasive monitoring programme Management of weed or invader plants: • Removal of weeds must be manually or by the use of an approved herbicide. Management of buffer areas: • Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. Protection of fauna: • Site management has to protect fauna that enters the processing area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Implement a weed and invader plant management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds.	

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	Groundwater	**Groundwater Monitoring:** Equipment's needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of hydrocarbon spills be discovered during the execution of the activities. • Notify DWS and the ECO immediately. • Clean waterbody immediate with the proper mitigation measures. Conduct the activity in terms of the Best Practice Guidelines for small scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Surface water Bodies	**Surface water Monitoring:** Ensure no litter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of hydrocarbon spills be discovered during the execution of the activities. • Notify DWS and the ECO immediately. • Clean waterbody immediate with the proper mitigation measures. Conduct the activity in terms of the Best Practice Guidelines for small scale mining as stipulated by DWS.	
	Health and safety risk	Health and safety Management:	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure workers have access to the correct personal protection equipment (PPE) as required by law. • Manage all operations in compliance with the Occupational Health and Safety Act as well as the Mine Health and Safety Act.	
	Protection of fauna	Monitor any ecologically sensitive species should they be observed on site.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. • Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Inspect area for erosion and pooling.	Inspect area for erosion and pooling.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the recognized landfill site at Robertson. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Monitoring of visual impacts. Inspect area for illegal littering and dumping	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. • Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR • Compliance to be monitored by the Environmental Control Officer. Role: • Minimize the visual impact of the activity on the surrounding environment	
	Fire Management	Fire Management	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Do not collect fire wood • In the event of a fire an alarm will be activated to alert all employees and contractors; • Identify the type of fire and the appropriate extinguishing material. For example, water for a grass fire, and mono ammonium phosphate based fire extinguisher for chemical and electrical fires; • In the event of a small fire the fire extinguishers placed around the mine will be used to contain and extinguish the fire; • In the event of a large fire, the fire department will be notified and must react timeously; • A Fire Association will be set up with the mine and surrounding land owners to facilitate communication during fire events and assist in fighting fires, where necessary; • Report all fires	

(l) Indicate the frequency of the submission of the performance assessment/environmental audit report.

The Mineral and Petroleum Resources Development Regulations stipulates that performance assessment reporting should be done annually. The applicant commits to submitting the performance assessment reports of the proposed processing activity annually to DMR for perusal.

(m) Environmental Awareness Plan

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

The purpose of this section is to outline the methodology that will be used to educate the mine's employees and contractors of any environmental risks associated with their work and the manner in which these risks must be dealt with so as to avoid pollution and minimize the degradation of the environment.

Once prospecting of the proposed area starts, a copy of the Basic Assessment Report and Environmental Management Programme report will be handed to the site manager during the site establishment meeting. Issues such as topsoil handling, site clearance, fire principals and hazardous waste handling will be discussed. An induction meeting will be held with all the site workers to inform them of the Basic Rules of Conduct with regard to the environment. Please refer to **Error! Reference source not found.** for the Environmental Awareness Plan for the proposed prospecting right area.

The operations manager must ensure that he/she understands the EMPR document and its requirement and commitments. An Environmental Control Officer needs to check compliance of the prospecting activities to the management programmes described in the EMPR.

Training Needs

A training needs analysis will be performed through all levels of the organization including those within the administration, plant and prospecting worker sectors. Each of the categories / levels of the organization have different responsibilities and roles, accordingly different knowledge requirements are applicable. These are summarized in **Error! Reference source not found.** below.

After the training needs have been identified, it is the responsibility of the SHE Office to ensure that personnel attend the relevant identified training.

Training will also address the specific measures and actions as listed in the EMPR. This Environmental Awareness Plan (EAP) is intended to supplement the Safety, Health and Environmental (SHE) training and awareness requirements. Issues such as topsoil handling, site clearance, fire principals and waste handling will be discussed with the manager to ensure that he understands the goals as set out in the EMPR. An induction meeting will also be held with all the site workers to inform them of the basic steps towards environmental awareness with regard to the environment.

