



IMVUSA KOALIEN (PTY) LTD

**PROPOSED KAOLIN MINING PERMIT APPLICATION: PORTION 1 OF FARM
RONDAWEL 638, KAMIESBERG LOCAL MUNICIPALITY, NAMAQUA DISTRICT
MUNICIPALITY, NORTHERN CAPE**

**FINAL BASIC ASSESSMENT REPORT (FBAR) &
ENVIRONMENTAL MANAGEMENT PROGRAMME
REPORT (EMPr)**


DMR REF: NCS 30/5/1/1/2/1 (10638) MP

Date: 30 January 2018

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mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

FINAL 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).

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DMR REFERENCE NUMBER: NCS 30/5/1/1/2/1 (10638) MP

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.

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

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

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PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1 CONTACT PERSON & CORRESPONDENCE ADDRESS

1.1 Details of the EAP

Name of The Practitioner: Jennifer Barnard (Green Direction Sustainability Consulting (Pty) Ltd)
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1.2 Expertise of the EAP

The qualifications of the Environmental Assessment Practitioner (EAP)

- Masters in Environmental Science: University of KwaZulu-Natal, Durban
- SACNASP: Pr. Nat. Sci. (Professional Natural Scientist)
- EAPASA: Registered with Interim Certification Board of Assessment Practitioners in South Africa

Refer to **Appendix A** for CV of EAP.

2 LOCATION OF THE ACTIVITY

Farm Name:	Portion 1 of the farm Rondawel 638
Application area (Ha)	5 ha
Magisterial district:	Namaqualand
Distance and direction from nearest town	33km south-west from Garies
21 digit Surveyor General Code for each farm portion	C053 0000 00000638 00001

2.1 Locality Map

Refer to **Appendix B1** and **Appendix B2** which shows that the proposed Kaolin mining area is situated on a 5ha section of Portion 1 of the Farm Rondawel 638. The nearest town is Garies, which is located adjacent to the N7, and the site is located 33km in a south-westerly direction along existing farm roads and tracks.

3 DESCRIPTION OF THE PROPOSED ACTIVITIES

3.1 The Scope of the Proposed Activities

The proposed kaolin mining area is situated on a 5ha section on Portion 1 of the Farm Rondawel 638. The kaolin mining operation is to be carried out by the Applicant, Imvusa Kaolien (Pty) Ltd. The mining operation is to be carried out by the Applicant and it must be noted that this operation is only an extension of an existing operation (NC 10423MP) under cover of a separate environmental authorization and approved Decommissioning, Rehabilitation and Closure Plan with the necessary financial provision.

Refer to **Appendix B3** which shows the proposed mine location in relation to other mining permits and prospecting rights, and to **Appendix B4** for the mine layout and co-ordinates. **Appendix B5** shows the mine locality in relation to the prospecting area, Operation Company Head-Quarters (HQ) and access.

Kaolin clay that is to be mined is an inert material that is non-toxic and not affected by weathering. Kaolin residues are typically benign from a pollution point of view. Mining will be in the form of a simple process that only includes an opencast quarry with excavation, loading and hauling of Kaolin. The depth of the excavations will be less than 6 meters and no infrastructure or services will be developed as technical

resources will be shared with the adjacent mining operation. The areas allocated for mining and stockpiling would first be stripped of all available topsoil. This topsoil would be stockpiled separately for later use when the quarry is rehabilitated. Any overburden in the form of low grade Kaolin and rocks will be removed and stockpiled separately for later use when the quarry is rehabilitated. Due to a shortage of topsoil the white Kaolin will still be visible above surface after rehabilitation but with the natural movement of the dune sand will be covered naturally. Processing will take place by screening and Kaolin is sold as a FoT product without any refinery. No tailings are generated during the mining process. The estimated footprint of the excavation is 5Ha and at final closure the sides of the excavation will be profiled to form an even depression.

Refer to **Appendix C: Site Plan** which shows the location of the proposed Kaolin mining permit area, laydown areas and access routes. Refer to Section 3.3 below for a description of the proposed activities in the Construction, Operational and Decommissioning Phases.

3.2 Listed Activities

Table 1: Listed and Specified Activities

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE
Mining of Kaolin by means of an opencast quarry, including: <ul style="list-style-type: none"> Removal of topsoil and overburden and backfill on a cut and fill basis. Refer to Appendix C: Site Plan. Accessing the site via existing farm tracks. Temporary stockpiling of topsoil in laydown areas prior to replacing on mined areas. Removal of natural vegetation. 	5Ha	X	GNR 983 Listing Notice 1 of 2014 (dated 8 December 2014), as amended by GNR 327 (dated 7 April 2017): Activity 21: Any activity including the operation of that activity which requires a mining permit in terms of section 27 of MRPDA, including - (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing.
The rehabilitation, decommissioning and closure of the mining site which will only be required at final decommissioning and closure.	5Ha	X	GNR 983 Listing Notice 1 of 2014 (dated 8 December 2014), as amended by GNR 327 (dated 7 April 2017): Activity 22: The decommissioning of any activity requiring – (i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).
Mining will require the clearance of an area of 1 hectare or more of indigenous vegetation.	5Ha	X	GNR 983 Listing Notice 1 of 2014 (dated 8 December 2014), as amended by GNR 327 (dated 7 April 2017): Activity 27: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.
Opencast quarry including: <ul style="list-style-type: none"> Removal of topsoil overburden and Kaolin Ore Refer to Appendix C: Site Plan. Temporary stockpiling (drying) of extracted Kaolin ore prior to screening, bagging and hauling in trucks to end users. 	5Ha	X	GNR 983 Listing Notice 1 of 2014 (dated 8 December 2014), as amended by GNR 327 (dated 7 April 2017): Activity 28: Commercial or industrial developments where such land was used for agriculture on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.

3.3 Description of the activities to be undertaken

The methodology and technology to be employed in each phase is described below:

3.3.1 Construction phase: Development of infrastructure and logistics

- Access and service roads: Access to the mine works will be via the Garies-Groenriviermond public road and existing farm tracks as shown in **Appendix C**. Existing farm tracks will be used as haul roads and no new roads will be developed.
- Water supply: No process water is used in the mining process.
- Electricity supply: No electricity is used in the mining area.
- Logistics: No infrastructure is present or will be required due to the small scale and simple mining method and the infrastructure of the adjacent mining operation will be shared, such as the supply of electricity from a mobile genset contained in a bunded generator bay with spill prevention measures.
- Waste management facilities will be shared with the adjacent mining operation and a temporary storage area for used lubrication products and other hazardous chemicals is provided for the collection of the small volume of waste before it is removed to the company headquarters.
- A service and wash bay is also provided for as part of the adjacent mining operation together with a bio-cell (soil farm).
- A bunded fuel supply with service apron is also provided as part of the adjacent mining operation.

3.3.2 Operational Phase

- Mining will be in the form of a roll over operation and mining blocks will be restricted to 0.5 Ha and maximum 6 metres deep, and walls will be developed in benches not exceeding 3 metres high.
- Large scale excavations and kaolin stockpiling will be undertaken by an excavator and one ADT that is on site on an ad hoc basis. This operation will only involve the loading and hauling of raw Kaolin. Only one Excavator and one ADT will be used for excavating, loading and hauling and no processing will take place.
- The only surface disturbance except for the mining excavation, will be a temporary stockpile area for topsoil as it will be re-used on a cut and fill basis (Refer to **Appendix C: Site Plan**).
- The depth of the mining operations will be less than 5m as the Kaolin outcrop at the surface with less than 1m overburden consisting mostly of low grade Kaolin. The total area under excavation will approximately be 5Ha.
- Mining will be in the form of a cut and fill operation where overburden will be backfilled in mined out sections and covered with topsoil as excavations advance.
- No industrial or mine waste is generated during the mining process. Processing only includes the spreading of Kaolin to dry out where after is screened a bagged to be sold as a FoT product.
- Product stockpiles form part of the drying area that also serves as a dispatch yard.
- Primary processing only includes screening by means of a "trommel screen" provided as part of the adjacent operation so no Fine Residue Dumps (FRD) will be created.
- All overburden will be backfilled and the excavations profiled to form an even depression before topsoil is replaced and no waste dumps will be created above surface.
- Domestic or any other waste generated during the mining operation will be stored in a temporary storage area provided as part of the waste management and services of the adjacent operation from where it will be removed to the adjacent existing mining site's Head Quarters at the main farm building on the property.
- Only minor repairs are done on site at the service bay provided for as part of the adjacent operation or for emergency repair a PVC lining and drip trays are used and accidental spills are cleaned up immediately by removing of the contaminated soil. The small volume of contaminated soil will be treated in the bio-cell (soil farm) and only one excavator (TLB) and tractor trailer unit is used in the mining process that is transported to the Applicant's headquarters for major repairs.

3.3.3 Decommissioning Phase

Planning for closure and restoration from the beginning of an operation makes the process easier; waste can be removed as it is created, excavation can be planned so that topography restoration is less complicated, and topsoil can be re-used at shorter intervals. The decommissioning and closure phase at the end of the life of the mine will consist of implementing the Final Rehabilitation, Decommissioning and Closure Plan (attached at **Appendix F**).

Site rehabilitation can make the land more valuable and attractive for resale. Additionally, establishing a closure strategy (and communicating that activity to the public) can help enhance the company's reputation as a socially-responsible operation. The decommissioning and closure phase at the end of the life of the mine will consist of implementing this final rehabilitation, decommissioning and closure plan.

4 POLICY & LEGISLATIVE CONTEXT

4.1 Table of Applicable Legislation and Guidelines

Table 2: Applicable Legislation and Guidelines

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
<p>Constitution of South Africa, specifically everyone has a right; a. to an environment that is not harmful to their health or wellbeing; and b. to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: i. prevents pollution and ecological degradation; ii. promote conservation; and iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.</p>	<p>Mining Permit activities</p>	<p>The mining permit activities shall be conducted in such a manner that significant environmental impacts are avoided, where significant impacts cannot all together avoided be minimised and mitigated in order to protect the environmental right of South Africans.</p>
<p>Minerals and Petroleum Resources Development Act (No 28 of 2002) [MPRDA] Section 27 (as amended)</p>	<p>Application to the DMR for a mining permit in terms of Section 27 for an area not exceeding 5 hectares in extent.</p>	<p>The conditions and requirements attached to the granting of the Mining Permit will apply to the mining activities. DMR is the Competent Authority (CA) for this NEMA application</p>
<p>National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA]</p> <p>GNR 983 Listing Notice 1 of 2014 (dated 8 December 2014), as amended by GNR 327 (dated 7 April 2017) Listing Notice 1, Activity 21</p>	<p>Application to the DMR for Environmental Authorisation in terms of the 2014 EIA Regulations</p>	<p>An Application for Environmental Authorisation must be submitted to DMR for an Environmental Authorisation.</p> <p>The listed activities that are triggered determine the Environmental Authorisation (EA) application process to be followed.</p> <p>The appropriate EA will be obtained before proceeding with any Kaolin mining activities.</p> <p>Measures will be implemented to prevent any pollution occurring during the mining activities. The disturbed area shall be rehabilitated in such a way that is stable, non-polluting, non-eroded, free from alien invasive species and suitable for the agreed post closure land use.</p> <p>The compilation of this Basic Assessment Report and the Public Participation Process are required in terms of NEMA.</p>
<p>National Environmental Management:</p>	<p>Section 8.2.7 & 8.2.8.</p>	<p>There are no listed Critically</p>

Biodiversity Act, 2004 (Act 10 of 2004) [NEMBA] National list of ecosystems that are threatened and in need of protection, 2011 (in GN 1002 dated 2 December 2011)	Figures 3 & 4.	Endangered, Endangered or Vulnerable ecosystems on site. The site is located within in a CBA2 Area River FEPA sub-catchment.
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) [NEMBA] Alien and Invasive Species List, 2016 (in GN No. 864 dated 29 July 2016)	Section 8.2.6	According to Munica and Rutherford (2006), alien invasive vegetation associated with the Namaqualand Sand Fynbos are <i>Acacia cyclops</i> and <i>A. saligna</i> occur as scattered.
National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004). National Dust Control Regulations in GN R827 of 1 November 2013	Part B: EMP and Sections 13.8; 13.9; 13.10 & Section 15	Dust control measures are included in the EMPr
National Environmental Management: Waste Act, (Act 59 of 2008) [NEMWA] (as amended)	Part B: EMP and Sections 13.8; 13.9; 13.10 & Section 15 Management measures are included in the EMPr and as part of the environmental awareness plan.	The generation of potential waste will be minimized through ensuring employees of the Applicant are subjected to the appropriate environmental awareness campaign before commencement of mining. All waste generated during the mining activities will be disposed of in a responsible legal manner. Proof of legal disposal will be maintained on site.
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	Section 8.2.11	The kaolin mining will take place on a 5ha area. An Archaeological Impact Assessment report is attached at Appendix G . The recommendations have been included in the FBAR and EMPr. The Interim Comment from SAHRA is attached at Appendix D . The formal letter and geological map (requested by SAHRA) from Dr Almond has been attached to the end of the AIA report (Appendix G).
National Water Act, 36 (Act 36 of 1998)	Section 8.2.7 for description of surface water resources in local area.	No Water Use License is required.
Promotion of Administrative Justice Act, 2000 (Act 3 of 2000) [PAJA]	Decision by the Competent Authority	Gives effect to section 33 of the Constitution that requires that "Everyone has the right to administrative action that is lawful, reasonable and procedurally fair". All administrative actions must be based on the relevant considerations
Land Use Planning Act, 2014 (Act 3 of 2014) (LUPA)	Comments required from the Kamiesberg Local Municipality.	Consent use in terms of the Kamiesberg Municipal Planning By-Law, 2015 is required to permit mining on properties that are zoned for Agricultural purposes.
Municipal Plans and Policies		
Kamiesberg Integrated Development Plan (IDP)	Section 5.3	The Need & Desirability of the project is referenced in terms of the LM IDP, specifically relating to employment creation, adaption to climate change and sustainable resource utilisation. Relevant mitigation measures have been included in the EMPr.
Namaqua District Municipality IDP	Section 5.4	The Need & Desirability of the project is referenced in terms of the District Municipality IDP, specifically relating to employment creation, and ensuring the implementation of environmentally

		sustainable practices, along with an integrated approach to addressing climate change response, which are included in the EMPr
Northern Cape Provincial Spatial Development Framework (NCPSPDF)	Section 5.5	Sustainable development is a key consideration as addressed in this impact assessment report.
Northern Cape Provincial Growth and Development Strategy 2004-2014 (NCPGDS)	Section 5.6	Sustainable development is a key consideration as addressed in this impact assessment report.
Standards, Guidelines and Spatial Tools		
Mining and Biodiversity Guideline: 2013 Mainstreaming biodiversity into the mining sector. Pretoria.	Section 5.1 & 8.2.8 Figure 5	The mitigation measures contained in Appendix E and carried through to the EMPr address and mitigate the potential impacts of the proposed mining site within an area zoned as “Category D: Moderate Biodiversity Importance”, which requires (in summary), an environmental impact assessment process to address the issues of sustainability.
DEA Guideline on Need & Desirability (2017)	Section 5.5	Refer to Section 5.5.
DEA Guideline on PPP DMR Guideline on Consultation with Communities and I&APs (undated)	Section 7	Refer to Section 7 and Appendix D.
DEAT Integrated Environmental Management Information Series 5: Impact Significance (2002)	Section 8	Refer to Appendix E.
DEAT Integrated Environmental Management Information Series 7: Cumulative Effects Assessment (2004)	Section 8	Refer to Appendix E.
SANBI BGIS databases (www.bgis.sanbi.org)	Baseline environmental description and Figures 1 to 5	Used during desktop research to identify sensitive environments within the mining permit area.
SANS 1929:2005 Edition 1.1 – Ambient Air Quality Limits for Common Pollutants	Management and monitoring measures	Standard for dust fallout. The activity in question for this application is driving on farm tracks.

