



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT BASIC ASSESSMENT REPORT
and
DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT
for
IMERY'S REFRACTORY MINERALS SOUTH AFRICA: CAPE BENTONITE MINE
PROPOSED BENTONITE AND ZEOLITE PROSPECTING RIGHT
on
ERF 2224
HEIDELBERG, WESTERN CAPE

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

NAME OF APPLICANT: Imerys Refractory Minerals South Africa (Pty) Ltd t/a Cape Bentonite Mine

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FILE REFERENCE NUMBER SAMRAD: (Still to be obtained)

March 2019

1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 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 cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

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

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

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

2. Objective of the basic assessment process

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

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

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PART A

SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

a) Details of the EAP

i) Name and Contact Details of the EAP

Name of The Practitioner: Johmandie Pienaar (Giliomee)
Tel No.: 021 671 1660
Cell No.: 072 240 3092
e-mail address: johmandie@ecoimpact.co.za

ii) Expertise of the EAP.

The qualifications of the EAP (with evidence).

Johmandie Pienaar (Giliomee) holds a Baccalaureus Technologiae Degree (Cum Laude) in Nature Conservation from the Cape Peninsula University of Technology and has also completed the following short courses at the Centre for Environmental Management:

- Implementing Environmental Management Systems (ISO 14001)(2009);
- Occupational Health and Safety Law for Managers (2010);
- Implementing an OHS Management System based on OHSAS 18001 (2010) and;
- Occupational Health and Safety Management System OHSAS 18001 Audit: A Lead Auditor Course Based on ISO 19011 and ISO 17021 (2011).
- Conduct Outcome Based Assessment (May 2015).

Summary of the EAP's past experience.

(In carrying out the Environmental Impact Assessment Procedure)

Johmandie has been involved in environmental management and assessment aspects since 2005 having worked for South African National Parks and then as an private Environmental Manager for an estate in the Swartland.

Since March 2009 Johmandie has been practicing as an Environmental Assessment Practitioner, as part of an environmental consultancy company, on several projects throughout South-Africa and mainly within the Western Cape.

Johmandie has also been involved in successfully compiling, coordinating and managing Basic Assessment Reports, Environmental Impact Assessments, Section 24G Applications, NEMA EIA Checklists, Environmental Management Programmes, Waste License Applications, Water Use License Applications, Mining Right and Prospecting Right Applications, Environmental Rehabilitation Plans, Baseline Biodiversity Surveys for numerous clients.

Johmandie has also conducted and completed numerous Environmental Control Officer jobs, and since 2011 been involved in Occupational Health and Safety Auditing, Managing and Training specializing in the auditing of construction sites and implementing and auditing Occupational Health and Safety Management Systems, and providing training on the implementation of Occupational Health and Safety Management System OHSAS 18001.

(Refer to **Appendix A** for EAP CV)

b) **Location of the overall Activity.**

Farm Name:	Erf 2224
Application area (Ha)	101.1580ha
Magisterial district:	Swellendam
Middle Point (GPS Co-ordinates) of Property	34° 04' 33.29"S 20° 58' 30.98"E
Distance and direction from nearest town	The property is situated approximately 2km northeast of the town Heidelberg and can be accessed via gravel roads leading from Heidelberg off Van Riebeek street towards the N2
21 digit Surveyor General Code for each farm portion	C07300030000222400000

c) **Locality map**

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

See locality maps as attached under **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 the aforesaid main and listed activities, and infrastructure to be placed on site

See locality maps as attached under **Appendix B**

(i) Listed and specified activities

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc. E.g. for mining,- 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.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)
Conduct bentonite and zeolite	82Ha –	X	GNR 983, Activity no:

prospecting activities on cultivated agricultural land as proposed on Erf 2224	Transformed Agricultural Land on which Prospecting Activities are Proposed 101.15804Ha – Total Property Size		12, 20, 22, 28
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Applicability of Section 20 of the MPRDA and GNR 984 Listing Notice 2 Activity No.19 during proposed bentonite and zeolite prospecting activities:

As per bulk sampling definition confirmed by Mr John LC Kilham (M Sc Geology; Pr.Sci.Nat. MGSSA from the Kglagadi Group) bulk sampling occurs when several tonnes to 100's of tonnes of sampling material are removed and disposed of per target site to compile detailed mineralization models.

During the bentonite and zeolite prospecting activities proposed by Cape Bentonite Mine approximately 100-200kg of sample material will be removed in total for the whole property during the sampling to be conducted (less than 1kg of sample material will be removed at each sampling point).

During drilling the drilled material will not be removed permanently as sampling material nor disposed of, less than 1kg sample is taken of the orebody and material is then immediately replaced, the proposed drilling is therefore not bulk sampling.

Thus **bulk sampling will not occur, nor will the removal and disposal of bulk samples occur** during the proposed bentonite and zeolite prospecting activities as described in the activities description below. Section 20 of the MPRDA and Activity 19 of Listing Notice 2 of GNR 984 are therefore not applicable.

(ii) Description of the activities to be undertaken

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

Imerys Refractory Minerals South Africa (Pty) Ltd t/a Cape Bentonite Mine is an existing Bentonite and Zeolite mining company operating on various farms in close proximity to the towns of Heidelberg and Riversdale that fall within the Hessequa Local Municipality and Eden District Municipality in the Western Cape Province.

Imerys Refractory Minerals South Africa (Pty) Ltd proposes to prospect cultivated agricultural land on Erf 2224 for potential viable bentonite and zeolite resources to be mined.

The **proposed prospecting activities** will entail the following phases:

- **Phase 1 – Field Mapping and Surveying**

A qualified geologist will survey/explore the transformed cultivated areas on the proposed prospecting property by foot and map potential visible bentonite and zeolite outcrops. If such visible outcrops are found on the transformed cultivated areas of property the geologist will map these areas for potential sampling during phase 3.

- **Phase 2 – Literature Review**

A qualified geologist will research known geological literature of the property and surrounds to assist in determining approximate location of viable bentonite and zeolite deposits on the transformed cultivated areas of the property.

After the completion of phases 1 and 2 the geologist will produce potential bentonite and zeolite deposits maps for the property which will serve as guidelines for the next phase which will entail drilling and sampling.

- **Phase 3 –Drilling and Sampling**

Direct push sampler drilling and sampling – using the maps as produced by the geologist during phases 1 and 2 the geologist will determine which orebodies must be investigated further by direct push sampler drilling. This is conducted by the mining company itself and involves the use of a direct push sampler drill rig. The drill rig will push a stainless steel tube of 50-60cm long into the ground, once full it will bring it up and the sample will be taken out. This process will be carried out until bentonite is found or reaching the depth of around 6m. The hole will then immediately be rehabilitated by backfilling and a month later the site is revisited to determine if any the holes re-opened due to decompaction. The sampler holes will have the following maximum temporary footprints – Diameter 60mm; depth 6m = 3.6m³ overburden material produced by drilling to be backfilled immediately after sample has been taken. Samples would be collected according to the geology. Approximately 1000 sampler holes are proposed for the property, but final proposed direct sampler holes's amount will be determined during the completion of phases 1 and 2 therefore proposed direct sampler holes amount might increase or decrease.

Boreholes and sampling - following the results of the samples collected during the direct push sampler drilling, a qualified drilling contractor will be appointed by the mining company and under the guidance and supervision of the qualified geologist conduct the following drilling activities on the areas as identified by the geologist. Drilling involves using a rotary percussion drilling rig bringing samples to the surface in the form of chips. The drilled boreholes will have the following maximum temporary footprints - diameter 0.2m by 0.2m; depth 30m = 12 m³ maximum overburden material produced per borehole to be replaced immediately after sample has been taken. <1kg of sample material is collected by the geologist from each borehole for testing. The drilling samples collected are sent to the laboratory at the cape bentonite mine processing plant near Heidelberg and tested for specific properties to establish the quality of ore as well as determine approximate extension and volume of the available ore body. Approximately 60 drilling sections/lines with 3 boreholes each are proposed for the property = approximately 180 boreholes in total for the property, but final proposed boreholes amount will be determined during the completion of phases 1 and 2 and direct push sampler drilling results and the number of proposed drilling boreholes therefore might increase or decrease. In total only between 100- 200kg of sample material will be removed for further testing.

Rehabilitation – immediately (same day) following samples taken during drilling as described above the drilled material will be replaced and existing agricultural land contour structures will be reinstated. The disturbed prospecting areas will be monitored for signs of erosion for at least six months after sampling or until the landowner plants the lands (whichever comes first) and erosion rectification and prevention measures will be implemented as and if required. Alien invasive and weed vegetation monitoring and removal will be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land (whichever comes first). This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Should any remaining

indigenous vegetation and/or watercourse/wetland areas be impacted upon by the proposed prospecting activities a suitably qualified botanical and/or freshwater specialist must be appointed to assess the significance of the impacts and provide recommendations for rehabilitation/rectification. The specialist/s must provide a list of locally indigenous terrestrial and/or aquatic vegetation to be used during the rehabilitation of affected indigenous vegetation and/or watercourse/wetland areas as part of his/her assessment of the affected areas.

- **Phase 4 – Sample Analysis**

<1kg of sample material is collected by the geologist from each borehole for testing. The samples collected are sent to the laboratory at the cape bentonite mine processing plant near Heidelberg and tested for specific properties to establish the quality of ore as well as determine approximate extension and volume of the available ore body.

- **Phase 5 – Maps, Reserve and Resource Modelling**

Maps will be produced showing the location, depth and extent of physical prospecting work, together with, sampling points and the lithology, mineral content and mineral distribution identified, relative to the prospecting area. Following the results of sample analysis conducted the geological reserve modelling is done by using SURPAC and AUTOCAD geological software to determine the grades and quantities of available bentonite and zeolite resources and produce the feasibility reports for the property as investigated/surveyed.

All significant environmental, cultural and socio-economic features applicable to the site were identified and informed the preferred activity, location and layout as proposed. The preferred prospecting activities, location and layout was assessed against the no go option of the site remaining as is.

Prospecting Drilling Phase

The potential impacts rated as medium negative before mitigation measures are implemented and as low negative after mitigation measures are implemented include potential impacts of/on – Increased dust levels; Potential erosion of the site and surrounds due to proposed prospecting activities along steep slopes; Prospecting activities can result in increased sediment loads in water resources; Impact of proposed prospecting activities on terrestrial indigenous vegetation areas as associated with mapped terrestrial CBAs and ESAs; Impact of proposed prospecting activities on secondary-, primary drainage lines and man-made dams with associated wetland characteristics and aquatic vegetation as associated with mapped NFEPA's and aquatic CBAs and ESAs; Waste from chemical toilets and litter; Hydrocarbon spill; Fire; Increased traffic due to the prospecting activities requiring various vehicles to come onto and leave the site; Prospecting on agricultural land.

The potential impacts rated as low negative before and after mitigation measures are implemented include potential impacts of/on – Emissions; Impact on the naturally occurring fauna and avifauna present in the area; The potential impact of the proposed prospecting activities on archaeological, paleontological and heritage remains; Noise due to machinery and people on site; A negative visual impact due to the creation of drill sites.

Potential positive impacts during this phase include – Discovering and confirmation of viable bentonite and zeolite deposits on transformed cultivated agricultural land which may in turn lead to sustained jobs and other socio-economic benefits to the local landowners and communities if mining rights for the discovered deposits are obtained.

All the potential impacts can be mitigated to a potential low negative significance by implementing the mitigation measures as included and described in the EMP and specialist report.

Closure/Rehabilitation Phase

The potential impacts rated as medium negative before mitigation measures are implemented and as low negative after mitigation measures are implemented include potential impacts of/on – Potential erosion of the site and surrounds during rehabilitation phase; Introduction of alien and weed plant species during rehabilitation.

Potential positive impacts during this phase include – Rehabilitation of agricultural land to be used for agricultural cultivation and livestock grazing as per previous land use.

It was concluded by the EAP that the proposed development will not have a significant negative environmental impact if proposed mitigation measures are implemented and it was recommended that the Environmental Management Programme be adhered to accordingly.

e) Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
(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)
Minerals and Petroleum Resources Development Act (No 28 of 2002) and National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA] and relevant regulations	Sections 38 to 47 of MPRDA S24(1) of NEMA S28(1) of NEMA	An application for a Prospecting Right and Environmental Authorisation will be submitted to the DMR. Draft BAR will be submitted to the DEA&DP: Land Management for comments.
Land Use Planning Ordinance (15 of 1985)	-	NA
National Heritage Resources Act 25 of 1999 [NHRA]	-	Notice of Intent to Develop submitted to Heritage Western Cape
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) [NEMWA] and relevant regulations	-	Draft BAR will be submitted to the DEA&DP: Waste Management and DEA&DP: Pollution and Chemical Management for comments.
National Environmental Management: Biodiversity Act 10 of 2004 [NEMBA] and relevant regulations	-	No prospecting activities to take place on any remaining indigenous vegetation areas nor within watercourses. All potential indirect impacts to be mitigated
National Environmental Management: Air Quality Act, 39 of 2004 [NEMAQA] and Relevant Regulations	-	NA
National Water Act, 1998 (Act No. 36	Section 21 –	Draft BAR to be submitted to the

of 1998) [NWA] and relevant regulations	Water Use Activities	BGCMA to determine applicability of Section 21 of the NWA
Conservation of Agricultural Resources Act, 43 of 1983 [CARA]	-	Draft BAR to be submitted to the Western Cape Department of Agriculture for comments. All impacted areas to be rehabilitated to previous agricultural state
National Health Act, 61 of 2003; Constitution of the Republic of South Africa, 1996	-	NA
Fencing Act, 31 of 1963	-	NA
National Veld and Forest Fire Act 101 of 1998 [NVFFA]	-	NA
Environment Conservation Act, 73 of 1989, Western Cape Noise Control Regulations	-	NA
National Forests Act, 84 of 1998	-	NA
Hazardous Substances Act, 15 of 1973	-	NA
National Environmental Management: Protected Areas Act 57 of 2003	-	NA
Mine Health and Safety Act, 1996 (Act No. 29 of 1996)	-	NA
Compensation for Occupational Injuries and Diseases Act 130 of 1993	-	NA
Basic Conditions of Employment Act 75 of 1997	-	NA
Labour Relations Act 66 of 1995	-	NA

POLICY/ GUIDELINES	ADMINISTERING AUTHORITY
Hessequa Municipality SDF	Hessequa Municipality
Hessequa Municipality Town planning regulations	Hessequa Municipality
Guideline on Public Participation	Department of Mineral Resources and Environmental Affairs
Guidelines on Alternatives	Department of Mineral Resources and Environmental Affairs
Guideline on Need and desirability	Department of Mineral Resources and Environmental Affairs
Guideline for Environmental Management Plans (EMP's)	Department of Mineral Resources and Environmental Affairs
PGWC Urban Edge Guidelines	Western Cape Department of Environmental Affairs and Development Planning
PGWC SDF	Western Cape Department of Environmental Affairs and Development Planning

- f) **Need and desirability of the proposed activities.**
(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

Imerys Refractory Minerals South Africa (Pty) Ltd t/a Cape Bentonite Mine is an existing Bentonite and Zeolite mining company operating on various farms in close proximity to the

towns of Heidelberg and Riversdale that fall within the Hessequa Local Municipality and Eden District Municipality in the Western Cape Province.

If viable bentonite and zeolite deposits can be discovered by the proposed prospecting activities and a mining right can be obtained for the viable deposits discovered the lifespan of the mining company will be increased.

Cape Bentonite Mine currently employs 43 people, of which 90% are from the local communities of Heidelberg and Riversdale. The company also invests in the local community through a Social Labour Plan. The Social Labour Plan consists of a 5 year investment plan which includes projects such as upgrading or creating community infrastructures, bursaries, internship, skills development programs etc. in order to improve the educations and skills level of the local community members. In total the Social Labour Plan of Cape Bentonite currently invests an average of R320 000 per year into the local community. Cape Bentonite is also supporting on a daily basis the local suppliers in order to provide the company with the items required in the Bentonite Production. And the company also pays royalties to the land owners of the properties where mining related activities occur and are proposed.

Eco Impact was appointed to conduct an ecological baseline assessment to determine which areas on Erf 2224 will be suitable, in terms of avoiding significant detrimental biophysical environmental impacts as far as possible, for the proposed prospecting activities and assess the potential impacts of the proposed prospecting activities on the terrestrial and aquatic ecological features as present on the property.

Sensitive environmental features that were identified on the property include indigenous vegetation remnants which exists throughout the property and consists of Critically Endangered - Eastern Ruens Shale Renosterveld also identified as Terrestrial Critical Biodiversity Areas ("CBA") as according to the Fine Scale Planning ("FSP") for Hessequa, as well as scattered Milkwood trees (*Sideroxylon inerme*) within the cultivated lands.

Other sensitive environmental and landscape features identified on the property include non-perennial drainage lines, man-made and natural dams with associated wetland characteristics mostly connected to remaining indigenous remnants, also classified as Critical Biodiversity Areas ("CBA") and Ecological Support Areas ("ESA") and National Wetland Freshwater Ecosystems Priority Areas ("NFEPA").

Significant direct impacts potentially associated with the prospecting drilling phase are direct loss of indigenous terrestrial and aquatic vegetation and disturbance of soil which may lead to partial disruption of ecological processes due to fragmentation of habitat and erosion. The extent in this case would be local. Indirect impacts would occur mostly during the rehabilitation phase and in this case the nature would vary from the introduction of alien vegetation to partial disruption of ecological processes due to the effects of the alien species encroachment and/or erosion. The extent of the potential indirect impacts in this case would be local.

It is recommended that where no gravel roads exists as buffer areas an buffer area of at least 8m as measured from the edge of the sensitive environmental and landscape features and located on completely transformed cultivated land must be maintained throughout the prospecting activities phase. The proposed buffer areas may only be used as roads and for stormwater/erosion management and no other activities associated with the proposed prospecting of the site may occur within the buffer areas. Individual *Sideroxylon inerme* trees ("Milkwood trees") must be demarcated with a 5m radius buffer area, before any prospecting activities occurs within a 50m range of the trees.

The ecological baseline assessment concluded that if the proposed prospecting activities remains on the completely transformed cultivated agricultural areas of the property and the specialist recommendations are adhered to that the proposed prospecting activities will not have any significant detrimental environmental impacts on any of the sensitive environmental and landscape features as present on the site.

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

- **Preferred site alternative**

This is the preferred site alternative for the proposed bentonite and zeolite prospecting right because there are aboveground evidence of bentonite deposits present on the property. Prospecting is therefore proposed to determine the extent and viability of these deposits for potential future mining.

- **Preferred activity alternative**

No activity alternatives were assessed other than the activities as proposed as the reason for the application is proposed bentonite and zeolite prospecting activities, with the least invasive and minimal impact prospecting methods being proposed.

- **Preferred technology alternative**

No technology alternatives were assessed other than the technology to be used as proposed as the method of bentonite and zeolite prospecting is singular and the prospecting activities as proposed are the most “environmentally-friendly” prospecting techniques available which will have the least possible detrimental environmental impacts.

- **No-go/No-prospecting alternative**

The No-Go option will result in the site remaining as it is presently, cultivated agricultural land being cultivated and grazed by livestock on an ongoing basis. If additional viable bentonite and zeolite deposits are discovered during the proposed prospecting activities the potential socio-economic benefits of mining the viable bentonite and zeolite deposits will outweigh the potential negative impacts of prospecting on the environment if specialist and EMP recommendations are effectively implemented.

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.

Location alternatives – Erf 2224 was the only location alternative considered, because there are aboveground evidence of bentonite deposits present on the property. Prospecting is therefore proposed to determine the extent and viability of these deposits for potential future mining.

Activity alternatives- No activity alternatives were assessed other than the activities as proposed as the reason for the application is proposed bentonite and zeolite prospecting activities, because the property is expected. to have viable high quality bentonite and zeolite deposits.

Layout alternatives – Potential prospecting areas were considered and assessed by the ecologist. The proposed prospecting areas on completely transformed cultivated agricultural land are informed by the ecologist recommendations. (Refer to Appendix B for proposed prospecting areas layout plans and Appendix E for specialist report).

Technology alternatives – No technology alternatives were assessed other than the technology to be used as proposed as the method of bentonite and zeolite prospecting is singular and the prospecting activities as proposed are the most “environmentally-friendly” prospecting techniques available which will have the least possible detrimental environmental impacts.

Operational alternatives – No operational alternatives exist. The method of bentonite and zeolite prospecting is singular and is described in this report and prospecting work programme (“PWP”) (Refer to Appendix D for prospecting work programme).

The No-Go/No-Prospecting Option- The No-Go option will result in the site remaining as it is presently, cultivated agricultural land being cultivated and grazed by livestock on an ongoing basis. If additional viable bentonite and zeolite deposits are discovered during the proposed prospecting activities the potential socio-economic benefits of mining the viable bentonite and zeolite deposits outweigh the potential negative impacts of prospecting on the environment if specialist and EMP recommendations are effectively implemented.

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.)

Also Refer to **Appendix C for proof of PPP conducted.**

This section of the report is included in compliance with the Regulations. Public participation is an integral part of the EIA process and affords potentially interested and potentially affected parties (I&APs) an opportunity to participate in the EIA process, or to comment on any aspect of the development proposals.

Other relevant considerations regarding the public participation process being undertaken for this project are that:

- The public participation process being undertaken for this project complies with the requirements of the Regulations.
- The description of the public participation process included in sections below itemises the steps and actions undertaken.

THE FOLLOWING PUBLIC PARTICIPATION PROCESS WAS AND WILL BE CONDUCTED:

Notification to I&APs

Potential I&AP's are notified about the project in the following manner (this is in compliance with Regulation 41 of GN R982):

- Fixing notice boards at the boundary of the property in compliance with Regulation 41 of GN R982. Notice boards were placed on the site boundary on 14 December 2018.
- Written notifications are sent via registered post to potential I&APs (i.e. landowner, direct neighbours etc.) inviting them to register and give comments on the proposed development within 30 days from the date which appears on the notice. These notifications are in line with the requirements of the Regulations. Written notifications were sent to the landowner and direct neighbours on 2 January 2019.
- Placing an advertisement in a local newspaper of the notice in compliance with the Regulations. A notice was placed in the Suid-Kaap Forum on 10 January 2019

All potential I&APs were afforded the opportunity (within a 30 day period) to register for the project. All registered I&APs will be informed of further activities regarding the project.

Public Meetings, Workshops and Pre-application Meetings

No public meetings, workshops and pre-application meetings have been held thus far. The need for public meetings, workshops and pre-application meetings will be determined during the course of the public participation process as and if requested by I&APs and key departments.

Availability of the Pre-application Draft Basic Assessment Report

Before submission of the EA and Prospecting Right application form to the DMR the pre-application Draft Basic Assessment Report was distributed to all registered I&APs, key departments and organs of state for a 30 day commenting period.

Availability of the Draft Basic Assessment Report

As per the requirements of Regulation 43 of GN R982, the Draft Basic Assessment Report (BAR) will be made available to all relevant state departments and all registered I&APs for a 30 day commenting period.

The Draft BAR will be included for statutory comment with the written notice as sent to the commenting organs of state for a 30 day commenting period. Electronic copies (CDs) will be made available to any department or I&AP on request.

The Draft Basic Assessment Report will be sent to the following Key Departments for consideration/comments:

- Department: Mineral Resources
- Breede-Gouritz Catchment Management Agency (also commenting on behalf of Department of Water and Sanitation)
- CapeNature Scientific Services
- DEA&DP: Development Facilitation
- DEA&DP: Land Management
- DEA&DP: Pollution & Chemical Management
- DEA&DP: Waste Management

- DEA&DP: Planning
- DEA&DP: Air Quality Management
- Department of Agriculture
- Eden District Municipality
- Heritage Western Cape: A Notice of Intent to Develop was submitted to HWC.
- Hessequa Municipality

Proof of delivery and document placement will be attached to the final BAR.

Comments received will be responded to as per the requirements of regulations. The comments and response report as well as all comments received will be attached to the final BAR under Appendix C.

The Final BAR Phase

Once all comments have been received, the BAR will be finalised taking into account the comments and submitted to the competent authority for a decision.

Decision and Appeal Period

Once the DMR have reviewed the Final BAR and are satisfied that it contains sufficient information to make an informed decision, the DMR will use the information contained within the BAR to determine the environmental acceptability of the proponent's preferred options. A decision on the applications and associated reports will be made by the DMR based on the findings of the BAR.

Following the issuing of the decision, all key department and registered I&APS will be notified and afforded the opportunity to appeal the decision to the MEC of the DMR in terms of the NEMA.

Proof of the Public Participation Process conducted/to be conducted will be attached to the Final BAR under Appendix C.

iii) Summary of issues raised by I&APs

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

Interested and Affected Parties List the names 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
<u>AFFECTED PARTIES</u>				
Landowner	X			
Count The Silver 13 BK PO Box 25 Heidelberg 6665	-	Proof of landowner consent still to be provided.	-	-
Lawful occupier/s of the land	NA			
No lawful or unlawful occupiers present on proposed prospecting areas	-			
Landowners or lawful occupiers on adjacent properties	X			
PW Hoffman	-	No		

PO Box 123 Heidelberg 6665		comments received to date 19/03/2019			
PF Du Toit & Seuns PO Box 196 Heidelberg 6665	-	No comments received to date 19/03/2019			
HJ Duminy PO Box 211 Heidelberg 6665	-	No comments received to date 19/03/2019			
DWRH Trust PO Box 511 George 6665	-	No comments received to date 19/03/2019			
PM Cronje PO Box 123 Heidelberg 6665	-	No comments received to date 19/03/2019			
Local and District Municipalities	X				
Hessequa Municipality municipal manager on behalf of municipal council	-	Pre-app. Draft BAR sent for comments 11/02/2019, no comments received to date 19/03/2019			
Eden District	-	Pre-app.			