Table 30: Environmental Awareness Plan

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
Senior Management including Process Managers and Head of Department	Managing the Social & Environmental Assessment & Management System (SEAMS), and the Safety, Health & Environmental (SHE) Management System	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the significant impacts as described in the EIA/EMP during the various phases		
		Knowledge of the commitments made in the EMP relevant to the various phases		
		Setting and reviewing the mine's Environmental objectives		
		Directing the SEAMS and SHE management system, and monitoring their progress		
		Accessing the legal register and searching for details	Training on the legal register	Once off
		Emergency preparedness and response		
Environmental Management & SHE Representative, Internal Auditor	Managing the SEAMS and the SHE Management System Monitoring and auditing	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the significant impacts as described in the EIA/EMP during the various phases		
		Knowledge of the commitments made in the EMP relevant to the various phases		
		Directing the SEAMS and SHE management system, and monitoring their progress		
		Current knowledge of South African regulatory requirements, best practice guidelines and applicable legislation	Training on the legal register	On going
		Emergency preparedness and response		
		Knowledge in spill management, stockpile management, discard management, water management and waste management	Meetings and Talk Topics	Continuous
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge of the SABS standards and other relevant legislation regarding the correct storage of chemicals	Training on the SABS standards and other legislation	Annual
		Knowledge of auditing techniques and report writing	Auditor training	Annual
Section Managers & Section Engineers	Implementation and daily management of the SEAMS and the SHE Management System	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases		
		Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives.	Meetings and talk topics	Continuous
		Knowledge in stockpile management, discard management, water management and waste management		
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge in the correct storage of chemicals		
Engineering HOD & General Engineering Supervisor	Implementation and daily management of the SEAMS and the SHE Management System	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases		
		Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives.		
		Knowledge in spill management and waste management	Meetings and talk topics	Continuous
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge in the correct storage of chemicals		
Mine Captain & General Engineering Supervisors	Implementation and daily management of the SEAMS and the SHE Management System	Understanding the purpose of the SEAMS and SHE Management System Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives.	General in-house, management training	Once off

Table 30: Environmental Awareness Plan

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
		Knowledge in spill management and waste management Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting Knowledge in the correct storage and handling of chemicals Understanding the requirements for not polluting the environment	Meetings and talk topics	Continuous
Supervisors, Shift Boss & Forman	General Environmental Awareness and job specific impacts	Understanding the purpose of the SEAMS and SHE Management System Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting Knowledge in spill management and waste management Understanding the requirements for not polluting the environment	General in-house, management training	Once off
Operators, tradespersons & Floor Employees	General Environmental Awareness and job specific impacts	General Awareness of aim and purpose of the SEAMS and SHE Management System Understanding the SEAMS Management Plan relevant to their operations Understanding the requirements for not polluting the environment General understanding of the relevant Operational procedures, Emergency Response Plans and Incident reporting	Environmental Awareness Training	Annual
General Administration Staff	General Environmental Awareness and job specific impacts	General Awareness of aim and purpose of the SEAMS and SHE Management System Understanding the SEAMS Management Plan relevant to their operations Understanding the requirements for not polluting the environment General understanding of the relevant Operational procedures, Emergency Response Plans and Incident reporting	Environmental Awareness Training	Annual
Security	General Environmental Awareness and job specific impacts	General Awareness of aim and purpose of the SEAMS and SHE Management System Understanding the requirements for not polluting the environment General understanding of the relevant Operational procedures, Emergency Response Plans and Incident reporting	Environmental Awareness Training	Annual
Senior Management including Process Managers and Head of Department	Managing the Social & Environmental Assessment & Management System (SEAMS), and the Safety, Health & Environmental (SHE) Management System	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the significant impacts as described in the BAR/EMP during the various phases		
		Knowledge of the commitments made in the EMP relevant to the various phases		
		Setting and reviewing the mine's Environmental objectives		
		Directing the SEAMS and SHE management system, and monitoring their progress		
		Accessing the legal register and searching for details	Training on the legal register	Once off
		Emergency preparedness and response		
Management SHE Officer & Environmental Representative, Internal Auditor	Managing the SEAMS and the SHE Management System Monitoring and auditing	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the significant impacts as described in the EIA/EMP during the various phases		
		Knowledge of the commitments made in the EMP relevant to the various phases		
		Directing the SEAMS and SHE management system, and monitoring their progress		
		Current knowledge of South African regulatory requirements, best practice guidelines and applicable legislation	Training on the legal register	On going
		Emergency preparedness and response		
		Knowledge in spill management, stockpile management, discard management, water management and waste management	Meetings and Talk Topics	Continuous
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge of the SABS standards and other relevant legislation regarding the correct storage of chemicals	Training on the SABS standards and other legislation	Annual
		Knowledge of auditing techniques and report writing	Auditor training	Annual
Section Management		Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	