5 NEED & DESIRABILITY OF THE PROPOSED ACTIVITIES

5.1 Mining and Biodiversity Guidelines (2013)

The Mining and Biodiversity Guidelines (2013)¹ state that: “Sustainable development is enshrined in South Africa’s Constitution and laws. The need to sustain biodiversity is directly or indirectly referred to in a number of Acts, not least the National Environmental Management: Biodiversity Act (No. 10 of 2004) (hereafter referred to as the Biodiversity Act), and is fundamental to the notion of sustainable development. International guidelines and commitments as well as national policies and strategies are important in creating a shared vision for sustainable development in South Africa”.

DMR, as custodian of South Africa’s mineral resources, is tasked with enabling the sustainable development of these resources. This includes giving effect to the constitutional requirement to “prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”².

The primary environmental objective of the MPRDA is to give effect to the “environmental right”³ contained in the South African Constitution. The MPRDA further requires the Minister to ensure the sustainable

¹ Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, South African Mining and Biodiversity Forum, and South African National Biodiversity Institute. 2013. Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector. Pretoria.

² Constitution of the Republic of South Africa (No. 108 of 1996).

³ Section 24 of the Constitution states that “everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other

development of South Africa's mineral resources, within the framework of national environmental policies, norms and standards, while promoting economic and social development.

The Mining and Biodiversity Guidelines (2013) document identifies four categories of biodiversity priority areas in relation to their biodiversity importance and implications for mining. The category of relevance to this proposed kaolin mining project is "Category D: Moderate Biodiversity Importance", which requires (in summary), an environmental impact assessment process to address the issues of sustainability. Refer to Section 8.2.7 and **Figure 5**. This FBAR and EMPr provides the environmental impact assessment required for the activities triggered.

5.2 Kaolin Material Supply and Employment benefits

Kaolin is inert and non-toxic, which makes it suitable for a range of different applications. Filler grade Kaolin is used, among other applications, in the manufacture of paper, paint, adhesives, rubber and pesticides, and is used in certain medications. It is therefore a very valuable commodity used in industry.

The proposed Kaolin mining activity is considered to be a temporary land use, and the area will be rehabilitated in accordance with the Mining Closure and Rehabilitation Plan, attached as **Appendix F**. The benefits of the project can be divided into social and economic classifications. The mine will provide limited direct employment for local persons. The operation further creates indirect employment opportunities in the industrial and medical industries.

5.3 Kamiesberg IDP (2017 2018)

In the Constitution of South Africa (108 of 1996) the objectives of a municipality or local government structure are described as follows under "section 152. (1) the objects of local government are-

- (a) to provide democratic and accountable government for local communities;
- (b) to ensure the provision of services to communities in a sustainable manner;
- (c) to promote social and economic development;
- (d) to promote a safe and healthy environment; and
- (e) To encourage the involvement of communities and community organisations in the matters of local government".

The vision of the Local Municipality is: "The establishment of a climate change orientated and economically viable lifestyle through sustainable growth".

The strategic objectives of the Kamiesberg IDP 2011 to 2017 include:

- To create an enabling environment for economic growth that attracts investors, encourages innovation and facilitate pro-poor interventions
- To ensure ecological integrity through sustainable practices of municipal governance.

The Kamiesberg Municipality serves a geographical area of 11 742 km² and is divided into four municipal wards. The total population is estimated at over 10 187, the majority of whom are not economically active. The municipality provides services to the towns and settlements of Garies, Hondeklipbaai, Kamassies, Kamieskroon, Kharkams, Kheis, Klipfontein, Leliefontein, Lepelfontein, Nourivier, Paulshoek, Rooifontein, Soebatsfontein, Spoegrivier and Tweerivier. The nearest business centre is Springbok 120 km away. The municipality provides electricity to 86 farms within its area.

The Kamiesberg Local Municipality is divided into four municipal wards and provides services to the towns and settlements of Kamassies, Rooifontein, Nourivier, Leliefontein, Paulshoek, (Ward 4), Kheis, Kharkams, Tweerivier (Ward 3) Koiingnaas, Hondeklipbaai, Soebatsfontein, Spoegrivier, Kamieskroon (Ward 1) Garies, Lepelfontein and Klipfontein (Ward 2).

The project area is located with the Garies, Lepelfontein and Klipfontein Municipal Ward (Ward 2).

Ward 2 is the biggest ward of all 4 wards in the Kamiesberg area with a total population of 3 262 which represent 32% of the total population. The male population consists of 50.33% and female population is 49.63% of the total for Ward 2.

measures that: prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

A strong focus on Local Economic Development is required to create local job opportunities and to create a conducive environment for investment.

The proposed kaolin mining project will provide job security, local employment, local skills transfer, economic upliftment and Kaolin material supply for various industrial and medical sectors, in a sustainable manner as ensured through this environmental impact assessment process and implementation of the Closure and Rehabilitation Plan.

Climate Change is affecting socio-economic indicators such as water, sanitation, food security, health, energy, industrial developments and human settlements. Kamiesberg Municipality is under threat from climate change due to the sensitivity of the natural environments and un-developed beach areas along the coast to rising sea levels and the risk to development in low lying areas. Furthermore, changing rainfall patterns and extreme weather events have already had an impact and Kamiesberg has not recovered from the worst drought on record requiring emergency augmentation and restriction measures to secure a supply of water for the growing population.

In the past five years floods have caused major damage to property and infrastructure and put lives at risk, most notable being the freak floods in which had a significant effect on financial and insurance arrangements of the affected households. Special attention to the susceptibility of the rural areas is given in the Disaster Management Plan and a Joint Management Action Plan for the area has been developed by the authorities and community representatives.

The surrounding areas have also suffered major fires under hot and dry conditions. These issues not only affect the human population, but the endemic flora and the fauna are particularly susceptible to lasting changes in climate conditions. Over the long term this will lead to major loss of biodiversity. In Kamiesberg some mitigation measures against the repercussions of climate change are already in place, ranging from restrictions to develop in areas at risk of flooding, and desalination equipment to secure a fresh water supply.

The proposed Kaolin mine does not require water for processing. The effects of climate change, such as flood events, on the proposed kaolin mining project will be mitigated as per the measures contained in the EMPr. The mitigation for emissions of greenhouse gases from vehicles associated with the kaolin mining activities is addressed in Appendix E and included in the EMPr.

5.4 Namaqua District Municipality Draft IDP 2017 2018

The vision of the Namaqua District Municipality IDP is: “Namakwa District Municipality, a centre of excellence!”

The Mission Statement is:

A government institution legislatively mandated to stimulate economic and social transformation within the jurisdiction of the Namakwa District Municipality;

By fostering partnership with relevant institutions to ensure sustainable development

Proactively supporting and capacitating B-municipalities

Be a transparent and accountable centre of excellence.

Provide local leadership on environmental sustainability and climate change response.

The Strategic Objectives are

- Ensuring the delivery of basic services which include water, sanitation, electricity and waste management
- Creation of a thousand job opportunities through the community public works programme, as part of 4,5 million EPWP jobs.
- Transformation of administrative and financial systems of NDM and relevant B-Municipalities, which includes supply chain management
- Ensure the filling of six critical posts (Municipal Manager, Chief Financial Officer (CFO), Town Planner, Town Engineer, Human Resource Manager, Communication Manager) in all municipalities in the District
- Clean audits for all Municipalities.
- Building municipal capacity to enable municipalities to collect their revenue.
- Ensure sustainable economic and social transformation in the District.
- A society with a renewed sense of identity and confident in their skills and knowledge.
- Bridging the digital divide.
- Ensure the implementation of environmentally sustainable practices, along with an integrated approach to addressing climate change response, across all sectors.

The Namakwa District Municipality adheres to the values contained in the Batho Pele Principles.

The effects of climate change, such as flood events, on the proposed kaolin mining project will be mitigated as per the measures contained in the EMPr. The mitigation for emissions of greenhouse gases from vehicles associated with the kaolin mining activities is addressed in **Appendix E** and included in the EMPr.

5.5 Northern Cape Provincial Spatial Development Framework (NCPSDF)

The NCPSDF states that the: “Cape is not one of South Africa’s richest provinces in monetary terms. Accordingly, there is a need for coherent prioritisation of projects within a spatial economic framework that takes due cognisance of environmental realities and the imperative to create a developmental state”. The NCPSDF was designed as an integrated planning and management tool for all spheres of government to facilitate on-going sustainable development throughout the province.

The NCPSDF, together with the Provincial Growth and Development Strategy (PGDS), is set to fulfil an important role as a spatial and strategic guideline that addresses the key challenges of poverty, inequality and environmental degradation through the innovative use of the resources (capital) of the province for the benefit of all concerned.”

The potential for job security, employment and skills transfer are identified as positive environmental impacts in this report. The potential negative environmental impacts can be mitigated through the implementation of the EMPr and the Closure and Rehabilitation Plan, to ensure a sustainable kaolin mining activity.

5.6 Northern Cape Provincial Growth and Development Strategy 2004 – 2014 (NCPGDS)

The NCPGDS has the following vision for the Province: “Building a prosperous, sustainable growing provincial economy to reduce poverty and improve social development.” The strategy for the growth and development of the Province is guided by the following key principles:

- Equality – notwithstanding the need to advance persons previously disadvantaged, development planning should ensure that all persons should be treated equally;
- Efficiency –the promotion of the optimal utilisation of existing physical, human and financial resources;
- Integration – the integration of spatially coherent regional and local economic development and improved service delivery systems.
- Good Governance – the promotion of democratic, participatory, cooperative and accountable systems of governance and the efficient and effective administration of development institutions;
- Sustainability – the promotion of economic and social development through the sustainable management and utilisation of natural resources and the maintenance of the productive value of the physical environment;
- Batho Pele – the placement of people and their needs at the forefront of its concern and serve their physical, psychological, developmental, economic, social and cultural interests equitably.

5.7 DEA Guideline on Need and Desirability (2017)

As referenced in the DEA Guideline on Need and Desirability (2017), NEMA defines “evaluation” as “the process of ascertaining the relative importance or significance of information, in the light of people’s values, preferences and judgements, in order to make a decision.” In evaluating each impact (negative and positive) in terms of each of the aspects of the environment, “need and desirability” must specifically be considered in the analysis of each impact of the proposed activity. However, to determine if the proposed activity is the best option when considering “need and desirability”, it must also be informed by the sum of all the impacts considered holistically. In this regard “need and desirability” also becomes the impact summary with regard to the proposed activity. Refer to Sections 8 and 9 below which provides the impact process and summary, and **Appendix E** (the impact assessment tables).

These Guidelines state that: “In considering the impact summary it must be remembered that ultimately the aim of EIA is to identify, predict and evaluate the actual and potential risks for and impacts on the geographical, physical, biological, social, economic and cultural aspects of the environment, in order to find the alternatives and options that best avoid negative impacts altogether, or where negative impacts cannot be avoided, to minimise and manage negative impacts to acceptable levels, while optimising positive impacts, to ensure that ecological sustainable development and justifiable social and economic development outcomes are achieved”.

The **principles of Integrated Environmental Management (EIM)** as set out in Section 23 of NEMA have been considered in this environmental assessment, EMPr and Closure Report, as explained below.

- **Environmental management placing people and their needs at forefront of its concern, and serve their physical, physiological, developmental, cultural and social interests equitably** – This process will be undertaken in a transparent manner and all effort will be made to involve all the relevant stakeholders and Interested and Affected Parties. I.e. Public participation will be undertaken to obtain the issues / concerns / comments of the affected people for input into the process.
- **Socially, environmentally and economically sustainable development** – All aspects of the receiving environment and how this will be impacted has been considered and investigated to ensure a minimum detrimental impact to the environment. Where the impact could not be avoided, suitable and effective mitigation measures were proposed to ensure that the impact is mitigated. i.e. this report along with the EMPr proposes mitigation measures which will minimise the negative impacts of the proposal on the environment.
- **Consideration for ecosystem disturbance and loss of biodiversity** – the project site is located within the Groen River Freshwater Ecosystem Priority Area (FEPA) river sub-catchment, and in a Critical Biodiversity Area 2 (CBA2). The Namaqualand Sand Fynbos vegetation type found on site is not listed in the "National List of Threatened Ecosystems that are Threatened and in Need of Protection" in GN 1002 dated 9/12/2011. Ecosystem disturbance and loss of biodiversity are considered in the impact assessment. The kaolin extraction process is considered to be a relatively short-term type of mining. Rehabilitation back to the natural state is a key component, and will be undertaken in a phased manner as the mining activities progress. This report together with the EMPr and Closure Plan proposes mitigation measures which will minimise the impacts of the proposal on the environment.
- **Pollution and environmental degradation** – The implementation of recommendations made and proposed mitigations in the Environmental Management Programme Report (EMPr) will ensure minimum environmental degradation.
- **Landscape disturbance** – All aspects of the receiving environment and how this will be impacted has been considered and investigated to ensure a minimum detrimental impact to the environment. Where the impact could not be avoided, suitable and effective mitigation measures were proposed to ensure that the impact is mitigated. I.e. Landscape disturbance impacts associated with the development such as erosion and dust has been identified and mitigation measures have been proposed to minimise the impacts.
- **Waste avoidance, minimisation and recycling** – These aspects were considered and incorporated into the operational component of the project.
- **Responsible and equitable use of non-renewable resources** – These aspects have been considered and there is not much scope to reduce the use of non-renewable resources, such as vehicle transport.
- **Avoidance, minimisation and remedying of environmental impacts** - All aspects of the receiving environment and how this will be impacted have been considered and investigated to ensure a minimum detrimental impact to the environment. Where the impact could not be avoided, suitable and effective mitigation measures were proposed to ensure that the impact is mitigated. A number of mitigation measures have been proposed to minimise the impact of the proposal on the environment.
- **Interests, needs and values of Interested and Affected Parties** – This process has been undertaken in a transparent manner and all effort is being made to involve all the relevant stakeholders and Interested and Affected Parties (I&APs). The DBAR was made available to all identified I&APs to obtain comments on the proposed development.
- **Access of information** – Potential Interested and Affected Parties were notified of the proposal and the availability of the Draft Basic Assessment Report (DBAR), and therefore notified of the opportunity to register as an I&AP. Refer to Section 7.
- **Promotion of community well-being and empowerment** – This process will be undertaken in a transparent manner and all effort will be made to involve all the relevant stakeholders and I&APs.