Municipality		Draft BAR sent for comments 11/02/2019, no comments received to date 19/03/2019			
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA etc.)	X				
Breede Gouritz Management Agency (also commenting on behalf of Department of Water and Sanitation)	-	Pre-app. Draft BAR sent for comments 11/02/2019, no comments received on 20/03/2019	<p>COMMENTS ON THE PROPOSED BENTONITE AND ZEOLITE MINING(PROSPECTING) RIGHT APPLICATION ON ERVEN 2224, HEIDELBERG, WESTERN CAPE</p> <p>The above mentioned report, dated 4 February 2019 has reference.</p> <p><u>The Breede-Gouritz Catchment Management Agency (BGCMA) has the following comments:</u></p> <p>1. No operation is allowed within 100m of water resource or 1:100 year flood line, whichever is the greatest. If the proposed activity falls within this area, authorization needs to be put in place in terms of the National Water Act (NWA), 1998 (Act No36. of 1998). This is to ensure that the riparian ecological status of the water resource will not be negatively impacted.</p>	1-2. As indicated within the Basic Assessment Report and Ecological Baseline Assessment specialist study conduct (refer to Appendix E1) sensitive environmental features such as secondary drainage lines, man-made and natural dams with associated wetland characteristics mostly connected to remaining indigenous remnants, also classified as Critical Biodiversity Areas (“CBA”) and Ecological Support Areas (“ESA’) and National Wetland Freshwater Ecosystems Priority Areas (“NFEPA”) are present	

			<p>2. Please note that any development within 500m from the boundary of any wetland requires authorization in terms of the National Water Act (NWA), 1998 (Act No36 of 1998).</p> <p>3. No water maybe abstracted from any surface water body and groundwater unless authorized by this Agency. Where will the water for the proposed activity be sourced from?</p> <p>4. Where solid waste disposal is to take place on site, ensure that only non-toxic materials which have no risk</p>	<p>throughout the proposed prospecting property, however all watercourse and/or wetland features have been included in the no-go/no-prospecting areas. Where no existing gravel roads exists as buffer areas an buffer area of at least 8m as measured from the edge of the sensitive environmental and landscape features and located on completely transformed cultivated land must be maintained throughout the prospecting activities phase. The proposed buffer areas may only be used as roads and for stormwater/erosion management and no other activities associated with the proposed prospecting of the site may occur within the buffer areas.</p> <p>The ecological baseline assessment concluded that if the proposed prospecting activities remains on the completely transformed cultivated agricultural areas of the property as proposed and the specialist recommendations are adhered to that the proposed prospecting activities will not have any significant detrimental environmental impacts on any of the sensitive environmental and landscape features as present on the site (which includes all water resources, wetland and indigenous vegetation areas).</p> <p>Therefore the likelihood that the proposed direct-push drilling and borehole drilling sampling as proposed on completely cultivated agricultural land will have negative impact on any water resources is very low.</p> <p>3. No water will be abstracted from any water body or groundwater and the proposed activities will not use water.</p> <p>4. No solid waste will be produced during the prospecting activities and no waste will be buried.</p>	
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			<p>of polluting the groundwater, are buried in designated approved areas at acceptable depths below ground level.</p> <p>5. No surface, ground or storm water may be polluted as a result of any activities on the site. Please use silt retention traps and a Storm water master plan to prevent erosion and pollution.</p> <p>6. The rehabilitation of the site must ensure that the final conditions of the site is environmentally acceptable and that there will be no adverse long term effects on the surrounding environment especially the water resources.</p> <p>7. For ease of reference kindly include Table of contents and page numbers in your report.</p> <p>8. Please note that all requirements as stipulated in the National Water Act (NWA), 1998 (Act No. 36 of 1998) must be adhered to.</p> <p>9. Please note that this Agency reserves the right to amend and/or add to the comments made above in the light of subsequent information received.</p>	<p>5. As per EMP requirements – no surface, ground or storm water may be polluted due to the proposed prospecting activities. No silt traps or storm water master plan is required for the proposed prospecting activities.</p> <p>6. This is as per current rehabilitation plan requirements.</p> <p>7. BAR and EMPr have been amended accordingly.</p> <p>8. This is as per current EMPr requirements.</p>	
CapeNature	-	Pre-app. Draft BAR sent for comments 11/02/2019,			

		no comments received to date 19/03/2019			
Heritage Western Cape	-	HWC NID sent, await response. Pre-app. Draft BAR sent for comments 11/02/2019, no comments received to date 19/03/2019			
Department of Agriculture	-	Pre-app. Draft BAR sent for comments 11/02/2019, no comments received to date 19/03/2019			
Communities	X				
Municipal manager to be consulted on behalf of local communities	-	Pre-app. Draft BAR sent for comments 11/02/2019, no comments received to date			

		19/03/2019			
Dept. Land Affairs	NA				
Traditional Leaders	NA				
Western Cape Dept. Environmental Affairs and Development Planning	X				
Directorate: Waste Management	-	Pre-app. Draft BAR submitted for comments 04/02/2019, comments received 08/03/2019	<p>COMMENT ON THE PRE-APPLICATION BASIC ASSESSMENT REPORT FOR LISTED ACTIVITIES ASSOCIATED WITH THE BENTONITE AND ZEOLITE PROSPECTING RIGHT APPLICATION ON ERF NO. 2224, HEIDELBERG</p> <p>3. Directorate: Waste Management – Ms Simone Bugar (Simone.Bugar@westerncape.gov.za) Tel: (021) 483 4090:</p> <p>3.1 The following amendments to the EMPr are proposed:</p> <p>3.1.1 Please note that chemical toilet wastewater <u>cannot be deemed as refuse</u> and can therefore not be disposed of at a licensed waste disposal facility (page 149 of the Draft BAR). Chemical toilets must be emptied on a regular basis and the content disposed of at a sewage treatment facility.</p> <p>3.1.2 The clearance of alien invasive vegetation during and after completion of the prospecting activities must be undertaken in a manner to prevent the</p>	<p>3.1.1 Requirements relating to chemical toilets have been amended accordingly in the EMPr.</p> <p>3.1.2 Recommendation included in the EMP requirements under Alien Vegetation Management.</p>	

			<p>creation of dust.</p> <p>3.1.3 All green waste cleared from the site must be beneficiated or taken to an approved waste disposal facility. Invasive alien plant species which are removed from the site should not be chipped for mulch if they are in a seed-bearing state. Such material must be disposed of at a suitably licensed waste disposal facility. Wherever possible, suitable larger stumps should be made available to the local community for use as firewood.</p>	<p>3.1.3 No “green waste” is expected to be cleared as per proposed prospecting activities sampling will be done via push-drilling and boreholes and all material removed during drilling will be replaced immediately after samples has been taken therefore site clearance is not required. It is also not expected that any alien tree plant species (especially not larger stumps) will be removed as prospecting activities are proposed on annually cultivated agricultural land which only has returning weed species as associated with cultivated lands. The recommendations have however been included in the EMP requirements under Alien Vegetation Management.</p>	
Development/Land Management	-	<p>Pre-app. Draft BAR sent for comments 11/02/2019, comments received 08/03/2019</p>	<p>COMMENT ON THE PRE-APPLICATION BASIC ASSESSMENT REPORT FOR LISTED ACTIVITIES ASSOCIATED WITH THE BENTONITE AND ZEOLITE PROSPECTING RIGHT APPLICATION ON ERF NO. 2224, HEIDELBERG</p> <p>2. Directorate: Development Management (Region 3) – Ms Shireen Pullen Shireen.Pullen@westerncape.gov.za Tel: (044) 805 8600</p> <p>2.1 The Pre-application BAR indicates that Phase 3 of the Prospecting Work Programme (“PWP”) will entail invasive prospecting activities, consisting of direct push sampler drilling – (1000 sampler holes) and sampling, and boreholes (180 boreholes) and sampling. The Draft BAR should be more specific to</p>	<p>2.1 Proposed prospecting activities Phase 3 description has been amended accordingly.</p>	

		<p>indicate that during the proposed prospecting activities, approximately 100-200kg of sample material will be removed during the borehole drilling process (as opposed to direct push sampling)</p> <p>2.2 Table 5.1 of Appendix D: Prospecting Work Programme indicates that Phase 3 of the PWP will consist of <u>trenching</u>, drilling and sampling. The Draft BAR must provide clarity whether trenching and drilling techniques will be employed and provide a description and impact assessment of proposed trenching activities.</p> <p>2.3 The Ecological Baseline Assessment dated June 2018 compiled by Eco Impact Legal Consulting was undertaken to assess the biodiversity and freshwater ecosystem impacts of the proposed prospecting activities on Erf No 2224 and the Remainder of Erf No 1015, Heidelberg. However, the Pre-application BAR only refer to the undertaking of prospecting activities on Erf 2224. The Draft BAR must provide clarity on the properties earmarked for prospecting activities.</p> <p>2.4 According to the Ecological Baseline Assessment, the prospecting area contains critically endangered Eastern Ruens Shale Renosterveld vegetation, which is also identified as a Critical Biodiversity Area ("CBA");</p>	<p>2.2 This is a typing error in the PWP which has now been corrected, no trenching is proposed during prospecting activities only direct-push sampling and sampling boreholes as described.</p> <p>2.3 Eco Impact was appointed to survey Erven 2224 and 1015 for the ecological baseline survey, but afterwards the applicant instructed that prospecting activities will only be applied for on Erf 2224 as proposed within the BAR.</p> <p>2.4 A Map 6: Proposed prospecting layout map with no-go areas has been included under Appendix B, demarcating the "no-go" areas to be demarcated under supervision on the ECO before Phase 3 invasive prospecting activities commences as per EMPr requirements.</p>	
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			<p>and four scattered individual Milkwood trees within the cultivated lands. These areas must be clearly mapped as “no-go” areas on the prospecting layout plan, and demarcated and excluded during Phase 3 (invasive prospecting activities) of the PWP.</p> <p>2.5 Furthermore, the non-perennial drainage lines, and artificial - and natural dams with associated wetland characteristics, must also be clearly mapped as “no-go” areas and demarcated during prospecting activities. These sensitive environmental and landscape features are also classified as CBAs, Ecological Support Areas and National Wetland Freshwater Ecosystem Priority Areas, which are required to meet the national conservation target for threatened vegetation types; and which offers opportunities for the continuation of ecological connectivity.</p> <p>2.6 Please note that the Draft EMPr does not comply with all the information requirements stipulated in Appendix f of the Environmental Impact Assessment Regulations, 2014 (as amended). The EMPr should therefore be revised to comply with legislative requirements, including auditing requirements.</p> <p>2.7 The Draft BAR and EMPr must indicate whether any water and/or drilling fluid would be required for borehole drilling, the estimated</p>	<p>2.5 The no-go areas as demarcated on maps 4 and 6 under Appendix B of the BAR includes all remaining indigenous vegetation areas, non-perennial drainage lines, artificial-and natural dams, CBAs, ESAs and NFEPAs.</p> <p>2.6 The EMPr has been amended accordingly.</p> <p>2.7 No water or drilling fluid will be required for direct-push drilling or borehole drilling as proposed.</p>	
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			<p>volumes of water required (if any), and whether any effluent will be released during the drilling process. If drilling fluid will be required and/or if effluent will be released, then the composition of the drilling fluid/chemical additives must be indicated, and the management of potential effluent released during the drilling must be addressed in the EMPr.</p> <p>2.8 An Alien Invasive Management Plan, which details the management of alien invasive vegetation during prospecting and rehabilitation activities, should also be incorporated into the EMPr. This Management Plan must also include, in consultation with the landowner, the management of alien plant and weed species for one year after the PWP has been completed, or until cultivation activities commences again.</p> <p>2.9 The Pre-application BAR indicates that the estimated financial provision for rehabilitation is R400 000. It is unclear whether the amount includes the rehabilitation of area to be used as access roads where no existing gravel</p>	<p>2.8 During the implementation of the prospecting activities the landowner continues with his cultivation on the applicable lands as normal and prospecting activities are only done during the periods which the lands has not been planted and has already been harvested, which means that once the annual crops have been sown the landowner periodically sprays herbicide for agricultural weed control on the lands. Therefore, unless otherwise stipulated in the contract with the landowner, the landowner will continue with weed control practices during cultivation as per usual, however if the prospecting activities leads to the landowner not being able to cultivate the applicable lands the mining company will be responsible for alien plant and weed control on the applicable lands until the land is planted by the landowner or for at least one year after prospecting activities have been completed, whichever comes first. The alien vegetation management section in the EMPr has been amended accordingly to provide more details on what is required.</p> <p>2.9 Prospecting rehabilitation will take place at the same time as prospecting implementation/invasive sampling. During push-drill sampling or borehole sampling the material removed during drilling will be replaced/rehabilitated on the same day as when the push-drill sampling or borehole sampling has taken</p>	
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		<p>roads exist, and if the cost of emptying and eventual removal of the chemical toilets were included. A detailed breakdown of what the financial provision for rehabilitation entails is recommended.</p> <p>2.10 Indigenous vegetation should be reintroduced during the rehabilitation process. Where revegetation work will be done on the disturbed areas, only suitable indigenous vegetation that occurs naturally in the immediate area, or suitable agricultural crops, should be planted to prevent erosion.</p> <p>2.11 All road paths that will be created</p>	<p>place. No new access roads will be created and only existing gravel roads will be used therefore it will not be necessary to rehabilitate access roads. If however the use of these access roads by the prospecting company leads to erosion of roads, the prospecting company will be financially responsible to implement erosion rectification and prevention measures as per the EMP requirements. Emptying and removal of chemical toilets is seen as part of "operational costs" as the toilet will be moved as and when required throughout the prospecting sampling phase and once finished removed from site completely by the prospecting company. Exactly what measures will need to be implemented for successful rehabilitation cannot be determined at this stage as this will depend on factors such as whether or not erosion at the impacted sites occurred etc. but as per EMP requirements the ECO will monitor and evaluate whether or not follow-up rehabilitation measures will be required and the prospecting company remains financially responsible until successful rehabilitation has been obtained.</p> <p>2.10 Invasive prospecting is proposed only on annually cultivate agricultural land therefore no indigenous vegetation areas are to be impacted upon by the proposed prospecting activities. However, should any indigenous vegetation areas be impacted upon due to for example edge effects the indigenous vegetation areas must be rehabilitated with locally indigenous vegetation under the guidance of a suitably qualified botanical specialist. This is as per EMP requirements. The landowner will be planting the agricultural crops annually as per current practise, because invasive prospecting activities will only take place during time where the lands have not yet been planted and already been harvested.</p> <p>2.11 No new road paths will be created within</p>	
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			because of vehicle movement over undisturbed areas must be rehabilitated as close as possible to the former state, and erosion-preventative measures must be implemented to mitigate potential erosion of loose soil, both from vehicle paths and drilled sites.	undisturbed areas. Only existing gravel farm roads will be used. As per EMPr requirements the prospecting company will be responsible to implement erosion mitigation measures at the prospecting activities areas during invasive prospecting and until successful rehabilitation has been achieved or until the farmer cultivates the land, whichever comes first.	
Pollution and Chemical Management	-	Pre-app. Draft BAR submitted for comments 04/02/2019, no comments received 19/03/2019			
Planning	-	Pre-app. Draft BAR sent for comments 11/02/2019, no comments received 19/03/2019			
Air Quality Management	-	Pre-app. Draft BAR submitted for comments 04/02/2019, comments received 08/03/2019	<p>COMMENT ON THE PRE-APPLICATION BASIC ASSESSMENT REPORT FOR LISTED ACTIVITIES ASSOCIATED WITH THE BENTONITE AND ZEOLITE PROSPECTING RIGHT APPLICATION ON ERF NO. 2224, HEIDELBERG</p> <p>4. Directorate: Air Quality Management - Mr Peter Harmse (Peter.Harmse@westerncape.gov.za)</p>		

			Tel: (021) 483 4383		
			4.1 This Directorate notes that the potential creation of dust and noise is of short duration, and the avoidance and management of these impacts were sufficiently addressed in the EMPr. This Directorate awaits the Draft BAR to provide any further comment, if necessary.	-	
Other Competent Authorities affected	X				
<u>OTHER</u>	<u>AFFECTED</u>				
<u>PARTIES</u>					
NA					
<u>INTERESTED PARTIES</u>					
NA					

iv) The Environmental attributes associated with the alternatives.

(The environmental attributed 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).

Geographical, Physical and Biological Characteristics

The farm is characterised by its undulating landscape with associated steep slopes, drainage lines and gorges which limits the extent of cultivation to moderate slopes and flat lying areas.

The original natural vegetation type on the greater property and surrounds have been mapped for the SA Vegetation Map (Mucina & Rutherford 2006) and for the Hessequa Fine Scale Vegetation Map (Vlok & de Villiers 2007) as Eastern Ruens Shale Renosterveld (*Critically Endangered*).

The remaining Eastern Ruens Shale Renosterveld remnants are mainly located within along secondary non-perennial drainage line areas, but are mostly transformed to a certain degree due to ongoing agricultural activities such as cultivation and heavy livestock grazing also leading to alien tree and weed encroachment.

From the site survey conducted and most recent google earth map images it is evident that the proposed prospecting activities areas have been ploughed and cultivated within the last year 2017-2018. Except for four scattered individual Milkwood trees remaining within the cultivated agricultural lands, which must not be impacted upon, no natural, near natural or rehabilitating indigenous vegetation remnants; or watercourses are located on the proposed prospecting activities areas as proposed on cultivated agricultural land.

Several non-perennial secondary drainage lines are located throughout the property due to the undulating nature of the topography which eventually feeds into manmade dams and eventually the Duiwenhoks River.

Most of the drainage lines with their associated wetland characteristics are in a moderate to good condition as they are located within the “klowe” too steep to plough and surrounded by indigenous vegetation remnants which also remains because the areas are too steep to plough for cultivation.

The prospecting activities are however proposed on completely transformed cultivated agricultural land and therefore the overall potential impact significance on geographical, physical and biological characteristics is expected to be low to negligible.

Also refer to Ecological Baseline Assessments as done by Eco Impact under Appendix E1.

Socio-Economic Characteristics

The communities of Heidelberg and Riversdale whom directly benefits from the Cape Bentonite Mine operations is located within the Hessequa Municipality jurisdiction as part of the Eden District Municipality.

In 2011 Hessequa has one of the smaller populations in the Eden District consisting of 52 642 of Eden District's 574 265 people. Hessequa's population however grew at a slow annual average rate of 1.8 per cent between 2001 and 2011, below the District (2.4 per cent) and provincial rates. Hessequa's population growth rate over the 2001 to 2011 period was also one of the slowest in the District, only to Kannaland (0.3 per cent) and Oudtshoorn (1.3 per cent) with lower growth within the Eden District.

According to forecasts by the Department of Social Development, Hessequa Municipality's population will continue to grow with the additional of approximately 1 650 people from 53 511 to 55 164 people, between 2013 and 2017.

Hessequa's population age distribution in 2013 was as follows: Children (aged 0 - 14 years) 23.9 per cent, Working age population (aged 15 - 64 years) 64.4 per cent and the Aged (aged 65 years and above) 11.6 per cent.

Learner enrolment in Hessequa has increased from 8 475 in 2013 to 8 572 in 2014. For the same period, the average learner-teacher ratio has increased just slightly from 24.3 for 2013 to 26.6 in 2014. Hessequa Municipality's dropout rates are very high, with a dropout rate of 33.9 in 2012 and a rate for dropouts in the FET phase in 2013 of 38.2.

In the 2013 matric examinations, 96.5 per cent of Hessequa Municipality's matriculants passed; which is the highest matric pass rate in the District.

In 2014, there are 82 healthcare facilities operational in the Eden District, of which 42 are fixed primary healthcare structures, with 6 district and 1 regional hospital. Of the total number of facilities, 10 are situated in Hessequa, including 4 fixed clinics, 2 satellite and 3 mobile clinics. Hessequa also has one district hospital.

In terms of reported HIV patients in Hessequa the uptake of Antiretroviral treatment (ART) has gradually increased over the past years. Keeping with this trend, 2014 figures have increased with an additional 2 386 in the District, of which 118 was in Hessequa.

Tuberculosis (TB) patient numbers in Hessequa has, over the past year, fallen just slightly, from 343 in 2012/13 to 333 in 2013/14, administered from 10 Hessequa facilities.

In 2014, the full immunisation rate for the Eden District was 86.3, with Hessequa virtually the same at 86.4.

The number of malnourished children under five years in the Western Cape in 2014 was 1 087. For the Eden District it was 168 of which 7 were in Hessequa. Hessequa had one of the lower malnutrition rates in the District, their rate of 175 per 100 000 was lower than the District rate of 319, as well as lower than the Province's 180.

Of the 730 deliveries to women under 18 years in the District, 61 deliveries were in Hessequa. Although the Hessequa numbers seem relatively low compared with other municipalities, the delivery rate was one of the higher ones in the District, with a rate of 10.3 compared to the District average of 7.9.

In 2010, the proportion of people in Hessequa living in poverty in 2010 was third lowest (16.0 per cent) in the District, after Mossel Bay (12.4 per cent) and Knysna (15.0 per cent). Of the

Eden local municipalities, Oudtshoorn (34.1 per cent) had the highest percentage of people in poverty.

The per capita GDP in the Western Cape Province was estimated at R43 557 per annum in 2011 (2005 prices). Per capita GDP for the Eden District of R32 956 was thus well below the provincial average with Hessequa's per capita GDP (R19 702) the lowest of all the local municipalities in the District. Mossel Bay (R55 019) had the highest per capita GDP in the region, followed by Knysna (R34 791) and Bitou (R31 501).

In 2011 the largest proportion of households in Hessequa earned between R9 601 and R307 600 per annum. A similar pattern can be seen for the other local municipalities in the District. Although lower than some of the other local municipalities, it is concerning that a significant proportion of households in Hessequa have no income.

Household income for Hessequa in 2011:

7.9% (None income); 1.7% (R1 - R4 800); 3.0% (R4 801 - R9 600); 14.1% (R9 601 - R19 600); 22.5% (R19 601 - R38 200); 22.5% (R38 201 - R76 400); 14.3% (R76 401 - R153 800); 9.0% (R153 801 - R307 600); 3.6% (R307 601 - R614 400); 0.9% (R614 001 - R1 228 800); 0.3% (R1 228 801 - R2 457 600); 0.3% (R2 457 601+)

With the exception of drug-related crime, crime levels in Hessequa have remained relatively stable over the past number of years. This spike in drug-related crime is concerning and appears to be at odds with Hessequa's generally low crime levels. In more recent years the area has seen an increase in burglaries at residential premises. It should however be noted that drug-related crime and driving under the influence of alcohol or drugs are heavily dependent on police for detection and increases in these recorded crimes are likely to be from a combination of an increase in the level of crime and an increase in level of policing in the area.

Access to potable water in Hessequa is good (97.5 per cent), above the District average of 95.2 per cent in 2013. In 2013, an estimated 90.4 per cent of households in Hessequa had access to basic sanitation services. This was above the District average of 85.1 per cent; which placed Hessequa second after Mossel Bay (90.5 per cent) in terms of household access to basic sanitation services. Household electricity access levels are generally good across the District, with Hessequa Municipality's 2013 household access level at 94.8 per cent, highest in the District. At 78.9 per cent in 2013, Hessequa Municipality's household access level to refuse removal services was significantly below the District average of 86.5 per cent. It has the third lowest access level in the region, after Kannaland's 66.0 per cent and Oudtshoorn's 78.0 per cent; it falls well short of Knysna's 93.0 per cent and Mossel Bay's 92.7 per cent.

It is estimated that in 2013, 94.4 per cent of households in Hessequa had access to formal housing. This is second highest in the District, after Kannaland's 96.8 per cent. Bitou (72.9 per cent) has the lowest proportion of households with access to formal housing.

The Eden District regional economy generated 8.1 per cent of the Western Cape GDP during 2013, i.e. R35 billion of the total R431 billion. Hessequa is the 22nd ranking non-metro municipality according to growth and size (between 2000 and 2013), its percentage contribution to real GDP growth and size being 0.4 per cent. According to the Growth Potential of Towns Study, the towns in Hessequa are classified mostly as having medium growth potential, only Stilbaai have high potential while socio economic need is seen as being very low to medium. Overall, growth in Hessequa for the 2000 to 2013 period was slower than that of the Eden District region. With the exception of Knysna, Bitou and Mossel Bay, Agriculture growth for the 2000 to 2013 period was relatively slow across the Eden District; in Hessequa, Agriculture's

performance was particularly poor, with the sector contracting by 1.8 per cent per annum. While Manufacturing growth did better than that of Agriculture across the region, Hessequa's 2.7 per cent growth over the 2000 to 2013 period in Manufacturing was well below the District's 4.4 per cent. Hessequa's Services growth of 2.1 per cent was also below that of the District's 5.4 per cent.

In 2011, The Western Cape unemployment rate was 21.6 per cent, significantly higher than Hessequa's 14.1 per cent, which was the lowest unemployment rate in the District. As with all the other local municipalities in the District, at 27.6 per cent, Hessequa's youth unemployment rate (18.9 per cent) is a few percentage points higher than the overall unemployment rate. Overall, over the 2000 to 2013 period, the District has experienced an expansion in its employment, due to the net employment creation in the region's services industries (38 600) even though the Agriculture (-11 650) and Manufacturing (-4 400) sectors shed large numbers of jobs. The largest number of job created was recorded in Mossel Bay and Bitou Municipalities. With the services sector generally requiring a high skill level, there appears to be a trend towards employing higher skilled persons.

In the Hessequa area, the overall job losses over the 2000 - 2013 period can also be seen in all sectors, i.e. in Agriculture (-3 320), Manufacturing (-380) as well as in Services (-630). Because job losses were experience across all, Hessequa experienced overall job losses for the 2000 to 2013 period.

Overall Hessequa Municipality has shown limited improvement over the years with regard to its socio-economic environment as discussed above. The socio-economic profile illustrates how the socio-economic environment impacts on the standard of living for people within the Municipality. Low population growth has partially concealed the relatively poor overall economic performance of the area since 2000. According to Census information, in 2011, 7.9 per cent of households had no income. Although poverty levels are still relatively high, they have decreased over time. A decrease in poverty levels will in turn translate into decreased dependence on indigent support that the Municipality provides. Other areas where the Municipality still experiences challenges include education, where literacy rates are relatively low and dropout rates are high. Unemployment remains a challenge and has even increased slightly between 2001 and 2011 with the unemployment rate amongst the youth even higher than the generally rate. Most towns in Hessequa was ranked as having only medium growth potential while socio-economic needs were generally low. Only Stilbaai in the Hessequa municipal region had high growth potential. The Municipality should attempt to take advantage of at least this one area while also seeking further potential in some of the other areas, potentially looking at opportunities in the agricultural/agro-processing sector.

Information obtained from the Socio-economic Profile of Hessequa Municipality for 2014
(Western Cape Government Provincial Treasury)

Cultural Characteristics

See Notice of Intent to Develop as submitted to Heritage Western Cape under Appendix E2. It is not expected that the activities will have any impacts on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 nor impact on any building or structure older than 60 years in any way. Heritage Western Cape record of decision on the NID as submitted is still awaited. HWC RoD will be included in the Final BAR.

(b) Description of the current land uses.

LAND USE OF THE SITE

Untransformed area	Low density residential	Medium density residential	High density residential
Informal residential	Heavy industrial	Tourism & Hospitality facility	Dam or reservoir
Old age home	Airport	Filling station	Nature conservation area
Retail	Commercial & warehousing	Light industrial	Medium industrial
Power station	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex
Open cast mine	Underground mine	Spoil heap or slimes dam	Quarry, sand or borrow pit
Hospital/medical center	School	Tertiary education facility	Church
Sewage treatment plant	Train station or shunting yard	Railway line	Major road (4 lanes or more)
Harbour	Sport facilities	Golf course	Polo fields
Landfill or waste treatment site	Plantation	Agriculture X	River, stream or wetland
Mountain, koppie or ridge	Museum	Historical building	Graveyard
Archaeological site			
Other land uses (describe):			

Provide a description:

The applicable proposed prospecting areas are located on cultivated agricultural lands.

LAND USE CHARACTER OF SURROUNDING AREA

Highlight the current land uses and/or prominent features that occur within +/- 500m radius of the site and neighbouring properties if these are located beyond 500m of the site.

Untransformed area X	Low density residential X (Farm Houses)	Medium density residential	High density residential
Informal residential	Heavy industrial	Tourism & Hospitality facility	Man-made Farm Dam X or reservoir
Old age home	Airport	Filling station	Nature conservation area
Retail	Commercial & warehousing	Light industrial	Medium industrial
Power station	Office/consulting room	Military or police base/station/compound	Casino/entertainment complex
Open cast mine	Underground mine	Spoil heap or slimes dam	Quarry, sand or borrow pit
Hospital/medical center	School	Tertiary education	Church

		facility	
Sewage treatment plant	Train station or shunting yard	Railway line	Major road (4 lanes or more)
Harbour	Sport facilities	Golf course	Polo fields
Landfill or waste treatment site	Plantation	Agriculture X	River, stream, wetland or drainage line X
Mountain, koppie or ridge X	Museum	Historical building	Graveyard
Archaeological site			
Other land uses (describe):			

Provide a description:

Within a 500m radius of the proposed prospecting areas lies farm houses, cultivated agricultural land an irrigations areas, indigenous vegetation areas, “koppies” and drainage lines due to the undulating nature of the property, man-made farm dams and a dairy.

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

The only “infrastructure” on site is informal gravel roads and farm fencing of agricultural lands.

GRADIENT OF THE SITE

Indicate the general gradient of the sites (highlight the appropriate box).

Flat	Flatter than 1:10	1:10—1:4	Steeper than 1:4
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LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site (highlight the appropriate box(es)).

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
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GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on or near any of the following (highlight the appropriate boxes)?

Shallow water table (less than 1.5m deep)	YES	NO	UNSURE
Seasonally wet soils (often close to water bodies)	YES	NO	UNSURE
Unstable rocky slopes or steep slopes with loose soil	YES	NO	UNSURE
Dispersive soils (soils that dissolve in water)	YES	NO	UNSURE
Soils with high clay content	YES	NO	UNSURE
Any other unstable soil or geological feature	YES	NO	UNSURE
An area sensitive to erosion	YES	NO	UNSURE
An area adjacent to or above an aquifer.	YES	NO	UNSURE
An area within 100m of the source of surface water	YES	NO	UNSURE

Please indicate the type of geological formation underlying the site.

Granite	Shale	Sandstone	Quartzite	Dolomite	Dolorite	Other (describe)
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Please provide a description.

On a regional level the site geology is derived from the Bokkeveld group as part of Worcester Normal Fault of the Cape Fold Belt Area.

On a local level the site geology consists mainly of volcanic sedimentary deposit in the early Cretaceous layers composed of continental layers from Alluvial to Siltstones and Lacustine.

SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites (highlight the appropriate boxes)?

Perennial River	YES	NO	UNSURE
Non-Perennial River	YES	NO	UNSURE
Permanent Wetland	YES	NO	UNSURE
Seasonal Wetland	YES	NO	UNSURE
Artificial Wetland	YES	NO	UNSURE
Estuarine / Lagoonal wetland	YES	NO	UNSURE

Please provide a description.

The secondary non-perennial drainage lines with seasonal wetland characteristics adjacent to the proposed prospecting areas are storm water run-off drainage lines as formed within undulating topography i.e. “klowe” and only “flows” temporarily during heavy rains and flow stops immediately after rain once storm water has flowed to lower lying areas. Water from drainage lines which does not collect in the farm dams eventually feeds into the Duiwenhoks River west of the property.

Artificial wetlands also exist throughout the property due to man-made farm dams.

Also refer to Ecological Baseline Assessments as done by Eco Impact under Appendix E1.

BIODIVERSITY

Highlight the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category).

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	Sensitive environmental features that were identified on the property include indigenous vegetation remnants which exists throughout the property and consists of Critically Endangered - Eastern Ruens Shale Renosterveld also identified as Terrestrial Critical Biodiversity Areas (“CBA”) as according to the Fine Scale Planning (“FSP”) for Hessequa,

				<p>as well as scattered Milkwood trees (<i>Sideroxylyn inerme</i>) within the cultivated lands. .</p> <p>Other sensitive environmental and landscape features identified on the property include non-perennial drainage lines, man-made and natural dams with associated wetland characteristics mostly connected to remaining indigenous remnants, also classified as Critical Biodiversity Areas (“CBA”) and Ecological Support Areas (“ESA”) and National Wetland Freshwater Ecosystems Priority Areas (“NFEPA”). .</p> <p>Prospecting will however not be done on any area demarcated as terrestrial or aquatic CBA or ESA, nor on any NFEPA, and no Milkwood trees will be impacted.</p>
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Highlight and describe the habitat condition on site.

