mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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: Vast Mineral Sands Pty Ltd Reg: 2016/376575/07

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FILE REFERENCE NUMBER SAMRAD: NC 30/5/1/1/2(11923) PR

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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.

PART A

SCOPE OF ASSSSMENT AND BASIC ASSESSMENT REPORT

3. Contact Person and correspondence address

a) Details of

i) Details of the EAP

Name of The Practitioner: PHS Consulting - Paul Slabbert

Tel No.: 0827408046

Fax No. : 0865083249

e-mail address: paul@phsconsulting.co.za

ii) Expertise of the EAP.

(1) **The qualifications of the EAP**

(with evidence). Honours degree B Art Et Scien, Environmental Planning

- Professional Certified Member of the of the Interim Certification Board for Environmental Impact Practitioners (EAPSA)
- Professional Certified Member of the Association of Professional Heritage Practitioners (APHP)
- Corporate Member of the South African Planning Institute (SAPI) & Professional Member of the International Association for Impact Assessment (IAIA)

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

(In carrying out the Environmental Impact Assessment Procedure) 17 years experience as an EAP & mining related application

b) Location of the overall Activity.

Farm Name:	Remainder of Farm 1; Portion 8 of Farm 1; Portion 9 of Farm 1; Farm 155 - Namaqualand Rd, Northen Cape
Application area (Ha)	83263, 96 ha reduced to 40 300 ha feasable prospecting area
Magisterial district:	Namaqualand
Distance and direction from nearest town	Between Port Nolloth and Alexanderbaai
21 digit Surveyor General Code for each	C05300000000000100000; C05300000000000100008; C05300000000000100009;

farm portion	C05300000000015500000

c) Locality map

(show nearest town, scale not smaller than 1:250000). Appendix 1, Area is south of Orange River Mouth along the coastline, up to 15 km south of Port Nolloth. Prospecting will take place along the coastline up to a maximum distance of 7 km inland.

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

The application (Appendix 1; Locality) is for a Prospecting Right for Heavy Minerals. No bulk sampling will take place. The Applicant proposes to prospect for heavy minerals by means of non-invasive methods such as desktop analyses, remote sensing, surface mapping and surveying of the deposit, and by means of invasive methods such as truck-mounted RC drills and hand-held auger drilling.

The proposed non-invasive prospecting methods will cover the entire prospecting lease area, while invasive prospecting (drilling) will be concentrated in those areas recognised as having potential for the concentration of heavy minerals. Where possible, existing mine roads and tracks will be utilised for access to the various prospecting sites and environmentally sensitive areas will be avoided as far as is practically possible. All prospecting will be conducted in terms of the directives as contained in this Environmental Management Programme (EMP), which will be submitted to the DMR as part of the Prospecting Right Application process. No processing of materials will take place on site and all sample preparation and analyses will take place in off-site laboratories and other existing off-site facilities

Prospecting will take place over a 60-month (five year) period, and will initially comprise of non-invasive methods (Phase 1), which will include surface mapping and surveying of the deposit(s). Phase 2 will comprise of invasive prospecting methods, and will respectively include auger and RC drilling of material. Phases 3 and 4 will respectively comprise of off-site sample processing and data analysis, and decision making. Phase 5 will include rehabilitation. Some of these phases will be undertaken in parallel.

The 83 263.96 ha cadastral area consists of 4 farms, this was narrowed down to 40 300 ha suitable prospecting area after the exclusion of no-go areas. These areas are indicated on the constraints plan attached under Appendix 2. The majority of the area proposed for prospecting was already subject to mining and other prospecting activities over many years, therefore the activity does not intrude into virgin and undisturbed areas.

Wrt NEMA triggers, no infrastructure will be developed, it will be a small team with a 4x4 vehicle/ drill rig truck. No new roads will be constructed only limited off-road driving will take place. Existing tracks will be used, and where none exist the 4x4 vehicle will drive in the open veld. After drilling, the compacted area will be destabilised and the tracks will be raked. Sampling within 100 m of the sea will take place by hand only and collectively more than 5 cubic meters of material will be removed. When sampling has been completed the site will immediately be rehabilitated and any new tracks raked and closed. The rehabilitation team will inspect all sites 3 months after the initial rehabilitation action.

(i) Listed and specified activities

NAME OF ACTIVITY	Aerial extent of	LISTED	APPLICABLE

(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.)	**the Activity** **Ha or m²**	**ACTIVITY** **Mark with an X where applicable or affected.**	**LISTING NOTICE** **(*GNR 544, GNR 545 or GNR 546)***
Prospecting right - Phase 1 involve surveying and pegging of the anticipated deposit determined by surface mapping. The information gained from the above non-invasive prospecting may result in a review of the proposed drilling positions/prospecting grid. Phase 2 will comprise of invasive prospecting methods, and will respectively include auger and RC drilling of material. Depending on the results there will be two drilling sessions within this phase. Phases 3 and 4 will respectively comprise of off-site sample processing and data analysis, and decision making.	83 263.96 ha cadastral area, narrowed down to 40 300 ha suitable prospecting area but footprint of collective drilling impact will be 54.8 ha approx.	x	GN No. R983 Activity 20
Phase 5 will include rehabilitation and closure. Please note this phase will run concurrent with the drilling phase 2. Rehabilitation will take place when drill site is completed after 3hours of work.	83 263.96 ha cadastral area, narrowed down to 40 300 ha suitable prospecting area but footprint of collective drilling will be 54.8 ha approx.	x	GN No. R983 Activity 22
Some drilling will take place within 100 m from the high water mark of the sea and it is estimated that more than 5 cubic meter of sand will be removed as samples	The coastline identified for prospecting is approx 90 km long, 900 ha of prospecting fall within the 100 m zone. Hand sampling will take place in this zone. No driving within this zone.	x	GN No. R983 Activity 19

(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)

Find the prospecting work plan attached under Appendix 3. Prospecting will be for the following Heavy Minerals.

Mineral /Commodity	Code	Type Code
Heavy Minerals (General)	HM	HM
Rutile (Heavy Mineral)	Rt	HM
Ilmenite (Heavy Mineral)	Il	HM
Zircon (Heavy Mineral)	Zr	HM
Monazite (Heavy Mineral)	Mz	HM
Leucoxene (Heavy Mineral)	Lx	HM

The proposed prospecting activities will be undertaken in six main phases as described below.

G.1 Phase 1: Non-invasive Prospecting

Non-invasive prospecting will cover the coastal reaches of the four farms, and will include the following sub-phases:

- Phase 1a will involve the following desk-top activities: data acquisition from government and private sources, and analysis of any existing/previous prospecting and drilling data, satellite (Landsat and ASTER) imagery, aerial photos, and terrain data, as well as geological map interpretation. The synthesis and interpretation of such information will contribute towards providing a clear picture of the location and characteristics of the heavy mineral deposit/s, and will guide the in-field prospecting programme.
- Phase 1b: Surface mapping will be conducted by the project geologist (Dr J Hattingh) and assistants, and will take place over a period of 2 months. Such mapping will encompass GPS controlled traverses, and aerial photo mapping.
- Phase 1c will involve surveying and pegging of the anticipated deposit. This sub-phase will include the following activities:
  - Surveying of the mapped area to be prospected. A grid (250m x 250m) will be marked on the map, after which those positions will be marked in the field by a surveyor with labelled droppers (pegs). Shallow (12m depth) hand-held auger drilling will take place at these positions (see Phase 2a below).
  - Access routes to the drill sites will also be located (existing roads will be used wherever possible, new tracks will be rehabilitated).
- Phase 1d: The information gained from the above non-invasive prospecting may result in a review of the proposed drilling positions/prospecting grid. These specific areas cannot be determined at the time of writing of this report. In order to expedite this procedure, the following is recommended as a way forward:
  - This EMP has identified no-go areas based on information such as sensitive vegetation etc. The constraints map attached under Appendix 2 has eliminated certain areas and reduced the prospecting area from 83 663 ha to 40 300 ha.

o Within this identified target area, a specialist botanist (busy finalising his report) and heritage practitioner has confirmed the presence of ecological and heritage resources and procedures to apply.
o If the prospecting auger drill hole grid requires adjustment, then such amendments/appendices (to both the Prospecting Work Programme and the EMP) will be lodged with the DMR. Note however that although the positions of the drill holes may alter slightly, the method and environmental impact mitigation measures are not expected to require any revision.

G.2 Phase 2: Invasive Prospecting (Drilling)

Phase 2 will be initiated after the detailed analysis of all the Phase 1 results have been collated, and by convening the appropriate persons to conduct the following task:

- Educate/train the staff conducting the prospecting programme on environmental and heritage issues (the details of which are discussed in the EMP).