Potential impacts on the biophysical environment and socio-economic conditions have been assessed, and steps have been taken to mitigate negative impacts, and enhance positive impacts. The recommendations

from the AIA (**Appendix G**) have been included in the FBAR. Any additional mitigation measures from SAHRA will be included in the EMPr. Adequate and appropriate opportunity will be provided for public participation. Environmental attributes have been considered based on the available information, and environmental management practices have been identified and established to ensure that the proposed activities would proceed in accordance with the principles of IEM.

6 MOTIVATION FOR THE PREFERRED SITE, ACTIVITY & ALTERNATIVE

Refer to Section 8 for the description of the alternatives.

The site was selected as it contains good quality Kaolin. The layout and technology of this proposed Kaolin mining project has been determined by the shape, position and orientation of the mineral resource, which is located 1 metre below overburden where it is proposed to be mined to a depth of 6 metres. Refer to the Site Plan attached as **Appendix C**. No new infrastructure is required to be constructed as all the existing mining facilities on the adjacent mine will be utilised, and there are existing access roads that will be used. The operational approach is practical and based on best practice to ensure a phased mining approach of blocks of 0.5 Ha, followed by rehabilitation in sequential stages.

- The preferred and only location of the Kaolin mining activity is on the earmarked section of Portion1 of Farm Rondawel 638.
- The preferred and only activity is the mining of Kaolin.
- The preferred and only technology is the use of an excavator, Front End Loader and Backhoe Actor to excavate the Kaolin, transport it to the primary processing yard, and for trucks to transport the bagged Kaolin offsite to its destination.
- The Site Plan or layout of the activity on the site is shown in **Appendix C**.

There are therefore no other reasonable or feasible sites, layouts, activities, technologies, or operational alternatives for further consideration in the impact assessment component, other than the mandatory “no-go” alternative that must be assessed for comparison purposes as the environmental baseline.

7 PUBLIC PARTICIPATION PROCESS

7.1 Introduction

The public participation process has been conducted according to the requirements as prescribed in Regulations 40 to 44 of the EIA Regulations, 2014 (as amended).

7.2 Comment period on Draft BAR and EMPr

The commenting period of 30 days on the Draft Basic Assessment Report and EMPr was from 1st November 2017 to 30th November 2017.

All public consultation documents, such as a proof of the advertisement placed in the local newspaper; site notices placed on site; letters delivered to neighbours; and proof of project notification, are included in **Appendix D**.

7.3 DMR Report on the Results of Consultation

The DMR's "Report on the Results of Consultation" is included at **Appendix D**.

7.4 Summary of Issues Raised by I&APs

This table has been completed following the public participation process conducted on the Draft Basic Assessment Report.

Table 3: Summary of Issues Raised by I&APs

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
<u>AFFECTED PARTIES</u>					
Landowner	X				
Mr AA Nieuwoudt: Portion 1 Rondawel No 638		No comments			
Lawful occupier/s of the land					
N/A					
Landowners or lawful occupiers on adjacent properties	X				
Ms JS Nieuwoudt : Remainder Rondawel No. 638		No comments			
Ms MJ Kotze: Portion 4; Rondabel No. 542		No comments			
Mr GS Nieuwoudt: Farm 657 Prev 542/2 & 541/4		No comments			
Ms C Barkhuizen: Remainder De Dam No 541		No comments			
Rondabel Boerdery CC: Portion 1 De Dam No 541		No comments			
Municipal Councillor	X				
c/o Kamiesberg Local Municipality: Mr. Joseph Cloete		No comments			
Municipality	X				

Kamiesberg Local Municipality: Mr. Joseph Cloete		No comments			
Namaqua District Municipality: Mr. Christiaan Fortuin		No comments			
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA					
N/A					
Communities					
N/A					
Dept. Land Affairs					
N/A					
Traditional Leaders					
N/A					
Dept. Environmental Affairs & Nature Conservation	X				
Ms Onwabile Ndzumo - Springbok		No comments			
Other Competent Authorities affected	X				
Dept. Water & Sanitation: Ms Jolene Van Wyk-Towell		No comments			
Dept. Agric., Land Reform & Rural Development – Mr Leon October		No comments			
SAHRA		Interim Comment attached at Appendix D.	Formal letter from Dr Almond and geological map required.	Formal letter obtained.	Refer to end of Appendix G.
<u>OTHER AFFECTED PARTIES</u>					
Rondawel Kaolin (Pty) Ltd		No comments			
FarloSPACE (Pty) Ltd – NC 30/5/1/1/2/12012PR		No comments			
<u>INTERESTED PARTIES</u>					
None					

8 PROCESS TO REACH THE PROPOSED PREFERRED ALTERNATIVE

8.1 Process to Reach the Proposed Preferred Alternative

With reference to the site plan provided as **Appendix C** 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.

8.1.1 Location or site alternatives

This site was selected because it contains good quality kaolin deposit close to the surface and it is located in a convenient position close to the N7 3km from Garies. It is located adjacent to an existing kaolin mine and will share the existing mine and farm infrastructure. The rural nature of the area effectively means that the proposed mining activities will not disturb any local communities. There are no reasonable or feasible location alternatives for further consideration.

8.1.2 Type of activity

The Applicant is not the land owner, so it would not be realistic for this company to propose another type of activity, as their core business is the supply of Kaolin material. The holder of a mining permit is required to rehabilitate the environment affected by mining to its natural state or to another predetermined land use. The mining activity takes place over a relatively short time period, so the selection of the best post-mining long term land use is an important consideration. In the case of this application the best post-mining land use alternative is to return the site to its natural state. Other activity alternatives have therefore not been considered as the purpose of the proposed project is to mine Kaolin from the deposit located on Portion 1 of Farm Rondawel 638 as indicated. The only other activity required to be assessed in terms of NEMA is the “do-nothing” alternative, as detailed further in section 8.1.6 below.

8.1.3 Design or Layout of activity

The design or layout of a mining project is determined by the shape, position and orientation of the mineral resource, which in this case is a kaolin deposit located on the farm. Best practice dictates that it is better to mine and rehabilitate the area sequentially in mining blocks, as this minimises the disturbance to the mining blocks once they have been rehabilitated. The significance of the environmental impacts associated with different possible design or layout alternatives would be very similar, therefore layout alternatives have not been assessed in the impact ratings table.

8.1.4 Technology Alternatives

The technology used in a mining project is determined by the shape, position and orientation of the mineral resource, with the technology alternative for kaolin mining being restricted to the use of a Front End Loader to remove the kaolin to an average depth of 6 metres, where it is packaged into bags and loaded on trucks for hauling to its destination. There are no technology alternatives for further consideration.

8.1.5 Operational alternatives

The proposed kaolin mining activities will take place during normal working hours from 07h30 to 17h00 on week days only. The hauling of the kaolin will therefore also take place during these hours. There are no operational alternatives for further consideration.

8.1.6 The No-go Alternative

The No-Go Alternative will mean that kaolin mining will not take place. There will be no supply of Kaolin for industrial and medical purposes. There will be no new employment opportunities or guaranteed job security for the existing mine employees on the adjacent mine.

The No-Go Alternative will result in the status quo remaining, and the kaolin deposit located adjacent to the existing mine not being exploited.

The assessment of alternatives must at all times include the “no-go” option as a baseline against which all other alternatives must be measured. The “no go” alternative is therefore assessed together with the preferred alternative.

8.2 The Environmental Attributes Associated with the Alternatives (Baseline Environment)

8.2.1 Regional Setting

The proposed kaolin mining area is located on Portion 1 of Farm Rondawel 638, located off the Garies-Groenriviermond public road approximately 33km south-west of Garies.

8.2.2 Landscape and Land Use

The regional topography surrounding the mining area is generally flat lying coastal plain with a mean height of 200m above sea-level, with undulations relating to incised episodic drainage channels. About 20 km east of the mining area, the topography takes on a hilly form of Namaqualand. The soils in the area are generally not suitable for dry land crop production therefore the pre-mining land capacity is categorized as Class III grazing land. The productivity of the area is very low at 8-10Ha/SSU.

Refer to **Figure 1** which shows the land-use as per the SANBI BGIS map viewer database dated 2009. The proposed project site is located adjacent to an existing Kaolin mine, shown on the land-use map as mine areas and areas of no vegetation. The land-use of the proposed project site is shown as Shrubland Fynbos and Low Shrubland, as evidenced on site. Refer to the site photographs at **Appendix B6**.

8.2.3 Geology

Mucina and Rutherford (2006) describe the geology and soils as aeolian, deep, loose red sand overlying marine or other sediments. Red Kalahari sand (Hutton) overlies the entire. The upper 10cm sandy soil contains a little humus and grass seed. This is underlain by sand of similar type, and is on average a further 40 cm thick. It generally overlies dorbank and/or silcrete and/or clay. Given the high sand content of this material as well as the lack of vegetation cover, it is very susceptible to erosion (particularly wind erosion) and gully erosion in areas where storm-water is allowed to concentrate.

The subsoil consists of kaolin (the commodity to be mined in this case), clayey sand/silt, dorbank and silcsete up to a maximum of 10m in depth.

8.2.4 Slope

Refer to **Figure 1** which shows the contours at a 20 metre intervals located between 120m and 140m above mean sea level.

8.2.5 Climate

Refer to the climate diagram inserted below as Diagram 1 for FFd1 Namaqualand Sand Fynbos [referenced from Figure 4.57 in Mucina and Rutherford (2006)]. The Mean Annual Precipitation is 106mm, and the Mean Annual Potential Evaporation is 2488mm. The mean annual soil moisture stress is 81% when evaporation demand was more than double the soil moisture supply.

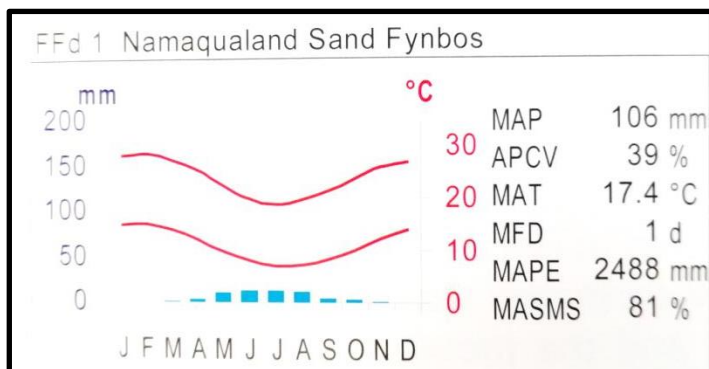


Diagram 1: Climate diagram for FFd1 Namaqualand Sand Fynbos

[The blue bars show the median monthly precipitation. The red lines show the mean daily maximum and minimum temperature. MAP: Mean Annual Temperature. MFD: Mean Frost Days. MAPE: Mean Annual Potential Evaporation. ASMS: Mean Annual Soil Moisture Stress (% of days when evaporation demand was more than double the soil moisture supply).]

8.2.6 Vegetation

Refer to **Figure 2** mapped from the SANBI BIS National Vegetation Map, which shows the location of the project site within FFd1 Namaqualand Sand Fynbos. According to Mucina and Rutherford (2006) this vegetation is associated with slightly undulating plains comprising both isolated streets and dune fields of aeolian sand (deep, loose red sand overlying marine or other sediments), scattered shrubs dominated by restoid and asteraceous fynbos with localised pockets of proteoid fynbos.

As referenced from the Approved EMPr for 10413MP (for the adjacent existing mine): “Most plant growth is restricted to the relatively shallow topsoil layer. Plant rooting systems favours extensive networks of shallow roots. The area falls within the coastal plain (Strandveld) vegetation of the succulent karoo biome. Strandveld vegetation varies in height and this is associated with depth of calcareous sands.

Short forms of plants occur on exposed calcretes and characterised by the presence of the following dominant species: *Ehrharta calycina*, *E. villosa*, *Protasparagus capensis*, *Tetragonia frutescens* and *Zygophyllum morgansa*. Plants which are drought-deciduous with succulent leaves are fairly common. Short Strandveld is found on shallow soils with little storage of moisture. Plants reflect the aridity of the substrate, are very short and considerably succulent. Projected vegetation cover of perennial species is usually less than 50%. Heuweltjies are prominent features and the plant community found on these show an increase in the dwarf succulent components, grading into Succulent Karoo vegetation with an increase in distance from the sea. Dominant species in this short Strandveld vegetation includes *Cephalophyllum spongiosum*, *Galenia fruticose*, *Mesembryanthemum barklyii*, *Othona longifolia*, *Zygophyllum cordifolium* as well as *Ruchsia* spp.