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing/harvesting regimes etc.)
Natural	0%	Prospecting activities are only proposed on transformed cultivated and grazed agricultural lands. Individual Milkwood trees within the cultivated agricultural land will be demarcated and not be impacted upon.
Near Natural (includes areas with low to moderate level of alien invasive plants)	0%	
Degraded (includes areas heavily invaded by alien plants)	0%	
Transformed (includes cultivation, dams, urban, plantation, roads, etc.)	100%	

Complete the table to indicate:

- (i) the type of vegetation, including its ecosystem status, present on the site; and
- (ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		Aquatic Ecosystems						
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	Wetland (including rivers, depressions, channelled and unchannelled wetlands, flats, seeps pans, and artificial wetlands)			Estuary		Coastline	
	Endangered							
	Vulnerable							
	Least/Not Threatened	YES	NO	UNSURE	YES	NO	YES	NO

Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

Sensitive environmental features that were identified on the property include indigenous vegetation remnants which exists throughout the property and consists of Critically Endangered - Eastern Ruens Shale Renosterveld also identified as Terrestrial Critical Biodiversity Areas ("CBA") as according to the Fine Scale Planning ("FSP") for Hessequa, as well as scattered Milkwood trees (*Sideroxylyn inerme*) within the cultivated lands.

Other sensitive environmental and landscape features identified on the property include non-perennial drainage lines, man-made and natural dams with associated wetland characteristics mostly connected to remaining indigenous remnants, also classified as Critical Biodiversity Areas ("CBA") and Ecological Support Areas ("ESA") and National Wetland Freshwater Ecosystems Priority Areas ("NFEPA").

Prospecting will however not be done on any area demarcated as terrestrial or aquatic CBA or ESA nor on any NFEPA's. Individual Milkwood trees within the cultivated agricultural land will be demarcated and not be impacted upon.

Also refer to Ecological Baseline Assessments as done by Eco Impact dated May 2016 under Appendix E1.

(d) Environmental and current land use map.

(Show all environmental, and current land use features

Refer to Appendix B.

Impacts that may result from the prospecting excavation/trenching/drilling phase (briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the prospecting excavation/ drilling phase.

POTENTIAL IMPACTS ON GEOGRAPHICAL AND BIOPHYSICAL ASPECTS

Nature of impact: Increased dust levels			
Discussion: Drilling activities will create a temporary increase in dust levels. When the topsoil is removed there may be windblown soil.			
Cumulative impacts: The potential for dust nuisance due to proposed prospecting drilling is expected to be even less significant than the potential dust nuisance that is created during the ploughing of the agricultural lands as per current practice.			
Mitigation: <ul style="list-style-type: none"> • A speed limit of 30km/hour will be enforced through a fining system. • All vehicle drivers entering the site will be informed of the speed limit. • No vegetated areas will be cleared for proposed prospecting activities, only drill sampling will occur which does not require that large areas be cleared. • All impacted areas to be rehabilitated immediately (same day) by means of replacing soil material removed and shaping topsoil according to surrounding topography and contours. • Temporarily halt material handling in extreme windy conditions. 			
Preferred Prospecting Area			No Go option
	Without Mitigation	With Mitigation	
Extent	2	1	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	5	2	
Magnitude	2	2	
Probability	4	2	
Significance	36-Medium	10-Low	
Status	Medium significance if not mitigated	Low significance if mitigated	
Reversibility	100%		
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented		
Can impacts be mitigated?	1 – Can be completely mitigated		

Nature of impact: Potential erosion of the site and surrounds due to proposed prospecting activities along steep slopes			
Discussion: Due to the undulating terrain on which the prospecting activities are proposed storm water runoff may cause erosion of the disturbed sites			
Cumulative impacts: Erosion of the disturbed sites and surrounding environments			
Mitigation: <ul style="list-style-type: none"> • Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. • Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. • Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. 			

- Backfill proposed prospecting boreholes immediately (same day) with onsite drilled material after samples have been collected.
- Monitor prospecting areas for signs of erosion for at least six months after sampling or until the area is planted by the landowner (whichever comes first) and implement erosion rectification and prevention measures as and if required.

Preferred Prospecting Area			No Go option
	Without Mitigation	With Mitigation	
Extent	2	1	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	3	1	
Magnitude	6	2	
Probability	4	2	
Significance	44 – Medium	8 - Low	
Status	Medium significance if not mitigated	Low significance if mitigated	
Reversibility	100% Partly Reversible		
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented		
Can impacts be mitigated?	1 – Can be completely mitigated		

Nature of impact:

Emissions

Discussion:

Vehicles and machinery on the site will produce tailpipe emissions.

Cumulative impacts:

This will contribute to atmospheric pollution.

Mitigation:

- Vehicles and machinery will be maintained to minimize emissions. A log book will be filled in to keep a record of all maintenance problems encountered and mitigation measures implemented to resolve the problem.
- Vehicles and machinery emitting excessive emissions will be stopped immediately and not allowed to operate until the necessary repairs have been made.

Preferred Prospecting Area			No Go option
	Without Mitigation	With Mitigation	
Extent	2	1	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	1	1	
Magnitude	6	2	
Probability	2	2	
Significance	18 – Low	8 - Low	
Status	Low significance if not mitigated	Low significance if mitigated	
Reversibility	0%		
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented		
Can impacts be mitigated?	2-Partly		

Nature of impact:

Prospecting activities can result in increased sediment loads in water resources if disturbed areas are eroded.

Discussion:

Prospecting activities can impact negatively upon the surface and groundwater resources adjacent to the sites.

Cumulative impacts:

Stormwater runoff from disturbed areas may lead to higher sediment and solute content of water leaving the area, thus filtering into water sources and lowering water quality in the area.

Mitigation:

- Demarcate recommended buffer areas along watercourses before prospecting commences and maintain demarcation throughout prospecting operations until rehabilitation/closure phase.
- All roads need to be maintained and monitored. Visible signs of possible erosion must be immediately rehabilitated.
- Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds.

	Preferred Prospecting Area		No Go option
	Without Mitigation	With Mitigation	
Extent	2	1	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	1	1	
Magnitude	6	2	
Probability	4	2	
Significance	36 - Medium	8 - Low	
Status	Medium significance if not mitigated	Low significance if mitigated	
Reversibility	100%		
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented		
Can impacts be mitigated?	1-Yes		

Nature of potential impact:

Impact of proposed prospecting activities on terrestrial indigenous vegetation areas as associated with mapped terrestrial CBAs and ESAs

Discussion:

Indigenous vegetation remnants are present throughout the surrounding areas and adjacent to the prospecting activities areas as proposed on transformed cultivated agricultural land.

To prevent any potential direct or indirect detrimental impacts on these remnants mitigation measures as listed must be implemented throughout the proposed prospecting activities.

Cumulative impacts:

Erosion, loss of conservation worthy species and natural vegetation habitat during prospecting activities.

Mitigation:

- The individual *Sideroxylon inerme* trees ("Milkwood trees") that were recorded within the cultivated areas must be demarcated within a 5m buffer radius by the ECO before any prospecting activities occurs within a 50m range of the trees and must remain demarcated throughout the applicable prospecting operational and rehabilitation phases. Demarcation can be removed when implementation of the applicable rehabilitation measures have been completed.
- Clearly demarcate the 8m wide buffer areas proposed as measured from the edge of all remaining indigenous vegetation areas and undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas.
- Demarcation method to be approved by an Environmental Control Officer (ECO).
- No disturbance should be allowed within the remaining indigenous vegetation areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance.
- No natural vegetation areas edges may be cleared or impacted upon by the proposed prospecting activities.
- The proposed buffer areas to be located within existing cultivated land may only be used as roads and for stormwater management and no other activities associated with the proposed prospecting of the site may occur within the buffer areas.
- Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds.

- Backfill prospecting areas (same day) with onsite drilled material after samples have been collected.
- Monitor prospecting areas for signs of erosion for at least six months after sampling or until the landowner plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required.

Preferred Prospecting Area		No Go option
	Without Mitigation	With Mitigation
Extent	2	1
Duration	3	1
Magnitude	6	2
Probability	4	2
Significance	44 – Medium	8 - Low
Status	Medium significance if not mitigated	Low significance if mitigated
Reversibility	100% Reversible	
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented	
Can impacts be mitigated?	1 – Can be completely mitigated	

Not Applicable (No prospecting activities to take place during the No-Go Alternative)

Nature of potential impact:

Impact of proposed prospecting activities on secondary drainage lines and man-made dams with associated wetland characteristics and aquatic vegetation as associated with mapped NFEPA's and aquatic CBAs and ESAs

Discussion:

Other sensitive environmental and landscape features identified on the property include non-perennial drainage lines, man-made and natural dams with associated wetland characteristics mostly connected to remaining indigenous remnants, also classified as Critical Biodiversity Areas ("CBA") and Ecological Support Areas ("ESA") and National Wetland Freshwater Ecosystems Priority Areas ("NFEPA").

The proposed prospecting activities will however not have any significant detrimental impacts on these sensitive environmental and landscape features as it is recommended that prospecting activities are restricted to the completely transformed cultivated agricultural areas.

To prevent potential edge effects a buffer area of at least 8m as measured from the edge of the sensitive environmental and landscape features and located on completely transformed cultivated land must be maintained throughout the prospecting activities phase. The proposed buffer areas may only be used as roads and for stormwater management and no other activities associated with the proposed prospecting of the site may occur within the buffer areas.

Cumulative impacts:

Disturbance and transformation of watercourse areas during prospecting activities.

Mitigation:

- Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas at least 8m from the edge of the any drainage lines, indigenous vegetation and dams with associated wetland characteristics and aquatic vegetation.
- No disturbance should be allowed within the drainage line or wetland areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance.
- No drainage line or wetland areas edges may be disturbed or impacted upon by the proposed prospecting activities.
- Storm water and erosion control measures to be implemented as per an EMP must be conducted and monitored to prevent siltation or erosion of sensitive environmental and landscape features as identified on site.
- Backfill proposed drilling sites and boreholes immediately (same day) with onsite drilled material after samples have been collected.
- Monitor prospected areas for signs of erosion for at least six months after sampling or until the landowner has planted the area (whichever comes first) and implement erosion rectification and

prevention measures as and if required.

- No prospecting activities may occur within 100m from any drainage line or 500m from any wetland without determining requirement for water use authorisation from Department of Water and Sanitation or the Breede Gouritz Catchment Management Agency

Preferred Prospecting Area		No Go option
	Without Mitigation	With Mitigation
Extent	2	1
Duration	3	1
Magnitude	6	2
Probability	4	2
Significance	44 – Medium	8 - Low
Status	Medium significance if not mitigated	Low significance if mitigated
Reversibility	100% Reversible	
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented	
Can impacts be mitigated?	1 – Can be completely mitigated	

Not Applicable (No prospecting activities to take place during the No-Go Alternative)

Nature of impact:

Waste from chemical toilets and litter

Discussion:

There are no daily negative impacts associated with the enclosed chemical toilets to be provided. The possible negative impacts associated with chemical toilets are due to accidents. A leaking chemical toilet could cause soil pollution, as well as ground and surface water pollution in storm events.

Litter will be taken off site daily by the operators.

Cumulative impacts:

Only in extreme cases where multiple leaks occur will environmental pollution occur.

Litter may also cause nuisance if not removed daily.

Mitigation:

- The toilets are emptied at least once a week or when almost full.
- If a leak occurs the correct emergency procedure is to be followed (see EMP).
- Litter will be collected and removed from site by the operator on a daily basis.
- All sewage waste water must be disposed of at a licensed waste water treatment works.

Preferred Prospecting Area		No Go option
	Without Mitigation	With Mitigation
Extent	2	1
Duration	2	1
Magnitude	6	0
Probability	3	0
Significance	30-Medium	-
Status	Medium significance if not mitigated	No significance if mitigated
Reversibility	100% Reversible	
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented	
Can impacts be mitigated?	1 – Can be completely mitigated	

Not Applicable (No prospecting activities to take place during the No-Go Alternative)

Nature of impact:

Hydrocarbon spill

Discussion:

There is the potential for hydrocarbon to spill or leak from vehicles and machinery to be used on site.

Cumulative impacts:

Pollution of soil, potential pollution of surface water run-off, potential pollution of ground water if the spill is not cleaned up. The significance of the associated impacts will be dependent on the scale of the spill.

Mitigation:

- Any vehicle which is leaking hydrocarbons (e.g. petrol, diesel or oil) will be serviced in a concreted workshop to repair the leak. If it is not possible to repair the leak immediately, a drip tray will be placed under the leak to trap any spillages. The content of the drip trays will be decanted into an old oil drum for removal from the site to a hazardous waste handling facility.
- Hydrocarbon spillages are to be cleaned up immediately.
- The prospecting company will also maintain a store of suitable absorbent material, suitable bioremediation substance and a spill kit. All incidences/ spillages are to be recorded in an incident log book. Contaminated soil must go to Vissershok Hazardous Landfill site.

	Preferred Prospecting Area		No Go option
	Without Mitigation	With Mitigation	
Extent	2	1	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	2	1	
Magnitude	6	0	
Probability	3	2	
Significance	30- Medium	4 - Low	
Status	Medium significance if not mitigated	Low significance if mitigated	
Reversibility	100% Reversible		
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented		
Can impacts be mitigated?	1 – Can be completely mitigated		

Nature of impact:

Fire

Discussion:

There is the potential for fire to occur on the site. Veld fires can occur across the vegetated areas of the property.

Cumulative impacts:

Negative impacts associated with fires include:

smoke emission, loss of flora and fauna, loss of crops, hazard to human life and health, damage to infrastructure

Mitigation:

- All employees will be trained on fire safety and on how to reduce the probability of a fire spreading out of control.
- Anyone who observes a fire must report it immediately to the fire protection agency/ fire brigade and their supervisor.

	Preferred Prospecting Area		No Go option
	Without Mitigation	With Mitigation	
Extent	3	1	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	1	1	
Magnitude	8	2	
Probability	3	2	
Significance	36- Medium	8 - Low	
Status	Medium significance if not mitigated	Low significance if mitigated	
Reversibility	0%		
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented		
Can impacts be mitigated?	2 – Partly		

Nature of impact: Impact on the naturally occurring fauna and avifauna present in the area			
Discussion: No fauna or avifauna species of conservations concern were identified during the survey. The proposed development will not impact on any known conservation worthy species or their habitat.			
Cumulative impacts: Loss of indigenous fauna and avifauna species habitat.			
Mitigation: <ul style="list-style-type: none"> • Rehabilitate the area after prospecting activities are complete to previous agricultural state. • Use of stockpiled topsoil to rehabilitate the site. • Restrict prospecting activities only to approved prospecting areas on transformed cultivated agricultural land. 			
Preferred Prospecting Area			No Go option
	Without Mitigation	With Mitigation	
Extent	2	1	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	2	1	
Magnitude	6	2	
Probability	2	1	
Significance	20- Low	4- Low	
Status	Low significance if not mitigated	Low significance if mitigated	
Reversibility	100% Reversible		
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented		
Can impacts be mitigated?	1 – Can be completely mitigated		

POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS

Nature of impact: Sustained jobs			
Discussion: The continued employment of at least 43 local residents in the area will be ensured if viable deposits of bentonite and zeolite are discovered and confirmed on site and mining rights to mine the viable deposits can be obtained.			
Cumulative impacts: The continued employment of at least 43 local residents in the area will be ensured			
Mitigation: Approve proposed prospecting right and if viable bentonite and zeolite deposits are discovered and confirmed approve mining right.			
Preferred Prospecting Area			No Go option
	Without Mitigation	With Mitigation	
Extent	High Positive – Sustained jobs for local communities		High Negative – Not authorising of proposed prospecting right will lead to potential viable bentonite and zeolite deposits not being discovered and confirmed which may in turn lead to shortening of the mine lifespan which in turn will lead to loss of existing jobs.
Duration			
Magnitude			
Probability			
Significance			
Status			
Reversibility			
Irreplaceable loss of resources			
Can impacts be mitigated?			

Nature of impact:

Increased traffic due to the prospecting activities requiring various vehicles to come onto and leave the site.			
Discussion: The prospecting machinery will only have a traffic impact on entering and leaving the site and is therefore regarded as negligible. Making use of existing roads will cause deterioration. Also potential dust generation and noise generation and safety concerns for surrounding residents.			
Cumulative impacts: The minor increase in traffic volumes at certain times of day will add to the existing traffic volumes. As the existing traffic volumes are very low, this cumulative impact is not significant.			
Mitigation:			
<ul style="list-style-type: none"> A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers entering the site will be informed of the speed limit. Speed limit will be applicable when all vehicles drive through areas where farm yard and housing is next to the road as well. The applicant will be responsible for upkeep and repair of farm roads used during prospecting activities to the satisfaction of the landowner. 			
Preferred Prospecting Area			No Go option
	Without Mitigation	With Mitigation	
Extent	3	3	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	2	2	
Magnitude	4	2	
Probability	4	3	
Significance	36- Medium	21- Low	
Status	Medium significance if not mitigated	Low significance if mitigated	
Reversibility	100%		
Irreplaceable loss of resources	1-Will not be lost		
Can impacts be mitigated?	1-Yes		

Nature of impact: Prospecting on agricultural land
Discussion: During the prospecting activities as proposed on agricultural land currently being used for crop cultivation and livestock grazing, the affected excavation/drilling areas cannot be used for agricultural activities
Cumulative impacts: Temporary loss of agricultural land for agricultural use., however the landowner will be allowed to continue with his cultivation as per current practice because invasive prospecting will only be conducted during the times when the lands are not planted and have already been harvested.
Mitigation:
<ul style="list-style-type: none"> Compensate the landowner for the temporary loss of agricultural land during prospecting activities. Undertake prospecting activities on agricultural land before the onset of the annual planting season and then again only after the crop has been harvested. Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. Backfill proposed prospecting drilling and borehole sites immediately (same day) with onsite drilled material after samples have been collected. Monitor prospecting areas for signs of erosion for at least six months after sampling or until the landowners plants the area (whichever comes first) and implement erosion rectification and prevention measures as and if required. Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a

year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Refer to the EMPr for further details.			
Preferred Prospecting Area		No Go option	
	Without Mitigation	With Mitigation	
Extent	3	1	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	5	1	
Magnitude	6	2	
Probability	4	2	
Significance	56 - Medium	8 - Low	
Status	Medium significance if not mitigated	Low significance if mitigated	
Reversibility	100%		
Irreplaceable loss of resources	1-Will not be lost		
Can impacts be mitigated?	2- Can be partly mitigated.		

POTENTIAL IMPACTS ON CULTURAL-HISTORICAL ASPECTS

Nature of impact: The potential impact of the proposed prospecting activities on archaeological, paleontological and heritage remains			
Discussion: It is not expected that the prospecting activities as proposed on annually cultivated agricultural lands will have any detrimental impacts on any heritage resources, and also no large excavations are proposed only small scale direct-push drilling and borehole drilling which is not expected to expose any archaeological or palaeontological findings.			
Cumulative impacts: Potential impact on underground historical findings, but which is highly unlikely.			
Mitigation:			
<ul style="list-style-type: none"> Should any burials, fossils or other historical material be encountered during drilling, work must cease immediately and HWC must be contacted. 			
Preferred Prospecting Area		No Go option	
	Without Mitigation	With Mitigation	
Extent	1	1	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	5	1	
Magnitude	2	2	
Probability	2	2	
Significance	16-Low	8 - Low	
Status	Low significance if not mitigated	No significance if mitigated	
Reversibility	0% reversibility – once the historical features are destroyed, it cannot be recovered.		
Irreplaceable loss of resources	3- Completely irreplaceable		
Can impacts be mitigated?	1-Yes		

POTENTIAL NOISE IMPACTS

Nature of impact: Noise due to machinery and people on site
Discussion:

Prospecting machinery may cause noise disturbance to the directly adjacent land users/ owners. It is not anticipated that the noise will be considerable and will only be temporary.			
Cumulative impacts: Noise due to prospecting activities may cause a nuisance to adjacent landowners.			
Mitigation:			
<ul style="list-style-type: none"> No activities that may generate noise levels above the legal limit for rural areas in terms of the Environmental Conservation Act, Western Cape Noise regulations will be conducted. Machinery and vehicles should be regularly maintained to prevent excessive noise. All machinery and work activities must adhere to the requirements of the noise regulations. 			
Preferred Prospecting Area		No Go option	
	Without Mitigation	With Mitigation	
Extent	2	2	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	2	1	
Magnitude	2	2	
Probability	1	1	
Significance	6- Low	5-Low	
Status	Low significance if not mitigated	Low significance if mitigated	
Reversibility	This will not be a long term impact nor will it have an impact on the natural processes. It is thus 100% reversible.		
Irreplaceable loss of resources	1- No resources will be lost.		
Can impacts be mitigated?	2- Can be partly mitigated.		

POTENTIAL VISUAL IMPACTS

Nature of impact: A negative visual impact due to the creation of prospecting drilling sites.
Discussion: Transformation of landscape/topography of the sites will be temporary only during prospecting drilling and will not have a significant impact on visual aspects of the area as the prospecting sites are not visible from any main tourist routes and will be located in transformed agricultural areas immediately rehabilitated and reinstated after samples have been collected
Cumulative impacts: Unightly prospecting site.
Mitigation:
<ul style="list-style-type: none"> Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. Backfill proposed prospecting drilling sites and boreholes immediately (same day) with onsite drilled material after samples have been collected. Monitor prospecting areas for signs of erosion for at least six months after sampling or until the farmer has planted the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required. Only use drilled material as derived and conserved from the proposed prospecting site to backfill and rehabilitate impacted areas. Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land (whichever comes first). This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner.

Preferred Prospecting Area			No Go option
	Without Mitigation	With Mitigation	
Extent	1	1	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	5	2	
Magnitude	2	2	
Probability	2	2	
Significance	16-Low	10 - Low	
Status	Low significance if not mitigated	Low significance if mitigated	
Reversibility	This will not be a long term impact nor will it have an impact on the natural processes. It is thus 100% reversible.		
Irreplaceable loss of resources	1- No resources will be lost.		
Can impacts be mitigated?	2- Can be partly mitigated.		

Impacts that may result from the closure/rehabilitation phase (briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning/closure/rehabilitation phase.

Nature of potential impact: Potential erosion of the site and surrounds during rehabilitation phase			
Discussion: Disturbance of the land during prospecting activities could lead to soil erosion which can occur due to wind (wind erosion cause dust pollution); and due to overland storm water flow should heavy rains fall on disturbed and rehabilitated areas.			
Cumulative impacts: Exposing and disturbing soil may lead to erosion of site and surrounds if not mitigated.			
Mitigation:			
<ul style="list-style-type: none"> Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. Backfill proposed drill and borehole site immediately (same day) with onsite drilled material after samples have been collected. Monitor prospecting areas for signs of erosion for at least six months after sampling or until the farmer plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required. 			
Preferred Prospecting Area			No Go option
	Without Mitigation	With Mitigation	
Extent	2	1	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	3	1	
Magnitude	6	2	
Probability	4	2	
Significance	44 – Medium	8 - Low	
Status	Medium Significance without Mitigation	Low Significance with Mitigation	
Reversibility	100% Reversible		
Irreplaceable loss of resources	1-Resource will not be lost if mitigated		
Can impacts be	1 – Can be completely mitigated		

mitigated?		
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Nature of potential impact: Introduction of alien and weed plant species during rehabilitation
Discussion: Indirect impacts occur mostly during the rehabilitation phase and in this case the nature would vary from the introduction of alien and weed vegetation, to partial disruption of ecological processes due to the effects of the alien and weed species. The extent of the indirect impact in this case will be local.
Cumulative impacts: Disturbance of the site due to proposed prospecting activities may lead to introduction of alien and weed vegetation encroachment during rehabilitation, which may in turn lead to infestation of surrounding remaining natural areas and drainage lines resulting in disruption and destruction of ecological processes.
Mitigation: <ul style="list-style-type: none"> • Only use drilled material as derived and conserved from the proposed prospecting sites to backfill and rehabilitate impacted areas. • Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land (whichever comes first). This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Also refer to the EMPr for more details on alien vegetation management to be conducted.

Preferred Prospecting Area			No Go option
	Without Mitigation	With Mitigation	
Extent	3	1	Not Applicable (No prospecting activities to take place during the No-Go Alternative)
Duration	5	1	
Magnitude	6	2	
Probability	4	2	
Significance	56 - Medium	8 - Low	
Status	Medium significance if not mitigated	Low significance if mitigated	
Reversibility	100%		
Irreplaceable loss of resources	1-Will not be lost if mitigated		
Can impacts be mitigated?	1 – Can be completely mitigated		

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).

RISK REGISTER

The risk assessment tool is founded upon a risk register, comprised of 26 potential risks, covering the full range of activities associated with the identification, planning, operation and closure of the proposed bentonite quarry. These risks are divided into the following logical structure of risk categories:

- Health and safety risks (5);
- Technical risks (1);
- Natural environment risks (7);
- Built environment risks (5);
- Economic risks (1); and

- Legal and authorisation risks (7).

Category	Number	Issue / Risk Event
Health & Safety	1	Risk of public injury/death due prospecting operations
	2	Risk of injury/ death to livestock and natural fauna due to prospecting operations
	3	Risk of public injury/ death due to drowning in poorly drained prospecting area
	4	Risk of injury/ death to workers due to unsafe working conditions
	5	Risk to passing traffic due poor visibility, operation of large plant, unsafe prospecting development adjacent to road and/ or lack of adequate traffic safety measures
Technical	6	Risk of substandard material quality and non-optimal exploitation of resource due to poor planning and/ or implementation of prospecting plan
Natural Environment	7	Risk of negative visual aesthetics experienced by public due to scarring, scale, location in sensitive environment, dumping and/ or abandonment of plant
	8	Risk of instability, slippage and failure of re-vegetation due to steep slopes and/ or erosion
	9	Risk of sedimentation to watercourse or water bodies due to steep slope and/ or erosion
	10	Risk of environmental degradation due to illegal dumping, unplanned or uncontrolled spoiling and/ or <i>ad hoc</i> prospecting
	11	Risk of spread of alien/ invasive vegetation due to disturbance caused by prospecting
	12	Risk of spreading fire due to inadequate fire planning and implementation
	13	Risk of nuisance to flora and fauna due to noise and dust generation
Built Environment	14	Risk of nuisance to neighbours and lands due to dust and noise generation
	15	Risk of direct and indirect damage to heritage resources/ significance due to poor planning and implementation of prospecting plan
	16	Risk of loss of access to property due to operation of heavy plant
	17	Risk of permanent loss of land use potential due to poor operation and abandonment of prospecting area
	18	Risk of damage to service infrastructure due to proximity of services
Economic	19	Risk of increased operation/ rehabilitation costs and lost opportunity due to poor operation
Legal and Authorisation	20	Risk of legal action due to the failure to comply with the requirements of the Mine Health
	21	Risk of prosecution or stop works order from authority due to lack of authorisation
	22	Risk of legal action, prohibition of access or compensation claim by landowner due to failure to formally secure property and agree on conditions of use, and/ or due to irresponsible operation/ abandonment of the prospecting area
	23	Risk of legal action or compensation claim by third party due to irresponsible operation/abandonment of the prospecting

		area
	24	Risk of not obtaining closure certification from DMR due to absence of extent authorization for prospecting area, failure to satisfy the conditions attached to any authorisation and/ or failure to achieve satisfactory rehabilitated state for mining area
	25	Risk of unregulated removal of materials by unauthorised third party due to uncontrolled access
	26	Risk of uncontrolled development of mining area, with attendant risks, due to formally shared liability Act

Risk Management

The utilisation of materials sources is in essence about the management of assets and risk, and hence, the approach adopted for the compilation of the EMP is founded on a risk management philosophy. Risk management is best described as the process of measuring/ assessing risk and then developing strategies to address the identified risks. As such, it represents a logical and systematic approach to the identification, analysis, assessment, treatment, monitoring, and communication of the risks inherent to the use of material sources.

The risk assessment tool presented here is based upon the International Organisation for Standardisation (ISO), ISO 31000:2009 Risk Management – Principles and Guidelines, and represents a systematic and proven process consisting of the following key steps (refer to Figure 1.1)

- Establish the context to clarify the scope of the risk assessment process;
- Identify the potential risks;
- Evaluate the identified risks to determine the probability of a risk occurring and its consequence;
- Map the identified risks to compared them against criteria for treatment; and
- Develop appropriate risk treatments or mitigation measures.