Invasive prospecting includes the following sub phases:

- Phase 2a: Drilling will either be conducted by a truck-mounted RC drill rig or by a hand-held engine-powered auger drill (inside littoral active zone). Approximately 500 RC drill holes are anticipated to be drilled as subphase I to a maximum depth of approximately 15m each.

The RC drill uses compressed air that raises the drilled material to the surface for sampling purposes. The hand-held auger has a 30cm core barrel at the end of the drill rods that catches the sediment as is progress in a batch approach. Hand drilling will take place in the littoral active zone and sensitive areas, no beach driving will take place.

- Phase 2b: This sub-phase will involve a second round of infill drilling. Additional drill holes will be drilled in feasable areas to check for continuity of the heavy mineral deposits. The number of additional holes required will be determined by the results of the first phase of drilling (Phase 2a). Normally 2/3 of the initial hole total is drilled, therefore approx. 300 holes could follow. The same drilling methods will be implemented as described for Phase 2a above.

G.2.1 Drilling Grid Layout

The Applicant's consulting geologists have, through past experience and aerial photo interpretation, been able to roughly delineate the heavy mineral reserve and as such will reduce the application area to encompass specific portions of the farms. Access to the drill sites will be by existing farm roads or fence line tracks wherever possible. Drill lines will relate to a east west grid, 500 m apart with approx. 3 holes on each line with a minimum width of 1 km apart.

G.2.2 Drilling Programme

The prospecting right is required for a period of five years (60 months). Note that this application has been lodged for 60 months to allow for any delays which may occur or any further amendments which may be required.

Drilling is proposed to take place in two 1-month periods separated by an analysis phase. The first phase of drilling will require the drilling of approximately 500 drill holes, followed by a second round of infill drilling of approx. 300 holes if deemed feasable. This will allow for phased chemical analyses of the samples, and a decision after each period as to whether to continue with the prospecting programme or not. It is anticipated that the drill rig will require between two and three hours to complete drilling activities on each drill site. Note that only one of each drill type (auger and one reverse circulation) will be on site at any one time. Only hand held drill will be used in the littoral active zone (100 m from the sea) and other sensitive areas. The 4x4 drill rig relate to a truck and compressor impacting on a 64 sqm area per hole over a 2-3 hour period before moving on to the next hole.See Appendix 3 for the proposed prospecting schedule.

The contract(s) to conduct the aforementioned drilling and bulk sampling programme/s will be put out to tender once the Prospecting Right approval has been granted by the DMR.

No bulk sampling will be conducted as the drilling provides sufficient sample for the test work required for heavy minerals chemical and metallurgical analyses.

G.3 Phase 3: Sample Processing and Data Analysis

Drill samples will be taken from the material raised by the drilling process before the hole is backfilled in reverse order. Samples will be removed by a 4x4 “bakkie”.
This phase will also consist of an analysis of all the information received from the invasive and non-invasive prospecting activities. The economic feasibility studies, required to determine the economic and metallurgical viability of the project will be conducted by analysing the results of the data gathered from the prospecting programme, and the pre-feasibility studies will be finalised.
The sample processing will serve to assess the expected mine yield and will guide the design aspects for potential future mining, if a measured resource is the outcome of this processing programme.

G.4 Phase 4: Decision-making

The following activities will be undertaken as part of this final phase (Phase 4) of the proposed Prospecting Work Programme:

- The results of the non-invasive and invasive prospecting methods will be fully assessed and analysed to obtain a detailed understanding of the geology of the project area. This will entail computer generation of models to simulate the deposit.
- Various reports, as are required in terms of the MPRDA, will be submitted to the DMR throughout the prospecting process.
- The Applicant (in consultation with the project team) will make a decision regarding the way forward. The Applicant will have three possible options to choose from regarding the way to proceed, namely:

1. Submit a Mining Right Application: Should prospecting yield positive results, a Mining Right Application may be lodged with the DMR.
2. Continue prospecting: If the prospecting results are non-conclusive, the Applicant might decide to continue prospecting. Should such a course of action be chosen, an application for a Prospecting Right Renewal may have to be lodged with the DMR, if required. Continued prospecting could include additional auger drilling and/or bulk sampling.
3. Discontinue the entire operation: If the results of the prospecting activities are negative, the Applicant will most likely decide to discontinue the entire operation. Should this option be chosen, the Applicant will be required to conduct full rehabilitation of the drill and sampling sites and any other disturbed areas. A Closure Application will, in this event, be lodged with the DMR.

G.5 Phase 5: Rehabilitation

Each drill hole site (approx. 64 sqm) will be rehabilitated as prospecting proceeds. Rehabilitation will be in accordance with the directives contained in the EMP. Compacted area will be raked and if off an existing track the tracks will be raked, covered and blocked. The EMP also describes mitigation measures for the environmental impacts that might be associated with the proposed drilling activities. It should be noted that some of the proposed prospecting phases will be undertaken in parallel, as are reflected in the prospecting schedule. Rehabilitation follow-up will take place 3 months after the initial round.

e) Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (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	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLIY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.** (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, 2002 (ACT 28 OF 2002)	NC30/5/1/1/2/11923	Prospecting Right in process
NEMA and associated guidelines	NC30/5/1/1/2/11923	Duty of Care, PPP, Alternatives and EMP's
Control of Vehicles in the Coastal Zone	No vehicles will drive in the coastal zone	Vehicles will park outsdie the littoral active zone and drilling will be by hand.
Municipality IDP & PSDF		Identifies needs, desirability and constraints of the area and Community.
National Environmental Management: Biodiversity Act , 2004		The EMPr will regulate the applicant's implementation of biodiversity management measures. This is particularly relevant by avoiding the no-go areas
National Heritage Resources Act, 25 of 1999 ("NHRA")	Commenting	Archaeological and Palaeontological awareness plan and training and fossil finds procedure to be implemented.
National Environmental Management: Waste Act, Act 59 of 2008 (NEMWA)NEM: WA (as amended	Management measures environmental awareness plan	The generation of potential waste will be minimised through ensuring employees of the drilling contractor are subjected to the appropriate Environmental awareness campaign before commencement of drilling. All waste generated during the

		drilling activities will be disposed of in a responsible legal manner.

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).

Heavy Minerals sand deposits are the main source of zirconium, titanium and a very good source of rare earth elements. South Africa has been a major supplier of zirconium and titanium and has a well-developed heavy mineral mining sector supplying the world market with some 25% of its zirconium demand. Increase in heavy mineral prices and the availability of new markets has rendered previously marginal heavy mineral deposits such as this Alexkor deposit potentially viable at present. Long term forecasts show an increasing deficit in the supply of zirconium, titanium and rare earths. A need for South African mining companies to position itself to satisfy this expected demand is of utmost strategic importance.

Prospecting activities are therefore needed to:

1. Confirm and obtain additional information concerning potential targets through minimally invasive activities (e.g. desktop studies) and invasive (e.g. drilling) activities.
2. Assess if the resource can be extracted through future mining in an environmentally, socially and economically viable manner. Should prospecting activities prove that there are feasible minerals to allow for mining, a new mine may be developed which would generate extensive employment opportunities in an area where employment is needed.

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

The proposed site was selected based on extensive research and also following on information from previous prospecting activities in the area.

This area has been extensively mined for diamonds during the past 90 years by Alexkor and its predecessor the State Alluvial Diggings. This development resulted directly in the establishment of good infrastructure with two large well serviced towns accommodating some 15 000 inhabitants. Many of these inhabitant are directly dependant on the jobs provided by the mine or service industries to the mine. Some four smaller towns in the area also benefits in the same way from the activities at Alexkor.

However, the general consensus is that the diamonds are fast becoming a depleted resource as can be seen in not only the down scaling of activities at Alexander Bay but also the neighbouring diamond mine at Kleinzee during the past decade. This has led to major job losses and economic down turn in these towns. The economies of the towns in the area have started to change its focus from mining to tourism. However, this change is slow and can only accommodate a small percentage of inhabitants.

Heavy mineral mining will most definitely give the communities in the area a new lease of life and will see to the further development of infrastructure of the area that will be to the advantage of the greater community. A very important aspect is that heavy mineral mining will result in the systematic rehabilitation of the area including the slimes and coarse tailing dumps that will be mined and eradicated from the landscape presently littered by large dumps.