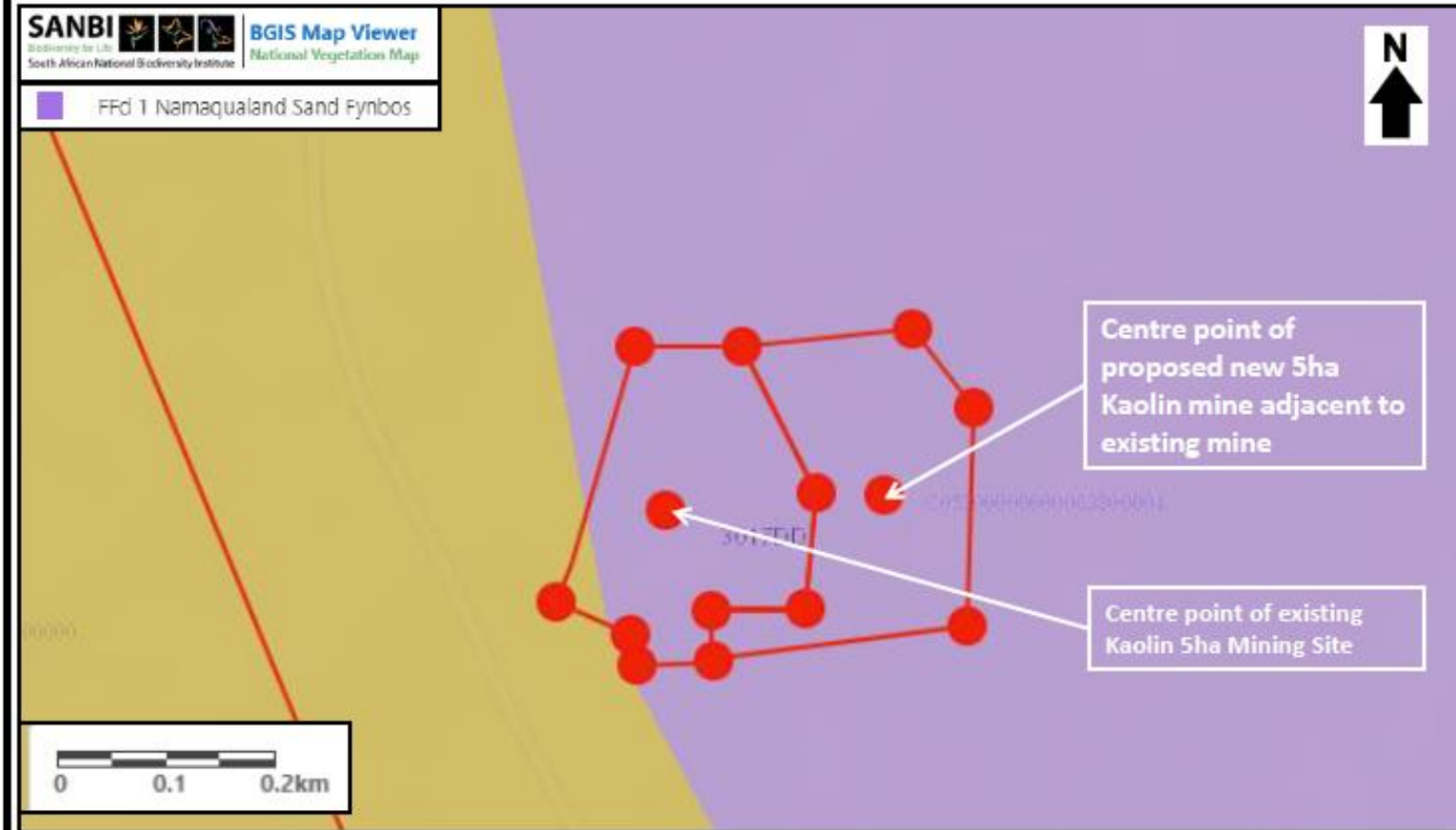
Medium Strandveld has taller shrubs and a greater grass component. Canopy cover is in the range of 50% to 60% resulting in a "pockmarked" appearance to the veld. Typical dominant species include *Arctotis merxmuelleri*, *Cephalophyllum* spp, *Drosanthemum* spp, *Manochlamys albicans* and *Ruchsia robusta*.

Tall Strandveld occurs where deeper calcareous sands occur. It is fairly dense with a canopy cover of 65% to 75%. This 1m to 2m tall shrubs are dominated by *Ericophalus racemosus*, *Salvia aurea* and *Zygophyllum morgansa*. The tall Strandveld vegetation takes years to develop to its full potential. Inland from the coast overgrazing can lead to irreversible changes and Cape Fynbos elements take over this niche. The only trees occur along the bank of the drainage channels as represented by *Acacia karoo*.”

According to Mucina and Rutherford (2006) this vegetation type is Least Threatened, with 1% statutorily conserved in the Namaqua National Park. Alien invasive vegetation associated with the Namaqualand Sand Fynbos is *Acacia cyclops* and *A. Saligna* occurs as scattered (Munica and Rutherford (2006).

Refer to Site Photographs attached at **Appendix B6**.

Figure 2: Location of Proposed Kaolin Mining Project showing Vegetation Type as FFd 1 Namaqualand Sand Fynbos



Invula Kaolien (Pty) Ltd Mining Project:
Basic Assessment

Source: SANBI BGIS National Vegetation Map
Scale on Map



8.2.7 Water Resources

The property is located within the Department of Water & Sanitation's Lower Orange Water Management Area (14). No drainage channels are close to the mining area. In the surrounding area surface water only accumulates in the drainage channels after exceptionally good rains. The Mean Annual Run-off (MAR) is in any event very low given the low rainfall average is 106mm occurring mainly in the winter months, high evaporation rates, and shallow grade of the slope toward the drainage channels and the permeability of the soils. (Refer to section 8.2.5 above.)

The surface water quality (when available) is suitable for animal consumption but not for potable water. No natural wetlands exist in the area.

Refer to **Figure 3** that shows the location of the project site in relation to the Groen River, which has been earmarked as a Phase 2 Freshwater Ecosystem Priority Area (FEPA)⁴. The project site is located approximately 2.1 km from the edge of the Groen River and within the FEPA sub-catchment. The Groen River has a "Class C: Moderately Modified" river status (as referenced from the SANBI BGIS NFEPA Database Map Viewer) which means that a loss and change of natural habitat and biota have occurred but that the basic ecosystem functions are still predominantly unchanged (Technical Report for the National Freshwater Ecosystem Priority Areas Project; WRC Report No. 1801/2/11, August 2011). For river FEPAs the whole sub-quaternary catchment is applicable, although FEPA status applies to the actual river reach within such a sub-quaternary catchment.

There are no wetlands near the proposed project site as shown in **Figure 3**.

Due to the shallow nature of operations the impact on the groundwater is considered insignificant. The absence of a waste handling program can however have a significant impact through oil and fuel spills and soil contamination.

As described in section 5.1 above, the "Mining and Biodiversity Guidelines (2013)" document identifies four categories of biodiversity priority areas in relation to their biodiversity importance and implications for mining. The category of relevance to this proposed kaolin mining project is "Category D: Moderate Biodiversity Importance".

8.2.8 Critical Biodiversity Areas

Refer to **Figure 4** which shows that the proposed kaolin mining operation is located within a Critical Biodiversity Area 2 (CBA 2). The CBA map prepared as Figure 4 has not been gazetted and approved by the Minister, only approved by the MEC.

Critical Biodiversity Areas (CBAs)⁵ are areas that are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure. These include:

- All areas required to meet biodiversity pattern (e.g. species, ecosystems) targets;
- Critically Endangered (CR) ecosystems (terrestrial, wetland and river types);
- All areas required to meet ecological infrastructure targets, which are aimed at ensuring the continued existence and functioning of ecosystems and delivery of essential ecosystem services; and
- Critical corridors to maintain landscape connectivity.

CBAs are areas of high biodiversity and ecological value and need to be kept in a natural or near-natural state, with no further loss of habitat or species. Degraded areas should be rehabilitated to natural or near-natural condition. Only low-impact, biodiversity-sensitive land uses are appropriate. In the maps, a distinction is made between CBAs that are likely to be in a natural condition (CBA 1) and those that are potentially degraded or represent secondary vegetation (CBA 2). This distinction is based on best available land cover data, but may not be an accurate or current reflection of condition.

⁴ FEPAs are strategic spatial priorities for conserving freshwater ecosystems and supporting sustainable use of water resources. FEPAs were determined through a process of systematic biodiversity planning and were identified using a range of criteria for conserving ecosystems and associated biodiversity of rivers, wetlands and estuaries. FEPA maps are suitable to use at a desktop level for planning and decision-making processes at the national or water management area level. In general, confidence in the FEPA maps at a national level is high but decreases at more local levels of planning.

⁵ Pool-Stanvliet, R., Duffell-Canham, A., Pence, G. & Smart, R. 2017. The Western Cape Biodiversity Spatial Plan Handbook. Stellenbosch: CapeNature.

Figure 3: Location of Proposed Kaolin Mining Project in relation to NFEPA - Groen River

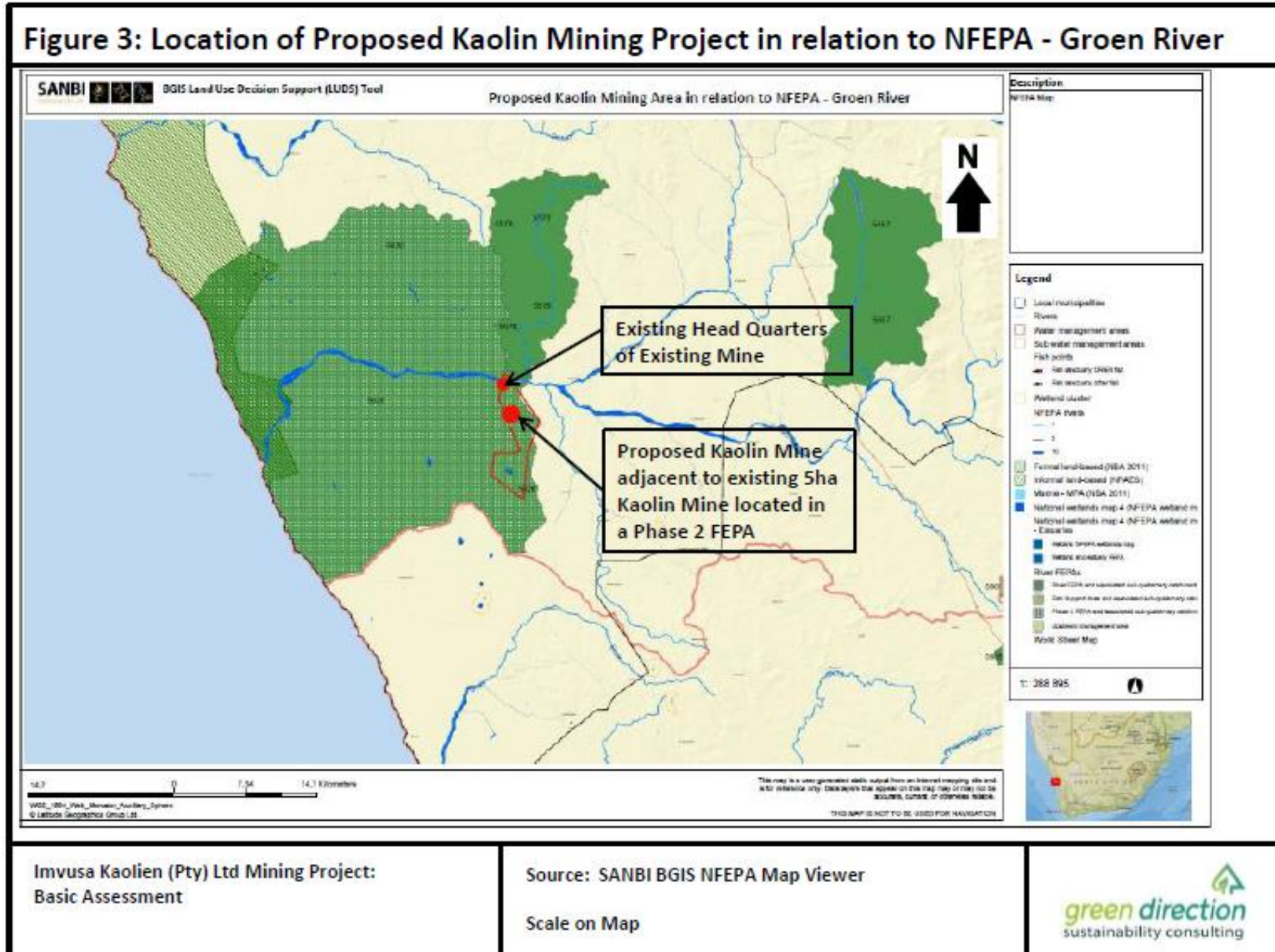
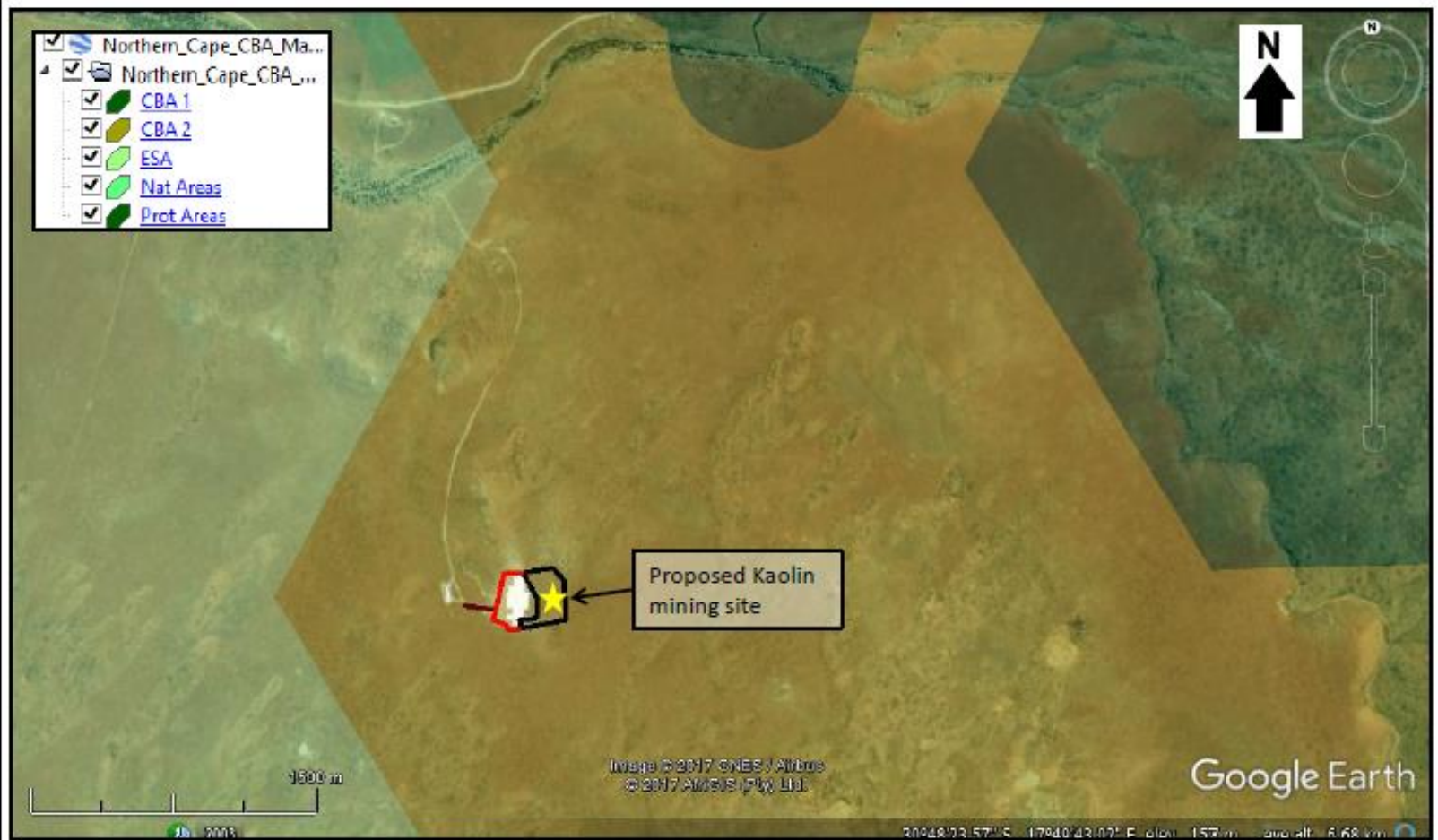