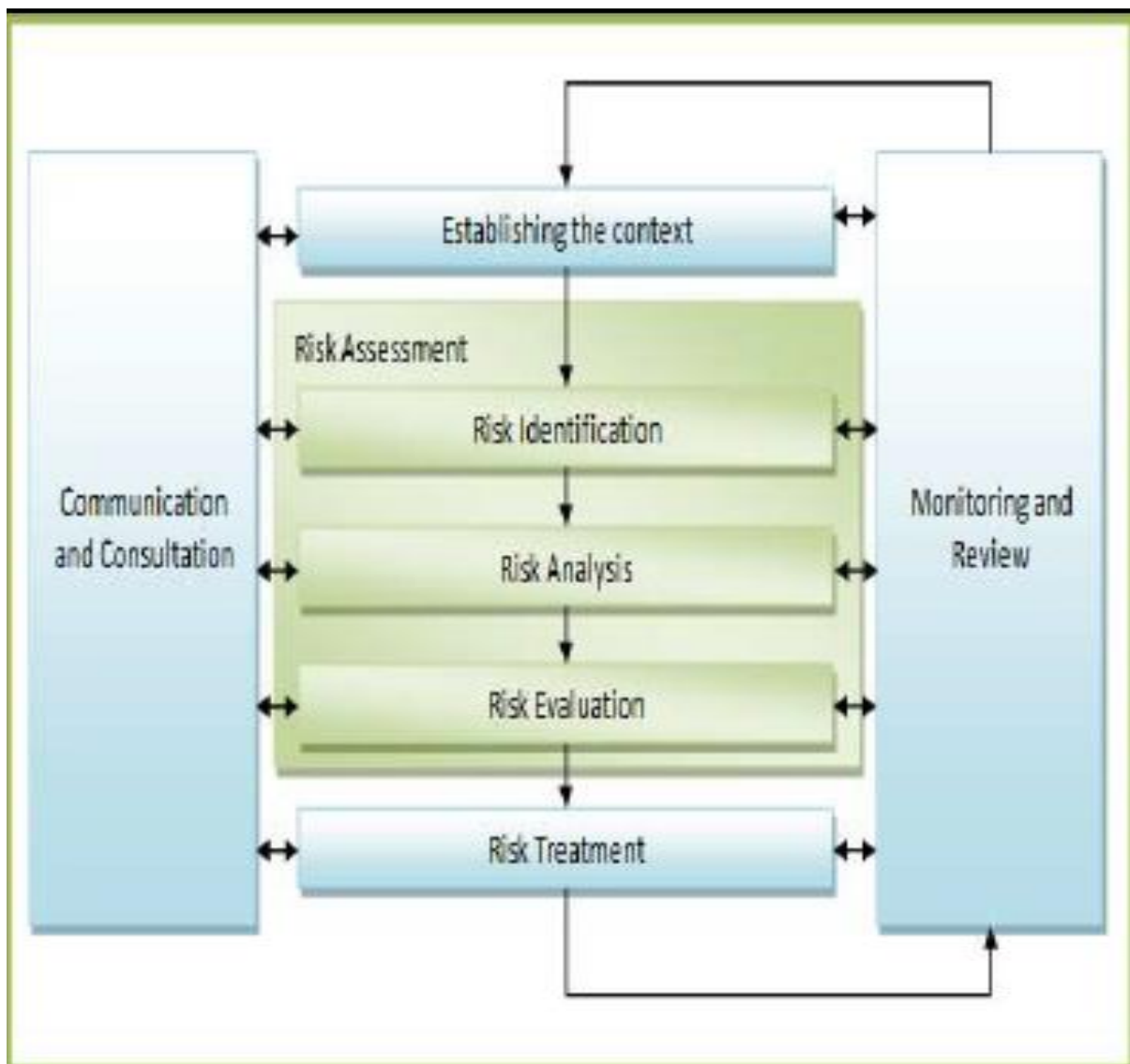


Figure 1.1.

In terms of the M&PRDA, the prospecting right holder liability for a particular material source persists until such time as a Closure Certificate has been issued by DMR. An advantage of the risk assessment approach detailed here is that it links in well with the legal requirements related to closure, specifically the requirements for the completion of an Environmental Risk Report as part of closure applications.

- **Risk probability**

Risk probability refers to the likelihood of an event occurring. It is important to evaluate this likelihood in the context of the anticipated use of the bentonite mine and with the anticipated controls in place. In other words, this is the likelihood that, under the anticipated mining conditions, the event described in the risk register will occur at some time in the future. It is evaluated on a semi-quantitative scale of 0 to 5, modified from the AS/ NZ 4360: 1995 Standard:

Rating Description

- 0-Impossible
- 1-Unlikely
- 2-Possible

- 3-Probable
- 4-Highly Probable
- 5-Almost Certain

The risk assessment tool includes a guideline for the determination of risk probability. The risk assessor is required to be familiar with, and refer to this guideline to inform the selection of the risk probability.

- **Risk consequence**

Risk consequence refers to the magnitude of the consequences, should the risk event occur. It is evaluated on a scale of 0 to 4, modified from the AS/ NZ 4360: 1995 Standard:

Rating Description

- 0-Insignificant
- 1-Minor
- 2-Moderate
- 3-Major
- 4-Catastrophic

The risk assessment tool includes a guideline for the determination of risk consequences. The risk assessor is required to be familiar with, and refer to this guideline to inform the selection of the risk consequence. The consequences of certain of the risks in the risk register can be predetermined to an extent. For example, the consequence of an injury or death of a person falling down a steep slope will never be “insignificant”. Rather, it will always have a “major” or “catastrophic” consequence. In such cases, the risk evaluation sheet is blanked out for inapplicable selections. This reduces the degree of subjectivity of the evaluation and streamlines the process.

Mapping of risk

The total elimination of all risks is typically not financially or technically feasible. A degree of risk will always exist and the intention of risk management is to reduce that risk in a systematic and cost effective manner. It is therefore important that the treatment of risks is undertaken by prioritising and addressing risk in a systematic manner. This is the role of risk mapping. The mapping of risks enables not only the comparative assessment of different material sources in terms of risk, but also facilitates the visualisation of the relative levels of different risks within a specific mine area. As such, it is an invaluable tool in the identification and prioritisation of risk treatments.

For the risk mapping tool, a simplistic approach is adopted to the mapping of risk. For each identified risk, a risk score is determined based on the product of risk probability and risk consequence. So for example where a risk is probable (probability rating of 3) and has a moderate consequence (consequence rating of 2), its risk score would be 6 (3 x 2). The resultant risk scores can be utilised in one of two ways:

- All risk scores for a particular site (i.e. the individual risk scores for each of the 26 identified risks) can be summed to give a total risk score for that mine area. This value can then be used to identify and prioritise high risk material sources for treatment; and
- For a specific mine the risk score for each risk can be used to identify the most significant risks within that site and prioritise their treatments.

The risk assessment tool utilised for the current investigation includes a graphic risk-mapping instrument to guide the identification and prioritisation of risk treatments within specific material sources. This instrument distinguishes between high, medium and low risk, defined as follows:

- **High risk:** Risk events falling into this class, are high probability of occurring with major to catastrophic consequences under the current status quo. These risks require urgent and immediate attention to either reduce the probability of occurrence, consequences of occurrence or both to acceptable levels.
- **Medium risk:** Risk events falling into this class require active management and mitigation to reduce their probability of occurrence, consequences of occurrence or both to acceptable levels.
- **Low risk:** Risk events falling into this class do not necessarily require mitigation, however on-going monitoring is required to ensure that they do not later move into the medium or high risk class as a result of changing circumstances.

It is important to emphasise that the risk assessment tool represents a semi-quantitative approach. The numerical values simply aid in the integration of the various variables comprising risk (viz. risk probability and consequence) and facilitate the interpretation and prioritisation of this risk. The risk values are not absolute and are thus not meaningful beyond the comparative assessment reflected in the EMP. The objective is simply to produce a more detailed prioritisation than is usually achieved in pure qualitative analysis, not to suggest any realistic values for risk such as presented in a truly quantitative analysis.

Treatment of risk

As outlined previously, the total elimination of all risk is typically not economically feasible and it is thus important that the treatment of risk be undertaken by prioritising and addressing high and medium risk issues in their order of significance. The intention of the risk management effort is to focus attention on what matters most. In many instances, the treatment of one particular risk will have a positive effect (reduction of risk) on a number of other risk events. A range of mechanisms exist for the treatment of risk, viz. transferring the risk, avoiding the risk, mitigating the risk or accepting the consequences of a particular risk. The approach to risk treatment will vary depending on the stage at which the risk assessment process is being undertaken, viz. feasibility versus planning versus operation versus closure.

Feasibility stage

(Proposed prospecting activities falls within the feasibility stage as described below.)

The focus of the feasibility stage is to identify suitable material sources, viz. bentonite or zeolite mine that contain adequate reserves of appropriate material, which can be mined in a sustainable manner. Accordingly, the key question during the feasibility stage is “Should a particular area be utilised or not?” In informing this decision, the risk assessment process should be utilised to identify sites where:

- Specific high risks render the use of the site unacceptable; or
- The combined effects of a number of medium and low risks render the use of the site unacceptable.

In exceptional circumstance, particularly where material sources in a particular area are in short supply, it may be decided to utilise a site despite of the findings of the risk assessment. In this situation, the risk assessment would guide the planning for this site.

Below is the assessment methodology utilized in determining the significance of the potential prospecting activities impacts as identified, and where applicable the possible alternatives, on the biophysical and socio-economic environment. The methodology is broadly consistent to that described in DEA’s Guideline Document on the EIA Regulations

(1998).

ASSESSMENT METHODOLOGY

This section outlines the methodology used to assess the significance of the potential environmental impacts. For each impact, the EXTENT (spatial scale), MAGNITUDE (size or degree scale) and DURATION (time scale) are used to ascertain the SIGNIFICANCE of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The mitigation described in the EMP represents the full range of plausible and pragmatic measures *but does not necessarily imply that they should or will all be implemented.*

Assessment criteria for the evaluation of impacts

CRITERIA	CATEGORY	DESCRIPTION
Extent or spatial influence of impact	Regional	Beyond a 20 km radius of the site
	Local	Within a 20 km radius of the centre of the site
	Site specific	On site or within 100 m of the site
Magnitude of impact (at the indicated spatial scale)	High	Natural and/ or social functions and/ or processes are <i>severely</i> altered
	Medium	Natural and/ or social functions and/ or processes are <i>notably</i> altered
	Low	Natural and/ or social functions and/ or processes are <i>slightly</i> altered
	Very Low	Natural and/ or social functions and/ or processes are <i>negligibly</i> altered
	Zero	Natural and/ or social functions and/ or processes remain <i>unaltered</i>
Duration of impact	Prospecting period	Up to 60 months Up to 10 years after prospecting
	Medium Term	
	Long Term	More than 10 years after prospecting

The SIGNIFICANCE of an impact is derived by taking into account the temporal and spatial scales and magnitude. The means of arriving at the different significance ratings is explained in the following table.

Definition of significance ratings

SIGNIFICANCE RATINGS	LEVEL OF CRITERIA REQUIRED
High	<ul style="list-style-type: none"> • High magnitude with a regional extent and long term duration • High magnitude with either a regional extent and medium term duration or a local extent and long term duration • Medium magnitude with a regional extent and long term duration
Medium	<ul style="list-style-type: none"> • High magnitude with a local extent and medium term duration • High magnitude with a regional extent and mining period or a site specific extent and long term duration • High magnitude with either a local extent and mining period duration or a site specific extent and medium term duration • Medium magnitude with any combination of extent and duration except site specific and mining period or regional and long term • Low magnitude with a regional extent and long term duration

Low	<ul style="list-style-type: none"> • High magnitude with a site specific extent and mining period duration • Medium magnitude with a site specific extent and mining period duration • Low magnitude with any combination of extent and duration except site specific and mining period or regional and long term • Very low magnitude with a regional extent and long term duration
Very low	<ul style="list-style-type: none"> • Low magnitude with a site specific extent and mining period duration • Very low magnitude with any combination of extent and duration except regional and long term
Neutral	<ul style="list-style-type: none"> • Zero magnitude with any combination of extent and duration

Once the significance of an impact has been determined, the PROBABILITY of this impact occurring as well as the CONFIDENCE in the assessment of the impact would be determined using the rating systems outlined in below respectively. It is important to note that the significance of an impact should always be considered in concert with the probability of that impact occurring.

Probability ratings		Criteria	
Definite		>95% chance of impact occurring.	
Probable		5 – 95% chance of impact occurring.	
Unlikely		<5% chance of impact occurring.	
Confidence ratings	Criteria		
Certain	Wealth of information on and sound understanding of the environmental factors potentially influencing the impact.		
Sure	Reasonable amount of useful information on and relatively sound understanding of the environmental factors potentially influencing the impact.		
Unsure	Limited useful information on and understanding of the environmental factors potentially influencing this impact.		
Criteria	Description		
Nature	a description of what causes the effect, what will be affected, and how it will be affected.		
	Type	Score	Description
Extent (E)	None (No)	1	Footprint
	Site (S)	2	On site or within 100 m of the site
	Local (L)	3	Within a 20 km radius of the centre of the site
	Regional (R)	4	Beyond a 20 km radius of the site
	National (Na)	5	Crossing provincial boundaries or on a national / land wide scale
Duration (D)	Short term (S)	1	0 – 1 years
	Short to medium (S-M)	2	2 – 5 years
	Medium term (M)	3	5 – 15 years
	Long term (L)	4	> 15 years
	Permanent(P)	5	Will not cease
Magnitude (M)	Small (S)	0	will have no effect on the environment
	Minor (Mi)	2	will not result in an impact on processes
	Low (L)	4	will cause a slight impact on processes
	Moderate (Mo)	6	processes continuing but in a modified way

	High (H)	8	processes are altered to the extent that they temporarily cease
	Very high (VH)	10	results in complete destruction of patterns and permanent cessation of processes.
Probability (P) the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned	Very improbable (VP)	1	probably will not happen
	Improbable (I)	2	some possibility, but low likelihood
	Probable (P)	3	distinct possibility
	Highly probable (HP)	4	most likely
	Definite (D)	5	impact will occur regardless of any prevention measures
Significance (S)	Determined through a synthesis of the characteristics described above: S = (E+D+M) x P Significance can be assessed as low, medium or high		
Low: < 30 points:	The impact would not have a direct influence on the decision to develop in the area		
Medium: 30 – 60 points:	The impact could influence the decision to develop in the area unless it is effectively mitigated		
High: < 60 points:	The impact must have an influence on the decision process to develop in the area		
No significance	When no impact will occur or the impact will not affect the environment		
Status	Positive (+)		Negative (-)
The degree to which the impact can be reversed	Completely reversible (R)	90-100%	The impact can be mostly to completely reversed with the implementation of the correct mitigation and rehabilitation measures.
	Partly reversible (PR)	6-89%	The impact can be partly reversed providing that mitigation measures as stipulated in the EMP are implemented and rehabilitation measures are undertaken
	Irreversible (IR)	0-5%	The impact cannot be reversed, regardless of the mitigation or rehabilitation measures taking place
The degree to which the impact may cause irreplaceable loss of resources	Resource will not be lost (R)	1	The resource will not be lost or destroyed provided that mitigation and rehabilitation measures as stipulated in the EMP are implemented
	Resource may be partly destroyed (PR)	2	Partial loss or destruction of the resources will occur even though all management and mitigation measures as stipulated in the EMP are implemented
	Resource cannot be replaced (IR)	3	The resource cannot be replaced no matter which management or mitigation measures are implemented.
The degree to which the impact can be mitigated	Completely mitigatable (CM)	1	The impact can be completely mitigated providing that all management and mitigation measures as stipulated in the EMP are implemented
	Partly mitigatable (PM)	2	The impact cannot be completely mitigated even though all management and mitigation measures as stipulated in the EMP are implemented. Implementation of these measures will provide a measure of mitigatability

	Un-mitigatable (UM)	3	The impact cannot be mitigated no matter which management or mitigation measures are implemented.
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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)

Location and layout alternatives – Erf 2224 was the only location alternative considered, because there are aboveground evidence of bentonite deposits present on the property. Prospecting is therefore proposed to determine the extent and viability of these deposits for potential future mining. The preferred layout alternative was considered and assessed by the ecologist. The proposed prospecting areas on completely transformed cultivated agricultural land are informed by the ecologist recommendations. (Refer to Appendix B for proposed prospecting areas layout plans and Appendix E for specialist report).

Significant positive impact/s:

- No impact on any terrestrial or aquatic indigenous vegetation areas, watercourses, wetland nor on CBAs, ESAs or NFEPAs.
- Invasive prospecting activities to be conducted outside of planting, growing and harvesting season allowing landowner to continue with crop planting practices.
- Potentially increasing operational lifespan of Cape Bentonite Mine ensuring income for at least 43 local residents from the area employed by Cape Bentonite Mine, compensation for landowner and support of local suppliers; if additional viable bentonite and zeolite deposits are discovered and confirmed on the property and a mining right for the areas can be successfully obtained.

Significant negative impact/s:

- Temporary loss of agricultural lands for agricultural activities such a livestock grazing, while site is rehabilitating.

The No-Go Option- The No-Go/No-Prospecting option will result in the site remaining as it is presently, cultivated agricultural land being cultivated and grazed by livestock on an ongoing basis. If additional viable bentonite and zeolite deposits are discovered during the proposed prospecting activities the potential socio-economic benefits of mining the viable bentonite and zeolite deposits outweigh the potential negative impacts of prospecting on the environment if specialist and EMP recommendations are effectively implemented.

Significant positive impact/s:

- Current agricultural activities taking place on site to continue as is.

Significant negative impact/s:

- High quality bentonite and zeolite deposits as located on transformed agricultural land located not discovered nor potentially mined which in turn could lead to loss of local community income and decrease of operational lifespan of Cape Bentonite Mine.

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 mitigations 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).

Refer to Part A h) v) above for risk and impact assessments and associated mitigation measures proposed.

ix) Motivation where no alternative sites were considered.

Erf 2224 was the only location alternative considered, because there are aboveground evidence of bentonite deposits present on the property. Prospecting is therefore proposed to determine the extent and viability of these deposits for potential future mining.

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

Layout alternatives were considered and assessed by the ecological specialist. The proposed layout is informed by the specialist's recommendations and all proposed prospecting activities areas are located outside of any indigenous terrestrial or aquatic vegetation areas and drainage lines, will not impact on any water courses/wetlands and will be restricted to transformed cultivated agricultural land.

The potential impacts identified would be adequately managed and effectively mitigated through the implementation of the recommendations outlined in this report as well as the proposed Environmental Management Programme (EMP).

- 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.)**

All significant environmental, cultural and socio-economic features applicable to the site were identified and informed the preferred activity, location and layout as proposed. The preferred prospecting activities, location and layout was assessed against the no go option of the site remaining as is.

Prospecting Drilling Phase

The potential impacts rated as medium negative before mitigation measures are implemented and as low negative after mitigation measures are implemented include potential impacts of/on – Increased dust levels; Potential erosion of the site and surrounds due to proposed prospecting activities along steep slopes; Prospecting activities can result in increased sediment loads in water resources; Impact of proposed prospecting activities on terrestrial indigenous vegetation areas as associated with mapped terrestrial CBAs and ESAs; Impact of proposed prospecting activities on secondary-, primary drainage lines and man-made dams with associated wetland characteristics and aquatic vegetation as associated with mapped NFEPAs and aquatic CBAs and ESAs; Waste from chemical toilets and litter; Hydrocarbon spill; Fire; Increased traffic due to the prospecting activities requiring various vehicles to come onto and leave the site; Prospecting on agricultural land.

The potential impacts rated as low negative before mitigation measures are implemented include potential impacts of/on – Emissions; Impact on the naturally occurring fauna and avifauna present in the area; The potential impact of the proposed prospecting activities on archaeological, paleontological and heritage remains; Noise due to machinery and people on site; A negative visual impact due to the creation of excavation pits/trenches.

Potential positive impacts during this phase include – Discovering and confirmation of viable bentonite and zeolite deposits on transformed cultivated agricultural land which may in turn lead to sustained jobs and other socio-economic benefits to the local landowners and communities if mining rights for the discovered deposits are obtained.

All the potential impacts can be mitigated to a potential low negative significance by implementing the mitigation measures as included and described in the EMP and specialist report.

Closure/Rehabilitation Phase

The potential impacts rated as medium negative before mitigation measures are implemented and as low negative after mitigation measures are implemented include potential impacts of/on – Potential erosion of the site and surrounds during rehabilitation phase; Introduction of alien and weed plant species during rehabilitation.

Potential positive impacts during this phase include – Rehabilitation of agricultural land to be used for agricultural cultivation and livestock grazing as per previous land use.

It was concluded by the EAP that the proposed development will not have a significant negative environmental impact if proposed mitigation measures are implemented and it was recommended that the Environmental Management Programme be adhered to accordingly.

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 E.g. For mining,- 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.)	POTENTIAL IMPACT (Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc....)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Mining, commissioning, operational Decommissioning, closure, post-closure)	SIGNIFICANCE if not mitigated	MITIGATION TYPE (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. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation..	SIGNIFICANCE if mitigated
Prospecting Drilling and Closure/Rehabilitation	Increased dust levels	Natural Environment, road users and nearby residents	Drilling and Closure/ Rehabilitation	36-Medium	<ul style="list-style-type: none"> • A speed limit of 30km/hour will be enforced through a fining system. • All vehicle drivers entering the site will be informed of the speed limit. • No vegetated areas will be cleared for proposed prospecting activities, only drill sampling will occur which does not require that large areas be cleared. • All impacted areas to be rehabilitated immediately (same day) by means of 	10-Low

					<p>replacing soil material removed and shaping topsoil according to surrounding topography and contours.</p> <ul style="list-style-type: none"> Temporarily halt material handling in extreme windy conditions. 	
Prospecting Drilling and Closure/Rehabilitation	Potential erosion of the site and surrounds due to proposed prospecting activities along steep slopes	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	44-Medium	<ul style="list-style-type: none"> Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. Backfill proposed prospecting boreholes immediately (same day) with onsite drilled material after samples 	8-Low

					<p>have been collected.</p> <ul style="list-style-type: none"> • Monitor prospected areas for signs of erosion for at least six months after sampling or until the landowner plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required. 	
Prospecting Drilling and Closure/Rehabilitation	Emissions - Vehicles and machinery on the site will produce tailpipe emissions causing air pollution	Natural resources	Drilling and Closure/ Rehabilitation	18-Low	<ul style="list-style-type: none"> • Vehicles and machinery will be maintained to minimize emissions. A log book will be filled in to keep a record of all maintenance problems encountered and mitigation measures implemented to resolve the problem. • Vehicles and machinery emitting excessive emissions will be stopped immediately and not allowed to operate until the necessary repairs have been made. 	8 - Low
Prospecting Drilling and Closure/Rehabilitation	Prospecting activities can result in increased sediment loads in water resources.	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	36 - Medium	<ul style="list-style-type: none"> • Demarcate recommended buffer areas before prospecting commences and maintain demarcation throughout prospecting operations until 	8 - Low

					rehabilitation/closure phase. <ul style="list-style-type: none"> All roads need to be maintained and monitored. Visible signs of possible erosion must be immediately rehabilitated. Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. 	
Prospecting Drilling and Closure/Rehabilitation	Impact of proposed prospecting activities on terrestrial indigenous vegetation areas as associated with mapped terrestrial CBAs and ESAs	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	44-Medium	<ul style="list-style-type: none"> The individual <i>Sideroxylon inerme</i> trees (“Milkwood trees”) that were recorded within the cultivated areas must be demarcated within a 5m buffer radius by the ECO before any prospecting activities occurs within a 50m range of the trees and must remain demarcated throughout the applicable prospecting operational and rehabilitation phases. Demarcation can be removed when implementation of the 	8-Low

					<p>applicable rehabilitation measures have been completed.</p> <ul style="list-style-type: none"> • Clearly demarcate the 8m wide buffer areas proposed as measured from the edge of all remaining indigenous vegetation areas and undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. • Demarcation method to be approved by an Environmental Control Officer (ECO). • No disturbance should be allowed within the remaining indigenous vegetation areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance. • No natural vegetation areas edges may be cleared or impacted upon by the proposed prospecting activities. • The proposed buffer areas to be located within existing cultivated land may only be used as roads and for 	
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					<p>stormwater management and no other activities associated with the proposed prospecting of the site may occur within the buffer areas.</p> <ul style="list-style-type: none"> • Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. • Backfill proposed prospecting boreholes immediately (same day) with onsite drilled material after samples have been collected. • Should any indigenous vegetation areas be impacted upon by the proposed prospecting activities rehabilitation must be done with local indigenous vegetation under the guidance of a suitably qualified botanical specialist. • Monitor rehabilitated prospecting areas for signs of erosion for at least six months after 	
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					sampling or until the landowner plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required.	
Prospecting Drilling and Closure/Rehabilitation	Impact of proposed prospecting activities on secondary drainage lines and man-made dams with associated wetland characteristics and aquatic vegetation as associated with mapped NFEPAs and aquatic CBAs and ESAs	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	44 - Medium	<ul style="list-style-type: none"> • Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas at least 8m from the edge of the any drainage lines, indigenous vegetation and man-made dams with associated wetland characteristics and aquatic vegetation. • No disturbance should be allowed within the drainage line or wetland areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance. • No drainage line or wetland areas edges may be disturbed or impacted upon by the proposed prospecting activities. • Storm water and erosion control measures to be 	8 - Low

					<p>implemented as per an EMP must be conducted and monitored to prevent siltation or erosion of sensitive environmental and landscape features as identified on site.</p> <ul style="list-style-type: none"> • Backfill proposed prospecting boreholes immediately (same day) with onsite drilled material after samples have been collected. • Monitor prospecting areas for signs of erosion for at least six months after sampling or until the landowner plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required. • No prospecting activities may occur within 100m from any drainage line or 500m from any wetland without determining requirement for water use authorisation from Department of Water and Sanitation or the Breede Gouritz Catchment Management Agency • All requirements as 	
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					stipulated in the National Water Act (NWA), 1998 (Act No. 36 of 1998) must be adhered to.	
Prospecting Drilling and Closure/Rehabilitation	Waste from chemical toilets and litter leading to environmental pollution	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	30-Medium	<ul style="list-style-type: none"> The toilets are serviced when needed and emptied when almost full. If a leak occurs the correct emergency procedure is to be followed (see EMP). Litter will be collected and removed from site by the operator on a daily basis. 	0-No significance
Prospecting Drilling and Closure/Rehabilitation	Hydrocarbon spill leading to environmental pollution	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	30-Medium	<ul style="list-style-type: none"> Any vehicle which is leaking hydrocarbons (e.g. petrol, diesel or oil) will be serviced in a concreted workshop to repair the leak. If it is not possible to repair the leak immediately, a drip tray will be placed under the leak to trap any spillages. The content of the drip trays will be decanted into an old oil drum for removal from the site to a hazardous waste handling facility. Hydrocarbon spillages are to be cleaned up immediately. The prospecting company will also maintain a store of 	4 - Low

					<p>suitable absorbent material, suitable bioremediation substance and a spill kit. All incidences/ spillages are to be recorded in an incident log book. Contaminated soil must go to Vissershok Hazardous Landfill site.</p>	
Prospecting Drilling and Closure/Rehabilitation	Fire causing environmental destruction/transformation	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	36- Medium	<ul style="list-style-type: none"> All employees will be trained on fire safety and on how to reduce the probability of a fire spreading out of control. Anyone who observes a fire must report it immediately to the fire protection agency/ fire brigade and their supervisor/ mine manager. Vehicles must be parked in an area with no vegetation during a fire. 	8 - Low
Prospecting Drilling and Closure/Rehabilitation	Impact on the naturally occurring fauna and avifauna present in the area	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	20- Low	<ul style="list-style-type: none"> Rehabilitate the area after prospecting activities are complete to previous agricultural state. Use of stockpiled topsoil to rehabilitate the site. Restrict prospecting activities only to approved prospecting areas on transformed cultivated agricultural 	4-Low

					land.	
Prospecting Drilling and Closure/Rehabilitation and Mining of viable deposits discovered	Sustained jobs The continued employment of at least 43 local residents in the area will be ensured if viable deposits of bentonite and zeolite are discovered and confirmed on site and mining rights to mine the viable deposits can be obtained	Socio-economic Impacts	Drilling and Closure/ Rehabilitation and Mining of viable deposits discovered	High Positive – No mitigation required		
Prospecting Drilling and Closure/Rehabilitation	Increased traffic due to the mining activities requiring various vehicles to come onto and leave the site.	Socio Economic Impacts	Drilling and Closure/ Rehabilitation	36-Medium	<ul style="list-style-type: none"> A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers entering the site will be informed of the speed limit. Speed limit will be applicable when delivery trucks drive through areas where farm yard and housing is next to the road. The applicant will be responsible for upkeep and repair of farm roads used during prospecting activities to the satisfaction of the 	21- Low

					landowner.	
Prospecting Drilling and Closure/Rehabilitation	Prospecting on agricultural land leading to temporary loss of agricultural land currently being used for crop cultivation and livestock grazing	Socio Economic and Agricultural Resources Impacts	Drilling and Closure/ Rehabilitation		<ul style="list-style-type: none"> • Compensate the landowner for the temporary loss of agricultural land during prospecting activities. • Undertake prospecting activities on agricultural land before the onset of the annual planting season and do not undertake drilling or borehole sampling after the land has been planted for cultivation. • Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. • Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. • Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. 	8- Low
				56- Medium		