Ito technology drilling machinery is toed to either be a truck-mounted RC drill rig or by a hand-held engine-powered auger drill. The RC drill uses compressed air that raises the drilled material to the surface for sampling purposes. The hand-held auger has a 30cm core barrel at the end of the drill rods that catches the sediment as is progress in a batch approach.

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.

Pls Note: Each of the phases is dependent on the results of the preceding one. As such, mapping of the prospecting activities could thus not be undertaken for inclusion in this report. The stakeholder comment period has not been undertaken yet, and therefore comments raised by I&APs have not been included in this section. However, the sections will be updated in the final report to be submitted to DMR.

(a) the property or location where it is proposed to undertake the activity; was selected based on existing knowledge of Heavy Mineral deposits in the area. The Alexkor mine area has been identified based on knowledge of these mineral deposits and as such, no site alternatives have been considered for the proposed activities. However, we determined a constraints analysis where no-go areas were identified and buffers were in order to refine the final site selection from 83 263, 96 ha to 40 300 ha. Find the constraints analysis attached under Appendix 2. Therefore reducing the initial area by half and the potential impacts also by half.

(b) the type of activity to be undertaken; In terms of the technologies proposed, these have been chosen based on the known long term success of the selected drilling method and prospecting process. The prospecting activities proposed in the Prospecting Works Programme is dependent on the preceding phase as previously discussed; therefore no alternatives are indicated, but rather a phased approach of trusted prospecting techniques.

(c) the design or layout of the activity; The preferred drill layout is considered based on preceding phases and site constraints to minimise impacts. Each hole will take 2-3 hours to complete then the machine moves on to the next. Site establishment are done with closure in mind to ensure that only the required size is disturbed. Intact vegetation or animal burrow/nest and archaeological resources will be avoided by the geologist selecting the on-site drill position. Due to the location of the proposed drilling in relation to existing roads and the protocol in the current mining area no camp site will be required. The drilling contractor can make use of existing accommodation within the area.

(d) the technology to be used in the activity; The method and techniques employed for the investigation of potential targets and deposits are suitable for the proposed prospecting activities. They have been selected based on their minimal invasiveness which is envisaged to have minimal impact on the receiving environment.

(e) the operational aspects of the activity; The drilling will be done over a period of 5 days, where drilling activities will be conducted during daylight hours to minimize exposure to the risks. If necessary the drilling can be timed to accommodate the current mine operation if necessary. The time of implementing drilling activities during the course of the day may also be reconsidered in consultation with mine operator. Ideally drill activities will occur continuously until such time that a hole is completed, with no drilling occurring during the night.

(f) the option of not implementing the activity. Drilling is required in order to investigate the potential and feasibility of a resource as well as being used to generate a DMR compliant mineral resource statement. There is no potential for any future investment in a mine without the confirmation of the mineral resources which can only be obtained from drilling activities. Should the prospecting right be refused, effectively a Heavy Mineral resource will be sterilised. The socio-economic benefit and most notably the future

employment potential of mine development will also be lost if the prospecting activities are not implemented in order to determine the feasibility of deposit that may occur within the area.

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.

The Draft Basic Assessment Report was submitted or made available for comment to the competent authority, commenting authorities, landowners, surrounding property owners and other identified stakeholders for review (see list of identified stakeholders attached under Appendix 4). Comments received were recorded and are reflected in the Final Basic Assessment Report to be submitted to DMR. (Refer to Appendix 4 for the detailed public participation process and the Consultation Report).

The following public participation has been conducted for the proposed project to date:

- Identification of stakeholders, including occupiers of the property, owners and occupiers of land adjacent to the site, municipal officials and relevant State Departments as part of the Public Participation Process. All respondents will then be placed on the project database. The database will be used throughout the process to inform the stakeholders of the project.
- In order to canvass the issues and concerns of the broader public and to ensure that all IAPs are afforded the opportunity to comment on the application, the proposed project was announced as follows:

  - Erection of notices at the various municipal pay or public points in the area; advertising the proposed development and displaying the contact details of the EAP was displayed. The notices serve the purpose of informing potential IAPs of the project and therefore afford them the opportunity to comment.
  - Distribution of the notification letters to I&AP's via registered mail or e-mail or SMS with basic background and the locality map.
  - An advert was placed in Die Plattelander newspaper to notify the public about the Basic Assessment process, invite members of the public to register as I&APs on the project's database and notify the public of the availability of the Draft Basic Assessment Report and date of the public meeting.
  - A public & landowners meeting will be held on 3 May 2017 at 14h00 in Alexander Bay. (Please refer to Appendix 4 for comments recorded and meeting notes)
  - A copy of the Draft Basic Assessment Report was made available for public review for a 30 day review period from 13 April to 17 May.
  - The Draft Basic Assessment was available at the Port Nolloth library and at the first public security entrance office in Alexanderbaai.
  - All comments received during the review period of the draft Basic Assessment as well as responses provided have been captured and recorded within the Comments and Response Report in Appendix 4

- Once DMR has made a decision an Environmental Authorisation will be issued, all registered I&APs will be notified of the outcome of the application. To date, the I&APs identified is attached under Appendix 4.

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.
AFFECTED PARTIES			Find the proof of public consultation attached to this document. Due to the nature of comments detail issues and responses form part of the attached PPP document		
Landowner/s	**X**				
Richtersveld Sida Hub Communal Prop Assoc	x		Will be included after consultation		
Lawful occupier/s of the land					
Richterveld Mining Company	x		Will be included after consultation		
Alexkor Ltd	x		Will be included after consultation		
Landowners or lawful occupiers on adjacent properties	**X**				
De Beers Consolidated Mines Pty Ltd	x		Will be included after consultation		
Richtersveld Municipality	x		Will be included after consultation		
Kannikwa Diamond & Estate	x		Will be included after consultation		

Corp Ltd					
SANPARKS	x		Will be included after consultation		
Municipal councillor	**X**		Will be included after consultation		
Municipality	**X**		Will be included after consultation		
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					
Communities					
Richtersveld Self-Development Company	x		Will be included after consultation		
Richtersveld Community Trust	x		Will be included after consultation		
Richtersveld Sida !Hub Communal Property Association	x		Will be included after consultation		
Dept. Land Affairs					
Department of Agriculture, Land Reform and Rural Development	x		Will be included after consultation		
Traditional Leaders					
Richtersveld Community Trust	x		Will be included after consultation		
Dept. Environmental Affairs					
Department of Environment and	x		Will be included after consultation		

Nature Conservation					
Other Competent Authorities affected					
Department of Agriculture	x		Will be included after consultation		
Department of Water Affairs	x		Will be included after consultation		
Northen Cape Provincial Heritage Resource Agency	x		Will be included after consultation		
OTHER AFFECTED PARTIES					
Namakwa District Municipality			Will be included after consultation		
INTERESTED PARTIES					

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).

Topography

The surface of the land rises from shoreline (beaches, rocky and cliffed coastline, coves, bays & headlands) in the west to the coastal plains (sand plums & dunes) consisting of tailings & mine dumps that's dissected by a gravel spine road and mine service road network, from here the escarpment rises to the east into the hinterland hills that's dissected by the R 382 tar road between Port Nolloth and Alexanderbaai. Prospecting is proposed along the shoreline and coastal plains, between the HWM and 7 km inland where existing mine activities occur. The Orange River mouth is the northern boundary of the area and the Holgat River is located in the middle of the 90 km coastline, 45 km south of the Griep River mouth.

Catchment hydrology

This prospecting area falls within Water Management Area (WMA) 6 – Lower Orange, and straddles the catchment divide between quaternary catchments F50G and F40H (DWAF 2004). The natural mean annual runoff of all the coastal catchments in the WMA, which stretch some 285km from Strandfontein in the south to Alexander Bay at the mouth of the Orange River in the north, is estimated to be 24 million cubic metres (Mm3). All rivers in the area except the Orange River are ephemeral / episodic, and flow only sporadically in response to high rainfall events, mostly in their upper catchments, remote from the coast, where annual rainfall can exceed 100mm. As a result, available reliable yield from surface water sources in all the coastal catchments is estimated to be zero, while reliable yield from groundwater from the catchments is estimated to be a total of 3 Mm3/a. Approximately 6 Mm3/a of water is transferred into the southern part of the area from the Orange River to meet the urban / domestic requirements in the Alexander Bay, Port Nolloth and Kleinzee area (DWAF 2004).