Figure 4: Location of Proposed Kaolin Mining Project within a Critical Biodiversity Area 2

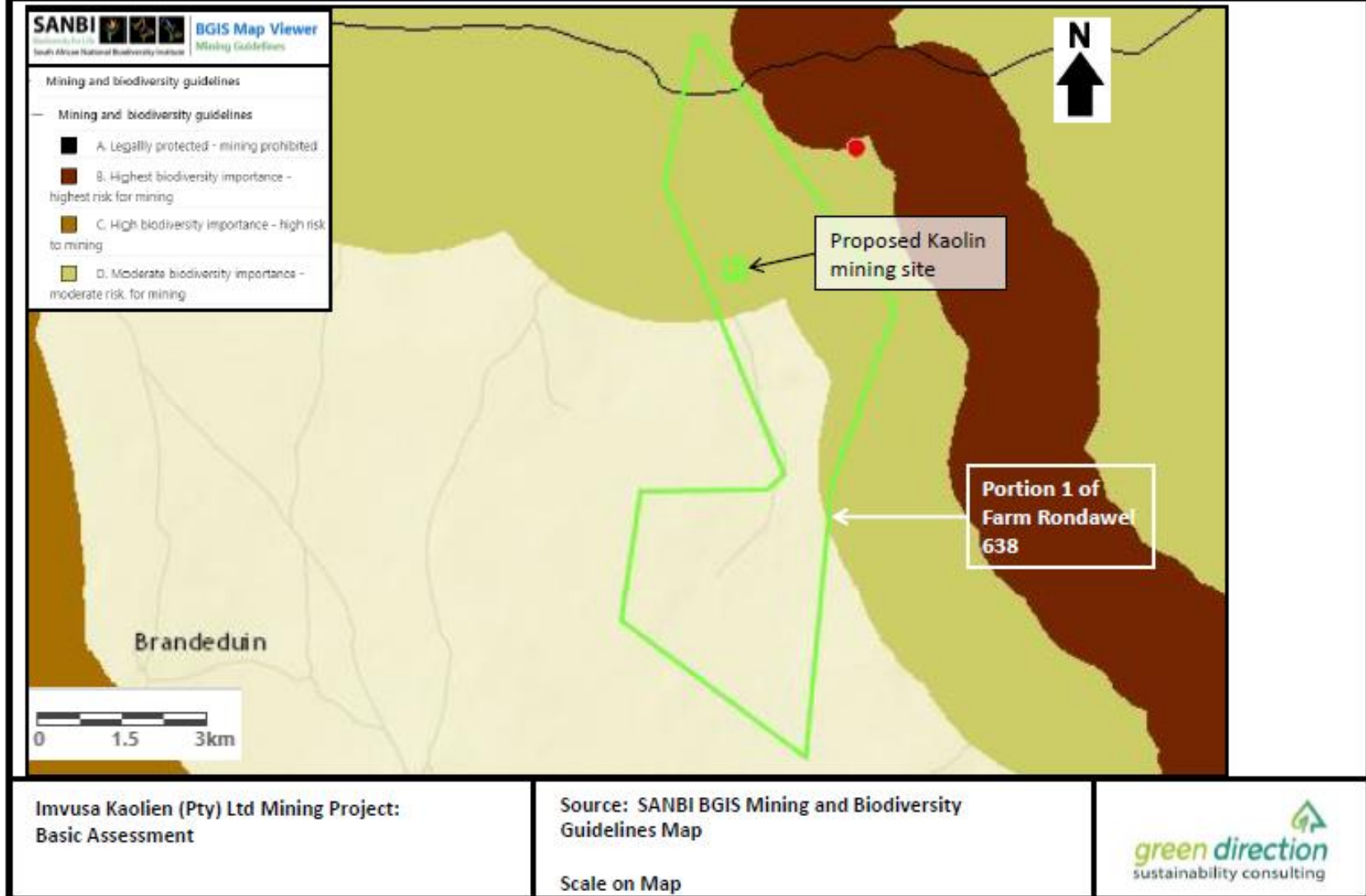


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Basic Assessment

Source: KMZ file
Scale on Map



Figure 5: Location of Proposed Sand Mining Project in terms of the Mining and Biodiversity Guidelines sourced from SANBI BGIS Map Viewer



Refer to the Site Photographs attached as **Appendix B2**, to observe the sparse vegetation cover of the proposed project site. A couple of sheep were seen grazing on site during the site visit held on the 9th October 2017.

Refer to **Figure 5** above which shows that the proposed mining site is a Category D: Moderate Biodiversity Importance as per the "Mining and Biodiversity Guidelines" categories referenced from the SANBI BGIS map viewer.

8.2.9 Emissions

Air Quality

Dust is generated by wind over un-vegetated or denuded areas and given the surrounding extent of semi-desert dust generation is high under windy conditions (dust storm). Dust is generated off un-surfaced roadways on site, and during the existing mining operations from the adjacent mine which has transported the finer sand and kaolin particles over the adjacent areas, as observed on site and evident in the site photographs attached at **Appendix B6**. Mining activities will take place in a very remote area and dust generation will be limited to a small radius around the operation.

Noise

Farm traffic-generated noise occurs in the area and such noise levels are low (observed estimate at ± 55 dBA). Noise from earth moving equipment and machinery associated with the existing mining operation on the adjacent mine will be within the norm and due to the remote locality of the operation will have no impact.

8.2.10 Socio-economic

The Namaqua District is sparsely populated, with a population of 115 842 and is the least populated district in the Northern Cape Province (and Country, although geographically the largest) with a population comprising 10,11% of the Province's total population.

Socio-economic profile

- The average growth rate for GGP in the area from 1996-2011 was 5.4 % and in 2007-2011 this has slowed down slightly to an average growth rate of 4.8%.
- The largest contributing sector to employment in the local economy (21.12% of total employment in the formal sector) is the Retail, Catering and accommodation sector

The Kamiesberg area was identified as the War on Poverty area in the Namakwa District. The government had to reach out and ensure that these communities are well informed about government basic services and issues of these communities are addressed immediately. The Department of Social Development funds Soup Kitchens and Drop –In- Centers initiatives that have food security as the core of their programmes. All Soup Kitchens that are opened are in War on Poverty Areas like Hondeklipbaai, Leliefontein, Garies and Kharkams. These Soup Kitchens respond to the needs of the poor, vulnerable and destitute who find it difficult to respond to the shocks and stresses that threaten their livelihoods.

Social Profile

- The total population of the Kamiesberg Municipal area was 10 187 in 2011.
- The average growth rate of the population from 2001-2011 is -0,54%. This indicate and confirms that a
- The average growth rate of households from 2001-2011 is 3.9%
- The Coloured population dominates the municipal area making up 85.61% of the population and the second most dominant population in the area being the white population making up 8,06% of the total population and thirdly the black population of 5,32 of the total population.
- The co-efficient for South Africa is 0.56 therefore Kamiesberg has a similar distribution of wealth as experienced nationally, which implies that Kamiesberg Municipality is still a relatively unequal society in terms of wealth distribution.

SUMMARY OF KAMIESBERG MUNICIPALITY'S DEMOGRAPHY

KAMIESBERG LOCAL MUNICIPALITY (NC064)	
Demographic Information	
Population	10 187
Age Structure	
Population Under 15	26.50%
Population 15 To 64	63.30%
Population Over 65	10.20%
Dependency Ratio	
Per 100 (15-64)	57.9
Sex Ratio	
Males per 100 females	101.7
Population Growth	
Per annum	-0.54%
Labour market	
Unemployment Rate (official)	30.80%
Youth Unemployment Rate (official) 15-34	40.40%
Education (aged 20 +)	
No Schooling	5.20%
Higher Education	16.60%
Matric	4.10%
Household dynamics	
Households	2992
Average Household Size	3.2
Female Headed Households	40.90%
Formal Dwellings	95.60%
Housing Owned	63.90%
Household services	
Flush Toilet Connected To Sewerage	38.80%
Weekly Refuse Removal	79.40%
Piped Water Inside Dwelling	41.70%
Electricity For Lighting	97.2%
Source: Census 2011 Municipal Fact Sheet, published by Statistics South Africa.	

8.2.11 Cultural, Heritage and Palaeontological Resources

Refer to the Archaeological Impact Assessment Report attached at **Appendix G**. The report concluded that: "An ephemeral scatter of stone artefacts was observed in the proposed new 5Ha extension of the kaolin mine, associated with an exposed silcrete outcrop. Other lithic material was noted in secondary context in the spoil

heaps east of the current mining area. The lithic material consists of a mixture of silcrete ESA (Early Stone Age) and MSA (Middle Stone Age) flakes, cores and blades as well as isolated LSA (Late Stone Age) quartz flaked pieces. No non-lithic material was observed in the existing mine or in the expansion area.

The very limited amount of LSA material suggests that it is unlikely that LSA burials will be uncovered.

There is no historic built environment in the identified mining area.”

The specialists’ reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented.

The following recommendations are made:

- A once off monitoring visit is suggested during the expansion of the mine in the vicinity of the exposed silcrete outcrop (S30.80829 E17.80289) at such time that stripping reaches that area, to record the presence (or not) of buried surfaces containing stone artefacts;
- The relevant heritage authority must be notified if any heritage resources (including burials) are uncovered during mining expansion.

The Interim Comment from SAHRA is attached at **Appendix D** and the formal letter from Dr Almond has been supplied.

8.2.12 Description of the current land uses

There is extensive livestock farming in the area.

Refer to **Figure 1**. The 2009 National mosaic land cover sourced from the SANBI BGIS database shows that the land-use of the proposed project site is shown as Shrubland Fynbos and Low Shrubland, as evidenced on site. Refer to the site photographs at **Appendix B2**. There are existing tracks on the farm, which provide access to the site. Refer to **Appendix C** (plan of site with access).

8.2.13 Description of specific environmental features and infrastructure on the site

Refer to **Appendix C** and **Figures 1 to 5**, which provide an overview of the position of the proposed project site.

8.2.14 Environmental and current land use map

Refer to **Figures 1 to 6** provided as part of the specific attributes of the proposed project site.

8.3 Impacts and risks identified for each alternative

8.3.1 Overview

As described in Section 3.3 of this report (and elsewhere), the mining activities are restricted to the removal of kaolin up to an average depth of 5 metres from the deposit located on Portion 1 of Farm Rondawel 638.

The potential risks associated with safety are listed in the Rehabilitation Plan as:

- Mine pit not in a stable condition can be detrimental to the safety and health of humans and animals.
- Affected environment not in a stable condition can be detrimental to the safety and health of humans and animals.
- Collapsing slope(s) of mine pit.
- Potentially dangerous areas like deep mine pit or equipment left behind.
- Unsafe erosion gully’s
- Post mining topography not compatible with original landform.
- Uncontrolled access to a potentially unsafe post-mining area

No infrastructure, sub-surface voids, fine residue dams or evaporation ponds will be developed that can lead to potentially unsafe post-mining areas; therefore no post mining access control would be required.

The potential risks regarding changes in land use:

- Uncontrolled expansion of mining footprint by not restricting the area disturbed by mining and the associated activities/infrastructure - loss of land with agricultural potential
- Post mining landform not compatible with the surrounding landscape and not capable of a productive land use that achieves a land capability equal to that of pre-mining conditions
- Long term changes in land use that cannot revert back to mainly industrial use caused by not implementing prompt rehabilitation and maintenance of disturbances when possible.
- Disturbance of ecology due to loss of habitat.
- Soil compaction due to hauling and development of stockpiles, limiting re-vegetation.
- Uncontrolled development of roads and new roads not kept to a minimum - existing farm roads not used for mining operations.

Risks with regard to aesthetic impact and emissions:

- Visual disturbance from the public road views – excavations or overburden dumps blocking the view
- Nuisance effects of air emissions (dust) no implementation and maintenance of dust monitoring programs accompanied by dust suppression activities if required.
- Noise disturbance.

The potential residue environmental risks as listed in the Rehabilitation Plan are:

- Oil fuel leaks onto virgin soil through the earthmoving and transport mobile plant
- The spillage of fuel during transfer from fuel bowser to equipment in the field.
- Post mining landscape that increases the requirement for long term monitoring and management.
- Unwanted ruins, buildings, foundations, footings, equipment and waste management practices creating or leaving legacies.
- Sub-surface infrastructure remaining behind, limiting the intended post closure land use including footings and foundations and power supply installations.
- Stockpiles and leftover product left behind

The risk of waste:

- No industrial or mine waste is generated during the mining process and all material consisting Kaolin will be removed from the site and sold as a FoT product. No processing will take place so no mining waste or overburden and fine residue dumps will be created and there will be only limited product stockpiles present on site.
- The potential risk is related to waste management practices that will require implementing of mitigation and management actions to limit the residual impact after mine closure.

8.3.2 Potential impacts and risks associated with the Preferred Alternative

Refer to **Appendix E** for the full Impact Assessment Tables for the Preferred and Only Alternative (Kaolin Mining Activity) compared to the No-Go Alternative.