					<ul style="list-style-type: none"> • Backfill proposed prospecting drilling an borehole areas immediately (same day) with onsite drilled material after samples have been collected. • Monitor prospecting areas for signs of erosion for at least six months after sampling or until the landowner plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required. • Only use drilled material as derived and conserved from the proposed prospecting site to backfill and rehabilitate impacted areas. • Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed 	
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					contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner.	
Prospecting Drilling and Closure/Rehabilitation	The potential impact of the proposed prospecting activities on archaeological, paleontological and heritage remains	Heritage Impacts	Drilling and Closure/ Rehabilitation	16-Low	Should any burials, fossils or other historical material be encountered during prospecting, work must cease immediately and HWC must be contacted.	8 - Low
Prospecting Drilling and Closure/Rehabilitation	Noise due to machinery and people on site	Noise impacts	Drilling and Closure/ Rehabilitation	6- Low	<ul style="list-style-type: none"> • No activities that may generate noise levels above the legal limit for rural areas in terms of the Environmental Conservation Act, Western Cape Noise regulations will be conducted. • Machinery and vehicles should be regularly maintained to prevent excessive noise. • All machinery and work activities must adhere to the requirements of the noise regulations. 	5-Low
Prospecting Drilling and Closure/Rehabilitation	A negative visual impact due to the creation of drill	Visual Impacts.	Drilling and Closure/ Rehabilitation	16-Low	<ul style="list-style-type: none"> • Existing agricultural land contour structures must be reinstated immediately (same day) 	10 - Low

	sites			<p>after prospecting activities completion.</p> <ul style="list-style-type: none"> • Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. • Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. • Backfill proposed prospecting areas immediately (same day) with onsite drilled material after samples have been collected. • Monitor prospecting areas for signs of erosion for at least six months after sampling or until the landowner plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required. • Only use drilled material as 	
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					<p>derived and conserved from the proposed prospecting site to backfill and rehabilitate impacted areas.</p> <ul style="list-style-type: none"> • Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. 	
Prospecting Closure/Rehabilitation	Potential erosion of the site and surrounds during rehabilitation phase	Natural and Agricultural Resources	Closure/Rehabilitation Phase	44-Medium	<ul style="list-style-type: none"> • Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. • Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. 	8-Low

					<ul style="list-style-type: none"> • Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. • Backfill proposed prospecting areas immediately (same day) with onsite drilled material after samples have been collected. • Monitor prospecting areas for signs of erosion for at least six months after sampling or until the landowner plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required. 	
Prospecting Closure/Rehabilitation	Introduction of alien and weed plant species during rehabilitation	Natural and Agricultural Resources	Closure/Rehabilitation Phase	56-Medium	<ul style="list-style-type: none"> • Only use drilled material as derived and conserved from the proposed prospecting site to backfill and rehabilitate impacted areas. • Alien invasive and weed vegetation monitoring and removal must be undertaken for 	8-Low

					at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Also refer to the EMP for further guidelines on alien vegetation management to be implemented during proposed prospecting activities.	
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Refer to section v) above for the supporting impact assessment conducted by the EAP

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.
Ecological Baseline	Eco Impact Legal Consulting (Pty) Ltd (Eco Impact) has been appointed by	X (All specialist	Part A – i) and j)

<p>Assessments</p> <p>by Eco Impact Legal Consulting</p> <p>June 2018</p>	<p>the Imerys Refractory Mineral SA to assess the biodiversity and freshwater ecosystems impacts of the proposed prospecting activities on erven 2224 and RE/1015 near Heidelberg in the Western Cape.</p> <p>Imerys Refractory Minerals South Africa (Pty) Ltd t/a Cape Bentonite Mine is an existing Bentonite and Zeolite mining company operating on various farms in close proximity to the towns of Heidelberg and Riversdale that fall within the Hessequa Local Municipality and Eden District Municipality in the Western Cape Province.</p> <p>Cape Bentonite Mines proposes to apply for a prospecting right to prospect for bentonite and zeolite on the erven 2224 and RE/1015 near the town of Heidelberg in the Western Cape.</p> <p>The proposed prospecting activities will entail the following phases:</p> <ul style="list-style-type: none"> • Phase 1 – Field Mapping and Surveying A qualified geologist will survey/explore the transformed cultivated areas on the proposed prospecting property by foot and map potential visible bentonite and zeolite outcrops. If such visible outcrops are found on the transformed cultivated areas of property the geologist will map these areas for potential sampling during phase 3. • Phase 2 – Literature Review A qualified geologist will research known geological literature of the property and surrounds to assist in determining approximate location of viable bentonite and zeolite deposits on the transformed cultivated areas of the property. <p>After the completion of phases 1 and 2 the geologist will produce potential bentonite and zeolite deposits maps for the property which will serve as guidelines for the next phase which will entail drilling and sampling.</p> <ul style="list-style-type: none"> • Phase 3 –Drilling and Sampling <p><i>Direct push sampler drilling and sampling</i> – using the maps as produced by the geologist during phases 1 and 2 the geologist will determine which orebodies must be investigated further by direct push sampler drilling. This</p>	<p>recommendations have been included in potential impact mitigation measures and EMPr requirements)</p>	<p>Part B – Environmental Management Programme Report</p> <p>Also refer to Appendix E for a copy of the specialist report.</p>
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<p>is conducted by the mining company itself and involves the use of a direct push sampler drill rig. The drill rig will push a stainless steel tube of 50-60cm long into the ground, once full it will bring it up and the sample will be taken out. This process will be carried out until bentonite is found or reaching the depth of around 6m. The hole will then immediately be rehabilitated by backfilling and a month later the site is revisited to determine if any the holes re-opened due to decompaction. The sampler holes will have the following maximum temporary footprints – Diameter 60mm; depth 6m = 3.6m³ overburden material produced by drilling to be backfilled immediately after sample has been taken. Samples would be collected according to the geology. Approximately 1000 sampler holes are proposed for the property, but final proposed direct sampler holes's amount will be determined during the completion of phases 1 and 2 therefore proposed direct sampler holes amount might increase or decrease.</p> <p><i>Boreholes and sampling</i> - following the results of the samples collected during the direct push sampler drilling, a qualified drilling contractor will be appointed by the mining company and under the guidance and supervision of the qualified geologist conduct the following drilling activities on the areas as identified by the geologist. Drilling involves using a rotary percussion drilling rig bringing samples to the surface in the form of chips. The drilled boreholes will have the following maximum temporary footprints - diameter 0.2m by 0.2m; depth 30m = 12 m³ maximum overburden material produced per borehole to be replaced immediately after sample has been taken. <1kg of sample material is collected by the geologist from each borehole for testing. The drilling samples collected are sent to the laboratory at the cape bentonite mine processing plant near Heidelberg and tested for specific properties to establish the quality of ore as well as determine approximate extension and volume of the available ore body. Approximately 60 drilling sections/lines with 3 boreholes each are proposed for the property = approximately 180 boreholes in total for the property, but final proposed boreholes amount will be determined during the completion of phases 1 and 2 and direct push sampler drilling results and the number of proposed drilling boreholes therefore might increase or decrease.</p> <p><i>Rehabilitation</i> – immediately (same day) following samples taken during drilling as described above the excavated material will be replaced and existing agricultural land contour structures will be reinstated. The disturbed prospecting areas will be monitored for signs of erosion for at</p>		
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	<p>least six months after sampling and erosion rectification and prevention measures will be implemented as and if required. Alien invasive and weed vegetation monitoring and removal will be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner.</p> <ul style="list-style-type: none"> <p>Phase 4 – Sample Analysis</p> <p><1kg of sample material is collected by the geologist from each borehole for testing. The samples collected are sent to the laboratory at the cape bentonite mine processing plant near Heidelberg and tested for specific properties to establish the quality of ore as well as determine approximate extension and volume of the available ore body.</p> <p>Phase 5 – Maps, Reserve and Resource Modelling</p> <p>Maps will be produced showing the location, depth and extent of physical prospecting work, together with, sampling points and the lithology, mineral content and mineral distribution identified, relative to the prospecting area. Following the results of sample analysis conducted the geological reserve modelling is done by using SURPAC and AUTOCAD geological software to determine the grades and quantities of available bentonite and zeolite resources and produce the feasibility reports for the property as investigated/surveyed.</p> <p>Sensitive environmental features that were identified on the property include indigenous vegetation remnants which exists throughout the property and consists of Critically Endangered - Eastern Ruens Shale Renosterveld also identified as Terrestrial Critical Biodiversity Areas (“CBA”) as according to the Fine Scale Planning (“FSP”) for Hessequa, as well as scattered Milkwood trees (<i>Sideroxylyn inerme</i>) within the cultivated lands.</p> <p>Other sensitive environmental and landscape features identified on the property include non-perennial drainage lines, man-made and natural dams with associated wetland characteristics mostly connected to remaining indigenous remnants, also classified as Critical Biodiversity Areas (“CBA”) and Ecological Support Areas (“ESA’) and National Wetland Freshwater</p> 		
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	<p>Ecosystems Priority Areas (“NFEPA”). .</p> <p>Prospecting will however not be done on any area demarcated as terrestrial or aquatic CBA or ESA nor on any NFEPA’s or indigenous vegetation areas. Individual Milkwood trees within cultivated lands will be demarcated and not be impacted upon.</p> <p>Significant direct impacts potentially associated with the prospecting excavation phase are direct loss of indigenous terrestrial and aquatic vegetation and disturbance of soil which may lead to partial disruption of ecological processes due to fragmentation of habitat and erosion. The extent in this case would be local. Indirect impacts would occur mostly during the rehabilitation phase and in this case the nature would vary from the introduction of alien vegetation to partial disruption of ecological processes due to the effects of the alien species encroachment and/or erosion. The extent of the potential indirect impacts in this case would be local.</p> <p>Where no existing gravel roads exists as buffer areas an buffer area of at least 8m as measured from the edge of the sensitive environmental and landscape features and located on completely transformed cultivated land must be maintained throughout the prospecting activities phase. The proposed buffer areas may only be used as roads and for stormwater/erosion management and no other activities associated with the proposed prospecting of the site may occur within the buffer areas.</p> <p>The ecological baseline assessment concluded that if the proposed prospecting activities remains on the completely transformed cultivated agricultural areas of the property as indicated on Map 4 of this report and the specialist recommendations as listed in this report are adhered to that the proposed prospecting activities will not have any significant detrimental environmental impacts on any of the sensitive environmental and landscape features as present on the site.</p> <p>Concluding Remarks and Summary of Impact Mitigation and Rehabilitation Measures Proposed before, during and after Prospecting Activities:</p> <p>If strict adherence is kept to the recommendations as set out in this report</p>		
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	<p>and incorporated into the Environmental Management Programme, the proposed development will not have a significant impact on any listed flora, fauna or avifauna species of conservations concern, their habitats or any sensitive environment and landscape features as identified on the property.</p> <ul style="list-style-type: none"> All proposed prospecting activities to be located on completely transformed and cultivated agricultural areas as identified on Maps 4 and 5 of this report. GPS co-ordinates of four scattered Milkwood trees within cultivated agricultural lands: <ol style="list-style-type: none"> 34° 04' 31.34"S 20° 58' 31.68"E 34° 04' 25.71"S 20° 58' 35.05"E 34° 04' 23.85"S 20° 58' 42.98"E 34° 04' 22.9" S 20° 58' 45.50"E Clearly demarcate the individual <i>Sideroxylon inerme</i> trees ("Milkwood trees") within a 5m radius buffer area, before any prospecting activities occurs within a 50m range of the trees. Demarcation method to be approved by Environmental Control Officer as required according to the EMP. Clearly demarcate all proposed prospecting activities areas and buffer areas as proposed. To prevent potential edge effects a buffer area of at least 8m as measured from the edge of the sensitive environmental and landscape features and located on completely transformed cultivated land must be maintained throughout the mining activities phase. The proposed buffer areas may only be used as roads and for stormwater management and no other activities associated with the proposed mining of the site may occur within the buffer areas. Demarcation method to be approved by an Environmental Control Officer (ECO). No disturbance should be allowed within the remaining indigenous vegetation, drainage lines and wetland areas. This includes no 		
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	<p>dumping of fill, no roads, and all forms of temporary disturbance.</p> <ul style="list-style-type: none"> • No natural vegetation, drainage lines or wetland areas edges may be cleared or impacted upon by the proposed prospecting activities. • Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. • Backfill proposed prospecting trenches and boreholes immediately (same day) with onsite excavated material after samples have been collected. • Only use topsoil and excavated material as derived and conserved from the proposed prospecting site to backfill and rehabilitate impacted areas. • Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. • Monitor excavated prospecting areas for signs of erosion for at least six months after sampling and implement erosion rectification and prevention measures as and if required. • Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. • In consultation with the Department of Water and Sanitation and the Breede Gourits Catchment Management Agency determine the need for water use authorisation for proposed prospecting activities within 100m from a drainage line or wetland. 		
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	<ul style="list-style-type: none"> • The project implementation process should be subject to standard Environmental Management Programme (EMP) prescripts and conditions, including recommendations as provided in this report and only proceed under supervision of a competent and diligent Environmental Control Officer during Phase 3 – Trenching, Drilling and Sampling of the proposed prospecting activities. <p>Eco Impact is of the opinion, and based on the survey and desk study done, that if the proposed prospecting activities remains on the completely transformed cultivated agricultural areas of the property as indicated on Maps 4 and 5 of this report and the specialist recommendations as listed in this report are adhered to that the proposed prospecting activities will not have any significant detrimental environmental impacts on any of the sensitive environmental and landscape features as present on the site.</p>		
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See specialist report/s attached under **Appendix E**.

I) Environmental impact statement

i. Summary of the key findings of the environmental impact assessment;

The objective of an EIA, in this case a basic assessment, is to find the alternative having the least negative environmental impact and which best benefits society. The assessment and evaluation of potential impacts associated with the proposed development was undertaken in an iterative manner, to inform proactively the 'shaping' of the optimum development proposal. Specialists and key stakeholders were involved in the EIA process to identify and assess potential impacts of the proposed development.

Imerys Refractory Minerals South Africa (Pty) Ltd t/a Cape Bentonite Mine is an existing Bentonite and Zeolite mining company operating on various farms in close proximity to the towns of Heidelberg and Riversdale that fall within the Hessequa Local Municipality and Eden District Municipality in the Western Cape Province.

Imerys Refractory Minerals South Africa (Pty) Ltd already have existing mining rights for bentonite and zeolite mining on other properties around Heidelberg and proposes to survey/investigate cultivated agricultural land on Erf 2224 for more potential viable bentonite and zeolite resources.

If viable bentonite and zeolite deposits can be discovered by the proposed prospecting activities and a mining right can be obtained for the viable deposits discovered the lifespan of the mining company will be increased.

Cape Bentonite Mine currently employs 43 people, of which 90% are from the local communities of Heidelberg and Riversdale. The company also invests in the local community through a Social Labour Plan. The Social Labour Plan consists of a 5 year investment plan which includes projects such as upgrading or creating community infrastructures, bursaries, internship, skills development programs etc. in order to improve the educations and skills level of the local community members. In total the Social Labour Plan of Cape Bentonite currently invests an average of R320 000 per year into the local community. Cape Bentonite is also supporting on a daily basis the local suppliers in order to provide the company with the items required in the Bentonite Production. And the company also pays royalties to the land owners of the properties where mining related activities occur and are proposed.

Eco Impact was appointed to conduct an ecological baseline assessment to determine which areas on Erf 2224 will be suitable, in terms of avoiding significant detrimental biophysical environmental impacts as far as possible, for the proposed prospecting activities and assess the potential impacts of the proposed prospecting activities on the terrestrial and aquatic ecological features as present on the property.

Sensitive environmental features that were identified on the property include indigenous vegetation remnants which exists throughout the property and consists of Critically Endangered - Eastern Ruens Shale Renosterveld also identified as Terrestrial Critical Biodiversity Areas ("CBA") as according to the Fine Scale Planning ("FSP") for Hessequa, as well as scattered Milkwood trees (*Sideroxylyn inerme*) within the cultivated lands.

Other sensitive environmental and landscape features identified on the property include non-perennial drainage lines, man-made and natural dams with associated wetland characteristics mostly connected to remaining indigenous remnants, also classified as Critical Biodiversity Areas ("CBA") and Ecological Support Areas ("ESA") and National Wetland Freshwater Ecosystems Priority Areas ("NFEPA").

Prospecting will however not be done on any area demarcated as terrestrial or aquatic CBA or ESA nor on any NFEPAs or indigenous vegetation areas. Individual Milkwood trees within cultivated lands will be demarcated and not be impacted upon.

Significant direct impacts potentially associated with the prospecting excavation phase are direct loss of indigenous terrestrial and aquatic vegetation and disturbance of soil which may lead to partial disruption of ecological processes due to fragmentation of habitat and erosion. The extent in this case would be local. Indirect impacts would occur mostly during the rehabilitation phase and in this case the nature would vary from the introduction of alien vegetation to partial disruption of ecological processes due to the effects of the alien species encroachment and/or erosion. The extent of the potential indirect impacts in this case would be local.

Where no existing gravel roads exists as buffer areas an buffer area of at least 8m as measured from the edge of the sensitive environmental and landscape features and located on completely transformed cultivated land must be maintained throughout the prospecting activities phase. A 5m buffer radius must also be demarcated and maintained throughout invasive prospecting phase around the individual Milkwood trees as found on site. The proposed buffer areas may only be used as roads and for stormwater/erosion management and no other activities associated with the proposed prospecting of the site may occur within the buffer areas.

The ecological baseline assessment concluded that if the proposed prospecting activities remains on the completely transformed cultivated agricultural areas of the property and the specialist recommendations are adhered to that the proposed prospecting activities will not have any significant detrimental environmental impacts on any of the sensitive environmental and landscape features as present on the site.

No fatal flaws were identified during the assessment that will lead to unacceptable environmental degradation during the proposed prospecting activities.

(ii) Final Site Map

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

Refer to maps attached under **Appendix B**

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

All significant environmental, cultural and socio-economic features applicable to the site were identified and informed the preferred activity, location and layout as proposed. The preferred prospecting activities, location and layout was assessed against the no go option of the site remaining as is.

Drilling and Sampling Phase

The potential impacts rated as medium negative before mitigation measures are implemented and as low negative after mitigation measures are implemented include potential impacts of/on – Increased dust levels; Potential erosion of the site and surrounds due to proposed prospecting activities along steep slopes; Prospecting activities can result in increased sediment loads in water resources; Impact of proposed prospecting activities on terrestrial indigenous vegetation areas as associated with mapped terrestrial CBAs and ESAs; Impact of proposed prospecting activities on secondary-, primary drainage lines and man-made dams with associated wetland characteristics and aquatic vegetation as

associated with mapped NFEPAs and aquatic CBAs and ESAs; Waste from chemical toilets and litter; Hydrocarbon spill; Fire; Increased traffic due to the prospecting activities requiring various vehicles to come onto and leave the site; Prospecting on agricultural land.

The potential impacts rated as low negative before mitigation measures are implemented include potential impacts of/on – Emissions; Impact on the naturally occurring fauna and avifauna present in the area; The potential impact of the proposed prospecting activities on archaeological, paleontological and heritage remains; Noise due to machinery and people on site; A negative visual impact due to the creation of excavation pits/trenches.

Potential positive impacts during this phase include – Discovering and confirmation of viable bentonite and zeolite deposits on transformed cultivated agricultural land which may in turn lead to sustained jobs and other socio-economic benefits to the local landowners and communities if mining rights for the discovered deposits are obtained.

All the potential impacts can be mitigated to a potential low negative significance by implementing the mitigation measures as included and described in the EMP and specialist report.

Closure/Rehabilitation Phase

The potential impacts rated as medium negative before mitigation measures are implemented and as low negative after mitigation measures are implemented include potential impacts of/on – Potential erosion of the site and surrounds during rehabilitation phase; Introduction of alien and weed plant species during rehabilitation.

Potential positive impacts during this phase include – Rehabilitation of agricultural land to be used for agricultural cultivation and livestock grazing as per previous land use.

It was concluded by the EAP that the proposed development will not have a significant negative environmental impact if proposed mitigation measures are implemented and it was recommended that the Environmental Management Programme be adhered to accordingly.

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 conditions of authorisation.

The National Environmental Management Laws Amendment Act 25 of 2014 and Section 38 of the MPRDA stipulated that the general objectives of integrated environmental management must be applied in accordance with NEMA and this will include the assessment and management of impacts identified as part of the EIA process. The following are proposed impact management mitigation measures to be implemented for each potential impact identified and assessed:

Increased dust levels

- A speed limit of 30km/hour will be enforced through a fining system.
- All vehicle drivers entering the site will be informed of the speed limit.
- No vegetated areas will be cleared for proposed prospecting activities, only drill sampling will occur which does not require that large areas be cleared.
- All impacted areas to be rehabilitated immediately (same day) by means of replacing soil material removed and shaping topsoil according to surrounding topography and contours.

- Temporarily halt material handling in extreme windy conditions. .

Potential erosion of the site and surrounds due to proposed prospecting activities along steep slopes

- Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion.
- Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas.
- Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds.
- Backfill proposed prospecting boreholes immediately (same day) with onsite drilled material after samples have been collected.
- Monitor prospecting areas for signs of erosion for at least six months after sampling or until the area is planted by the landowner (whichever comes first) and implement erosion rectification and prevention measures as and if required.

Emissions - Vehicles and machinery on the site will produce tailpipe emissions causing air pollution

- Vehicles and machinery will be maintained to minimize emissions. A log book will be filled in to keep a record of all maintenance problems encountered and mitigation measures implemented to resolve the problem.
- Vehicles and machinery emitting excessive emissions will be stopped immediately and not allowed to operate until the necessary repairs have been made

Prospecting activities can result in increased sediment loads in water resources if disturbed areas are eroded

- Demarcate recommended buffer areas before prospecting commences and maintain demarcation throughout prospecting operations until rehabilitation/closure phase.
- All roads need to be maintained and monitored. Visible signs of possible erosion must be immediately rehabilitated.
- Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds.

Impact of proposed prospecting activities on terrestrial indigenous vegetation areas as associated with mapped terrestrial CBAs and ESAs

- The individual *Sideroxylon inerme* trees (“Milkwood trees”) that were recorded within the cultivated areas must be demarcated within a 5m buffer radius by the ECO before any prospecting activities occurs within a 50m range of the trees and must remain demarcated throughout the applicable prospecting operational and rehabilitation phases. Demarcation can be removed when implementation of the applicable rehabilitation measures have been completed.
- Clearly demarcate the 8m wide buffer areas proposed as measured from the edge of all remaining indigenous vegetation areas and undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas.
- Demarcation method to be approved by an Environmental Control Officer (ECO).
- No disturbance should be allowed within the remaining indigenous vegetation areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance.
- No natural vegetation areas edges may be cleared or impacted upon by the proposed prospecting activities.

- The proposed buffer areas to be located within existing cultivated land may only be used as roads and for stormwater management and no other activities associated with the proposed prospecting of the site may occur within the buffer areas.
- Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds.
- Backfill prospecting areas (same day) with onsite drilled material after samples have been collected.
- Monitor prospecting areas for signs of erosion for at least six months after sampling or until the landowner plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required.

Impact of proposed prospecting activities on secondary drainage lines and man-made dams with associated wetland characteristics and aquatic vegetation as associated with mapped NFEPAs and aquatic CBAs and ESAs

- Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas at least 8m from the edge of the any drainage lines, indigenous vegetation and dams with associated wetland characteristics and aquatic vegetation.
- No disturbance should be allowed within the drainage line or wetland areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance.
- No drainage line or wetland areas edges may be disturbed or impacted upon by the proposed prospecting activities.
- Storm water and erosion control measures to be implemented as per an EMP must be conducted and monitored to prevent siltation or erosion of sensitive environmental and landscape features as identified on site.
- Backfill proposed drilling sites and boreholes immediately (same day) with onsite drilled material after samples have been collected.
- Monitor prospected areas for signs of erosion for at least six months after sampling or until the landowner has planted the area (whichever comes first) and implement erosion rectification and prevention measures as and if required.
- No prospecting activities may occur within 100m from any drainage line or 500m from any wetland without determining requirement for water use authorisation from Department of Water and Sanitation or the Breede Gouritz Catchment Management Agency

Waste from chemical toilets and litter leading to environmental pollution

- The toilets are emptied at least once a week or when almost full.
- If a leak occurs the correct emergency procedure is to be followed (see EMP).
- Litter will be collected and removed from site by the operator on a daily basis.
- All sewage waste water must be disposed of at a licensed waste water treatment works.

Hydrocarbon spill leading to environmental pollution

- Any vehicle which is leaking hydrocarbons (e.g. petrol, diesel or oil) will be serviced in a concreted workshop to repair the leak. If it is not possible to repair the leak immediately, a drip tray will be placed under the leak to trap any spillages. The content of the drip trays will be decanted into an old oil drum for removal from the site to a hazardous waste handling facility.
- Hydrocarbon spillages are to be cleaned up immediately.
- The prospecting company will also maintain a store of suitable absorbent material, suitable bioremediation substance and a spill kit. All incidences/ spillages are to be recorded in an incident log book. Contaminated soil must go to Vissershok Hazardous Landfill site.

Fire causing environmental destruction/ transformation

- All employees will be trained on fire safety and on how to reduce the probability of a fire spreading out of control.
- Anyone who observes a fire must report it immediately to the fire protection agency/ fire brigade and their supervisor/ mine manager.

Impact on the naturally occurring fauna and avifauna present in the area

- Rehabilitate the area after prospecting activities are complete to previous agricultural state.
- Use of stockpiled topsoil to rehabilitate the site.
- Restrict prospecting activities only to approved prospecting areas on transformed cultivated agricultural land.

Increased traffic due to the mining activities requiring various vehicles to come onto and leave the site

- A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers entering the site will be informed of the speed limit. Speed limit will also be applicable when delivery trucks drive through areas where farm yard and housing is next to the road.
- The applicant will be responsible for upkeep and repair of farm roads used during prospecting activities to the satisfaction of the landowner.

Prospecting on agricultural land leading to temporary loss of agricultural land currently being used for crop cultivation and livestock grazing

- Compensate the landowner for the temporary loss of agricultural land during prospecting activities.
- Undertake prospecting activities on agricultural land before the onset of the annual planting season and then again only after the crop has been harvested.
- Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion.
- Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas.
- Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds.
- Backfill proposed prospecting drilling and borehole sites immediately (same day) with onsite drilled material after samples have been collected.
- Monitor prospecting areas for signs of erosion for at least six months after sampling or until the landowners plants the area (whichever comes first) and implement erosion rectification and prevention measures as and if required.
- Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Refer to the EMP for further details.

The potential impact of the proposed prospecting activities on archaeological, paleontological and heritage remains

Should any burials, fossils or other historical material be encountered during mining, work must cease immediately and HWC must be contacted.

Noise due to machinery and people on site

- No activities that may generate noise levels above the legal limit for rural areas in terms of the Environmental Conservation Act, Western Cape Noise regulations will be conducted.
- Machinery and vehicles should be regularly maintained to prevent excessive noise.
- All machinery and work activities must adhere to the requirements of the noise regulations.

A negative visual impact due to the creation of prospecting drilling sites

- Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion.
- Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas.
- Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds.
- Backfill proposed prospecting drilling sites and boreholes immediately (same day) with onsite drilled material after samples have been collected.
- Monitor prospecting areas for signs of erosion for at least six months after sampling or until the farmer has planted the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required.
- Only use drilled material as derived and conserved from the proposed prospecting site to backfill and rehabilitate impacted areas.
- Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land (whichever comes first). This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner.

Potential erosion of the site and surrounds during rehabilitation phase

- Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion.
- Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas.
- Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds.
- Backfill proposed drill and borehole site immediately (same day) with onsite drilled material after samples have been collected.
- Monitor prospecting areas for signs of erosion for at least six months after sampling or until the farmer plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required.

Introduction of alien and weed plant species during rehabilitation

- Only use drilled material as derived and conserved from the proposed prospecting sites to backfill and rehabilitate impacted areas.
- Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land (whichever comes first). This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Also refer to the EMP for more details on alien vegetation management to be conducted.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

The prospecting company must appoint a suitably qualified ECO who will be responsible for ensuring compliance with the requirements of the EA and EMP during the proposed prospecting activities. The ECO must have at least five years of experience in environmental management and must be familiar with the environmental conditions of the area.

The ECO must:

- Inspect the site and record compliance with the EA and EMP;
- Inform key, on-site staff of their roles and responsibilities in terms of the EA and EMP;
- Ensure that all activities on site are undertaken in accordance with the EA and EMP;
- Immediately notify the prospecting company of any non-compliance with the EA or EMP, or any other issues of environmental concern; and

All specialist recommendations must be adhered to.

All EMP requirements must be adhered to.

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

(Which relate to the assessment and mitigation measures proposed)

EAP has no detailed knowledge of bentonite and zeolite deposits and distributions other than information as provided by Cape Bentonite Mine. Only knowledgeable on potential impacts of prospecting activities on the environment and the associated ecological and biodiversity aspects. In undertaking the investigation and compiling this report, the following has been assumed:

- The information provided by the client, engineers and specialists is accurate and unbiased;
- The scope of this investigation is to assess the direct and cumulative environmental impacts associated with the proposed prospecting activities.

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

i. Reasons why the activity should be authorized or not.

The EAP is of the opinion that the environmental authorisation should be issued.

The proposed sites on cultivated agricultural lands are considered suitable for bentonite and zeolite prospecting and the potential impacts identified would be adequately managed and effectively mitigated through the implementation of the recommendations outlined in this report as well as the proposed Environmental Management Programme (EMP).

It was concluded that the proposed activities will not have an unacceptable significant negative environmental impact on the environment if specialist and EMP recommendations are effectively implemented.

No fatal flaws were identified during the assessment that will lead to unacceptable environmental degradation during proposed prospecting activities.

ii. Conditions that must be included in the authorisation

The prospecting company must appoint a suitably qualified ECO who will be responsible for ensuring compliance with the requirements of the EA and EMP during the proposed prospecting activities. The ECO must have at least five years of experience in environmental management and must be familiar with the environmental conditions of the area.