Table 30: Environmental Awareness Plan

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
	Implementation and daily management of the SEAMS and the SHE Management System	Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases		Once off
		Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives.	Meetings and talk topics	Continuous
		Knowledge in stockpile management, discard management, water management and waste management		
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge in the correct storage of chemicals		
Engineering HOD & General Engineering Supervisor	Implementation and daily management of the SEAMS and the SHE Management System	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases		
		Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives.		
		Knowledge in spill management and waste management	Meetings and talk topics	Continuous
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge in the correct storage of chemicals		
Mine Captain & General Engineering Supervisors	Implementation and daily management of the SEAMS and the SHE Management System	Understanding the purpose of the SEAMS and SHE Management System. Knowledge of the relevant department's significant impacts as described in the BAR/EMP during the construction and operational phases Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives. Knowledge in spill management and waste management Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting Knowledge in the correct storage and handling of chemicals Understanding the requirements for not polluting the environment	General in-house, management training	Once off
			Meetings and talk topics	Continuous
Supervisors, Shift Boss & Forman	General Environmental Awareness and job specific impacts		General in-house, management training	Once off
Operators, tradespersons & Floor Employees		General Awareness of aim and purpose of the SEAMS and SHE Management System Understanding the SEAMS Management Plan relevant to their operations Understanding the requirements for not polluting the environment	Environmental Awareness Training	Annual
General Administration Staff				
Security				

Specialized Skills

The Training Department in conjunction with the SHE Officer are responsible for ensuring job specific training for personnel performing tasks, which can cause significant environmental and social impacts (e.g. receipt of bulk hazardous chemicals/fuel, hazardous materials handling, responding to emergency situations etc.). The Prospecting Right Manager with the assistance of the SHE Officer must identify relevant personnel and training courses.

On the job training is an essential tool in environmental awareness. Employees must be given details of the expected environmental issues and concerns specifically related to their occupation. Employees must be trained on how to respond if an environmental problem or source of environmental pollution arises. The training will be on-going, and all new employees will be provided with the same standard of training as existing employees.

Review of Training Material

Effectiveness of the environmental management training will be done by the management through task observations and during internal and external audits.

All training material for presentation to personnel and contractors will be reviewed annually to ensure consistency with organizational requirements and best practice guidelines. In addition to this, annual monitoring reports, audit results and all incident reports will be reviewed, any short comings and non-compliancy will be highlighted and management measures incorporated or improved upon within the training material.

Records

Records from the implementation of this EAP will be kept and controlled in accordance with the SHE Management System Control of Records Procedure, which is required to be implemented so as to provide evidence of conformity and effective operation of the relevant requirements of the SHE management system.

(2) Manner in which risk will be dealt with in order to avoid pollution or the degradation of the environment.

The operations manager must ensure that he/she understands the EMPR document and its requirement and commitments before any prospecting takes place. An Environmental Control Officer needs to check compliance of the prospecting activity to the management programmes described in the EMPR.

EMERGENCY RESPONSE PLAN AND PROCEDURES

As part of its management tools, a mine must have an Emergency Response Plan. These plans will be disseminated to all employees and contractors in the event of an emergency. In the case of a medical accident or problem, the mine has first aid kits available at various points and an emergency room. A First Aid officer will be on duty at all times. In the event of an emergency the checklist of emergency response units must be consulted and the relevant units notified.

Communication is vital in an emergency and thus communication devices, such as mobile phones, two-way radios, pagers or telephones, must be placed around the mine. Should the emergency have the potential to affect the surrounding communities, they will be alerted via alarm signals or contacted in person.

Emergency services will be sourced from the nearest main town, Prieska wherever possible. Contact details for the emergency services and local authorities are listed below; these will be displayed on site and made available to all employees and contractors.

Police Station (Prieska):	**053 353 5406**
Ambulance:	**053 353 1113**
Fire Department:	**053 353 5300**
Hospital:	**053 353 2037**
Department of Water and Sanitation:	**056 811 5834**
Department of Mineral Resources:	**053 807 1700**
Department of Environment and Nature Conservation:	**053 807 7300**
Department of Roads and Public Works:	**053 839 2100**
Department of Economic Development and Tourism:	**053839 4000**
Department of Agriculture, land reform and rural development:	**053 838 9100**

The following list represents the basic steps towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks.

Site Management

- Stay within boundaries of site – do not enter adjacent properties;
- Keep tools and material properly stored;
- Smoke only in designated areas; and
- Use toilets provided – report full or leaking toilets.

Water Management and Erosion

- Check that rainwater flows around work areas and are not contaminated;
- Report any erosion;
- Check that dirty water is kept from clean water;
- Do not swim in or drink from streams; and
- Any of the above actions will be included in the performance assessment report to the Department of Mineral Resources (DMR).