Table 4: Preferred Alternative: Potential Impacts and Risks per Phase per Activity

Phase	Activities	Potential Impacts
CONSTRUCTION PHASE	Site access	Disturbance of biodiversity for creation of new access tracks Soil compaction from repeated use of existing access tracks
	Site Establishment Activities (including: topsoil stripping and stockpiling, waste generation and management)	Noise Generation
		Visual intrusion
		Dust emissions causing nuisance from top soil stripping
		Biodiversity (wildlife and vegetation) disturbance from vehicles
		Soil, sand and groundwater contamination from hydrocarbons
		Soil erosion and soil compaction
		Socio-economic impact on job security, employment creation and economic spin-offs (positive impact)
		Refer to Appendix G. The specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented.
	OPERATION	Excavation of Kaolin;
Visibility of the Kaolin mining operations		

	movement of excavator, TLB and trucks on site; waste generation and management	Dust and vehicle emissions from general site activities
		Biodiversity (wildlife and vegetation) disturbance from vehicles
		Soil, sand and groundwater contamination from hydrocarbon spills
		Soil erosion, soil compaction and mixing of geological sequence
		Socio-economic impact on job security, employment creation and economic spin-offs (positive impact)
		Refer to Appendix G. The specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented.
DECOMMISSIONING PHASE	Rehabilitation of the mined area, scarifying compacted areas and vehicle tracks	Shaping of landscape profile and replacing topsoil
		Socio-economic impact on job security, employment creation and economic spin-offs (positive impact)

8.3.3 Potential Impacts and Risks associated with the No-Go Alternative

There would be no change to the biophysical environment with the No-Go Alternative. The landowner and Applicant would forgo an opportunity to create employment and generate an income from this project.

8.4 Methodology used in determining significance of potential impacts

Refer to Table 5 below, which provides the impact assessment criteria applied in the rating of the impacts associated with each phase of the proposed mining activity for the Preferred and Only Alternative. Each impact is assessed in terms of: nature (character status); extent (spatial scale); duration (time scale); probability (likelihood) of occurring; reversibility of the impact; the degree to which the impact may cause irreplaceable loss of resources; the significance (size or magnitude scale) prior to mitigation; the degree to which the impact can be mitigated; and, the significance (size or magnitude scale) after mitigation.

Table 5: Impact Assessment Criteria

ASSESSMENT CRITERIA	
NATURE	
Positive	Beneficial to the receiving environment
Negative	Harmful to the receiving environment
Neutral	Neither beneficial or harmful
EXTENT (GEOGRAPHICAL)	
Site	The impact will only affect the site
Local/ district	Will affect the local area or district
Province/region	Will affect the entire province or region
International and National	Will affect the entire country
CONSEQUENCE	
Loss/gain	The impact will result in loss or gain of resource
No loss/gain	The impact will result in no loss or no gain of resource
DURATION	
Construction period / Short term	Up to 3 years
Medium term	Up to 6 years after construction
Long term	More than 6 years after construction
PROBABILITY	
Definite	Impact will certainly occur (>75% probability of occurring)
Probable	Impact likely to occur (50 – 75% probability of occurring)
Possible	Impact may occur (25 – 50% probability of occurring)
Unlikely	Impact unlikely to occur (0 – 25% probability of occurring)
REVERSIBILITY	
Reversible	Impacts can be reversed though the implementation of mitigation measures
Irreversible	Impacts are permanent and can't be reversed by the implementation of mitigation measures
IRREPLACEABLE LOSS OF RESOURCES	
High	The impact is result in a complete loss of all resources
Medium	The impact will result in significant loss of resources
Low	The impact will result in marginal loss of resources
No Loss	The impact will not result in the loss of any resources
CUMULATIVE EFFECTS	
High	The impact would result in significant cumulative effects
Medium	The impact would result in moderate cumulative effects
Low	The impact would result in minor cumulative effects
SIGNIFICANCE RATINGS	
Very High	Major to permanent environmental change with extreme social importance.
High	Long term environmental change with great social importance.
Medium	Medium to long term environmental change with fair social importance.
Low	Short to medium term environmental change with little social importance.
Very low	Short-term environmental change with no social importance
None	No environmental change
Unknown	Due to lack of information
DEGREE TO WHICH IMPACT COULD BE AVOIDED/MANAGED/MITIGATED	
High	The impact could be significantly avoided/managed/mitigated.
Medium	The impact could be fairly avoided/managed/mitigated.
Low	The impact could be avoided/managed/mitigated to a limited degree.
Very Low	The impact could not be avoided/managed/mitigated; there are no mitigation measures that would prevent the impact from occurring.

8.5 The positive and negative impacts that the proposed activity and alternatives will have

Refer to **Appendix E** for the full Impact Assessment Tables for the Preferred and Only Alternative (Kaolin Mining Activity) compared to the No-Go Alternative.

Positive impacts

- Creation of employment and job security and economic spin-offs (positive impact)
- Provision of Kaolin material for industry and medicine.
- Removal of alien invasive plant species.
- Improvement in grazing of livestock following rehabilitation.

Negative impacts

The key potential negative impacts associated with the Kaolin mining activity include the following:

- Site access:
 - Disturbance of onsite fauna and flora
 - Soil compaction from repeated use of access tracks
- Site Establishment Activities (including: topsoil stripping and stockpiling, erection of temporary equipment laydown area, waste generation and management)
 - Noise Generation
 - Visual intrusion
 - Dust fall and nuisance from activities, dust emission from top soil stripping
 - Wildlife and vegetation disturbance from site preparation
 - Contamination and disturbance of topsoil and soil from compaction and soil disturbance due to topsoil stockpiling
- Removal of Kaolin to an average depth of 6 metres; movement of excavator, TLB and trucks on site; waste generation and management:
 - Noise caused by the machinery and vehicles on site, and by vehicles going to and from the mining site
 - Visibility of the mining operations
 - Dust emissions from general site activities (vehicle entrained dust)
 - Removal of Kaolin impacting on geological sequence
 - Disturbance of biodiversity from vehicles
 - Contamination from hydrocarbon spills and compaction on access tracks
 - A specialist heritage resources report has been prepared and is attached at **Appendix G**. The specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented. The Interim Comment from the South African Heritage Resources Agency (SAHRA) is attached at **Appendix D**, and the formal letter from Dr Almond has been supplied.
- Rehabilitation of the Kaolin mining area, scarifying compacted areas and vehicle tracks
 - Dust emission from decommissioning activities (vehicle entrained dust)
 - Soil erosion of topsoil
 - Ongoing removal of alien invasive plant species
 - Socio-economic impact on job security, employment creation and economic spin-offs (positive impact).

8.6 The possible mitigation measures that could be applied

Refer to **Appendix E** for the Impact Assessment Tables, as the mitigation measures are included under each impact.

8.7 Motivation where no alternative sites were considered

Alternatives were considered, as described in Section 8.1 and 8.3 above and subjected to the impact rating methodology in **Appendix E**.

8.8 Concluding Statement on Alternatives development

The site was selected as it contains good quality Kaolin adjacent to an existing Kaolin mine where the existing infrastructure can be shared. The layout and technology of this Kaolin mining project has been determined by the shape, position and orientation of the mineral resource.

Refer to the Site Plan attached as **Appendix C**.

The operational approach is practical and based on best practice to ensure a phased approach of mining followed by rehabilitation in sequential stages.

There are therefore no other reasonable or feasible sites, layouts, activities, technologies, or operational alternatives for further consideration in the impact assessment component, other than the mandatory "no-go" alternative that must be assessed for comparison purposes.

9 ENVIRONMENTAL IMPACT ASSESSMENT

9.1 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

Refer to **Appendix C** for the Site Plan of the Preferred and Only Alternative.

Refer to Section 8.3 above where the risks have been described.

Refer to Section 8.4 above where the methodology has been described, and refer to **Appendix E** for the full Impact Assessment Tables for the Preferred and Only Alternative (Kaolin Mining Activity) compared to the "No-Go" Alternative.

This BAR and EMPr were compiled through a detailed desktop investigation and site assessment in order to determine the environmental setting in which the project is located.

Input from stakeholders during the public participation process will also assist the EAP in the identification of any additional impacts associated with the proposed mining activities.

The methodology described above was used to assess the significance of the potential impacts of the Kaolin mining activities. The assessment of impacts is based on the experience of the EAP.

The mitigation measures proposed are considered to be reasonable and based on the location of the mining area and must be implemented in order for the outcome of the assessment to be accurate.

9.2 Assessment of each identified potentially significant impact and risk

Table 6: Significance of Impacts per Activity per Phase

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
Site Access	Soil compaction from repeated use of existing access tracks. Soil disturbance due to topsoil removal & stockpiling.	Loss of soil resource	Construction	MEDIUM	<ul style="list-style-type: none"> • After clearing, the affected area shall be stabilized to prevent any erosion or sediment runoff. Stabilized areas shall be demarcated accordingly. • Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces. • Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and stormwater run-off. • Top soil shall be removed separately and stockpiled separately from other soil base layers. • Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. • Topsoil storage areas must be convex and should not exceed 2m in height. • Topsoil must be treated with care, must not be buried or in any other way be rendered unsuitable for further use (e.g. by mixing with spoil) and precautions must be taken to prevent unnecessary handling and compaction. • In particular, topsoil must not be subject to compaction greater than 1 500 kg/m² and must not be pushed by a bulldozer for more than 50 metres. Trucks may not be driven over the stockpiles. • Temporarily halt material handling in windy conditions. • Compacted areas that are not required for 	LOW

					access shall be scarified after use during decommissioning and rehabilitation.	
	Disturbance of biodiversity	Limited loss of natural vegetation and ecological functioning a CBA 2 area and river FEPA sub-catchment	Construction	MEDIUM	<ul style="list-style-type: none"> Refer to Appendix C, which indicates the proposed 5Ha area for mining and the existing farm tracks that will be used wherever possible. The existing adjacent mine's operational infrastructure will be used for the new proposed mine. Remove alien invasive vegetation and ensure ongoing alien vegetation clearing in the area. No indigenous plants outside of the demarcated work areas may be damaged. The noise and vibration caused by the earthmoving equipment will disturb smaller animals. These will move away whilst operations are in progress. Should any animals be encountered these should be moved away by a suitably trained nature conservation officer, if necessary. 	LOW
Site establishment	Visibility	Visual intrusion	Construction	LOW	<ul style="list-style-type: none"> The site shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall be kept orderly. Restrict working hours to normal work day hours with no work over weekends when holidays occur to minimize hauling trucks along access roads. 	VERY LOW
	Noise, Dust and Vehicle emissions	Dust and noise nuisance and greenhouse emissions	Construction	LOW	<ul style="list-style-type: none"> The Contractor shall adhere to the local by-laws and regulations regarding the noise and associated hours of operations. The Contractor shall limit noise levels (e.g. install and maintain silencers on machinery). The provisions of SANS 1200A Sub clause 4.1 regarding "built-up" area shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas. Construction and demolition activities generating output of 85dB or more, shall be limited to normal working hours and not allowed during weekends to limit the impact of noise of neighbours. Should the Contractor need to work outside normal working hours, the surrounding neighbours shall be informed prior to the work taking place. No amplified music shall be allowed on site. 	VERY LOW

					<ul style="list-style-type: none"> On public roads adjacent to the site vehicles shall adhere to municipal and provincial traffic regulations including speed limits. Vehicles used on site for the construction related activities shall be maintained and in a good working condition so as to reduce emissions. Stockpiles must be maintained (covered where necessary) to avoid wind erosion of the material. Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces. 	
	Disturbance of biodiversity	Disturbance to natural vegetation and ecological functioning a CBA 2 area and river FEPA sub-catchment	Construction	MEDIUM	<ul style="list-style-type: none"> Refer to Appendix C, which indicates the proposed 5Ha area for mining. The existing adjacent mine's operational infrastructure will be used for the new proposed mine. Demarcate areas for clearing. Remove alien invasive vegetation and ensure ongoing alien vegetation clearing in the area No indigenous plants outside of the demarcated work areas may be damaged. The noise and vibration caused by the earthmoving equipment will disturb smaller animals. These will move away whilst operations are in progress. Should any animals be encountered these should be moved away by a suitably trained nature conservation officer, if necessary. 	VERY LOW
	Soil and sand contamination from hydrocarbons	Loss of soil resource through pollution	Construction	MEDIUM	<ul style="list-style-type: none"> Oils and lubricants must be stored within sealed containment structures of the demarcated areas of the adjacent mine. Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. Machinery must be kept in good working order and regularly inspected for leaks. A spill kit will be available on each site where mining activities are in progress. Any spillages will be cleaned up immediately. Waste materials generated on site must be stored in suitable lidded containers and 	LOW