Following South Africa's accession to the Ramsar convention, the Orange River Mouth was designated as a Ramsar site by South Africa in 1991. After Namibia ratified the Ramsar Convention in 1995, the designated area was enlarged and the Namibian part of the wetland was immediately designated as well. In the same year, the area was put on the Montreux record as part of it had been seriously degraded. The Orange River Mouth Interim Management Committee (ORMIMC) was established in 1995 and has served as an advisory body to the respective competent authorities. The ORMIMC has been the driving force behind current initiatives at the central government level in South Africa to rehabilitate the area, to remove it from the Montreux record, to get the area protected under South African law, and to draft a management plan for the Ramsar site. Despite these initiatives however, active management of the Ramsar site has been limited and has resided largely in the hands of the mining companies Alexkor and NAMDEB (jointly owned by De Beers and Namibian Government) located on the South African and Namibian sides of the estuary respectively. This situation has recently changed with the proclamation of the Sperrgebiet National Park in Namibia that includes the Namibian section of the Orange River Mouth and the settlement of a land claim on the South African section, which has now been handed over to the Richtersveld community. A 125 m buffer area was proposed between the Ramsar site and the prospecting area to avoid impacts.

The Holgat- and the Kamma Rivers, as is the case with other coastal rivers in Namaqualand, comprise relatively small river channels (in places, more than one channel) meandering in wide, shallow, alluvium-filled valleys that have been incised over time into the crystalline bedrock (Heydorn & Grindley, 1981). The episodic nature of the flow in the rivers is confirmed by long term records from Alexkor and its predecessor, Alexander Bay State Alluvial Diggings. No hydrological gauging stations were installed on

either river. The catchment areas of both rivers are very small. It is, however, meteorologically improbable that the peak flow rates increased by the ratio of the catchment areas: that is, they were unlikely to have exceeded 100m3/sec. The ephemeral nature of the rivers in the project area means that surface water resources are not used at all in the area, either for domestic use or stock watering. Neither river flows sufficiently reliably to be considered as a possible source of water for prospecting operations. No prospecting will take place inside these rivers or its riperian zones.

Geology

The geological conditions on site comprise an uncomplicated arrangement of aquifers and hydrostratigraphic units. The aquifers on site can be divided into two main units as follows:

Unconsolidated primary aquifer: This aquifer consists of the surface aeolian sands, marine sands and basal grits and conglomerates overlying the quartzitic and schist bedrock. The presence of damp sands and minor mud at the base of a number of exploration boreholes, most notably in areas corresponding to topographic lows in the surface of the bedrock, are indicative of a minor concentration of groundwater in the Muisvlak and Seemansrus areas. Although minor kaolinisation and cementation from the weathering of the feldspars in the underlying schist and gneisses exists, the unit is generally unconsolidated and relatively permeable. The unit has a relatively high clay content constituting some 20% of the overall volume on average with local values up to 35%. The undulating nature of the bedrock contact means that only local perched aquifers with limited aerial extent may form, separated by palaeo-highs in the bedrock contact.

Fractured secondary aquifer: This aquifer underlies the primary aquifer and comprises predominantly fractured bedrock within quartzite, gneiss and schist, which underlie the site. The bedrock geology consists of high-grade metamorphic rocks of the Namaqua-Natal Mobile Belt, which are generally massive and highly deformed. The topography of the bedrock contact with the overlying weathered material has been shown to correspond with structures in the bedrock such as faults and fractures, which are generally oriented north-north-west – south-south-east, northeast - south-west and west-northwest - east-south-east. Although significant groundwater flow may be encountered in faults and fracture zones, overall storativity is likely to be very limited with a resultant decrease in long-term sustainability of abstraction, particularly at the relatively high rates that would be required for production. Based on the apparent depths of drilling, it is clear that all the boreholes in the area are drilled into fracture or fault zones in the bedrock.

Exploration over the entire area will be limited to the unconsolidated primary aquifer where drilling will be done to an average depth of 15m below surface, groundwater will therefore not be affected or applicable in this application.

Vegetation

Apart from “topographic-specific” vegetation types such as those of pans, estuaries and dunes fields, Mucina only identifies the following vegetation types.

1. a coast-parallel zonation between:
 • seashore vegetation
 • coastal dune veld
 • inland yellow dune veld; and
2. a north-south consistency but with two physical controlling elements:
• the Visagiefontein-Kop watershed resulting in desert classification to its north
• the Holgat River (through emphasis on climatic south-north declines) splitting both the seashore vegetation and the white dune veld into their detailed classifications. South of the Holgat River, Namaqualand Seashore Vegetation (Least threatened) occur and north of the Holgat Namib Seashore vegetation (Vulnerable) occur, with Richtersveld Coastal Duneveld occurring from the south to the north

The most remarkable characteristic of the coastal vegetation from Port Nolloth to Alexander Bay is the apparent uniform species composition along the coast. The height of the shrubs decrease from the south to the north although the species composition remains the same with only a very low number of species disappearing towards the north. Localized variations in this distribution pattern does occur and is suspected to be caused by edaphic conditions. The depth of the soil above the calcrete / silcrete layer being

the most obvious. The prospecting activities will primarily be limited to the previously disturbed mining areas, and if in virgin intact areas, micro-sitting will avoid intact vegetation loss or root removal.

Cultural & Historic

The broader region is rich in SAN and Khoi-Khoi folklore and legend, much linked to special places which today are treasured and respected, and express a distinct identity of the Khoi-Khoi. Within the coastal belt, the Boegoeberg Twins (inselbergs) and environs represent a place of strong cultural heritage and association, while natural features including the "spuitgat caves" and natural coastal fountains were well frequented by Khoi-Khoi pastoralists. Transhumant pastoral activities were dictated by coastal winter rains, as well as coastal fountains, being the only source of water. One such fountain still existing in the vicinity of Muisvlakte, made the area a favoured destination by past pastoralists.

Archaeological impacts assessment undertaken in the rich diamond-mining regions on the Cape West coast of South Africa has shown that shore based mining operations impacts severely negatively on archaeological heritage sites. Mining operations over the last 80 odd years by Alexkor Limited, has unquestionably destroyed many sites in the Alexkor mining area.

Important vertebrate fossils (bone) and extinct marine molluscs have also been documented buried under many meters of overburden, in deep open cast mining operations and prospecting trenches. The reasons for the abundance of fossil palaeontological remains, is in part related to the highly calcareous character of the aeolianites (fossil dunes) and shallow marine sediments. The archaeological investigation has shown that, despite the destruction and damage of archaeological and palaeontological heritage remains caused as a result of historical mining operations, there are still likely to be intact and relatively well preserved sites in the Alexkor mining area. It is also highly probable that important vertebrate fossils and marine molluscs will be exposed below the overburden in deeper excavations and prospecting trenches.

A 300 m red-flag zone apply from the HWM of the sea where special care and micro-sitting of hole positions will apply.

Socio-Economic

A sparsely spread population, with the Richtersveld municipal area reflecting a density of 1,2 persons/km², comparable with the average density for the Namakwa District municipal area of <1 person/km². The majority of approx 64% live in Alexander Bay, Port Nolloth and Mc Dougall's Bay, and indicates that the mining sector is the main economic driver in the region. Such low density implies a scarcity of skills and a low revenue base which seriously limits services delivery capacity. The current trend is on-going out-migration of economically active persons (20-30 year age group), given urbanization trends and limited job opportunities following mine down-scaling or closure.

The broader regional community reflects poor socio-economic prospects, including: - Low literacy levels occurring widespread throughout the rural population - Unemployment due to a decrease in mining activities - Inadequate housing, with rentals largely in arrears - Low affordability levels - Very low level of community health - Poverty within certain communities. The socio-economic conditions within a post-diamond mining economy poses employment sustainability challenges, therefore new mining initiatives of different commodities could proof valuable for job security in the region.

(b) Description of the current land uses.

The application area of 83 263, 96 ha consist of 4 farm portions that is owned by the Richtersveld Sida Hub Communal Prop Assoc. The Richtersveld Mining Company and Alexkor mine the area as a JV. The land use on the entire area is mining. The area is managed according to a EMP for the Mining Right on the site. This EMP document act as baseline information and guideline for this protecting right application. This proposal will therefore not be a new use or a conflicting activity. The site is heavily disturbed by mining over the last 90 years. These disturbed areas will be subject to sampling for heavy mineral deposits.