The ECO must:

- Inspect the site and record compliance with the EA and EMP;
- Inform key, on-site staff of their roles and responsibilities in terms of the EA and EMP;
- Ensure that all activities on site are undertaken in accordance with the EA and EMP;
- Immediately notify the prospecting company of any non-compliance with the EA or EMP, or any other issues of environmental concern; and

All specialist recommendations must be adhered to.

All EMP requirements must be adhered to.

q) Period for which the Environmental Authorisation is required.

It is expected that prospecting activities will begin within one year of obtaining environmental authorisation. Prospecting activities are expected to take approximately 5 years. The Environmental authorization should be valid for 5 years.

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.

Yes, it is confirmed that the undertaking is provided and included at the end of the EMPr.

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.

During the prospecting work 1000 holes will be done with the direct push auger and 180 percussion drill holes. This correspond respectively to 36000m³ and 2160m³ which in total gives us around 40 000m³ of material which will be temporarily removed per drill and borehole site and immediately replaced after sampling.

Operational costs:

For the direct push auger drill, the rate is R15/hole and 3L/hole at R14/L, so for a 1000 boreholes the total cost will be R192 000.00.

For percussion drilling, at a rate of R500/m and 3L/m (R14/L) of Diesel per meter (on average we do 12m/hole) it is foreseen that the operational amount required to finance this project is approximately R1 170 720.00.

Rehabilitation costs:

At a rate of R10/cubic metre to rehabilitate it is foreseen that the rehabilitation amount required to finance this project is approximately R 400 000.00.

ii. Confirm that this amount can be provided for from operating expenditure. (Confirm that the amount, is anticipated to be an operating cost and is provided for as such

in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

The client has confirmed that this amount can be provided for from the operating expenditure.

t) Specific Information required by the competent Authority

i. 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**).

Please refer to the impact tables above for more detail. The proposed zeolite and bentonite prospecting activities will not have any significant detrimental impacts on the socio-economic conditions of the local landowners, residence or communities as assessed.

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 that Act, attach the investigation report as **Appendix** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6. and 2.12. herein).

A Notice of Intent to Develop was submitted to Heritage Western Cape for determining need for an HIA. It is not expected that any significant heritage resources will be impacted upon by the proposed mining activities. See Notice of Intent to Develop as submitted to Heritage Western Cape under **Appendix E2**. The prospecting activities will not impact on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 or impact on any building or structure older than 60 years in any way.

u) Other matters required in terms of sections 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 EIA Regulations, 2014 require that all EIA processes must identify and describe “alternatives to the proposed activity that are feasible and reasonable”. Different types or categories of alternatives can be identified, e.g. location alternatives, type of activity, design or layout alternatives, technology alternatives and operational alternatives. The “No-Go” or “No Project” alternative must also be considered. Please refer to the sections above for detailed assessment of the preferred site alternative and no go option assessments.

In the case of the proposed bentonite and zeolite prospecting activities on Erf 2224, the identification of feasible alternatives is severely constrained by a number of factors, including:

- The location of the viable bentonite and zeolite deposits on completely transformed and cultivated agricultural land.
- The specific prospecting footprints within the application property must take into account environmental constraints and significant landscape features as identified by the ecological specialist during the preliminary planning phase.

- The willingness of the landowner to allow prospecting activities.
- The proposed prospecting areas will be prospected using accepted bentonite and zeolite prospecting methods with the least potential environmental impacts and therefore no technology or process alternatives are considered.

A number of alternatives have however, been considered during preliminary planning phase. These alternatives, as well as reasons for their exclusion from further consideration, are summarised here. Prospecting layouts taking environmental sensitivities into account were considered within the proposed property. The proposed prospecting areas were identified using the pre-mining land capability, as per the South African Chamber of Mines (1991,) guidelines summarised below.

Criteria for wetland

Land with organic soils or supporting hygrophilous vegetation where soil and vegetation processes are water determined.

Criteria for arable/cultivation land

Land that does not qualify as a wetland.

The soil is readily permeable to a depth of 750 mm.

The soil has a pH value of between 4.0 and 8.4.

The soil has a low salinity and SAR.

The soil has less than 10% (by volume) rocks or pedocrete fragments larger than 100 mm in the upper 750 mm.

Has a slope (in percent) and erodibility factor (K) such that their product is <2.0

Occurs under a climate of crop yields that are at least equal to the current national average for these crops.

Criteria for grazing land

Land that does not qualify as wetland or arable land.

Has soil, or soil-like material, permeable to roots of native plants, that is more than 250 mm thick and contains less than 50 % by volume of rocks or pedocrete fragments larger than 100 mm.

Supports, or is capable of supporting, a stand of native or introduced grass species, or other forage plants utilisable by domesticated livestock or game animals on a commercial basis.

Criteria for wilderness land

Land that does not qualify as wetland, arable land or grazing land

Location alternatives – Erf 2224 was the only location alternative considered, because there are aboveground evidence of bentonite deposits present on the property. Prospecting is therefore proposed to determine the extent and viability of these deposits for potential future mining.

Activity alternatives- No activity alternatives were assessed other than the activities as proposed as the reason for the application is proposed bentonite and zeolite prospecting activities.

Layout alternatives – Layout alternatives were considered and assessed by the ecologist. The proposed prospecting areas on completely transformed cultivated agricultural land are informed by the ecologist recommendations. (Refer to Appendix B for proposed prospecting areas layout plans and Appendix E for specialist report).

Technology alternatives – No technology alternatives were assessed other than the technology to be used as proposed as the method of bentonite and zeolite prospecting is singular and the prospecting activities as proposed are the most “environmentally-friendly”

prospecting techniques available which will have the least possible detrimental environmental impacts.

Operational alternatives – No operational alternatives exist. The method of bentonite and zeolite prospecting is singular and is described in this report and prospecting work programme (“PWP”) (Refer to Appendix D for prospecting work programme).

The No-Go/No-Prospecting Option- The No-Go option will result in the site remaining as it is presently, cultivated agricultural land being cultivated and grazed by livestock on an ongoing basis. If additional viable bentonite and zeolite deposits are discovered during the proposed prospecting activities the potential socio-economic benefits of mining the viable bentonite and zeolite deposits outweigh the potential negative impacts of prospecting on the environment if specialist and EMP recommendations are effectively implemented.

No other alternatives were assessed as no feasible or reasonable alternative exists. Only the proposed development or the no-go option is suitable.

PART B
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

COMPLIANCE OF THIS EMPr WITH THE REQUIREMENTS OUTLINED IN SECTION 24N(2) & (3) OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO 107 OF 1998 AS AMENDED):

(2) The environmental management programme must contain-

(a) information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts or objectives in respect of-

- (i) planning and design;
- (ii) pre-construction and construction activities;
- (iii) the operation or undertaking of the activity in question;
- (iv) the rehabilitation of the environment; and
- (v) closure, if applicable;

Refer to Part B: EMP 1) d) Table iv) Impacts to be mitigated in their respective phases

(b) details of-

- (i) the person who prepared the environmental management programme; and
(Refer to Chapter 1 of the EMPr)
- (ii) the expertise of that person to prepare an environmental management programme;
(Refer to Chapter 1 of the EMPr)

Refer to Part B: EMP 1) a) Details of the EAP

(c) a detailed description of the aspects of the activity that are covered by the environmental management programme;

Refer to Part B: EMP 1) b) Description of the Aspects of the Activity

(d) information identifying the persons who will be responsible for the implementation of the measures contemplated in paragraph (a);

Refer to Part B: EMP 1) p) General Environmental Management Guidelines to be implemented during the Proposed Prospecting Activities

(e) information in respect of the mechanisms proposed for monitoring compliance with the environmental management programme and for reporting on the compliance;

Refer to Part B: EMP 1) g)- l) Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

(f) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined

state or to a land use which conforms to the generally accepted principle of sustainable development; and

Refer to Appendix F: Prospecting Closure/Rehabilitation Plan of the BAR as attached

(g) a description of the manner in which it intends to-

or (i) modify, remedy, control or stop any action, activity or process that causes pollution or environmental degradation;

Refer to Part B: EMP 1) d) Table iv) Impacts to be mitigated in their respective phases

(ii) remedy the cause of pollution or degradation and migration of pollutants; and
Refer to Part B: EMP 1) d) Table iv) Impacts to be mitigated in their respective phases

(iii) comply with any prescribed environmental management standards or practices.
Refer to Part B: EMP 1) d) Table iv) Impacts to be mitigated in their respective phases

(3) The environmental management programme must, where appropriate-

(a) set out time periods within which the measures contemplated in the environmental management programme must be implemented;

Refer to Part B: EMP 1) d) Table iv) Impacts to be mitigated in their respective phases

(b) contain measures regulating responsibilities for any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of prospecting or mining operations or related mining activities which may occur inside and outside the boundaries of the prospecting area or mining area in question; and

Refer to Part B: EMP 1) d) Table iv) Impacts to be mitigated in their respective phases

(c) develop an environmental awareness plan describing the manner in which-

(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and

Refer to Part B: EMP 1) m) Environmental Awareness Plan

(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment.

Refer to Part B: EMP 1) d) Table iv) Impacts to be mitigated in their respective phases and p) General Environmental Management Guidelines to be implemented during the Proposed Prospecting Activities

a) Details of the EAP

(Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 3 a) herein as required).

It is confirmed that the details and expertise of the EAP are already provided under Part A: BAR, Section 3 a).

b) Description of the Aspects of the Activity

(Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section 3 h) herein as required).

It is confirmed that the requirements to describe the aspects of the activity that are covered by the EMP are already provided under Part A: BAR, section 3 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)

Please refer to **Appendix B** of the BAR as attached.

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)

Main closure/rehabilitation objective is to rehabilitate the proposed prospecting areas as according to previous agricultural potential and ensure that the final conditions of the site is environmentally acceptable and that there will be no adverse long term effects on the surrounding environment especially the indigenous vegetation areas and water resources.

Imerys Refractory Minerals South Africa (Pty) Ltd proposes to prospect cultivated agricultural land on Erf 2224 for potential viable bentonite and zeolite resources to be mined.

The **proposed prospecting activities** will entail the following phases:

- **Phase 1 – Field Mapping and Surveying**

A qualified geologist will survey/explore the transformed cultivated areas on the proposed prospecting property by foot and map potential visible bentonite and zeolite outcrops. If such visible outcrops are found on the transformed cultivated areas of property the geologist will map these areas for potential sampling during phase 3.

- **Phase 2 – Literature Review**

A qualified geologist will research known geological literature of the property and surrounds to assist in determining approximate location of viable bentonite and zeolite deposits on the transformed cultivated areas of the property.

After the completion of phases 1 and 2 the geologist will produce potential bentonite and zeolite deposits maps for the property which will serve as guidelines for the next phase which will entail drilling and sampling.

- **Phase 3 – Drilling and Sampling**

Direct push sampler drilling and sampling – using the maps as produced by the geologist during phases 1 and 2 the geologist will determine which orebodies must be investigated further by direct push sampler drilling. This is conducted by the mining company itself and involves the use of a direct push sampler drill rig. The drill rig will push a stainless steel tube of 50-60cm long into the ground, once full it will bring it up and the sample will be taken out. This process will be carried out until bentonite is found or reaching the depth of around 6m. The hole will then immediately be rehabilitated by backfilling and a month later the site is revisited to determine if any the holes re-opened due to decompaction. The sampler holes will have the following maximum temporary footprints – Diameter 60mm; depth 6m = 3.6m³ overburden material produced by drilling to be backfilled immediately after sample has been taken. Samples would be collected according to the geology. Approximately 1000 sampler holes are proposed for the property, but final proposed

direct sampler holes's amount will be determined during the completion of phases 1 and 2 therefore proposed direct sampler holes amount might increase or decrease.

Boreholes and sampling - following the results of the samples collected during the direct push sampler drilling, a qualified drilling contractor will be appointed by the mining company and under the guidance and supervision of the qualified geologist conduct the following drilling activities on the areas as identified by the geologist. Drilling involves using a rotary percussion drilling rig bringing samples to the surface in the form of chips. The drilled boreholes will have the following maximum temporary footprints - diameter 0.2m by 0.2m; depth 30m = 12 m³ maximum overburden material produced per borehole to be replaced immediately after sample has been taken. <1kg of sample material is collected by the geologist from each borehole for testing. The drilling samples collected are sent to the laboratory at the cape bentonite mine processing plant near Heidelberg and tested for specific properties to establish the quality of ore as well as determine approximate extension and volume of the available ore body. Approximately 60 drilling sections/lines with 3 boreholes each are proposed for the property = approximately 180 boreholes in total for the property, but final proposed boreholes amount will be determined during the completion of phases 1 and 2 and direct push sampler drilling results and the number of proposed drilling boreholes therefore might increase or decrease. In total only between 100- 200kg of sample material will be removed for further testing.

Rehabilitation – immediately (same day) following samples taken during drilling as described above the drilled material will be replaced and existing agricultural land contour structures will be reinstated. The disturbed prospecting areas will be monitored for signs of erosion for at least six months after sampling or until the landowner plants the lands (whichever comes first) and erosion rectification and prevention measures will be implemented as and if required. Alien invasive and weed vegetation monitoring and removal will be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land (whichever comes first). This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Should any remaining indigenous vegetation and/or watercourse/wetland areas be impacted upon by the proposed prospecting activities a suitably qualified botanical and/or freshwater specialist must be appointed to assess the significance of the impacts and provide recommendations for rehabilitation/rectification. The specialist/s must provide a list of locally indigenous terrestrial and/or aquatic vegetation to be used during the rehabilitation of affected indigenous vegetation and/or watercourse/wetland areas as part of his/her assessment of the affected areas.

- **Phase 4 – Sample Analysis**

<1kg of sample material is collected by the geologist from each borehole for testing. The samples collected are sent to the laboratory at the cape bentonite mine processing plant near Heidelberg and tested for specific properties to establish the quality of ore as well as determine approximate extension and volume of the available ore body.

- **Phase 5 – Maps, Reserve and Resource Modelling**

Maps will be produced showing the location, depth and extent of physical prospecting work, together with, sampling points and the lithology, mineral content and mineral distribution identified, relative to the prospecting area. Following the results of sample analysis conducted the geological reserve modelling is done by using SURPAC and AUTOCAD geological software to determine the grades and quantities of available bentonite and zeolite resources and produce the feasibility reports for the property as investigated/surveyed.

All significant environmental, cultural and socio-economic features applicable to the site were identified and informed the preferred activity, location and layout as proposed. The preferred prospecting activities, location and layout was assessed against the no go option of the site remaining as is.

Prospecting Drilling Phase

The potential impacts rated as medium negative before mitigation measures are implemented and as low negative after mitigation measures are implemented include potential impacts of/on – Increased dust levels; Potential erosion of the site and surrounds due to proposed prospecting activities along steep slopes; Prospecting activities can result in increased sediment loads in water resources; Impact of proposed prospecting activities on terrestrial indigenous vegetation areas as associated with mapped terrestrial CBAs and ESAs; Impact of proposed prospecting activities on secondary-, primary drainage lines and man-made dams with associated wetland characteristics and aquatic vegetation as associated with mapped NFEPA's and aquatic CBAs and ESAs; Waste from chemical toilets and litter; Hydrocarbon spill; Fire; Increased traffic due to the prospecting activities requiring various vehicles to come onto and leave the site; Prospecting on agricultural land.

The potential impacts rated as low negative before and after mitigation measures are implemented include potential impacts of/on – Emissions; Impact on the naturally occurring fauna and avifauna present in the area; The potential impact of the proposed prospecting activities on archaeological, paleontological and heritage remains; Noise due to machinery and people on site; A negative visual impact due to the creation of excavation pits/trenches.

Potential positive impacts during this phase include – Discovering and confirmation of viable bentonite and zeolite deposits on transformed cultivated agricultural land which may in turn lead to sustained jobs and other socio-economic benefits to the local landowners and communities if mining rights for the discovered deposits are obtained.

All the potential impacts can be mitigated to a potential low negative significance by implementing the mitigation measures as included and described in the EMP and specialist report.

Closure/Rehabilitation Phase

The potential impacts rated as medium negative before mitigation measures are implemented and as low negative after mitigation measures are implemented include potential impacts of/on – Potential erosion of the site and surrounds during rehabilitation phase; Introduction of alien and weed plant species during rehabilitation.

Potential positive impacts during this phase include – Rehabilitation of agricultural land to be used for agricultural cultivation and livestock grazing as per previous land use.

It was concluded by the EAP that the proposed development will not have a significant negative environmental impact if proposed mitigation measures are implemented and it was recommended that the Environmental Management Programme be adhered to accordingly.

ii) Volumes and rate of water use required for the operation.

NA. The activity will not require any water for its operation.

iii) Has a water use licence been applied for?

Neither applicable nor required.

iv) Impacts to be mitigated in their respective phases

Measures to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<p>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc.</p> <p>E.g. For mining,- 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.)</p>	<p>(of operation in which activity will take place.</p> <p>State; Planning and design, Pre-Mining' Mining, Operational, Rehabilitation, Closure, Post closure).</p>	<p>(volumes, tonnages and hectares or m²)</p>	<p>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)</p>	<p>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)</p>	<p>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required.</p> <p>With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.</p> <p>Upon cessation of the individual activity</p> <p>or.</p> <p>Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.</p>
<p>Prospecting Drilling and Closure/Rehabilitation</p>	<p>Drilling and Closure/ Rehabilitation</p>	<p>82Ha – Transformed Agricultural Land on which Prospecting Activities are Proposed</p> <p>101.15804Ha – Total Property Size</p>	<p>Conserving and Rehabilitating Agricultural Land</p> <ul style="list-style-type: none"> • Compensate the landowner for the temporary loss of agricultural land during prospecting activities. • Undertake prospecting activities on agricultural land before the onset of the annual planting season and then again only after the crop has been harvested. • Existing agricultural land 	<p>Conservation of Agricultural Resources Act, 43 of 1983</p>	<p>Drilling and Closure/ Rehabilitation phases</p>

		<p>contour structures must be reinstated immediately (same day) after prospecting activities completion.</p> <ul style="list-style-type: none"> • Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. • Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. • Backfill proposed prospecting drilling and borehole sites immediately (same day) with onsite drilled material after samples have been collected. • Monitor prospecting areas for signs of erosion for at least six months after sampling or until the landowners plants the area (whichever comes first) and implement erosion rectification and prevention measures as and if required. • Alien invasive and weed 		
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			vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Refer to the EMPr for further details.		
Prospecting Drilling and Closure/Rehabilitation	Drilling and Closure/ Rehabilitation	82Ha – Transformed Agricultural Land on which Prospecting Activities are Proposed 101.15804Ha – Total Property Size	<p>Excessive Dust</p> <ul style="list-style-type: none"> • A speed limit of 30km/hour will be enforced through a fining system. • All vehicle drivers entering the site will be informed of the speed limit. • No vegetated areas will be cleared for proposed prospecting activities, only drill sampling will occur which does not require that large areas be cleared. • All impacted areas to be rehabilitated immediately (same day) by means of replacing soil material removed and shaping topsoil according to surrounding topography and contours. 	The dust generated and fallout will be monitored against the requirements described below and the activity will cease and mitigation measures implemented to ensure that the dust generated as a result of the activity meets the regulatory requirements. The National Dust Control Regulations regulates the following: No person may conduct any activity in such a way as to give rise to dust in such quantities and concentrations that the dust or dust fallout has a detrimental effect on the environment, including	Drilling and Closure/ Rehabilitation phases

			<ul style="list-style-type: none"> Temporarily halt material handling in extreme windy conditions. 	<p>health, social, economic, ecological or cultural heritage conditions or has contributed to the degradation of the ambient air quality beyond the premises where it originates from; or that the dust remains visible in the ambient air beyond the premises where it originates from; or if the dust fall at the boundary or beyond the boundary of the premises where it originates exceeds:</p> <ul style="list-style-type: none"> – 1200 mg/m²/day averaged over 30 days, measured in accordance with reference method ASTM D1739 (Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter)). <p>It is important to note that people experience dust deposition as a nuisance effect, and that there are no direct human health implications because the dust does not reach the lungs. Indirect effects on human and animal health may result from the deposition of dust containing toxicants onto edible plants. Heavy dust deposition can have detrimental effects on plants if the leaves are smothered to the extent</p>	
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				where transpiration and photosynthesis are affected. Particulate Matter). Two dust fallout incidents that exceeds the limit may occur within a year (not sequential months).	
Prospecting Drilling and Closure/Rehabilitation	Drilling and Closure/ Rehabilitation	82Ha – Transformed Agricultural Land on which Prospecting Activities are Proposed 101.15804Ha – Total Property Size	<p>Potential Erosion</p> <ul style="list-style-type: none"> Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. Backfill proposed prospecting boreholes immediately (same day) with onsite drilled material after samples have been collected. Monitor prospecting areas for signs of erosion for at least six months after 	Conservation of Agricultural Resources Act, 43 of 1983 and regulations	Drilling and Closure/ Rehabilitation phases

			sampling or until the area is planted by the landowner (whichever comes first) and implement erosion rectification and prevention measures as and if required		
Prospecting Drilling and Closure/Rehabilitation	Drilling and Closure/ Rehabilitation	82Ha – Transformed Agricultural Land on which Prospecting Activities are Proposed 101.15804Ha – Total Property Size	Noise <ul style="list-style-type: none"> • No activities that may generate noise levels above the legal limit for rural areas in terms of the Environmental Conservation Act, Western Cape Noise regulations will be conducted. • Machinery and vehicles should be regularly maintained to prevent excessive noise. • All machinery and work activities must adhere to the requirements of the noise regulations. 	The standard below will be used to measure noise levels and impacts. Table 2 of SANS 10103:2004 <i>The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication</i> where the daytime, equivalent continuous rating level is given as 45 dBA for Rural Districts.	Drilling and Closure/ Rehabilitation phases
Prospecting Drilling and Closure/Rehabilitation	Drilling and Closure/ Rehabilitation	82Ha – Transformed Agricultural Land on which Prospecting Activities are Proposed 101.15804Ha – Total Property Size	Emissions <ul style="list-style-type: none"> • Vehicles and machinery will be maintained to minimize emissions. A log book will be filled in to keep a record of all maintenance problems encountered and mitigation measures implemented to resolve the problem. • Vehicles and machinery emitting excessive emissions will be stopped immediately and not allowed to operate until the necessary repairs have 	Carbon monoxide (CO) is an odourless, colourless, and poisonous gas. Most CO is formed as a result of incomplete combustion of organic materials used as fuel. CO emissions are highest during incomplete combustion e.g. during idling and low speed mobile source operations, such as vehicle idle. CO enters the bloodstream and reduces oxygen delivery to the body's organs and tissues. Its most serious effects	Drilling and Closure/ Rehabilitation phases

			been made.	occur at high concentrations, and therefore it tends to be a localized problem. CO may produce adverse health effects such as headaches, work capacity impairment, learning ability impairment, dizziness, weakness, nausea, vomiting, loss of muscular control, increasing and decreasing respiratory rates, collapse, unconsciousness, or death. The health threat from CO is most serious for those who suffer from cardiovascular disease. Healthy individuals also can be affected, but only at higher concentrations. It is not anticipated that the CO emissions levels that is generated will cause the above effects. The occupational exposure limit of CO is 50 parts per million for a 40 hour work week. It is highly unlikely whether this level will be reached in the general environment.	
Prospecting Drilling and Closure/Rehabilitation	Drilling and Closure/Rehabilitation	82Ha – Transformed Agricultural Land on which Prospecting Activities are Proposed	Fire Control <ul style="list-style-type: none"> All employees will be trained on fire safety and on how to reduce the probability of a fire spreading out of control. Anyone who observes a fire must report it 	Conservation of Agricultural Resources Act, 43 of 1983 and National Veld and Forest Fire Act, 101 of 1998; and regulations	Drilling and Closure/Rehabilitation phases

		101.15804Ha – Total Property Size	immediately to the fire protection agency/ fire brigade and their supervisor/ mine manager.		
Prospecting Drilling and Closure/Rehabilitation	Drilling and Closure/ Rehabilitation	82Ha – Transformed Agricultural Land on which Prospecting Activities are Proposed 101.15804Ha – Total Property Size	Waste and Sewage Handling <ul style="list-style-type: none"> The toilets are serviced when needed and emptied when almost full. If a leak occurs the correct emergency procedure is to be followed (see EMP). Litter will be collected and removed from site by the operator on a daily basis. 	National Environmental Management: Waste Act (Act No 59 of 2008) and regulations	Drilling and Closure/ Rehabilitation phases
Prospecting Drilling and Closure/Rehabilitation	Drilling and Closure/ Rehabilitation	82Ha – Transformed Agricultural Land on which Prospecting Activities are Proposed 101.15804Ha – Total Property Size	Hydrocarbon Spill Handling <ul style="list-style-type: none"> Any vehicle which is leaking hydrocarbons (e.g. petrol, diesel or oil) will be serviced in a concreted workshop to repair the leak. If it is not possible to repair the leak immediately, a drip tray will be placed under the leak to trap any spillages. The content of the drip trays will be decanted into an old oil drum for removal from the site to a hazardous waste handling facility. Hydrocarbon spillages are to be cleaned up immediately. The prospecting company will also maintain 	Hazardous Substances Act, 15 of 1973 and National Environmental Management: Waste Act (Act No 59 of 2008); and regulations	Drilling and Closure/ Rehabilitation phases

			a store of suitable absorbent material, suitable bioremediation substance and a spill kit. All incidences/ spillages are to be recorded in an incident log book. Contaminated soil must go to Vissershok Hazardous Landfill site		
Prospecting Closure/Rehabilitation	Closure/Rehabilitation Phase	82Ha – Transformed Agricultural Land on which Prospecting Activities are Proposed 101.15804Ha – Total Property Size	Alien and Weed Vegetation Management <ul style="list-style-type: none"> • Only use drilled material as derived and conserved from the proposed prospecting sites to backfill and rehabilitate impacted areas. • Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land (whichever comes first). This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Also refer to the EMPr for more details on alien vegetation management to be 	National Environmental Management: Biodiversity Act 10 of 2004 [NEMBA] and relevant regulations Conservation of Agricultural Resources Act, 43 of 1983	Closure/Rehabilitation Phase

			conducted.		
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e) Impact Management Outcomes

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

ACTIVITY (whether listed or not listed). (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.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc....)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Mining, commissioning, operational Decommissioning, closure, post-closure)	MITIGATION TYPE (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. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation.. 	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.)
Prospecting Drilling and Closure/Rehabilitation	Increased dust levels	Natural Environment, road users and nearby residents	Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> • A speed limit of 30km/hour will be enforced through a fining system. • All vehicle drivers entering the site will be informed of the speed limit. • No vegetated areas will be cleared for proposed prospecting activities, only drill sampling will occur which does not require that large areas be cleared. • All impacted areas to be rehabilitated immediately (same day) by means of replacing soil material removed and shaping topsoil according to surrounding 	The National Dust Control Regulations regulates. Dust fallout may not exceeds 1200 mg/m ² /day averaged over 30 days, measured in accordance with reference method ASTM D1739 (Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter). Particulate Matter). Two dust fallout incidents that exceeds the limit may occur within a year (not

				topography and contours. • Temporarily halt material handling in extreme windy conditions.	sequential months).
Prospecting Drilling and Closure/Rehabilitation	Potential erosion of the site and surrounds due to proposed prospecting activities along steep slopes	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. Backfill proposed prospecting boreholes immediately (same day) with onsite drilled material after samples have been collected. Monitor prospecting areas for signs of erosion for at least six months after sampling or until the area is planted by the landowner (whichever comes first) and implement erosion rectification and prevention measures as and if required. 	Impact avoidance, if detected rectification and prevention.
Prospecting Drilling and Closure/Rehabilitation	Emissions - Vehicles and	Natural resources	/Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> Vehicles and machinery will be maintained to minimize 	The occupational exposure limit of CO is

	machinery on the site will produce tailpipe emissions causing air pollution			emissions. A log book will be filled in to keep a record of all maintenance problems encountered and mitigation measures implemented to resolve the problem. <ul style="list-style-type: none"> • Vehicles and machinery emitting excessive emissions will be stopped immediately and not allowed to operate until the necessary repairs have been made. 	50 parts per million for a 40 hour work week. It is highly unlikely whether this level will be reached in the general environment.
Prospecting Drilling and Closure/Rehabilitation	Prospecting activities can result in increased sediment loads in water resources.	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> • Demarcate recommended buffer areas before prospecting commences and maintain demarcation throughout prospecting operations until rehabilitation/closure phase. • All roads need to be maintained and monitored. Visible signs of possible erosion must be immediately rehabilitated. • Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. 	Impact avoidance, if detected rectification and prevention.
Prospecting Drilling and Closure/Rehabilitation	Impact of proposed prospecting activities on terrestrial indigenous vegetation	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> • The individual <i>Sideroxylon inerme</i> trees ("Milkwood trees") that were recorded within the cultivated areas must be demarcated within a 5m buffer radius by the ECO before any prospecting activities occurs 	Impact avoidance, if detected rectification and prevention.