					<ul style="list-style-type: none"> removed off site to a suitable disposal facility. Waste separation must be undertaken if practical for recycling Provide all workers with environmental awareness training. Provide a bin at the site. Regularly dispose of any solid waste at a municipal waste disposal site. Ensure all workers comply with the requirements of the EMPr. Provide a mobile ablution facility. 	
	Contamination and disturbance of soil from compaction and soil disturbance due to topsoil stockpiling	Loss of soil resource	Construction	MEDIUM	<ul style="list-style-type: none"> After clearing, the affected area shall be stabilized to prevent any erosion or sediment runoff. Stabilized areas shall be demarcated accordingly. Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces. Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and stormwater run-off. Top soil shall be removed separately and stockpiled separately from other soil base layers. Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. Topsoil storage areas must be convex and should not exceed 2m in height. Topsoil must be treated with care, must not be buried or in any other way be rendered unsuitable for further use (e.g. by mixing with spoil) and precautions must be taken to prevent unnecessary handling and compaction. In particular, topsoil must not be subject to compaction greater than 1 500 kg/m² and must not be pushed by a bulldozer for more than 50 metres. Trucks may not be driven over the stockpiles. Reduce drop height of material to a minimum. Temporarily halt material handling in windy conditions. A speed limit of 30km/hour will be displayed 	LOW

					and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit.	
	Heritage, Paleontological and Cultural Impacts	Heritage, Paleontological and Cultural resources	Construction	MEDIUM (-) (rating provided by specialist)	<ul style="list-style-type: none"> • Compacted areas that are not required for access shall be scarified after use during decommissioning and rehabilitation. • A specialist heritage resources report has been prepared and is attached at Appendix G. The specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented. • The Interim Comment from the South African Heritage Resources Agency (SAHRA) is attached at Appendix D, and the formal letter from Dr Almond has been supplied. 	MEDIUM (-) (rating provided by specialist)
	Socio-economic impact on job security, employment creation and economic spin-offs (positive impact)	Improvement in people's living standards, and support to local economy through supply of Kaolin for industrial use	Construction	MEDIUM (-)	<ul style="list-style-type: none"> • Employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling). 	MEDIUM (+)
Excavation of Kaolin; movement of excavator, TLB and trucks on site; waste generation and management	Noise caused by the machinery and vehicles on site and from hauling of Kaolin	Noise nuisance	Operation	LOW	<ul style="list-style-type: none"> • Ensure Kaolin hauling is during normal working hours and not on weekends. • No amplified music shall be allowed on site. • On public roads the vehicles shall adhere to municipal and provincial traffic regulations including speed limits. • Vehicles used on site for the construction related activities shall be maintained and in a good working condition so as to reduce emissions. • Ensure bagged Kaolin is properly secured for hauling. 	VERY LOW
	Visibility of the mining operations	Visual intrusion	Operation	LOW	<ul style="list-style-type: none"> • The site shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall be kept orderly. • Restrict working hours to normal work day 	VERY LOW

					hours with no work over weekends when holidays occur to minimize hauling trucks along access roads.	
	Dust (vehicle entrained dust) and Vehicle emissions	Dust and vehicle emissions including Greenhouse emissions	Operation	LOW	<ul style="list-style-type: none"> Incremental clearing of vegetation should take place to avoid unnecessary exposed surfaces. Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and stormwater run-off. Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. Reduce drop height of material to a minimum. Temporarily halt material handling in windy conditions. A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit. Ensure Kaolin hauling is during normal working hours and not on weekends No amplified music shall be allowed on site. On public roads the vehicles shall adhere to municipal and provincial traffic regulations including speed limits. Vehicles used on site for the construction related activities shall be maintained and in a good working condition so as to reduce emissions. Ensure bagged Kaolin is properly secured for hauling. 	VERY LOW

	Disturbance of biodiversity	Limited loss of natural vegetation and ecological functioning a CBA 2 area and river FEPA sub-catchment	Operation	MEDIUM	<ul style="list-style-type: none"> Refer to Appendix C, which indicates that existing farm tracks will be used. The mining area and stockpile areas must be demarcated and the footprint contained within the demarcated area. Mining areas to be limited to blocks of 0.5Ha at a time with progressive rehabilitation. The annual rehabilitation plan must be implemented. Remove alien invasive vegetation, and ensure ongoing alien vegetation clearing in the area. No indigenous plants outside of the demarcated work areas may be damaged. The noise and vibration caused by the earthmoving equipment will disturb smaller animals. These will move away whilst operations are in progress. Should any animals be encountered these should be moved away by a suitably trained nature conservation officer, if necessary. 	LOW
	Soil and sand contamination from hydrocarbon spills	Loss of soil resource through pollution	Operation	MEDIUM	<ul style="list-style-type: none"> Oils and lubricants must be stored within sealed containment structures of the demarcated areas of the adjacent mine. Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. Machinery must be kept in good working order and regularly inspected for leaks. A spill kit will be available on each site where mining activities are in progress. Any spillages will be cleaned up immediately. Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. Waste separation must be undertaken if practical for recycling Provide all workers with environmental awareness training. Provide a bin at the site. Regularly dispose of any solid waste at a municipal waste disposal site. Ensure all workers comply with the requirements of the EMPr. 	LOW

					<ul style="list-style-type: none"> • Provide a mobile ablution facility. 	
	Mixing of the geological sequence; change in landscape and topography; compaction of soil on access tracks and soil erosion	Loss of soil resource	Operation	MEDIUM	<ul style="list-style-type: none"> • After clearing, the affected area shall be stabilized to prevent any erosion or sediment runoff. Stabilized areas shall be demarcated accordingly. • Incremental clearing of vegetation should take place to avoid unnecessary exposed surfaces. • Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and stormwater run-off. • The stockpile areas for topsoil are temporary as they will be re-used on a cut and fill basis. • Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. • Reduce drop height of material to a minimum. • Temporarily halt material handling in windy conditions. • A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit. • Compacted areas that are not required for access shall be scarified after use during decommissioning and rehabilitation. • Planting of indigenous vegetation in areas under rehabilitation. • No industrial or mine waste is generated during the mining process. • Processing shall include the spreading of Kaolin to dry out where after it will be screened and bagged to be sold as a FoT product. • Product stockpiles shall form part of the drying area that shall also serve as a dispatch yard. • Primary processing shall include screening by means of a "trommel screen" provided as part of the adjacent operation so no Fine Residue Dumps (FRD) will be created. • Mining will be in the form of a cut and fill 	LOW

					<p>operation where overburden will be backfilled in mined out sections and covered with topsoil as excavations advance.</p> <ul style="list-style-type: none"> Mixing of the geological sequence of sediment will be avoided and at final closure oversize material and low grade Kaolin will first be backfilled into the excavation before covering with available topsoil. Due to a shortage of topsoil the white Kaolin will still be visible above surface after rehabilitation but with the natural movement of the dune sand will be covered naturally. Re-shaping of landscape and topography to form shallow depressions. 	
	Heritage, Paleontological and Cultural Impacts	Heritage, Paleontological and Cultural resources	Construction	MEDIUM (-) (rating provided by specialist)	<ul style="list-style-type: none"> A specialist heritage resources report has been prepared and is attached at Appendix G. The specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented. The Interim Comment from the South African Heritage Resources Agency (SAHRA) is attached at Appendix D, and the formal letter from Dr Almond has been supplied. 	MEDIUM (-) (rating provided by specialist)
	Socio-economic impact on job security, employment creation and economic spin-offs (positive impact)	Improvement in people's living standards, and support to local and regional economy	Operation	MEDIUM (-)	<ul style="list-style-type: none"> Employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling). Local economic spin-offs through purchasing of local materials required for construction activities. 	MEDIUM (+)

Rehabilitation of the mining area, scarifying compacted areas and vehicle tracks	Rehabilitation	Biodiversity, land use, visual landscape	Decommissioning	MEDIUM	<ul style="list-style-type: none"> Implementation of Final Rehabilitation, Decommissioning and Mine Closure Plan (Appendix F). Compacted areas shall be scarified after use during decommissioning and rehabilitation. Any stored topsoil shall be spread over the scarified surface. Reshaping of the mined areas to create shallow depressions. Ongoing removal of alien invasive vegetation as required. Planting of indigenous vegetation if necessary. 	VERY LOW
	Socio-economic impact on job security, employment creation and economic spin-offs (positive impact)	Rehabilitation	Decommissioning	MEDIUM (-)	<ul style="list-style-type: none"> Employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling) 	MEDIUM (+)

The supporting impact assessment conducted by the EAP is attached as **Appendix E**.

9.3 Summary of Specialist Reports

Table 7: Summary of Specialist Reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Archaeological Impact Assessment (attached at Appendix G)	<ul style="list-style-type: none"> A once off monitoring visit is suggested during the expansion of the mine in the vicinity of the exposed silcrete outcrop (S30.80829; E17.80289) at such time that stripping reaches that area, to record the presence (or not) of buried surfaces containing stone artefacts; The relevant heritage authority must be notified if any heritage resources (including burials) are uncovered during mining expansion. 	X	Section 8.2.11 Section 9.2: Table 6 Section 10.5 Section 10.7.1 & 10.7.2 EMPr: Part B Section 12.1 Section 13.8: Table 11 Section 13.10: Table 13 Appendix E: Impact Tables

10 ENVIRONMENTAL IMPACT STATEMENT

10.1 Summary of the key findings of the environmental impact assessment

The significance ratings of impacts after mitigation on the key aspects of the “preferred alternative” and the “no go” alternative are shown per Phase in the following tables.

Table 8: Significance Ratings of Impacts after Mitigation during Construction Phase (Site Access and Site Establishment)

IMPACTS AND ASPECTS	PREFERRED AND ONLY ALTERNATIVE (KAOLIN MINING ON 5HA ON PORTION 1 OF FARM RONDAWEL 638)	NO-GO ALTERNATIVE
1. SOIL EROSION AND COMPACTION: The clearing of areas for new access tracks and the mining of kaolin will result in the removal of existing vegetation and topsoil, which will disturb the soil increasing the potential for soil erosion by wind and loss of soil in the event of rainfall. Soil compaction will result from repeated use of access tracks.	Low / Insignificant Risk	N/A
2. WATER RESOURCES: Potential for ground water pollution due to oil spills during routine maintenance of equipment. No surface water resources are in close proximity to the proposed mining site.	Very Low / Insignificant Risk	N/A
3. LIMITED LOSS OF NATURAL VEGETATION AND ECOLOGICAL FUNCTIONING IN AN CRITICAL BIODIVERSITY AREA 2 (CBA 2) AND RIVER FEPA SUB-CATCHMENT: The proposed mining area footprint of 5ha will be cleared, mined and rehabilitated with the topsoil from the site, resulting in a temporary impact on localised ecological functioning.	Low / Insignificant Risk	N/A
4. POTENTIAL FOR SOIL CONTAMINATION AND SOLID WASTE POLLUTION DURING CONSTRUCTION PHASE	Low / Insignificant Risk	N/A
5. VISUAL INTRUSION: Caused by the front end loader, topsoil stockpiles, cleared areas, and movement of trucks on site during preparation of site access and site establishment. The site is however, remote and rural in nature with very few receptors (people) as it is located on private property.	Very Low / Insignificant Risk	N/A
6. EMISSIONS (DUST, VEHICLES & NOISE): Noise and dust will be created by mining equipment (e.g. front end loaders) and vehicles, which will emit Greenhouse Gases.	Very low / Insignificant Risk	N/A
7. HERITAGE, PALAEOLOGICAL AND CULTURAL IMPACTS: Refer to Appendix G .	Medium / Low Risk	N/A
8. CREATION OF EMPLOYMENT & JOB SECURITY WITH LOCAL AND REGIONAL ECONOMIC SPIN-OFFS	Medium (+)	Medium (-)

Table 9: Significance Ratings of Impacts after Mitigation during Operational Phase (Kaolin mining and transporting of materials)

IMPACTS AND ASPECTS	PREFERRED AND ONLY ALTERNATIVE (KAOLIN MINING ON 5HA PORTION 1 OF FARM RONDAWEL 638)	NO-GO ALTERNATIVE
1. SOIL EROSION, SOIL COMPACTION & GEOLOGICAL SEQUENCE: The mining of Kaolin will result in the removal of 1 metre of overburden and the sub-layers of Kaolin, with mixing of the geological sequence. Impacts are the potential for soil erosion by wind and loss of soil in the event of rainfall; soil compaction from repeated use of access tracks; and changes in the landscape and topography.	Low / Insignificant Risk	N/A
2. WATER RESOURCES: Potential for ground water pollution due to oil spills during routine maintenance of equipment. No surface water resources are in close proximity to the proposed mining site.	Low / Insignificant Risk	N/A
3. LIMITED LOSS OF NATURAL VEGETATION AND ECOLOGICAL FUNCTIONING IN AN CRITICAL BIODIVERSITY AREA 2 (CBA 2) AND RIVER FEPA SUB-CATCHMENT: The proposed mining area footprint of 5ha will be cleared, mined and rehabilitated with the topsoil from the site, resulting in a temporary impact on localised ecological functioning. Transport of materials will be along existing access tracks resulting in little impact on ecological functioning at a local level during the operation phase. The machinery and trucks will disturb local fauna.	Low / Insignificant Risk	N/A
4. POTENTIAL FOR SOIL CONTAMINATION AND SOLID WASTE POLLUTION DURING OPERATIONAL PHASE	Low / Insignificant Risk	N/A
5. VISUAL INTRUSION: Caused by the machinery, topsoil and rock stockpiles, cleared areas, and movement of trucks on site. The site is however, remote and rural in nature with no receptors (people) as it is located on private property.	Very Low / Insignificant Risk	N/A
6. EMISSIONS (DUST, VEHICLES & NOISE): Noise and dust will be created by mining equipment (e.g. front end loaders) and vehicles, which will emit Greenhouse Gases.	Very Low / Insignificant Risk	N/A
7. HERITAGE, PALAEOLOGICAL AND CULTURAL IMPACTS: Refer to Appendix G .	Medium / Low risk	N/A
8. CREATION OF EMPLOYMENT & JOB SECURITY WITH LOCAL AND REGIONAL ECONOMIC SPIN-OFFS	Medium (+)	Medium (-)

All of the negative identified impacts will occur for a limited period and the extent of the negative impacts will be localised. All of the identified impacts can be suitably mitigated. There is a correlation between cumulative impacts post mitigation, and significance rating of impacts after mitigation as indicated in **Appendix E**.

10.2 Final Site Map

Refer to the proposed site plan attached as **Appendix C**.

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

Refer to Section 10.1 above.

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

10.4.1 Management Objectives

The proposed impact management objectives are listed below:

- Objective 1 - To create a safe and rehabilitated post-mining environment.
 - Ensure safe mining area with no potentially dangerous areas like deep excavations.
 - Topsoil to be stockpiled and replaced during decommissioning and closure, and rehabilitation.

- Objective 2 - To minimise pollution or degradation of the environment
 - Provide sufficient information and guidance to plan the Kaolin mining activities in a manner that would reduce impacts as far as practically possible.
 - Limit residual environmental impact with no surface water or soil contamination by ensuring that no fuel or oil spills occur in the mining area.
 - Ensure that no solid waste or rubble is dumped on the site.
 - Ensure that portable toilets are used.

- Objective 3 – To minimise impacts on the community and to provide optimal post-mining social opportunities
 - Ensure that workers remain within the mining permit area.
 - Operate during normal working hours only.
 - Minimise the generation of noise and dust.
 - Respond rapidly to any complaints received.
 - Minimal negative aesthetic impact
 - Optimised benefits for the social environment

10.4.2 Outcomes

- By providing sufficient information to strategically plan the Kaolin mining activities, unnecessary social and environmental impacts be avoided.
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance.
- Provide a management plan that is effective and practical for implementation.
- Through the implementation of the proposed mitigation measures it is anticipated that the identified social and environmental impacts can be managed and mitigated effectively.
- 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 restricting the height of the stockpiled material, and through good housekeeping.
- Dust fall can be managed by reducing driving speeds when driving on unpaved roads.
- Wildlife disturbance and clearance of vegetation will be limited to the absolute minimum required and disturbed areas will naturally re-vegetate with locally indigenous species.
- Surface water and groundwater contamination by hydrocarbons can be managed by conducting proper vehicle maintenance, refueling with care to minimise the chance of spillages and by having a spill kit available on each site where mining activities are in progress.