Flooding

There is potential for flooding during the rainy season. This could result in a large volume of water flowing downstream or accumulating in a water containment facility and could cause major damage to equipment and endanger the lives of employees on site. Procedures must be put in place to ensure that there is a quick response to flood events and damage is kept to a minimum.

The procedure for flooding is as follows:

- DWS's flood warning system will be reviewed annually;
- Mine management will be made aware of any such event so they can take appropriate action to ensure production losses are kept to a minimum;
- All contaminated water will be contained on site, as far as possible and discharges to the environment will only occur if absolutely necessary in an extreme flood event.
- Check that rainwater flows around work areas and are not contaminated;
- Report any erosion;
- Check that dirty water is kept from clean water; and
- Do not swim in or drink from streams or the quarry.

Waste Management

- Take care of your own waste;
- Keep waste separate into labelled containers – report full bins;
- Place waste in containers and always close lid;
- Don't burn waste; and
- Pick-up any litter laying around.

Hazardous Waste Management (Petrol, Oil, Diesel, Grease)

Hydrocarbons such as diesel, petrol, and oil which are used as fuel for mine machinery which is kept on site, increases the possibility that spillage may occur. As this is a product mine there is also the possibility of a product spillage occurring. In the event of a spillage, procedures must be put into place to ensure that there are minimal impacts to the surrounding environment.

Diesel, engine oil and hydraulic oil are the most likely hydrocarbons identified during impact assessments that can result in an emergency situation.

The following procedure applies to a hydrocarbon spill:

- If any spills take place the contaminant together with the soil will be removed and placed in acceptable container to be removed with industrial waste to a recognised licence facility or licenced company.
- Bioremediation will be done on site to the satisfaction of DENC
- A spill clean-up kit is available at the storage yard
- All personnel will be trained n spill clean-up methodologies.
- Every precaution will be taken to prevent the spill from entering the surface water environment;

- In the event of a large spillage, adequate emergency equipment for spill containment or collection, such as additional supplies of booms and absorbent materials, will be made available and if required, a specialised clean-up crew will be called in to decontaminate the area. The soil will be removed and treated at a special soil rehabilitation facility;
- If the spill is larger than 100 litres the Department of Environmental and Nature Conservation (Northern Cape) (DENC) will be notified by fax and or phone within 24-hour of the event.
- Reasonable measures must be taken to stop the spread of hydrocarbons and secure the area to limit access;
- Dispatch necessary services;
- The incident must be reported to the Environmental coordinator immediately;
- The Environmental Coordinator will assess the situation from the information provided, and set up an investigation team or relevant personnel. Included in this team could be the Mine Manager, Chief Safety Officer, the employee who reported the incident and any individual responsible for the incident;
- When investigating the incident, priority must be given to safety;
- Once the situation has been assessed, the Environmental Coordinator must report back to the Mine Manager;
- The Mine Manager and the investigation team must make a decision on what measures can be taken to limit the damage caused by the incident, and if possible any remediation measures that can be taken;
- The source / reason of the spill or leak will be addressed immediately;
- Never mix general waste with hazardous waste;
- Use only sealed, non-leaking containers;
- Keep all containers closed and store only in approved areas;
- Always put drip trays under vehicles and machinery;
- Empty drip trays after rain;
- Stop leaks and spills, if safe;
- Keep spilled liquids moving away;
- Immediately report the spill to the site manager/supervision;
- Locate spill kit/supplies and use to clean-up, if safe;
- Place spill clean-up wastes in proper containers; and
- Label containers and move to approved storage area.

Breakdown of vehicles or equipment outside vehicle maintenance yard:

If any equipment of vehicles breaks down inside the pit or outside the storage yard the following emergency procedure will be followed:

- Drip pans will be placed at all point s where diesel, oil or any hydraulic fluid can rip and contaminate the oil;
- All efforts will be made to remove the vehicle or equipment to the storage area;
- If the vehicle or equipment cannot be removed the broken part will be drained of all fluid and the specific part remove to the service area;
- No repairs will be allowed to take place outside the maintenance yard or service area; and

- Any spills will be managed as described in the hydrocarbon section above.

Explosions

Explosions can occur in the plant and workshop areas when working with gas cylinders and chemicals. These could result in large numbers of employees being injured and requiring medical assistance.

The procedure to be followed is:

- Alternative evacuation routes will be devised, should a rock fall occur as a result of the explosion; and
- All relevant emergency response units must be notified and hospitals informed of incoming patients.