	<p>areas as associated with mapped terrestrial CBAs and ESAs</p>			<p>within a 50m range of the trees and must remain demarcated throughout the applicable prospecting operational and rehabilitation phases. Demarcation can be removed when implementation of the applicable rehabilitation measures have been completed.</p> <ul style="list-style-type: none"> • Clearly demarcate the 8m wide buffer areas proposed as measured from the edge of all remaining indigenous vegetation areas and undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. • Demarcation method to be approved by an Environmental Control Officer (ECO). • No disturbance should be allowed within the remaining indigenous vegetation areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance. • No natural vegetation areas edges may be cleared or impacted upon by the proposed prospecting activities. • The proposed buffer areas to be located within existing cultivated land may only be used as roads and for 	
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				<p>stormwater management and no other activities associated with the proposed prospecting of the site may occur within the buffer areas.</p> <ul style="list-style-type: none"> • Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. • Backfill prospecting areas (same day) with onsite drilled material after samples have been collected. • Monitor prospecting areas for signs of erosion for at least six months after sampling or until the landowner plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required. 	
Prospecting Drilling and Closure/Rehabilitation	Impact of proposed prospecting activities on secondary-, primary drainage lines and man-made dams with associated wetland characteristics and aquatic	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> • Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas at least 8m from the edge of the any drainage lines, indigenous vegetation and man-made dams with associated wetland characteristics and aquatic vegetation. • No disturbance should be 	Impact avoidance, if detected rectification and prevention.

	<p>vegetation as associated with mapped NFEPA's and aquatic CBAs and ESAs</p>			<p>allowed within the drainage line or wetland areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance.</p> <ul style="list-style-type: none"> • No drainage line or wetland areas edges may be disturbed or impacted upon by the proposed prospecting activities. • Storm water and erosion control measures to be implemented as per an EMP must be conducted and monitored to prevent siltation or erosion of sensitive environmental and landscape features as identified on site. • Backfill proposed drilling sites and boreholes immediately (same day) with onsite drilled material after samples have been collected. • Monitor prospected areas for signs of erosion for at least six months after sampling or until the landowner has planted the area (whichever comes first) and implement erosion rectification and prevention measures as and if required. • No prospecting activities may occur within 100m from any drainage line or 500m from any wetland without determining requirement for water use authorisation from Department of Water and Sanitation or the Breede 	
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				Gouritz Catchment Management Agency	
Prospecting Drilling and Closure/Rehabilitation	Waste from chemical toilets and litter leading to environmental pollution	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> • The toilets are emptied at least once a week or when almost full. • If a leak occurs the correct emergency procedure is to be followed (see EMP). • Litter will be collected and removed from site by the operator on a daily basis. • All sewage waste water must be disposed of at a licensed waste water treatment works. 	Impact avoidance, if detected rectification and prevention.
Prospecting Drilling and Closure/Rehabilitation	Hydrocarbon spill leading to environmental pollution	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> • Any vehicle which is leaking hydrocarbons (e.g. petrol, diesel or oil) will be serviced in a concreted workshop to repair the leak. If it is not possible to repair the leak immediately, a drip tray will be placed under the leak to trap any spillages. The content of the drip trays will be decanted into an old oil drum for removal from the site to a hazardous waste handling facility. • Hydrocarbon spillages are to be cleaned up immediately. • The prospecting company will also maintain a store of suitable absorbent material, suitable bioremediation substance and a spill kit. All incidences/ spillages are to be recorded in an incident log book. Contaminated soil must go to Vissershok Hazardous 	Impact avoidance, if detected rectification and prevention.

				Landfill site.	
Prospecting Drilling and Closure/Rehabilitation	Fire causing environmental destruction/transformation	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> All employees will be trained on fire safety and on how to reduce the probability of a fire spreading out of control. Anyone who observes a fire must report it immediately to the fire protection agency/ fire brigade and their supervisor/ mine manager. 	Impact avoidance, if detected rectification and prevention.
Prospecting Drilling and Closure/Rehabilitation	Impact on the naturally occurring fauna and avifauna present in the area	Natural and agricultural resources	Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> Rehabilitate the area after prospecting activities are complete to previous agricultural state. Use of stockpiled topsoil to rehabilitate the site. Restrict prospecting activities only to approved prospecting areas on transformed cultivated agricultural land. 	Impact avoidance, if detected rectification and prevention.
Prospecting Drilling and Closure/Rehabilitation	Increased traffic due to the mining activities requiring various vehicles to come onto and leave the site.	Socio Economic Impacts	Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers entering the site will be informed of the speed limit. Speed limit will also be applicable when delivery trucks drive through areas where farm yard and housing is next to the road. The applicant will be responsible for upkeep and repair of farm roads used during prospecting activities to the satisfaction of the landowner. 	Impact avoidance, if detected rectification and prevention.
Prospecting Drilling and	Prospecting on	Socio	Drilling and Closure/	<ul style="list-style-type: none"> Compensate the landowner 	Management of potential

Closure/Rehabilitation	agricultural land leading to temporary loss of agricultural land currently being used for crop cultivation and livestock grazing	Economic and Agricultural Resources Impacts	Rehabilitation	<p>for the temporary loss of agricultural land during prospecting activities.</p> <ul style="list-style-type: none"> • Undertake prospecting activities on agricultural land before the onset of the annual planting season and then again only after the crop has been harvested. • Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. • Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. • Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. • Backfill proposed prospecting drilling and borehole sites immediately (same day) with onsite drilled material after samples have been collected. • Monitor prospecting areas for signs of erosion for at least six months after sampling or until the landowners plants the 	scale/size of impact.
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				<p>area (whichever comes first) and implement erosion rectification and prevention measures as and if required.</p> <ul style="list-style-type: none"> • Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Refer to the EMPr for further details. 	
Prospecting Drilling and Closure/Rehabilitation	The potential impact of the proposed prospecting activities on archaeological, paleontological and heritage remains	Heritage Impacts	Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> • Should any burials, fossils or other historical material be encountered during drilling, work must cease immediately and HWC must be contacted. 	Impact avoidance, if detected rectification and prevention.
Prospecting Drilling and Closure/Rehabilitation	Noise due to machinery and people on site	Noise impacts	Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> • No activities that may generate noise levels above the legal limit for rural areas in terms of the Environmental Conservation Act, Western Cape Noise regulations will be conducted. • Machinery and vehicles should be regularly maintained 	Noise monitoring if needed to ensure noise levels are below 45 dBA. Table 2 of SANS 10103:2004 <i>The measurement and rating of environmental noise with respect to land use, health, annoyance and to</i>

				<p>to prevent excessive noise.</p> <ul style="list-style-type: none"> All machinery and work activities must adhere to the requirements of the noise regulations. 	<p><i>speech communication</i> where the daytime, equivalent continuous rating level is given as 45 dBA for Rural Districts.</p>
Prospecting Drilling and Closure/Rehabilitation	A negative visual impact due to the creation of excavation pits/trenches.	Visual Impacts.	Drilling and Closure/ Rehabilitation	<ul style="list-style-type: none"> Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. Backfill proposed prospecting drilling sites and boreholes immediately (same day) with onsite drilled material after samples have been collected. Monitor prospecting areas for signs of erosion for at least six months after sampling or until the farmer has planted the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required. 	Management of potential scale/size of impact.

				<ul style="list-style-type: none"> • Only use drilled material as derived and conserved from the proposed prospecting site to backfill and rehabilitate impacted areas. • Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land (whichever comes first). This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. 	
Prospecting Closure/Rehabilitation	Potential erosion of the site and surrounds during rehabilitation phase	Natural and Agricultural Resources	Closure/Rehabilitation Phase	<ul style="list-style-type: none"> • Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. • Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. • Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) 	Impact avoidance, if detected rectification and prevention.

				<p>any erosion from occurring on the prospecting activity areas and surrounds.</p> <ul style="list-style-type: none"> • Backfill proposed drill and borehole site immediately (same day) with onsite drilled material after samples have been collected. • Monitor prospecting areas for signs of erosion for at least six months after sampling or until the farmer plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required. 	
Prospecting Closure/Rehabilitation	Introduction of alien and weed plant species during rehabilitation	Natural and Agricultural Resources	Closure/Rehabilitation Phase	<ul style="list-style-type: none"> • Only use drilled material as derived and conserved from the proposed prospecting sites to backfill and rehabilitate impacted areas. • Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land (whichever comes first). This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Also refer to the EMPr for more details on alien 	Impact avoidance, if detected rectification and prevention.

				vegetation management to be conducted.	
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f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved).

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
<p>(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.).</p>	<p>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc....)</p>	<p>(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.)</p> <p>E.g.</p> <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring <p>Remedy through rehabilitation..</p>	<p>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-..</p> <p>Upon cessation of the individual activity or.</p> <p>Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.</p>	<p>(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)</p>
<p>Prospecting Drilling and Closure/Rehabilitation</p>	<p>Increased dust levels</p>	<ul style="list-style-type: none"> • A speed limit of 30km/hour will be enforced through a fining system. • All vehicle drivers entering the site will be informed of the speed limit. • No vegetated areas will be cleared for proposed prospecting activities, only drill sampling will occur which does not require that large areas be cleared. • All impacted areas to be rehabilitated immediately 	<p>Drilling and Closure/ Rehabilitation</p>	<p>The National Dust Control Regulations regulates. Dust fallout may not exceeds 1200 mg/m²/day averaged over 30 days, measured in accordance with reference method ASTM D1739 (Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter). Particulate Matter). Two dust fallout incidents that exceeds the limit may occur within a year (not sequential months).</p>

		<p>(same day) by means of replacing soil material removed and shaping topsoil according to surrounding topography and contours.</p> <ul style="list-style-type: none"> Temporarily halt material handling in extreme windy conditions. 		
Prospecting Drilling and Closure/Rehabilitation	Potential erosion of the site and surrounds due to proposed prospecting activities along steep slopes	<ul style="list-style-type: none"> Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. Backfill proposed prospecting boreholes immediately (same day) with onsite drilled material after samples have been collected. Monitor prospecting areas for signs of erosion for at least six months after sampling or until the area is planted by the landowner (whichever comes first) and 	Drilling and Closure/ Rehabilitation	Impact avoidance, if detected rectification and prevention.

		implement erosion rectification and prevention measures as and if required.		
Prospecting Drilling and Closure/Rehabilitation	Emissions - Vehicles and machinery on the site will produce tailpipe emissions causing air pollution	<ul style="list-style-type: none"> Vehicles and machinery will be maintained to minimize emissions. A log book will be filled in to keep a record of all maintenance problems encountered and mitigation measures implemented to resolve the problem. Vehicles and machinery emitting excessive emissions will be stopped immediately and not allowed to operate until the necessary repairs have been made. 	Drilling and Closure/ Rehabilitation	The occupational exposure limit of CO is 50 parts per million for a 40 hour work week. It is highly unlikely whether this level will be reached in the general environment.
Prospecting Drilling and Closure/Rehabilitation	Prospecting activities can result in increased sediment loads in water resources.	<ul style="list-style-type: none"> Demarcate recommended buffer areas before prospecting commences and maintain demarcation throughout prospecting operations until rehabilitation/closure phase. All roads need to be maintained and monitored. Visible signs of possible erosion must be immediately rehabilitated. Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. 	Drilling and Closure/ Rehabilitation	Impact avoidance, if detected rectification and prevention.
Prospecting Drilling and	Impact of proposed	<ul style="list-style-type: none"> The individual Sideroxylon 	Drilling and Closure/	Impact avoidance, if detected

<p>Closure/Rehabilitation</p>	<p>prospecting activities on terrestrial indigenous vegetation areas as associated with mapped terrestrial CBAs and ESAs</p>	<p>inerm trees (“Milkwood trees”) that were recorded within the cultivated areas must be demarcated within a 5m buffer radius by the ECO before any prospecting activities occurs within a 50m range of the trees and must remain demarcated throughout the applicable prospecting operational and rehabilitation phases. Demarcation can be removed when implementation of the applicable rehabilitation measures have been completed.</p> <ul style="list-style-type: none"> • Clearly demarcate the 8m wide buffer areas proposed as measured from the edge of all remaining indigenous vegetation areas and undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. • Demarcation method to be approved by an Environmental Control Officer (ECO). • No disturbance should be allowed within the remaining indigenous vegetation areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance. • No natural vegetation areas edges may be cleared or impacted upon by the 	<p>Rehabilitation</p>	<p>rectification and prevention.</p>
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		<p>proposed prospecting activities.</p> <ul style="list-style-type: none"> The proposed buffer areas to be located within existing cultivated land may only be used as roads and for stormwater management and no other activities associated with the proposed prospecting of the site may occur within the buffer areas. Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. <p>Backfill prospecting areas (same day) with onsite drilled material after samples have been collected.</p> <ul style="list-style-type: none"> Monitor prospecting areas for signs of erosion for at least six months after sampling or until the landowner plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required. 		
Prospecting Drilling and Closure/Rehabilitation	Impact of proposed prospecting activities on secondary drainage lines and man-made dams with associated wetland	<ul style="list-style-type: none"> Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas at least 8m from the 	Drilling and Closure/ Rehabilitation	Impact avoidance, if detected rectification and prevention.

	<p>characteristics and aquatic vegetation as associated with mapped NFEPAs and aquatic CBAs and ESAs</p>	<p>edge of the any drainage lines, indigenous vegetation and man-made dams with associated wetland characteristics and aquatic vegetation.</p> <ul style="list-style-type: none"> • No disturbance should be allowed within the drainage line or wetland areas. This includes no dumping of fill, no roads, and all forms of temporary disturbance. • No drainage line or wetland areas edges may be disturbed or impacted upon by the proposed prospecting activities. • Storm water and erosion control measures to be implemented as per an EMP must be conducted and monitored to prevent siltation or erosion of sensitive environmental and landscape features as identified on site. • Backfill proposed drilling sites and boreholes immediately (same day) with onsite drilled material after samples have been collected. • Monitor prospected areas for signs of erosion for at least six months after sampling or until the landowner has planted the area (whichever comes first) and implement erosion rectification and prevention measures as and if required. 		
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		<ul style="list-style-type: none"> No prospecting activities may occur within 100m from any drainage line or 500m from any wetland without determining requirement for water use authorisation from Department of Water and Sanitation or the Breede Gouritz Catchment Management Agency 		
Prospecting Drilling and Closure/Rehabilitation	Waste from chemical toilets and litter leading to environmental pollution	<ul style="list-style-type: none"> The toilets are emptied at least once a week or when almost full. If a leak occurs the correct emergency procedure is to be followed (see EMP). Litter will be collected and removed from site by the operator on a daily basis. All sewage waste water must be disposed of at a licensed waste water treatment works. 	Drilling and Closure/ Rehabilitation	Impact avoidance, if detected rectification and prevention.
Prospecting Drilling and Closure/Rehabilitation	Hydrocarbon spill leading to environmental pollution	<ul style="list-style-type: none"> Any vehicle which is leaking hydrocarbons (e.g. petrol, diesel or oil) will be serviced in a concreted workshop to repair the leak. If it is not possible to repair the leak immediately, a drip tray will be placed under the leak to trap any spillages. The content of the drip trays will be decanted into an old oil drum for removal from the site to a hazardous waste handling facility. Hydrocarbon spillages are to be cleaned up immediately. 	Drilling and Closure/ Rehabilitation	Impact avoidance, if detected rectification and prevention.

		<ul style="list-style-type: none"> The prospecting company will also maintain a store of suitable absorbent material, suitable bioremediation substance and a spill kit. All incidences/spillages are to be recorded in an incident log book. Contaminated soil must go to Vissershok Hazardous Landfill site. 		
Prospecting Drilling and Closure/Rehabilitation	Fire causing environmental destruction/transformation	<ul style="list-style-type: none"> All employees will be trained on fire safety and on how to reduce the probability of a fire spreading out of control. Anyone who observes a fire must report it immediately to the fire protection agency/fire brigade and their supervisor/ mine manager. 	Drilling and Closure/ Rehabilitation	Impact avoidance, if detected rectification and prevention.
Prospecting Drilling and Closure/Rehabilitation	Impact on the naturally occurring fauna and avifauna present in the area	<ul style="list-style-type: none"> Rehabilitate the area after prospecting activities are complete to previous agricultural state. Use of stockpiled topsoil to rehabilitate the site. Restrict prospecting activities only to approved prospecting areas on transformed cultivated agricultural land. 	Drilling and Closure/ Rehabilitation	Impact avoidance, if detected rectification and prevention.
Prospecting Drilling and Closure/Rehabilitation	Increased traffic due to the mining activities requiring various vehicles to come onto and leave the site.	<ul style="list-style-type: none"> A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers entering the site will be informed of the speed limit. Speed limit will also be applicable when 	Drilling and Closure/ Rehabilitation	Impact avoidance, if detected rectification and prevention.

		<p>delivery trucks drive through areas where farm yard and housing is next to the road.</p> <ul style="list-style-type: none"> The applicant will be responsible for upkeep and repair of farm roads used during prospecting activities to the satisfaction of the landowner. 		
Prospecting Drilling and Closure/Rehabilitation	Prospecting on agricultural land leading to temporary loss of agricultural land currently being used for crop cultivation and livestock grazing	<ul style="list-style-type: none"> Compensate the landowner for the temporary loss of agricultural land during prospecting activities. Undertake prospecting activities on agricultural land before the onset of the annual planting season and do not undertake trenching/drilling or excavation after the land has been planted for cultivation. Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas 	Drilling and Closure/ Rehabilitation	Management of potential scale/size of impact.

		<p>and surrounds.</p> <ul style="list-style-type: none"> • Backfill proposed prospecting drilling and borehole sites immediately (same day) with onsite drilled material after samples have been collected. • Monitor prospecting areas for signs of erosion for at least six months after sampling or until the landowners plants the area (whichever comes first) and implement erosion rectification and prevention measures as and if required. • Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land. This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Refer to the EMPr for further details. 		
Prospecting Drilling and Closure/Rehabilitation	The potential impact of the proposed prospecting activities on archaeological, paleontological and heritage remains	Should any burials, fossils or other historical material be encountered during mining, work must cease immediately and HWC must be contacted.	Drilling and Closure/ Rehabilitation	Impact avoidance, if detected rectification and prevention.
Prospecting Drilling and	Noise due to	<ul style="list-style-type: none"> • No activities that may 	Drilling and Closure/	Noise monitoring if needed to

Closure/Rehabilitation	machinery and people on site	<p>generate noise levels above the legal limit for rural areas in terms of the Environmental Conservation Act, Western Cape Noise regulations will be conducted.</p> <ul style="list-style-type: none"> • Machinery and vehicles should be regularly maintained to prevent excessive noise. • All machinery and work activities must adhere to the requirements of the noise regulations. 	Rehabilitation	ensure noise levels are below 45 dBA. Table 2 of SANS 10103:2004 <i>The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication</i> where the daytime, equivalent continuous rating level is given as 45 dBA for Rural Districts.
Prospecting Drilling and Closure/Rehabilitation	A negative visual impact due to the creation of excavation pits/trenches.	<ul style="list-style-type: none"> • Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. • Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas. • Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. • Backfill proposed prospecting drilling sites and boreholes immediately (same day) with onsite drilled material after samples have been collected. 	Drilling and Closure/ Rehabilitation	Management of potential scale/size of impact.

		<ul style="list-style-type: none"> • Monitor prospecting areas for signs of erosion for at least six months after sampling or until the farmer has planted the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required. • Only use drilled material as derived and conserved from the proposed prospecting site to backfill and rehabilitate impacted areas. • Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land (whichever comes first). This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. 		
Prospecting Closure/Rehabilitation	Potential erosion of the site and surrounds during rehabilitation phase	<ul style="list-style-type: none"> • Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion. • Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely 	Closure/Rehabilitation Phase	Impact avoidance, if detected rectification and prevention.

		<p>transformed and cultivated areas.</p> <ul style="list-style-type: none"> • Implement erosion and storm water runoff management measures as according to EMP requirements to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds. • Backfill proposed drill and borehole site immediately (same day) with onsite drilled material after samples have been collected. • Monitor prospecting areas for signs of erosion for at least six months after sampling or until the farmer plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required. 		
Prospecting Closure/Rehabilitation	Introduction of alien and weed plant species during rehabilitation	<ul style="list-style-type: none"> • Only use drilled material as derived and conserved from the proposed prospecting sites to backfill and rehabilitate impacted areas. • Alien invasive and weed vegetation monitoring and removal must be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land (whichever comes first). This must be 	Closure/Rehabilitation Phase	Impact avoidance, if detected rectification and prevention.

		done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Also refer to the EMPr for more details on alien vegetation management to be conducted.		
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g) 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.

Main closure/rehabilitation objective is to rehabilitate the proposed prospecting areas as according to previous agricultural potential and ensure that the final conditions of the site is environmentally acceptable and that there will be no adverse long term effects on the surrounding environment especially the indigenous vegetation areas and water resources.

Imerys Refractory Minerals South Africa (Pty) Ltd proposes to prospect cultivated agricultural land on Erf 2224 for potential viable bentonite and zeolite resources to be mined.

The **proposed prospecting activities** will entail the following phases:

- **Phase 1 – Field Mapping and Surveying**

A qualified geologist will survey/explore the transformed cultivated areas on the proposed prospecting property by foot and map potential visible bentonite and zeolite outcrops. If such visible outcrops are found on the transformed cultivated areas of property the geologist will map these areas for potential sampling during phase 3.

- **Phase 2 – Literature Review**

A qualified geologist will research known geological literature of the property and surrounds to assist in determining approximate location of viable bentonite and zeolite deposits on the transformed cultivated areas of the property.

After the completion of phases 1 and 2 the geologist will produce potential bentonite and zeolite deposits maps for the property which will serve as guidelines for the next phase which will entail drilling and sampling.

- **Phase 3 – Drilling and Sampling**

Direct push sampler drilling and sampling – using the maps as produced by the geologist during phases 1 and 2 the geologist will determine which orebodies must be investigated further by direct push sampler drilling. This is conducted by the mining company itself and involves the use of a direct push sampler drill rig. The drill rig will push a stainless steel tube of 50-60cm long into the ground, once full it will bring it up and the sample will be taken out. This process will be carried out until bentonite is found or reaching the depth of around 6m. The hole will then immediately be rehabilitated by backfilling and a month later the site is revisited to determine if any the holes re-opened due to decompaction. The sampler holes will have the following maximum temporary footprints – Diameter 60mm; depth 6m = 3.6m³ overburden material produced by drilling to be backfilled immediately after sample has been taken. Samples would be collected according to the geology. Approximately 1000 sampler holes are proposed for the property, but final proposed direct sampler holes's amount will be determined during the completion of phases 1 and 2 therefore proposed direct sampler holes amount might increase or decrease.

Boreholes and sampling - following the results of the samples collected during the direct push sampler drilling, a qualified drilling contractor will be appointed by the mining company and under the guidance and supervision of the qualified geologist conduct the following drilling activities on the areas as identified by the geologist. Drilling involves using a rotary percussion drilling rig bringing samples to the surface in the form of chips. The drilled boreholes will have the following maximum temporary footprints - diameter

0.2m by 0.2m; depth 30m = 12 m³ maximum overburden material produced per borehole to be replaced immediately after sample has been taken. <1kg of sample material is collected by the geologist from each borehole for testing. The drilling samples collected are sent to the laboratory at the cape bentonite mine processing plant near Heidelberg and tested for specific properties to establish the quality of ore as well as determine approximate extension and volume of the available ore body. Approximately 60 drilling sections/lines with 3 boreholes each are proposed for the property = approximately 180 boreholes in total for the property, but final proposed boreholes amount will be determined during the completion of phases 1 and 2 and direct push sampler drilling results and the number of proposed drilling boreholes therefore might increase or decrease. In total only between 100- 200kg of sample material will be removed for further testing.

Rehabilitation – immediately (same day) following samples taken during drilling as described above the drilled material will be replaced and existing agricultural land contour structures will be reinstated. The disturbed prospecting areas will be monitored for signs of erosion for at least six months after sampling or until the landowner plants the lands (whichever comes first) and erosion rectification and prevention measures will be implemented as and if required. Alien invasive and weed vegetation monitoring and removal will be undertaken for at least a year after sampling on disturbed prospecting areas or until the landowner starts with the annual cultivation activities on the affected land (whichever comes first). This must be done by the applicant, landowner or their appointed contractor, using CapeNature approved methodology depending on the contract agreement that the applicant has with the landowner. Should any remaining indigenous vegetation and/or watercourse/wetland areas be impacted upon by the proposed prospecting activities a suitably qualified botanical and/or freshwater specialist must be appointed to assess the significance of the impacts and provide recommendations for rehabilitation/rectification. The specialist/s must provide a list of locally indigenous terrestrial and/or aquatic vegetation to be used during the rehabilitation of affected indigenous vegetation and/or watercourse/wetland areas as part of his/her assessment of the affected areas.

- **Phase 4 – Sample Analysis**

<1kg of sample material is collected by the geologist from each borehole for testing. The samples collected are sent to the laboratory at the cape bentonite mine processing plant near Heidelberg and tested for specific properties to establish the quality of ore as well as determine approximate extension and volume of the available ore body.

- **Phase 5 – Maps, Reserve and Resource Modelling**

Maps will be produced showing the location, depth and extent of physical prospecting work, together with, sampling points and the lithology, mineral content and mineral distribution identified, relative to the prospecting area. Following the results of sample analysis conducted the geological reserve modelling is done by using SURPAC and AUTOCAD geological software to determine the grades and quantities of available bentonite and zeolite resources and produce the feasibility reports for the property as investigated/surveyed.

All significant environmental, cultural and socio-economic features applicable to the site were identified and informed the preferred activity, location and layout as proposed. The preferred prospecting activities, location and layout was assessed against the no go option of the site remaining as is.

Prospecting Drilling Phase

The potential impacts rated as medium negative before mitigation measures are implemented and as low negative after mitigation measures are implemented include

potential impacts of/on – Increased dust levels; Potential erosion of the site and surrounds due to proposed prospecting activities along steep slopes; Prospecting activities can result in increased sediment loads in water resources; Impact of proposed prospecting activities on terrestrial indigenous vegetation areas as associated with mapped terrestrial CBAs and ESAs; Impact of proposed prospecting activities on secondary-, primary drainage lines and man-made dams with associated wetland characteristics and aquatic vegetation as associated with mapped NFEPA's and aquatic CBAs and ESAs; Waste from chemical toilets and litter; Hydrocarbon spill; Fire; Increased traffic due to the prospecting activities requiring various vehicles to come onto and leave the site; Prospecting on agricultural land.

The potential impacts rated as low negative before and after mitigation measures are implemented include potential impacts of/on – Emissions; Impact on the naturally occurring fauna and avifauna present in the area; The potential impact of the proposed prospecting activities on archaeological, paleontological and heritage remains; Noise due to machinery and people on site; A negative visual impact due to the creation of excavation pits/trenches.

Potential positive impacts during this phase include – Discovering and confirmation of viable bentonite and zeolite deposits on transformed cultivated agricultural land which may in turn lead to sustained jobs and other socio-economic benefits to the local landowners and communities if mining rights for the discovered deposits are obtained.

All the potential impacts can be mitigated to a potential low negative significance by implementing the mitigation measures as included and described in the EMP and specialist report.

Closure/Rehabilitation Phase

The potential impacts rated as medium negative before mitigation measures are implemented and as low negative after mitigation measures are implemented include potential impacts of/on – Potential erosion of the site and surrounds during rehabilitation phase; Introduction of alien and weed plant species during rehabilitation.

Potential positive impacts during this phase include – Rehabilitation of agricultural land to be used for agricultural cultivation and livestock grazing as per previous land use.

It was concluded by the EAP that the proposed development will not have a significant negative environmental impact if proposed mitigation measures are implemented and it was recommended that the Environmental Management Programme be adhered to accordingly.

Also refer to Prospecting Closure/Rehabilitation Plan under **Appendix F**.

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

The environmental objectives in relation to the closure of the prospecting activities are included in the documents that have been submitted to the registered interested and affective parties and landowner for comment.

(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.

Refer to Appendix B for maps of proposed prospecting areas to be rehabilitated after prospecting sampling has been completed. Cape Bentonite Mine will be responsible for rehabilitating the prospecting activities areas as according to the recommendations of the

EMP. Refer to 1(a) above for rehabilitation measures to be implemented during and after the proposed prospecting activities.

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

The proposed rehabilitation measures/plan has been informed by the environmental impact assessment conducted; Potential impacts with associated mitigation measures were identified and included for each phase of the proposed prospecting activities i.e. trenching/drilling/excavation and closure/ rehabilitation phases.

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

During the prospecting work 1000 holes will be done with the direct push auger and 180 percussion drill holes. This correspond respectively to 36000m³ and 2160m³ which in total gives us around 40 000m³ of material which will be temporarily removed per drill and borehole site and immediately replaced after sampling.

Operational costs:

For the direct push auger drill, the rate is R15/hole and 3L/hole at R14/L, so for a 1000 boreholes the total cost will be R192 000.00.

For percussion drilling, at a rate of R500/m and 3L/m (R14/L) of Diesel per meter (on average we do 12m/hole) it is foreseen that the operational amount required to finance this project is approximately R1 170 720.00.

Rehabilitation costs:

At a rate of R10/cubic metre to rehabilitate it is foreseen that the rehabilitation amount required to finance this project is approximately R 400 000.00.

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

By signing this document the EAP hereby confirms that the applicant stated that the financial provision will be provided as determined.