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

The environmental features and infrastructure on site assisted in defining the combined constraints map (Appendix 2) the 83 263 ha area has been reduced to 40 300 ha suitable prospecting zone. Approximately 500 initial test holes will be drilled with an 64 sqm activity areas due to machinery and vehicles, this equate to an total impacted area of approximately 32 ha, that represent 0,038 % of the total area. Then if feasable an additional 300 holes will be drilled in selected areas with a footprint of 22.8 ha. The following exclusion no-go zones apply:

- Red-flagged 300 m coastal area (due to Archaeological, Palaeontological and Coastal littoral active zone). The area proposed for prospecting within the 300 m coastal red-flag area will be subject to hand drilling and 1 hole every 500 m. Considering the 90 km coastline it relate to 180 holes inside the 300 red flag zone and if a second round drilling apply it could be doubled.. These holes will be drilled by hand with no vehicle movement within the littoral active zone. The onsite geologist and drill team will be trained wrt Archaeological, Palaeontological and Coastal littoral active zone features in order to avoid sensitive and intact area.
- Other sensitive feathers is the Gariep River mouth that a Ramsar site, therefore a 125 m buffer apply,
- The Holgat & Kamma River' sand riperian zones will be regarded as no-go
- Intact ecological areas like the Lichen fields are also subject to exclusion,
- The Boegoeberg promontory and coastal surrounds,
- Geological unsuitable and undisturbed areas,
- The use of existing internal road and tracks are encouraged,
- Avoidance of current important mining operations and infrastructure.

(d) Environmental and current land use map.

(Show all environmental, and current land use features)

Attached under Appendix 2 is the environmental constraints analysis. Attached under Appendix 5 is the extent of the current Alexkor & RMC mine area and associated activities and the extent of the current disturbed mine areas. Most of the prospecting drill holes will be located within these disturbed areas. Prospecting will be within the Alexkor & RMC mine area. Also refer to the attached specialist reports.

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

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

Topography: There will be low impact significance on the topography of the area. The prospecting will not affect the shape of the area due to the nature of the proposal. After drilling the hole will be infilled and the terrain left in the same condition as it was found. The probability is definite and the duration of the impact is short term. The impact can be reversed but due to the low level of intrusion and surrounding mine area the resource is not lost or scarred for life. The site will continue to function as a mine afterwards as per landowners' rights.

Soil: Considering the size of the area in relation to the prospecting footprint of approx 54.8 ha the impacts are low. Prospecting will be inside existing mine disturbed areas, dumps and tailing dams. Workings relate to the removal of limited sample material and no bulk sampling will take place. The on-site material will be enough to accommodate the rehabilitation of the hole and raking of the area afterwards. The certainty of the impact is definite for the duration 2-3 hours per hole. Disturbance is reversible, damage is not

irreplaceable and the impact cannot be avoided. The impact on the area will be negated by breaking up the compacted virgin earth in the area where vehicles are driven and parked during drilling; this will be followed up 3 months after initial rehabilitation.

Land capability: The impact on land capability is considered low significance. The area will be rehabilitated to the pre-prospecting land use. No-go areas will be respected. All exisitng disturbed mine areas where prospecting will take place will be left as found and in virgin areas new tracks will be raked, holes filled up and compacted area broken up after the 2-3 hour drilling period. The certainty is definite and the duration for the the 2-3 hours of drilling. The site will be able to function as per pre-mining afterwards.

Land use: The impact on land use is considered low, mining rights are in place. Possible friction between mine operators landowners and prospecting personnel is reversible, damage is not irreplaceable and the impact can be avoided through consultation and mutual respect and an operational agreement if required.

Vegetation: The impact is considered low. This majority of the area is currently disturbed and the undisturbed indigenous vegetation is contained in the no-go areas. Where isolated indigenous vegetation occur in the prospecting area the geologist determining the drill position will avoid intact areas as far as possible by positioning the hole in a disturbed location. Impacts are reversible if avoided, damage is not irreplaceable and the impact can be avoided.

Animal life: There will be no effect on the animal life. Prospecting will take place in an existing mine area with many activities. The littoral active zone will be regarded as a no vehicle zone therefore avoiding impacts in this area. Mostly existing roads will be used, but if vehicles go off-road, care will be taken when driving by maintaining low speed and selective alignment. Impacts are reversible, damage is not irreplaceable and the impact can be avoided.

Surface water: The impact on surface water is considered low. The Orange River mouth will be avoided and a 125 m buffer is proposed where no prospecting can take place. Prospecting in the vicinity of the Orange River mouth relates to work on impacted mine areas. No mining will take place inside the Holgat and Kamma River zones. The prospecting will not contribute to any run-off contamination, due to rehabilitation after the 2-3 hour period it takes to drill a hole. The certainty is probable and the duration long term.

Ground water: There will be no effect on the groundwater of the area. The certainty is probable and the duration long term.

Air quality (Dust): The only impact on air quality will be during drilling sessions and when vehicular traffic moves over the terrain. The impact on the mining operation will be negligible due to the distances involved and due to the intensive activities already on site. The certainty is possible and the duration intermittently for the life of prospecting. Its reversible, damage is not irreplaceable and the impact cannot be avoided.

Noise: The only impact on the ambient noise levels of the area will be from the drilling rig travelling to and being established on each site, the diesel engine driving the drill, vehicles going to and from the drilling site and the voices of the drilling crew. Its reversible, damage is not irreplaceable, it’s possible and the impact cannot be avoided. The impact will be negligible due to the distances involved and the nature of mining activities already taking place. The certainty is possible and the duration intermittently for the life of the mine.

Sites and structures of archaeological and cultural interest: The character of the site will not be changed because it is already a mine. The certainty is possible and the duration for the life of prospecting. It’s not reversible, it relates to irreplaceable damage but it can be avoided through mitigation. A 300 m red flag area from the sea applies where special care and borehole location selection will take place.

Extent of visibility of prospecting relate to a drill rig and a 4x4 vehicle in one location for 2-3 hours. Visual disturbance caused by the drilling rig and other equipment is considered low. Its reversible, damage is not irreplaceable is possible and the impact can't be avoided.

Socio-economic structure of the area (negative impact on residences and operations): There will be no impact on the socio-economic structure of the area, because the area is a recognised mining node with various mine operations functioning along with other uses.

Traffic disturbances caused by increase of vehicle movement around the drilling site is limited to a drill rig and a 4x4 vehicle. In relation to the current activities it's a limited contributor therefore the impacts will be low. Its reversible, damage is not irreplaceable and the impact can be avoided.

Interested and affected parties: The prospecting will not impact upon the owners and of the property because of the small scale and no bulk sampling factor. The impact is considered to be low magnitude and the duration short to medium term while prospecting is active. The certainty is possible

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).

The attached EIA (Appendix 6) provides the detailed methodology used for the assessment of the significance of potential environmental impacts in the EIA. This methodology allows for the identified potential impacts to be analysed in a systematic manner, with significance rating (from insignificant to very high) assigned to each potential impact. The significance of an impact is defined as a combination of the consequence of the impact occurring and the probability that the impact will occur. The criteria used to determine impact consequence include extent, intensity and duration of the impact and are presented in the attachment.

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)

At the moment there is no alternative layout, the no-go areas were excluded eliminating impacts up-front. Should we receive comments that warrant changing the prospecting area and the no-go extent it will be considered to reduce the study area. The invasive activities that entail the drilling of approx. 500 phase 2a and possible 300 phase 2b exploration holes will have a minimal environmental and social impact as the drill sites will be confined to an 40 300 ha zone with footprint area of approximately 54.8 ha of the 83 623 ha sized mine area. This needs to be viewed in the context of the entire prospecting license area under application which it covers and it needs to be kept in mind that of the identified impacts will occur for a limited time and the extent of the impacts will be localised. All of the identified impacts can be suitably mitigated with the residual impact ratings being of low significance. After drilling activities have been completed and the drill pads rehabilitated to predrilling status, the impacts will cease to exist.

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).

Appendix 6

ix) Motivation where no alternative sites were considered.

The application is tied to one the Alexkor/RMC JV farm cadastral. The prospecting alternatives relates to site layout on a micro-scale after the prospecting right has been awarded. No other suitable farms exist in the area for applications. The prospecting application is a natural expansion of the existing mine due to the established infrastructure. The no-go development option is not regarded as feasible because potential resources are available. Mining land-use rights are in place. Based on this the farm is the only subject.

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

As part of the EIA, sensitive no-go areas were identified. These areas were excluded from the prospecting area and the area was reduced to half of the farm area. Futher to this no vehicle movment will be allowed within 100 m from the hwm of the sea (littoral active zone) and the 300 m zone from the hwm of the sea will be regarded as a red-flag heritage zone that require special care when drilling. The end result is a reduction of the area from 83 263 ha to 40 300 ha, with a combined drilling footprint of 54.8 ha.