Discoveries:

- Stop work immediately;
- Notify site manager/supervisor; and
- Includes – Archaeological finds, Cultural artefacts, Contaminated water, Pipes, Containers, Tanks and drums, Any buried structures.

Air Quality:

- Wear protection when working in very dusty areas;
- Implement dust control measures:
- Sweep paved roads;
- Water all roads and work areas;
- Minimize handling of material; and
- Obey speed limit and cover trucks.

Driving and Noise

- Use only approved access roads;
- Respect speed limits;
- Only use turn-around areas – no crisscrossing through undisturbed areas;
- Avoid unnecessary loud noises; and
- Report or repair noisy vehicles.

Flora and Fauna

- Do not remove any plants or trees without approval of the site manager;
- Do not collect fire wood;
- Do not catch, kill, harm, sell or play with any animal, reptile, bird or amphibian on site;
- Report any animal trapped in the work area; and
- Do not set snares or raid nests for eggs or young.

Fire Management

Veld fires and fires resulting from other sources must be handled with extreme caution. Fire extinguishers will be placed around the mine.

The following procedures apply to fires:

- In the event of a fire an alarm will be activated to alert all employees and contractors;
- Identify the type of fire and the appropriate extinguishing material. For example, water for a grass fire, and mono ammonium phosphate based fire extinguisher for chemical and electrical fires;
- In the event of a small fire the fire extinguishers placed around the mine will be used to contain and extinguish the fire;
- In the event of a large fire, the fire department will be notified and must react timeously;
- All staff will receive training in response to a fire emergency on site;
- A Fire Protection Association will be set up with the mine and surrounding land owners to facilitate communication during fire events and assist in fighting fires, where necessary;
- Fire breaks has been established and will be maintained around the prospecting area for the duration of the project;
- If possible all surrounding drains, such as storm water drains need to be covered and or protected to prevent any contaminated water from entering the drains
- In case of a chemical or petroleum fire, run-off from the area will be contained as far as possible using the most appropriate measures e.g. spill absorbent cushions, sand or a physical barrier;
- Contaminated run-off must be diverted into an oil sump, or cleaned up;
- All firefighting equipment will be inspected at least monthly to ensure that these are functioning;
- Do not light any fires on site, unless contained in a drum at demarcated area;
- Put cigarette butts in a rubbish bin;
- Do not smoke near gas, paints or petrol;
- Know the position of firefighting equipment;
- Report all fires; and
- Don’t burn waste or vegetation.

In addition to the induction meeting to be held with the site employees to inform them of the basic steps towards environmental awareness, the operators of earth moving equipment should be informed of the following requirements:

- Prospecting within demarcated areas;
- No-go areas;
- Establishment of access roads;
- Handling of hazardous waste and their storage facilities;
- Handling of biodegradable and non-degradable waste;
- Vehicle maintenance;
- Mining methods to be followed;

- Handling and storing of topsoil;
- Capping of drill holes;
- Speed control in order to reduce dust;
- Emergency procedure awareness;
- Labourers must be informed of the following during “toolbox talks”:
- Reporting of unusual observations to management (e.g. fossils, graves, etc.);
- Reporting of spills to management;
- Felling or damaging trees for firewood not allowed;
- Making fires not allowed;
- Hunting and killing of animals not allowed;
- Demarcated areas for mining;
- Establishing of access roads and erection of gates in fence lines;
- Toilet facilities and hygiene measures;
- Handling of waste;
- Vehicle maintenance and vehicle maintenance yard;
- Handling of topsoil; and
- Emergency procedures awareness.

g) Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually)

The applicant undertakes to annually review and update the financial provision calculation, upon which it will be submitted to DMR for review and approved as being sufficient to cover the environmental liability at the time and for closure of the mine at that time.

Effectiveness of the environmental management training will be done by the management through task observations and during internal and external audits. All training material for presentation to personnel and contractors will be reviewed annually to ensure consistency with organizational requirements and best practice guidelines. In addition to this, annual monitoring reports, audit results and all incident reports will be reviewed, any short comings and non-compliancy will be highlighted and management measures incorporated or improved upon within the training material.

2) Undertaking

The EAP herewith confirms

a) the correctness of the information provided in the reports **X**

b) the inclusion of comments and inputs from stakeholders and I&AP's **X**

c) the inclusion of inputs and recommendations from the specialist reports where relevant, and **X**

d) that the information provided by the EAP to interested and affected parties and any response by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein **X**

Signature of the Environmental Assessment Practitioner:

Greenmined Environmental

Name of Company:

25 September 2018

Date:

-END-

APPENDIX LIST