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

- **Monitoring of Impact Management Actions**
- **Monitoring and reporting frequency**
- **Responsible persons**
- **Time period for implementing impact management actions**
- **Mechanism for monitoring compliance**

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Prospecting: Drilling Phase	Impacts on soil, air, water resources, adjacent drainage lines, indigenous vegetation and agricultural land	Conduct regular internal audits and inspections of the prospecting activities and assess against prospecting right, Environmental Authorization and EMPr conditions. Yearly audits and mine performance assessment reports	Applicant and Environmental Control Officer	Monitoring should be undertaken for duration of the excavation/drilling/trenching phase. Internal audits and inspections should be undertaken at least monthly. External audits by a qualified ECO should be undertaken on a 3 monthly basis during excavation/drilling/trenching phase and 6 monthly during rehabilitation phase until successful rehabilitation has been achieved or until the impacted areas are ploughed/cultivated for the next crop planting season (whichever comes first). Reports should be made available to the Competent Authority if required in the form of an annual performance report.
Prospecting: Closure and	Successful rehabilitation of	Conduct regular internal audits and inspections of the mining operation	Applicant and Environmental Control Officer	Monitoring should be undertaken for duration of the

Rehabilitation Phase	impacted area	and assess against mine right, Environmental Authorization and EMPr conditions. Yearly audits and mine performance assessment reports		excavation/drilling/trenching phase. Internal audits and inspections should be undertaken at least monthly. External audits by a qualified ECO should be undertaken on a 3 monthly basis during drilling phase and 6 monthly during rehabilitation phase until successful rehabilitation has been achieved or until the impacted areas are ploughed/cultivated for the next crop planting season (whichever comes first). Reports should be made available to the Competent Authority if required in the form of an annual performance report.
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i) Indicate the frequency of the submission of the performance assessment/ environmental audit report.

Monitoring should be undertaken for duration of the excavation/drilling/trenching phase. Internal audits and inspections should be undertaken at least monthly. External audits by a qualified ECO should be undertaken on a 3 monthly basis during excavation/drilling/trenching phase and 6 monthly during rehabilitation phase until successful rehabilitation has been achieved or until the impacted areas are ploughed/cultivated for the next crop planting season (whichever comes first). Reports should be made available to the Competent Authority if required in the form of an annual performance report.

j) 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.

Prospecting company staff members will be informed of the potential environmental risks associated with their work by implementing environmental awareness training through the following methods:

- Monthly meetings
- Environmental Management Program Training (annually)
- Induction courses
- Training from the Environmental Control Officer (once a year)

The Environmental Awareness Plan should be reviewed regularly to ensure that relevant environmental concerns are discussed and that the potential impacts of such concerns are minimized. The syllabus to be taught to staff members has been determined through identification of the major environmental concerns raised in the Environmental Impact Assessment.

Monthly meetings:

Monthly meetings are ideal to facilitate awareness of job-specific environmental dangers and to educate employees on how they can live a more sustainable lifestyle outside work. The method and medium of communication during the monthly meetings will be determined by the team leader facilitating the meetings. The topics discussed in monthly meetings will be recorded in a logbook, with all employees present signing an attendance register.

The team leader who is to undertake the monthly meetings will be provided with the necessary training so that he can effectively inform the other employees about the topics listed below.

The topics for discussion have been identified as both topics specific to the prospecting activities but also topics that the employees can take home and use in their personnel lives:

Any notes or minutes of the meeting or other records of the meeting should be made available to all staff members at all time for perusal and for future reference purposes.

In addition to the monthly meeting, environmental topics will be discussed at a special meeting to be held if an environmental incident occurred during the previous day. Such incidents may include a fuel spill or a complaint from a surrounding landowner/ resident.

During these meetings, the following topics will be discussed:

- How the incident occurred;
- Why the incident occurred;
- How the incident was dealt with (if applicable);
- Evaluation of the response undertaken by the employees;

- Can the response be improved;
- What preventative measures should be implemented; and
- What can be done to reduce the probability of the incident recurring

The incident and the outcomes of the discussion will be noted in an incident logbook and mitigatory measures will be implemented by the employees and mine manager as required.

Environmental Management Program Training

Annually, aspects of the EMP will be selected to form part of a half days training workshop. Prospecting company employees will attend the training workshop based on the topics selected and environmental incidents that may have occurred during the previous few months. Examples of topics that may be included in the EMP training include:

- Clean up of oil spills;
- Water conservation;
- The importance of alien vegetation removal;
- Concurrent rehabilitation;
- Training on fire hazards;
- Crime and Trespassing;
- Identifying and preventing soil erosion, etc.

After attending the EMP training program the employees will be required to sign a register as proof of training.

Induction Training

All new employees will undergo an induction course when they are appointed by the prospecting company. Environmental awareness forms part of this induction course. The following syllabus of environmental training is to be included within the induction course.

Syllabus of environmental Training:

Sustainability

Discuss the concepts of sustainability, which must include:

- Definition of sustainable development.
- An explanation of the “Triple Bottom Line” of a sustainable development.
- An example of sustainable developments. These should be selected based on the audience, selecting a development that they can relate to.

Environmental Goals and Objectives

Discuss the latest specific environmental goals and objectives, as well as the benefits of achieving such goals. As these goals change, the induction course must be updated accordingly. Where possible, the goals and objectives covered should be selected on the basis of topics that personnel can relate to. These could include, but are not limited to the following:

Concurrent rehabilitation

Goal: Rehabilitate prospecting areas concurrently.

Objective: To ensure that all prospecting areas are concurrently rehabilitated.

Benefits: Reduce the cost of final rehabilitation.

Reduce the time to implement final rehabilitation. Reduce the time to obtain a closure certificate. Improve the ecological status of the site. The more surfaces rehabilitated the less chance of erosion and dust from exposed surfaces. To increase the aesthetical appeal of the prospecting site.

Waste minimization

Goal: Reduce waste generation and recycle where possible.

Objective: Initiate recycling projects where possible.

Benefits: Reduction of waste and promotion of recycling reduces the economic and environmental costs of dealing with waste. Recycling reduces the need to use non-renewable resources, ensuring that these will be available to future generations.

Reducing amounts of hydrocarbon spillages

Goal: Reduce the amount of hydrocarbon spillages and the impact from spillages that do occur.

Objective: To reduce probability of hydrocarbon spillages.

Benefits: Saving of oil reduces the need to use non-renewable resources.

Reduce the potential for soil contamination. Reduce the potential to pollute the ground water.

Also allow time for questions

After attending the induction training, the employees will be required to sign a register as proof of training.

Environmental Training from the Environmental Control Officer

Every year, a qualified environmental consultant will be employed to undertake an environmental performance assessment of the prospecting company. As part of the terms of reference to the consultant, it will be made a requirement that after the consultant has finished the activities required for the audit the consultant will inform all the employees of his/her findings and provide practical tips of reducing some of the environmental impacts noted. The employees will be required to sign a register as proof of training.

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

The prospecting company will implement an incident reporting procedure in order to identify risks timeously and implement actions to avoid or minimise environmental impacts.

k) Specific information required by the Competent Authority

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

No specific information requirements have been detailed by the Competent Authority to date. It is confirmed that the financial provisions will be reviewed annually.

l) Site Specific Storm water Management Measures to be implemented during Proposed Prospecting Activities

- Existing agricultural land contour structures must be reinstated immediately (same day) after prospecting activities completion.
- Undertake prospecting activities only in identified and specifically demarcated areas as proposed on completely transformed and cultivated areas.
- Implement erosion and storm water runoff management measures as and if required to prevent (or if prevention is not possible limit) any erosion from occurring on the prospecting activity areas and surrounds.
- Backfill proposed prospecting drill sites and boreholes immediately (same day) with onsite removed material after samples have been collected.
- Monitor prospected areas for signs of erosion six months after sampling or until the landowner plants the lands (whichever comes first) and implement erosion rectification and prevention measures as and if required.

Storm water management measure will be implemented as according to EMP guidelines and where applicable the Best Practice Guideline: Storm Water Management, 2006 for water resource protection in the South African Mining Industry published by the Department of Water Affairs attached as **Appendix G1** to be adhered to.

m) General Environmental Management Guidelines to be implemented during the Proposed Prospecting Activities

Responsibilities

The EA holder/applicant is ultimately responsible to ensure that all the requirements of the EMP are implemented during all phases of the proposed prospecting activities.

The Environmental Control Officer must be appointed by the EA holder/applicant before any prospecting activities commences.

The EA holder/applicant is also responsible to ensure that any contractors appointed know of and adhere to the requirements of the EMP.

It is also important to note that the EA holder/applicant must make sure that all on site staff are aware and adhere to all other relevant legislation that may relate to the activities taking place on site, especially local authority required compliances.

Environmental Control Officer:

The prospecting company must appoint or designate a suitable, experienced and qualified ECO before commencement of any prospecting activities to ensure compliance with the provisions of this EMP.

The ECO appointment contract must:

- Describe the level and type of competency required of the ECO ;
- Define and allocate the roles and responsibilities of the ECO.
- Indicate frequency of ECO site visits;

Site Meeting and Pre-conditions before Prospecting Activities Commence

The following pre-conditions must be fully met before any Prospecting activities may commence:

- A site meeting between the prospecting company manager and/or geologist and the ECO must take place at least 5 days prior to commencement of prospecting activities to:
 - Demarcate prospecting areas, services routes, stockpile areas, access, working boundaries and no-go areas;
 - Discuss methods and places for/of stockpiling;
 - Check required toilets and fire-fighting facilities to be in place;
 - Discuss and agree communication channels including provision of contact details;
 - Discuss and agree areas of responsibility;
 - Discuss and agree the demarcation and control of prospecting areas.
 - Discuss and implement adherence to site specific specialist recommendations.

Minutes of this formal site meeting must be kept, and are to be distributed to all parties.

The following equipment must be on site before any prospecting work is due to start:

- Sufficient and suitable chemical toilet facilities.
- Sufficient refuse bins, which are weather and wind proof, with proper lids.

- Adequate quantity of type ABC (all purpose) 12.5 kg fire extinguishers

Security and Safety:

Access to the prospecting site must be controlled. Telephone numbers of emergency services, including the local firefighting services, must be posted conspicuously at the prospecting site or at the entrance to the property. No firearms are permitted on the site, other than those authorised by the developer for the property security service provider. Notices should be displayed at all public entrances to the property, warning visitors that they are entering a prospecting site. Signboards to inform road users of the existing prospecting site must also be displayed on the property to warn any pedestrians or road users of the prospecting activities taking place on site.

Public Complaints:

A complaints register must be kept on site specifying the date, time, nature of complaint, details of the complainant and the responses undertaken to address and resolve problems raised.

Speed Limit:

For security and safety reasons the speed limit on the property for all prospecting vehicles is 30km per hour. The prospecting company is responsible for ensuring that all his employees, operators and delivery vehicles adhere to this rule.

Demarcation and Fencing:

No-go areas along the edge of the proposed prospecting area and around individual Milkwood trees must be clearly demarcated to restrict access/egress across such demarcated lines and minimise environmental impact. The ECO must indicate each boundary and/or access route to be demarcated and demarcation methods to be used before excavation commences and prospecting personnel will not be allowed beyond the perimeter of the site. All activities including stockpiling must occur within this demarcated area. The prospecting operator responsible must fund reinstatement or rehabilitation of damaged areas and features.

Where deemed necessary by the ECO physical demarcation of prospecting boundaries along no-go area should at the very least be via colour coded posts at least 1,5m high. Relatively small areas can be fenced with wooden or metal post at 3m centres with 1 plain wire strand tensioned horizontally at 900mm from ground level. Commercially available danger tape may also be wrapped around the wire strand. For large areas, like fairways, these posts are to be at 15m centres with 5 equidistant easily visible lime spot markings in between.

The onus here will fall on the prospecting staff to ensure all respect these no-go lines. Failure to ensure discipline will lead to the immediate erection of more physically challenging structures.

The prospecting operator must take measures to control the corrosive effects of storm-water runoff particularly in the hoarded-off areas. No run-off oil, fuel, sewage, or any other hazardous material is to be permitted, or allowed to enter the storm-water system or natural areas.

In the event that sensitive features are threatened by prospecting activities, the temporary fencing off of these areas or the prospecting area, when working in a mainly natural environment, is recommended and will be determined by the ECO.

Indigenous Fauna and Flora:

Indigenous plants or wild animals including reptiles, amphibians, birds, etc. may not be damaged or harmed or interfered with. Vegetation removed as part of the legitimate development requirements is excluded. Trapping, poisoning and/or killing of animals is specifically and strictly forbidden.

All topsoil materials must be stockpiled and stored (at site identified by ECO), and used for the infilling and landscaping of disturbed areas on the property.

Alien Vegetation Management:

During the implementation of the prospecting activities the landowner continues with his cultivation on the applicable lands as normal and prospecting activities are only done during the periods which the lands has not been planted and has already been harvested, which means that once the annual crops have been sown the landowner periodically sprays herbicide for agricultural weed control on the lands. Therefore, unless otherwise stipulated in the contract with the landowner, the landowner will continue with weed control practices during cultivation as per usual, however if the prospecting activities leads to the landowner not being able to cultivate the applicable lands the mining company/applicant will be responsible for alien plant and weed control on the applicable lands until the land is planted by the landowner or for at least one year after prospecting activities has been completed, whichever comes first.

The clearance of alien invasive vegetation during and after completion of the prospecting activities must be undertaken in a manner to prevent the creation of dust.

No on-site burying, dumping, stockpiling or burning of any weeds and aliens or invasive species must occur. Invasive alien plant species which are removed from the site should not be chipped for mulch if they are in a seed-bearing state. Such material must be disposed of at a suitably licensed waste disposal facility. Wherever possible, suitable larger stumps should be made available to the local community for use as firewood.

The applicant must make sure of and implement all legal requirements regarding herbicide application procedures if herbicide is to be used to control weeds/invasive plants. The instructions on the herbicide labels must be strictly followed throughout application.

The contractor shall take all necessary precautions to prevent overspray of herbicides outside of the demarcated prospecting areas and onto natural veld.

All personnel working with any herbicide, pesticide or fertilizer must be registered and comply with the requirements set in these registrations.

CapeNature approved methodology must be used during alien vegetation/weed control.

All equipment associated to herbicides and pesticides must be maintained in accordance to the set standards.

The disposal of all redundant and empty containers of herbicides and pesticides must be controlled and disposed of at a waste management facility licensed to do so under the National Environmental Management: Waste Act.

The removal of the alien and weed species encountered within the zone of influence of the proposed prospecting activities, must take place to comply with existing legislation (amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 and Section 28 of the National Environmental Management Act, 1998)

Alien vegetation that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it. Additionally, all care should be taken in the removal of alien vegetation to prevent seeds from falling on it, including (if necessary and practical) the use of temporary sheeting around the base of the plant.

No alien plants may be introduced to the prospecting area and surrounding areas during the rehabilitation phase and particular attention must be paid to ensure that any imported material used for rehabilitation purposes (if required), is certified weed-free.

Water and Soil Management:

No activities, including swimming, washing, recreation, ablution, vehicle-washing, etc. will be permitted in any of the watercourses and/or the wetlands. Water is to be protected and conserved at all times. No watercourse may be polluted or affected by the prospecting activities. No surface or groundwater may be polluted due to any activity on the property/site

Archaeology and Palaeontology Management:

Should any heritage or fossil remains be exposed during any excavation or related activities, these must immediately be reported to the Provincial Heritage Resource Authority of the Western Cape, Heritage Western Cape (in terms of the National Heritage Resources Act, 1999 (Act No.25 of 1999)). Heritage remains uncovered or disturbed during excavations must not be disturbed until inspection and verified by the professional.

Fuel, Lubricant and Hazardous Material Handling Programme:

Servicing and refuelling of vehicles and machinery not to take place on site. All vehicles must be in a good condition with no leakages leading to possible contamination of soil or water supplies.

If present on site all potentially hazardous chemicals and fuel should be stored in bunded areas which are clearly marked. The bunded areas must have a volume of 110% above that of the stored volume.

Mitigation measures must be put in place to avoid any hazardous material spillages, any spillage must be contained and immediately reported to the Departments Directorate: Pollution Management.

Hazardous spill reaction procedure:

Confine the Spill -

- Remove leaking container/vehicle from the site to a bunded area and repair leak immediately.
- Reduce flow from punctured area and seal the leak, by using the plug putty (Provided that the hole/tear is not larger than 5cm in width).

Clean Up of a spill -

- Confine spillage to smallest possible area
- Collect spill control kits and absorb the spillage by spreading the absorbent granules over the affected area.
- Shut off critical equipment and utilities.
- Attempt to de-contaminate or clean up the spill
- Place the soaked granules or contaminated soil into plastic bags and dispose with hazardous waste.
- Assess need for outside spill contractor to assist.
- Notify site manager of the need for or outside spill contractor and of the nature and location of the spill.

Within 24 hours of spill detection the ECO must be informed of the incident, where after ECO will conduct a site visit and recommend further remediation and/or rehabilitation methods to be implemented. Depending on type and extent of emergency that occurred specialists may be contacted to provide specific recommendations and an incident report might need to be completed and sent to municipal and governmental authorities

On completion of the clean-up operations, ECO to inspect site and announce "All Clear".

On-Site emergency repairs:

Only small mobile plant and emergency repairs are to take place on site. These will require the provision of drip trays and funnels to ensure that no oil or fuel leakages occur onto the ground. Should such spill take place, then the oil saturated soil is to be placed in suitable containers and disposed of at a hazardous waste disposal site. Any contamination of soil is to be treated with Spillsolve or similar product. Contaminated water as a result of an oil or fuel spillage on the area should similarly be treated in appropriate way, and the polluted water should not be specifically removed and not allowed to merge with run-off water collected in the trap collecting all run offs from the slab.

Collection of contaminated spares and waste oils and greases:

Contaminated spares, oil filters, gaskets, water, waste oils and fuel etc. must be stored in separate impermeable waste containers to be transported to or collected by a registered and reputed waste handling operator for disposal at a licensed hazardous waste disposal facility.

Staff will require instruction in:

- Deleterious effects of oil / fuel on the environment
- Identification of oil leaks
- Handling of oil / fuel leaks into soil
- Location and method in storage of contaminated spares
- Fire prevention and emergency drills in case of an accident

Roads:

Existing access roads will be used during prospecting work. The prospecting operator must ensure that access to prospecting sites and associated infrastructure and equipment is clearly defined and designated to be off-limits to the public at all times during prospecting.

Traffic safety measures must be considered and implemented in determining entry or exit points to public roads. Mud and sand deposited onto public roads by prospecting activities must be cleared regularly. Appropriate traffic warning signs must be maintained.

The applicant will be responsible for upkeep and repair of farm roads used during prospecting activities to the satisfaction of the landowner.

Dust and Noise Control:

The prospecting operator is to take appropriate measures to minimise the generation of dust as a result of prospecting works, to the satisfaction of the landowner. Vegetation must be stripped from demarcated prospecting sites only shortly before commencing with the prospecting process. On sandy or very dusty sites, mulched vegetation, which is to be obtained from area cleared for prospecting and is suitable, can be used as a method of stabilisation and dust control. Anchovy net can further be used as a method of stabilising dust control on prospecting sites or stockpiled sites, especially on sites where no current prospecting equipment is working. Seed bearing material with invasive vegetation must not be used for stabilization purposes. During high velocity wind conditions, the prospecting operator or his representative to evaluate the situation and make recommendations as to

whether dust suppression measures are adequate, or whether to suspend work until wind speeds drop to an acceptable level.

The use of potable water for dust suppression is discouraged and alternative sources of water should be considered and discussed with the landowner if required.

Prospecting noise levels must not pose a nuisance to the surrounding communities and all prospecting working hours must be limited to normal working hours weekday 8h00 – 17h00 unless arranged with municipality and landowner. All machinery and prospecting vehicles must be serviced regularly and be in a good working condition to prevent excessive noise generation.

Anti-erosion Measures:

The prospecting operator must take all appropriate and active measures to prevent erosion, especially wind and water erosion, resulting from operations and activities, specifically inclusive of storm water control measures, to the satisfaction of the ECO.

During prospecting the prospecting operator must protect areas susceptible to wind and water erosion, by installing all the necessary temporary and permanent works. Measures can include brush packing, anchovy net stabilisation, etc. Runoff from the site will be reduced to not exceed pre-development runoff by using detention facilities in critical places. Where required erosion protection measures must be installed.

Top Soil and Material Removal & Stockpiling:

A minimum of 100 mm topsoil must be removed from proposed drilling sites and separately stockpiled (within the demarcated working area or on designated areas). Topsoil stockpiles must be convex berms of 2m wide and should not exceed 1.5 metre in height, and if required be covered by anchovy net as necessary to prevent wind erosion. Topsoil must not be compacted in any way, especially by vehicles riding over it. Surplus sub-soil that becomes available during prospecting work must be used as fill material.

Appropriate use of Machinery:

The prospecting operator must at all times carefully consider what machinery is appropriate to the task to minimise the extent of environmental damage. No machinery is to operate outside of any demarcated working area. Operators of machinery must be suitably qualified.

Eating, Washing and Resting Areas:

The prospecting operator must designate restricted places for personnel to eat, wash and rest, within the specified working areas. The prospecting operator must provide adequate weather proof refuse bins. The feeding of, or leaving food for, animals is strictly prohibited. No persons will be permitted to live on site. Only employed security personnel will be allowed to overnight on site.

The prospecting operator is responsible for the provision of sufficient and suitably placed chemical toilets. Toilets must be neat and must be provided with doors and locks and must be secure to prevent wind damage. The prospecting operator must ensure that toilets are serviced and emptied when required. Chemical toilet wastewater must be disposed of at a licensed sewage treatment facility. Sanitation provision and servicing must be to the satisfaction of the landowner.

Cleaning of vehicles / equipment:

Washing of prospecting vehicles and equipment will only be allowed at the mining plant in bunded areas and not on proposed prospecting property.

Waste Disposal in terms of Integrated Waste Management:

The prospecting operator will be expected to keep his prospecting site neat and tidy and free of litter at all times. No on-site burying or dumping of any waste materials, vegetation, litter or refuse must be allowed. The prospecting operator must ensure that waste and surplus food, food packaging and organic waste are not disposed of by any workers anywhere on the site except in the provided removable refuse bins.

Refuse bins must be weather and animal proof. Bins must not be allowed to become overfull and must be emptied on a frequent basis by the prospecting operator. The prospecting operator must transport refuse collected from the working areas on site to a suitable waste site when required.

Refuse is deemed to include all discarded prospecting materials such as food waste etc. The prospecting operator must make adequate provision for the removal of prospecting rubble and other excess material. No material or prospecting rubble may be spoiled on the property.

All hazardous waste must be stored in a secured and demarcated area and disposed of using a registered waste disposal operator.

Waste minimisation should be implemented such as the avoidance, reduction and re-use of waste during prospecting, before considering the disposal of such waste. Any solid waste that is not being recycled must be disposed of at a licenced landfill. Recyclable general waste, building rubble and plant materials must be stored separately at prospecting site office and diverted from landfill facilities as far as possible. Plant materials can be sent for chipping or for composting.

All green waste cleared from the site must be beneficiated or taken to an approved waste disposal facility.

The applicant must obtain and file disposal certificates from service providers who will dispose of the general and hazardous waste as evidence that the waste has been disposed of at an appropriate and licenced facility.

Chemical toilets:

The mining company is responsible for the provision of sufficient and suitably placed chemical toilets. Toilets must be of a neat construction and must be provided with doors and locks and must be secure to prevent being windblown. Chemical toilets must be placed more than 32m away from any water courses. The mining company must ensure that toilets are serviced and emptied by the service provider on a weekly basis at least or when full/required. All chemical toilets waste water must be disposed of at a licensed waste water treatment works.

Fires:

The collecting and use of vegetation for firewood on the property is prohibited. No open fires will be allowed on site and adequate firefighting equipment should be available on site in good working order at all times as prescribed by the fire management protocols.

Site Clean Up:

The prospecting operators must ensure that all temporary structures, equipment, materials and facilities used or created on site for, or during prospecting activities, are removed once the project has been completed. The prospecting sites must be cleared, and cleaned to the satisfaction of the ECO.

Mining Personnel Safety:

All personnel must wear Personal Protective Equipment during the prospecting as required.

Emergency Response/Remedial Action Plans:

If an environmental emergency such as fire, oil/fuel spills, sewage pipe burst, floods etc. occurs on site during the prospecting phase immediate actions must be taken to manage and contain the situation by the prospecting operator/s and municipality.

Within 24hours of emergency detection the ECO must be informed of the incident, where after ECO will conduct a site visit and recommend further remediation and/or rehabilitation methods to be implemented. Depending on type and extent of emergency that occurred specialists may be contacted to provide specific recommendations.

An incident report must be completed and sent to municipal and governmental authorities.

Incident Reporting:

In order to ensure that the necessary environmental issues are adequately addressed and recorded, the following environmental reporting shall be undertaken:

- Incident reporting; and
- Compliance reporting

I.e. should there be any deviations from the EMP or any incident or potential incident that might impact on any water resources or sensitive environmental features, the relevant organs of state (to be determined by the ECO) must be notified immediately.

See below for a template of an Incident Report to serve as a guideline for the recording and addressing of emergency incidents as and when they occur.

ENVIRONMENTAL INCIDENT REPORT

DATE:	File Ref:
NAME:	Copy to:
EXACT LOCATION OF INCIDENT:	

SECTION 1 : DESCRIPTION OF INCIDENT

SECTION 2 : REMEDIAL ACTION REQUIRED

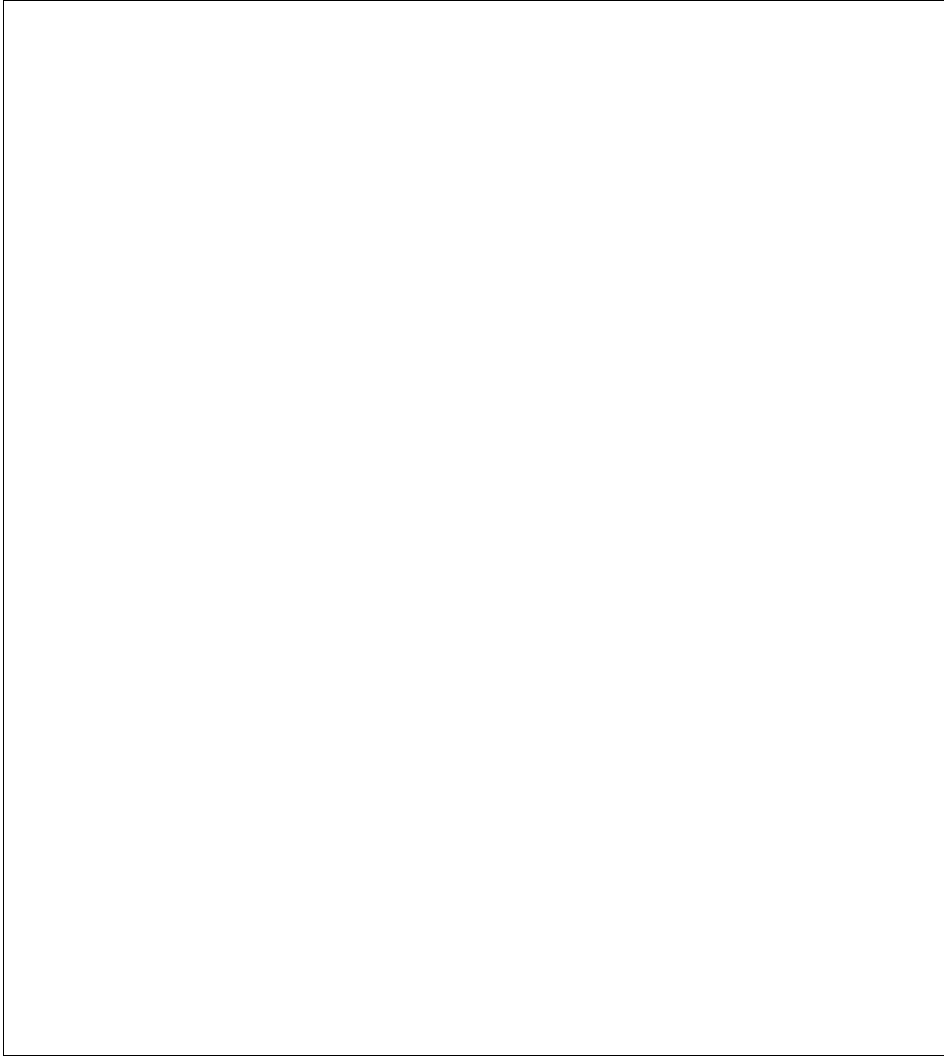
Remedial Action Due Date: _____
Confirmation of implementation: Name: _____ Date: _____

SECTION 3 : RELEVANT DOCUMENTATION

SECTION 4 : SIGNATURES

Municipal Engineer: Name: Date: _____
ECO: Name: Date: _____

SECTION 5 : DRAWING/SKETCH



APPENDICES		Tick the box if Appendix is attached
Appendix A:	EAP CV and Qualifications	X
Appendix B:	Site plan(s) and photographs	X
Appendix C:	Proof of Public Participation Process	X
Appendix D:	Prospecting Work Programme	X
Appendix E:	Specialist/s Report/s	X
Appendix F:	Prospecting Closure/Rehabilitation Plan	X
Appendix G:	Any Other (if applicable): Best Practice Guideline - Stormwater Management 2006	X

EAP UNDERTAKING/DECLARATION

The EAP herewith confirms

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



Signature of the environmental assessment practitioner:

Eco Impact Legal Consulting

Name of company:

25 March 2019

Date:

-END-