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 erer 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.)**

Appendix 6

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 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.)	**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. Construction, 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
Appendix 6						

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

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.
Geo-hydrological	The area has been mined extensively during the past 80 years. This allowed for the establishment of a very good survey record of conditions relating to the ground and surface water situation at the site. It is proposed that a 125m buffer zone is established between the Ramsar area and the prospecting area in order to avoid any disturbance that might cause interference with the natural flow of ground water or to generate dust that might impact the water body at the Orange River mouth. No prospecting will take place in the Holgat- and Kamma Rivers and the riparian zones should be excluded from prospecting. This will eliminate any possible impacts on both surface and ground water in these areas. Exploration over the entire area will be limited to the unconsolidated primary aquifer where drilling will be done to an average depth of 15m below surface.	x	Conclusion & Reccomendation
Botanical	Report by Dr David J. McDonald Pr. Sci. Nat. Botanical Specialist - Is in process of completion will be added to this report at the end of April 2017 and forwarded to the relevant ecological commenting bodies. Personal communication revieled that the impacts will be low, due to the current level of disturbance and the exclusion of identified no-go and/or special management zones..	Findings will be included in this report	
Heritage	Based on the available information, the proposed prospecting is	x	Conclusion &

	unlikely to impact on heritage resources and as such, it is recommended that, at this stage and due to the limited nature of the proposed interventions, no further heritage studies are required on condition that: - The no-go areas identified in Figure 5 be implemented - A red-flag area of 300m be implemented from the high water mark where extra care is taken in terms of avoiding impacts to significant archaeological resources including an archaeological and palaeontological awareness program implemented prior to prospecting - A Fossil Finds Procedure be implemented - A complete Heritage Impact Assessment is conducted prior to any subsequent phases of the project that include bulk sampling or mining activities		Reccomendations

Attach copies of Specialist Reports as appendices

l) Environmental impact statement

(i) Summary of the key findings of the environmental impact assessment;

The majority of the prospecting activities are non-invasive and hence will have very low to negligible environmental or social impact. The invasive activities that entail the initial drilling of approximately 500 exploration holes will have a minimal environmental and social impact as each drill site will be confined to an area of 64 m2. If feasible it will be followed by another round of drilling that entail approx. 300 holes. This needs to be viewed in the context of the current application and Alexkor/RMC mine area which covers 83 263ha.

The assessed impact ratings after implementation of the mitigation measures are summarised in the attached Appendix 6.

(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**

Appendix 2

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

When prospect drilling commence the drill rig will be at one given drill hole for 2-3 hours, then the hole and drill site will be rehabilitated before it moves on to the next site approx. 1 km away. If new off-road tracks are created these tracks will be raked after a drill line is completed. The impacts are split in two sections namely 1- site set-up and 2 - operations.

1 - Set-up:

Cultural and Heritage - a Local Possible low impact before mitigation and with mitigation a very low impact is expected.

Noise - a Local possible very low impact before and after mitigation is expected.

Visual - a Local possible very low impact before and after mitigation is expected.

Traffic - a Local probable very low impact before and after mitigation is expected.

Dust - a Local definite very low impact before and after mitigation is expected.

Soil & vegetation - a Local definite very low impact before and after mitigation is expected.

Animal life - a Local definite very low impact before and after mitigation is expected.

Social - a Local possible very low impact before and after mitigation is expected.

Job creation - a Local positive impact is expected.

2 - Drilling Operation:

Cultural and Heritage - a Local Possible low impact before mitigation and with mitigation a very low impact is expected.

Noise - a Local possible very low impact before and after mitigation is expected.

Visual - a Local possible very low impact before and after mitigation is expected.

Traffic - a Local probable very low impact before and after mitigation is expected.

Dust - a Local definite very low impact before and after mitigation is expected.

Soil & vegetation - a Local definite very low impact before and after mitigation is expected.

Animal life - a Local definite very low impact before and after mitigation is expected.

Social - a Local possible very low impact before and after mitigation is expected.

Job creation - a Local positive impact is expected.

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 objectives of the EMPr will be to:

- Provide sufficient information to strategically plan the prospecting activities as to avoid unnecessary social and environmental impacts.
- Provide sufficient information and guidance to plan prospecting activities in a manner that would reduce impacts (both social and environmental) as far as practically possible.
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance.
- Provide a management programme that is effective and practical for implementation.

Through the implementation of the proposed mitigation measures it is anticipated that the identified social & environmental impacts can be managed and mitigated effectively. Through the implementation of the mitigation and management measures it is expected that:

- Heritage/cultural resources can be managed by avoidance of known resources and though consultation with landowners/stakeholders. Contractor personnel will also be briefed of these sensitivities and consequences of any damage/removal of such features, the on-site geologist will be responsible for micro-sitting of drill hole positions to identify and avoid resources;
- Noise generation can be managed through consultation and restriction of operating hours and by maintaining equipment and applying noise abatement equipment if necessary;
- Visual intrusion can be managed through consultation with landowners/ stakeholders and by suitable siting of drill sites
- Traffic is managed as far as possible, speed limits are honoured and vehicle congested is prevented in and around the drilling site;
- Dust fall can be managed by application of speed limits and avoiding established operations
- Soil disturbance and clearance of vegetation at drill areas will be limited to existing disturbed areas and to the absolute minimum required no unnecessary uprooting of vegetation and disturbed areas will be raked;
- Animal life is protected, avoided and preserved at all times and the prospecting activities has minimal disturbance to the surrounding habitat;
- Social friction with landowners/mine operators can be managed by employing strong, experienced personnel with proven skills in public consultation and conflict resolution during stakeholder consultation phases.

All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and that they treat locals with respect and courtesy at all times.
- Employment is created during the prospecting- contributing to the local economic even if it is only on a temporary basis. Possible future mining could sustain the area and its people.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

- Maintain a 125 m buffer from the Ramsar area (Orange River)

Refrain from prospecting in the Holgat and Kamma river riperian zones

- Respect all no-go areas as per constraints map
- No vehicle driving within 100 m from the high water mark of the sea (littoral active zone), only hand drilling allowed in this area
- Regard the 300 m heritage zone from the high water mark of the sea as a red-flag area. Apply the following principles where extra care is taken in terms of avoiding impacts to significant archaeological resources including an archaeological and palaeontological awareness program implemented prior to prospecting
- Maintain a minimum 500m buffer from any infrastructure or dwelling;
- Landowners and mine operators should be engaged with at least 1 month prior to any site activities being undertaken once drill sites are known, in order to stipulate the drilling activities for security reasons; and
- A map detailing the drilling locations should be provided to the landowners and mine operator as well as the DMR prior to commencement of prospecting activities.

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

(Which relate to the assessment and mitigation measures proposed)

- It is assumed that the description of the proposed project, provided by the applicant is sufficient for providing the authorities with the right information for understanding the proposed project.
- It is assumed that the public consultation process to be undertaken as part of the Environmental Impact Assessment (EIA) will suffice and that the application will be soldiered objectively based on stakeholders' response to the proposed 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.

It is the opinion of the EAP that the proposed prospecting activities should be authorised.

- The environmental impacts associated with the limited drilling activities are minimal provided that the proposed mitigation is implemented;
- The spatial extent of the physical impact is approx. 32 ha phase 2a drilling (500 sites) and 22. 8 ha phase 2b drilling (300 sites) if deemed feasible on a 83 263 hectares application area;
- With appropriate care and consideration the impacts resulting from drilling can be suitably avoided, minimised or mitigated;
- With implementing the appropriate rehabilitation activities (immediate and follow-up), the impacts associated with the drilling activities can be reversed; and
- Without implementation of prospecting activities the knowledge concerning the potential mineral resource within the prospecting right area will not be confirmed.
- A need to position future mining to satisfy the expected demand for Heavy Minerals is of utmost strategic importance.
- Heavy mineral mining will most definitely give the communities in the area a new lease of life and will see to the further sustainability of infrastructure of the area that will be to the advantage of the greater community.

• A very important aspect is that future heavy mineral mining will result in the systematic rehabilitation of the area including the slimes and coarse tailing dumps that will be mined and eradicated from the landscape presently littered by large dumps.

• If mining should go ahead, and EIA will be conducted. It will be integrated with the current EMP and closure objectives to allow for a smooth transition.

ii) Conditions that must be included in the authorisation

• Maintain a 125 m buffer from the Ramsar area (Orange River)
• No mining in riperian zones of the on-site watercourses
• Respect all no-go areas as per constraints map
• No vehicle driving within 100 m from the high water mark of the sea (littoral active zone), only hand drilling allowed in this area
• Regard the 300 m heritage zone from the high water mark of the sea as a red-flag area. Apply the following principles where extra care is taken in terms of avoiding impacts to significant archaeological resources including an archaeological and palaeontological awareness program implemented prior to prospecting
• Maintain a minimum 500m buffer from any infrastructure or dwelling;
• Landowners and mine operators should be engaged with at least 1 month prior to any site activities being undertaken once drill sites are known for good communication and security reasons; and
• A map detailing the drilling locations should be provided to the landowners and mine operator as well as the DMR prior to commencement of prospecting activities.
• Record must be kept of the implementation of the EMP measures and monitoring of the efficiency of the implemented measures;
• Follow-up rehabilitation work 3 months after the initial rehabilitation is essential; and
• A suitable closure plan must be submitted to show sufficiently providence for the avoidance, management and mitigation of environmental impacts associated with the decommissioning of the proposed activities.

q) Period for which the Environmental Authorisation is required.

The authorisation is required for the duration of the prospecting right which is an initial 5 years plus a potential to extend the right by an additional 3 years. Therefore a total period of 8 years is required.

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.

An undertaking is provided at the end of this report

s) Financial Provision

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

i) Explain how the aforesaid amount was derived.

A financial provision of approximately, R 149 932, 75 which includes rehabilitation activities has been made by Vast Mineral Sands. A breakdown of these costs is presented in Appendix 10.

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).

Refer to the PWP (Appendix 3) indicating the budget for the prospecting operation

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** .

A full consultation process will be implemented during the environmental authorisation process. The purpose of the consultation is to provide affected persons the opportunity to raise any potential concerns. Concerns raised will be captured and addressed within the public participation section of this report. As the final positioning of the drill sites cannot be confirmed without completion of phase 1 of the prospecting programme, a recommendation has been made to ensure that the landowner and mine operators are engaged with a minimum of 1 month prior to implementing invasive activities (drilling) for security and communication reasons. The purpose of the re-consultation is to ensure that socio-economic impacts on directly affected persons can be raised and where possible addressed.

(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 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

Mitigation measures proposed in this report include that the 300 m from the HWM of the sea will be regarded as a red-flag zone where special care will be taken to avoid visible resources. pre-drilling awareness training will take place and a finds procedure will be implemented as per attached Appendix 11.

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 EAP must attach such motivation as **Appendix 4)**.

The proposed site was selected based on extensive research and also following on information from previous prospecting and mining activities in the area. There are known resource deposits in the area and mining is currently taking place on the proposed project area. In terms of the technologies proposed, the proposed prospecting has been chosen based on the long term success. The prospecting activities proposed in the Prospecting Works Programme (PWP) is dependent on the preceding phase as previously

discussed, therefore no alternatives are indicated, but rather a phased approach of trusted prospecting techniques.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

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 1(a) herein as required).

It is confirmed that the requirements for the provision of the details and expertise of the EAP are already included in PART B, section (1)(h)

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 (1)(h) herein as required).

It is confirmed that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART B, section (1)(h).

c) Composite Map

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

Please refer to Appendix 2 & 5 for the Composite Map

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)

After prospecting is completed at each drill site, it will be rehabilitated to be safe, stable, non-polluting, non-eroded and in a state that is suitable for agreed postclosure land use. A follow-up rehabilitation inspection will follow 3 months after initial work.

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

No water is required or water resource are affected (no prospecting inside a watercourse or riprerian zone and drilling will not affect groundwater as per specialist report), therefore no water use licence apply.

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

iv) Impacts to be mitigated in their respective phases

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

ACTIVITIES **(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.)	**PHASE** (of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).	**SIZE AND SCALE of disturbance** (volumes, tonnages and hectares or m^2)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (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)	**TIME PERIOD FOR IMPLEMENTATION** 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:- .. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Site establishment, operational drilling. rehabilitation all takes place within a 2-3 hour period before the rig move onto new site.	Setup; drilling & rehabilitation	Drilling Phase I - 32 ha Drilling Phase II - 22.8 ha	- Heritage resources in the 300 m coastal red-flag zone need to be avoided, when drill positions are determined in the veld. Awareness programme will assist the lead Geologist to determine site selection and what to look out for. If resources area found the Finds Procedure will be implemented.	Heritage Act	Before and during drilling activities
			- Noise; Operational and decommissioning activities will be limited to daylight hours on Mondays to Saturdays and no activities on Sundays and public	SANS 10103 guideline	Before and during drilling activities

			holidays; -Separation of distance of minimum 500m, but preferably 1000m to be maintained between drill sites and dwellings; Noise abatement equipment, such as mufflers on diesel engines, will be maintained in good condition; and - If intrusive noise levels are experienced by any person at any point, the source of the noise will be moved if practical, rig is only 2-3 hours on a site then it moves on.		
			-The drilling rig and other visually prominent items on the site will be located in consultation with the landowner if in sensitive area; - Rig will move on after 2-3 hours of drilling - Drilling takes place inside mine area, plus very short duration	N/a	Before and during drilling activities
			-Obey traffic signs around the site -Vehicles to make trips on/off site only when necessary - Vehicles to adhere to local speed limits as far as possible when driving in around site	Mine rules	Before and during drilling activities
			- Dust; Separation distance of minimum500m but preferably 1000m to be maintained between	GN R. 827 (NEM:AQA)	Before and during drilling activities

			drill sites and dwellings; and - Low vehicle speeds will be enforced on unpaved surfaces		
			- Soil & vegetation disturbance and clearance of vegetation at drill areas will be limited to the absolute minimum required; - No clear scraping (dozing) be carried out to establish a level drill site. - Avoid surface vegetation clearance to leave the roots intact so that vegetation can coppice and regrow; or avoid intact virgin areas and move drill hole - No driving on the beach and only hand drilling within 100 m from the hwm. - Use existing tracks as far as possible and if the rig drive off-road, rake tracks and compacted drill area after works - On site geologist need to avoid any animal nesting or manure sites - If any animals are encountered they must not be killed or injured, but should rather be removed or chased away from the site	NEM:BA & ICMA	Before and during drilling activities
			- All operations will be carried out under the guidance of a strong, experienced geological manager with proven skills in	Mine Rules	

			public consultation and conflict resolution; - All prospecting personnel will be made aware of the local conditions and sensitivities in the mine area - There will be a strict requirement to treat local residents and operators with respect and courtesy at all times.		

e) Impact Management Outcomes

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

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. Construction, 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.** • **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.**
Site establishment, operational drilling. rehabilitation all takes place within a 2-3 hour period before the rig move on to new site.	Cultural and Heritage	Destruction or loss of Cultural and Heritage Resources within the 300 m red-flag coastal zone	Setup & drilling	Extra care is taken in terms of avoiding impacts to significant archaeological resources by micro-sitting drill hole positions including an archaeological and palaeontological awareness program implemented prior to prospecting . A Fossil Finds Procedure be implemented.	Avoid impact and ensure very low levels of impact
	Noise	Noise Generation	Setup, drilling & rehabilitation	Activities will be limited to daylight hours on Mondays to Saturdays and no activities on Sundays and public holidays; Separation of distance of minimum 500m, but preferably 1000m to be maintained between drill sites and dwellings; Noise abatement equipment, such as mufflers on	Minimise intensity of impact

				diesel engines, will be maintained in good condition; and If intrusive noise levels are experienced by any person at any point, the source of the noise will be moved if practical, rig is only 2-3 hours on a site then it moves on.	
	Visual; Traffic & Dust	Additional activity and rig on site, increase in traffic movement and dust nuicence	Setup, drilling & rehabilitation	Respect landowner/operators needs to avoid visual intrusion and stay within the mine area; Obey traffic signs around the site; Vehicles to make trips on/off site only when necessary; Vehicles to adhere to local speed limits as far as possible when driving in around site Separation of distance of minimum 500m, but preferably 1000m to be maintained between drill sites and dwellings to avoid dust impacts; and keep vehicle speeds low to be enforced on unpaved surfaces	Avoid and minimise impacts and disturbance. The operation will be in mine area only therefore mine rules apply.
	Soil, vegetation & animals	Most of the drill holes will be on existing disturbed areas but there will be drilling off-road and insdie intact areas and on	Setup, drilling & rehabilitation	Soil & vegetation disturbance and clearance of vegetation at drill areas will be limited to the absolute minimum required; No clear scraping (dozing) be carried out to establish a level drill site. Avoid surface vegetation clearance to leave the roots	NEM:BA & ICMA; avoid sensitive feature by on site micro-sitting of drill holes by geologist and avoid no-go areas, this will avoid impacts.

		the beach		intact so that vegetation can coppice and regrow; or avoid intact virgin areas and move drill hole Use existing tracks as far as possible and if the rig drive off-road, rake & close tracks and compacted drill area after works No driving on the beach and only hand drilling within 100 m from the hwm. On site geologist need to avoid any nesting or manure sites If any animals are encountered they must not be killed or injured, but should rather be removed or chased away from the site .	
	Social	Conflict with landowners and mine operators	Setup, drilling & rehabilitation	All operations will be carried out under the guidance of a strong, experienced geological manager with proven skills in public consultation and conflict resolution; All prospecting personnel will be made aware of the local conditions and sensitivities in the mine area There will be a strict requirement to treat local residents and operators with respect and courtesy at all times.	Avoid impacts

f) Impact Management Actions

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

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…)**	**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** **Remedy through rehabilitation..**	**TIME PERIOD FOR IMPLEMENTATION** 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:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.	**COMPLIANCE WITH STANDARDS** (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)
Site establishment, operational drilling. rehabilitation all takes place within a 2-3 hour period before the rig move on to new site.	Cultural and Heritage	Extra care is taken in terms of avoiding impacts to significant archaeological resources by micro-sitting drill hole positions including an archaeological and palaeontological awareness program implemented prior to prospecting. A Fossil Finds Procedure be implemented	Planning stage, training personnel before going into the field, setup selection and micro-sitting and during drilling identify if resources are found	Adhere to the Heritage Act and the recommendations from Heritage Specialist.
	Noise	Activities will be limited to daylight hours on Mondays	Setup, drilling and rehabilitation	SANS 10103 guideline and acceptable for the mine

		to Saturdays and no activities on Sundays and public holidays; Separation of distance of minimum 500m, but preferably 1000m to be maintained between drill sites and dwellings; Noise abatement equipment, such as mufflers on diesel engines, will be maintained in good condition; and If intrusive noise levels are experienced by any person at any point, the source of the noise will be moved if practical, rig is only 2-3 hours on a site then it moves on.		operations
	Visual; Traffic & Dust	Respect landowner/operators needs to avoid visual intrusion and stay within the mine area; Obey traffic signs around the site; Vehicles to make trips on/off site only when necessary; Vehicles to adhere to local speed limits as far as possible when driving in around site; Separation of distance of minimum 500m, but preferably 1000m to be maintained between drill sites and dwellings to avoid	Setup, drilling and rehabilitation	Mine rules and acceptable to the mine operators

		dust impacts; and keep vehicle speeds low to be enforced on unpaved surfaces		
	Soil, vegetation & animals	Soil & vegetation disturbance and clearance of vegetation at drill areas will be limited to the absolute minimum required; No clear scraping (dozing) be carried out to establish a level drill site Avoid surface vegetation clearance to leave the roots intact so that vegetation can coppice and regrow; or avoid intact virgin areas and move drill hole Use existing tracks as far as possible and if the rig drive off-road, rake tracks and compacted drill area after works No driving on the beach and only hand drilling within 100 m from the hwm. On site geologist need to avoid any nesting or manure sites If any animals are encountered they must not be killed or injured, but should rather be removed or chased away from the site .	Training personel before going into the field, setup selection, access selection by avoiding new tracks and micro-sitting before drilling	NEM:BA & ICMA, limit new disturbance try stay within existing disturbed mine footprint.
	Social	All operations will be	Planning stage, training	Mine rules

		carried out under the guidance of a strong, experienced geological manager with proven skills in public consultation and conflict resolution; All prospecting personnel will be made aware of the local conditions and sensitivities in the mine area There will be a strict requirement to treat local residents and operators with respect and courtesy at all times.	personnel before going into the field, setup, drilling & rehabilitation	

i) Financial Provision

(1) Determination of the amount of Financial Provision.

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

The closure objectives are to record and communicate the results of the prospecting programme to the participating stakeholders, and to receive an effective closure certificate should the prospect indicate that the resource(s) would not support a sustainable mining operation.

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

Minimise the area to be disturbed and to ensure that the areas disturbed during the prospecting activities are rehabilitated and stable, as per the commitments made in the EMP. Sustain the pre-prospecting land use, and return the site the state it was found in.

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

After drilling has been completed in one area, the drilling team will ensure the site is reverted back to its original state by implementing the measures listed in Appendix 11.

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

The Company is required to make the prescribed financial provision for the rehabilitation or management of negative environmental impacts. If the Company fails to rehabilitate or manage any negative impact on the environment, the DMR may, upon written notice to the Company, use all or part of the financial provision to rehabilitate or manage the negative environmental impact in question. The Company will specify that the drilling contractor is required to comply with all the environmental measures specified in the EMP. This will include avoiding unnecessary disturbance of natural vegetation and the rehabilitation of each drill site, immediately after drilling has been completed. All tracks to the drill sites must be rehabilitated at the end of use. The closure objective is to leave the site as it was found. The financial provision provides for the final checking of all sites before closure.

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

The quantum of the financial provision required is R 149 932, 75. The Company must annually update and review the quantum of the financial provision (as per Regulation 54 (2) of the MPRDA). The financial Quantum Calculation is found under Appendix 10.

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

Please refer to Appendix 3 for more details on the financial provision for the proposed activity

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

g) Monitoring of Impact Management Actions
h) Monitoring and reporting frequency
i) Responsible persons
j) Time period for implementing impact management actions
k) 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
All Prospecting Activities	N/a	Ensure that the prospecting programme is being implemented in line with the approved prospecting works programme.	Consulting Geologist	Submit an annual prospecting progress report to DMR
Setup & Drilling Activities	Heritage Noise Dust fall Visual Soil & vegetation Social Housekeeping & maintenance Waste management Rehabilitation	Weekly inspections will cover the following: - Daily site selection to avoid heritage resources - Daily site selection to avoid intack fauna & flora sites - Implementation of effective waste management - Establish and implement a stakeholder compliant register on-site and ensure that all complaints are responded to promptly - Ensure that an oil spill kit is readily available - Ensure that all chemicals and hydrocarbons are stored within	On site Geologist	Weekly inspection and monthly internal reporting to EAP/ECO

		bund walls - Have driptrays on site to avoid soil contamination - Rehabilitation of drill sites. - Control and minimise the development of new access tracks by planning the daily route to follow - Appropriate storage and handling of topsoil.		
Post drilling	Open drill holes Revegetation Stability Soil erosion Closed tracks	The drill sites will be inspected 3 months after rehabilitation, to ensure futher backfilling if required, no erosion has occurred and that closed tracks is still effectively blocked and not recocnised as tracks.	On site Geologist	Monitoring Report
Environmental Authrisation	All commitments contained in the BA Report and accompanying EMPr	Ensure commitments made within the approved BAR and EMPr are being adhered to.	Independent EAP/ECO	Undertake and submit an environmental performance audit every year to DMR

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

Regular monitoring of all the environmental management procedures and mitigation measures shall be carried out by the Company in order to ensure that the provisions of this EMP are adhered to. Internal monthly reporting will take place and a follow-up report 3 months after rehabilitation. Formal monitoring and performance assessment of the EMP will be undertaken annually. Site photographs taken before drilling commences and after each drilling site has been rehabilitated must be included in the monthly internal report and the performance assessment reports

m) Environmental Awareness Plan

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

Environmental awareness training courses will be provided to all personnel on site by the independent EAP/ECO.

The environmental training courses will include, amongst others, aspects such as:
- Awareness training for contractors and employees
- Job specific training – training for personnel performing tasks which could cause potentially significant environmental impacts;
- Comprehensive training – on emergency response, spill management, etc;
- Specialised skills for engagement with mine operations;
- Mine rules and security protocol
- Training verification and record keeping.
- Environmental issues on site;
- Roles and responsibilities;
- The operational environmental management measures;
- Cultural awareness; and
- Heritage discovery procedures (Appendix 12).

All attendees shall remain for the duration of the course and, on completion, sign an attendance register that clearly indicates participants' names. A copy of the register shall be kept on record.

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

All employees must be provided with environmental awareness training to inform them of any environmental risks and security protocols which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment. This should be in conjunction with the implementation of the EMP.

n) Specific information required by the Competent Authority

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

Not applicable at this stage but as part of the anaul audit the finacial provsion will be reviewed.

2) UNDERTAKING

The EAP herewith confirms

a) the correctness of the information provided in the reports ☒

b) the inclusion of comments and inputs from stakeholders and I&APs ; ☐

c) the inclusion of inputs and recommendations from the specialist reports where relevant; ☒and

d) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected. parties are correctly reflected herein. ☐

Signature of the environmental assessment practitioner:

PHS Consulting

Name of company:

10 April 2017

Date:

-END-