10.5 Aspects for inclusion as conditions of Authorisation

- All mining and rehabilitation to be conducted as per the approved EMPr, and Rehabilitation, Decommissioning and Closure Plan (**Appendix F**).
- Concurrent mining and rehabilitation must be undertaken in the designated mining blocks.
- The new proposed mine is only an extension of an existing operation (NC 10423MP) and shall have access to the existing infrastructure on the adjacent mine.

- The proposed mining area must be clearly demarcated with semi-permanent markers.
- The upper 50cm of soil must be removed and stockpiled to be returned after mining by spreading evenly over the mined area.
- Eradicate all alien vegetation in the area during and regularly after mining.
- The Kaolin mining operator must appoint a suitably qualified ECO who will be responsible for ensuring compliance with the requirements of the EMPr during the mine operation and decommissioning.
 - The ECO must:
 - Inspect the site and record compliance with the EMPr;
 - Inform key, on-site staff of their roles and responsibilities in terms of the EMPr;
 - Ensure that all activities on site are undertaken in accordance with the EMPr;
 - Immediately notify the mine operator of any non-compliance with the EMPr, or any other issues of environmental concern.
- Should any burials, fossils or other historical material be encountered during construction, work must cease immediately and SAHRA must be contacted.
- The mine operation must follow an Integrated Waste Management approach. Control measures must be implemented to prevent pollution of any water resource or soil surface by oil, grease, fuel or chemicals. Appropriate pollution prevention measures must be implemented to prevent dust.
- A speed limit of 30km/hour on site will be displayed and enforced through a fining system. The national speed limits will be applicable for hauling trucks.
- The access roads shall be maintained during operational activities.
- Refer to **Appendix G**. The specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented. Interim Comments from the South African Heritage Resources Agency (SAHRA) are attached at **Appendix D**, and the formal letter from Dr Almond has been supplied.

10.6 Description of any assumptions, uncertainties and gaps in knowledge

- The desk-top research included reference to the SANBI BGIS database map viewer for the various baseline environmental attributes, and any assumptions or gaps in knowledge expressed by SANBI in the provision of this information would be applicable to this information as referenced.
- It is assumed that the proposed mitigation measures as listed in this report and included in the EMPr will be implemented and adhered to. Mitigation measures are proposed which are considered to be reasonable and must be implemented in order for the outcome of the assessment to be accurate.

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

10.7.1 Reasons why the activity should be authorized or not

It is the opinion of the EAP that the proposed Kaolin mining activity should be authorised. In reaching this conclusion the EAP has considered that:

- The new proposed mine is only an extension of an existing operation (NC 10423MP) and shall have access to the existing infrastructure on the adjacent mine. The operation of this existing mine is managed very well ensuring excellent compliance with environmental standards, as observed during the site visit held on the 9th October 2017.
- Kaolin is a sought after mineral required for industrial and medical purposes.
- The "preferred alternative" takes into account location alternatives, activity alternatives, layout alternatives, technology alternatives and operational alternatives.
- The approach taken is that it is preferable to avoid significant negative environmental impacts, wherever possible.
- The site is located in a CBA2 area and within a Freshwater Ecosystem Priority Area (FEPA) sub-catchment. It is the opinion of the EAP that the underlying biodiversity objectives and ecological functioning will not be compromised, subject to the strict adherence to the EMPr and Rehabilitation, Decommissioning and Closure Plan (**Appendix F**). It is noted that the grazing potential of the mined and rehabilitated area will improve.

An Archaeological Impact Assessment Report attached at **Appendix G** has been prepared and submitted to the South African Heritage Resources Agency (SAHRA). SAHRA requested a formal paleontological letter

from Dr. John Almond. This letter dated 30 January 2018 with geological map has been included after the AIA report, which is attached as **Appendix G**.

- No negative biophysical impacts have been identified that are so severe as to prevent the proposed mining activity from taking place.
- The activity has been assessed to have a positive socio-economic impact, especially in terms of the creation of employment and the provision of Kaolin for industrial and medical uses.
- Provided the recommended mitigation measures are implemented and mining activities are managed in accordance with the stipulations of the EMPr, and Rehabilitation, Decommissioning and Closure Plan (**Appendix F**), in an environmentally sound manner, the potential negative impacts associated with the implementation of the preferred alternative can be reduced to acceptable levels.

10.7.2 Conditions that must be included in the authorisation

As per section 10.5 above:

- All mining and rehabilitation to be conducted as per the approved EMPr, and Rehabilitation, Decommissioning and Closure Plan (**Appendix F**).
- Concurrent mining and rehabilitation must be done in the designated mining blocks.
- The proposed mining area must be clearly demarcated with semi-permanent markers.
- The upper 50cm of soil must be removed and stockpiled to be returned after mining by spreading evenly over the mined area.
- Eradicate all alien vegetation in the area during and regularly after mining.
- Refer to **Appendix G**. The heritage specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented. Interim Comments from the South African Heritage Resources Agency (SAHRA) are attached at **Appendix D**, and the formal letter from Dr Almond has been supplied.
- The Kaolin mining operator must appoint a suitably qualified ECO who will be responsible for ensuring compliance with the requirements of the EMPr during the mine operation and decommissioning.
 - The ECO must:
 - Inspect the site and record compliance with the EMPr;
 - Inform key, on-site staff of their roles and responsibilities in terms of the EMPr;
 - Ensure that all activities on site are undertaken in accordance with the EMPr;
 - Immediately notify the mine operator of any non-compliance with the EMPr, or any other issues of environmental concern.
- Should any burials, fossils or other historical material be encountered during construction, work must cease immediately and SAHRA must be contacted.
- The mine operation must follow an Integrated Waste Management approach. Control measures must be implemented to prevent pollution of any water resource or soil surface by oil, grease, fuel or chemicals. Appropriate pollution prevention measures must be implemented to prevent dust.
- A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers will be informed of the speed limit applicable to the length of the access road off the N14 where after the national speed limits will be applicable for hauling trucks. The access road will be maintained during operational activities.

10.7.3 Period for which the Environmental Authorisation is required

The authorisation is required for the duration of the Kaolin mining permit which is an initial 2 years plus a potential to extend the permit by an additional 3 years. Normally there is also a time delay in the granting of applications for renewal therefore a total period of 10 years may be required.

10.7.4 Undertaking

It is confirmed 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 (BAR) and the Environmental Management Programme report (EMPr).

11 FINANCIAL PROVISION

11.1 Legal Framework

With the repeal of Section 41 of the MPRDA (Act 28 of 2002) that requires that the owner of a mine must make financial provision for the remediation of environmental damage, regulations pertaining to the financial provision for prospecting, exploration, mining or production operations under section 44, read with sections 24 of the National Environmental Management Act, 1998 (Act No.107 of 1998) were issued in 2015.

According to regulation 7 the applicant or holder of a right or permit must ensure that the financial provision is, at any given time, equal to the sum of the actual costs of implementing the plans and report contemplated in regulation 6 and regulation 11(1). In terms of regulation 11(1) the holder of a right or permit must ensure that a review is undertaken of the requirements for:

- (a) annual rehabilitation, as reflected in an annual rehabilitation plan;
- (b) final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of operations as reflected in a final rehabilitation, decommissioning and mine closure plan; and,
- (c) remediation of latent or residual environmental impacts which may become known in the future, including the pumping and treatment of polluted or extraneous water, as reflected in an environmental risk assessment report.

11.2 Calculation

Financial provision in terms of reg. 6(c) is covered by the requirements for the actual costs of implementation of the measures required for final rehabilitation, decommissioning and closure of the mining operations at the end of the life of operations as reflected in the final rehabilitation, decommissioning and mine closure plan in terms of regulation 6(b) and attached as **Appendix F**.

Table 10: Table of Costs for Final Rehabilitation, Decommissioning and Closure of the Mining Operations

Cost Factor 1				
Demolish and remove Buildings/Infrastructure including subsurface structures and bunded fuel storage - Salvage useable material, break structure and dispose in waste dump				
Risk based criteria and assumptions with regard to rehabilitation				
The cement structures used as part of the waste management facilities of the mine will not form part of this final decommissioning, rehabilitation and closure plan.				
All other structures will be demolished and terracing and foundations removed to the lesser of 500 mm below the original ground level.				
Inert waste, which is more than 500 mm underground, such as pipes, will be left in place				
All services related to the mining operation, water supply lines and storage on site will have to be demolished				
Mining/Sampling Area	Unit	No Units	Unit Cost	Cost per Element
Logistical facilities 0.5 Ha	Areas	1.00	R7,212.00	R7,212.00
Processing plant 0.5 Ha	Areas	1.00	R7,212.00	R7,212.00
			Sub-Total	R14,424.00
Cost Factor 2				
Remove waste from temporary storage and scrap from salvage yard				
Risk based criteria and assumptions with regard to rehabilitation				
A hazardous disposal site will not be constructed and all hazardous waste will be removed from site and transported to the nearest licensed facility.				
Waste will be dispose/recycled every 3 month and there will never be more than 3 month worth of waste in the temporary storage areas				
Salvage Yard	Areas	1.00	R7,328.00	R7,328.00
Temporary waste storage area	Areas	1.00	R7,328.00	R7,328.00
			Sub-Total	R14,656.00
Cost Factor 3				

Final cleanup - remove all mining related waste walk through with landowner				
Risk based criteria and assumptions with regard to rehabilitation				
Removal of all structures and infrastructure not to be retained by the landowner in terms of section 44 of the MPRDA.				
All fixed assets that can be profitably removed will be removed for salvage or resale.				
Any item that has no salvage value to the mine, but could be of value to individuals, will be sold (zero salvage assumed in cost estimation) and the remaining treated as waste and removed from site.				
Areas less than 10 Ha	Areas	1.00	R4,328.00	R4,328.00
			Sub-Total	R4,328.00
Cost Factor 4				
Loading and transport of overburden and product stockpile for backfill > 80m				
Risk based criteria and assumptions with regard to rehabilitation				
Return of land to its pre-mining land capability where possible				
It is assumed that the post-mining pit stability and profile will be addressed as part of the operation and necessary remedial actions implemented prior to closure.				
Backfilling is done as part of operations.				
Excavations will be developed in segments < 0.5Ha to provide for concurrent rehabilitation as part of the annual rehabilitation plan.				
Leftover Product or low grade product	m ³	100.00	R9.53	R953.00
			Sub-Total	R953.00
Cost Factor 5				
Backfill and profiling pit slope 18° by means of dozing <80m				
Risk based criteria and assumptions with regard to rehabilitation				
It is assumed that the post-mining pit stability and profile will be addressed as part of the operation and necessary remedial actions implemented prior to closure.				
Backfilling is done as part of operations.				
Excavations will be developed in segments < 0.5Ha to provide for concurrent rehabilitation as part of the annual rehabilitation plan.				
Backfill burrow pit boulders and overburden	Ha	1.00	R9,648.98	R9,648.98
			Sub-Total	R9,648.98
Cost Factor 6				
Spreading topsoil level area				
Risk based criteria and assumptions with regard to rehabilitation				
All disturbed and exposed surfaces will be covered with at least 150 mm of topsoil and re-vegetation must be allowed to take place naturally				
Where topsoil is not available, the cost for in-situ remediation will be the same as the estimate for top soiling				
Product drying, Stockpile and Dispatch Yard	Ha	1.00	R3,253.06	R3,253.06
Laydown and movement area	Ha	1.00	R3,253.06	R3,253.06
Salvage Yard	Ha	0.50	R3,253.06	R1,626.53
			Sub-Total	R8,132.65
Cost Factor 7				
Ripping and levelling Roads and all compacted areas				
Risk based criteria and assumptions with regard to rehabilitation				
All compacted areas due to hauling and stockpiling must be ripped to 300 mm				
Existing tracks will be used and no new roads will be developed.				
The stockpile and logistics area will not exceed the planned footprint.				
Product drying, Stockpile and Dispatch Yard	Ha	1.00	R245.36	R245.36
Laydown and movement area	Ha	1.00	R245.36	R245.36
Salvage Yard	Ha	0.50	R245.36	R122.68
			Sub-Total	R613.40
Total estimated cost to fully decommissioned the mining site at final closure				R52,756.03

11.3 Explain how the aforesaid amount was derived

According to regulation 6 an applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for:

- a) annual rehabilitation, as reflected in an annual rehabilitation plan;
- b) final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of operations, as reflected in a final rehabilitation, decommissioning and mine closure plan; and,
- c) remediation of latent or residual environmental impacts which may become known in the future, including the pumping and treatment of polluted or extraneous water, as reflected in an environmental risk assessment report.

11.4 Confirm that this amount can be provided for from operating expenditure

The amount needed for the implementation of the final rehabilitation, decommissioning and closure plan will be provided to DMR in the form of a bank guarantee and the plan will be revised on an annual basis in terms of regulation 11(1) of the NEMA Financial Regulations 2015.

Provision for implementation of the annual rehabilitation plan is to be provided as part of the environmental audit report in terms of Regulation 34 (1)(b) of the NEMA EIA Regulations (2014) will be provided as part of the operational budget. Proof of access to the necessary fund will be provided as part of the Mine Works Plan (MWP) together with proof of access to the necessary financial resources.

12 SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

12.1 Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998)

The EIA report must include the:-

- (1) Impact on the socio-economic conditions of any directly affected person

A full consultation process is being 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 (attached as **Appendix D**) to inform the decision-making process.

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

Refer to **Appendix G**. The specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented. Interim Comments from the South African Heritage Resources Agency (SAHRA) are attached at **Appendix D**.

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

A motivation for investigating the reasonable and feasible alternatives is provided in Section 8 above.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

13 ENVIRONMENTAL MANAGEMENT PROGRAMME

13.1 Details of the EAP

This is addressed in Section 1.1 above.

13.2 Description of the Aspects of the Activity

This is addressed in Part A, Sections 9 and 10 above.

13.3 Composite Map

This is addressed in Section 8 above, and the Site Plan is attached as **Appendix C**.

13.4 Description of Impact management objectives including management statements

This is addressed in Section 10.4 above.

13.5 Determination of closure objectives

This is addressed in Section 10.4 above.

13.6 Volumes and rate of water use required for the operation

The proposed Kaolin mining activity does not require water for operation.

13.7 Has a water use license has been applied for?

A Water Use License is not required.

13.8 Impacts to be mitigated in their respective phases

Table 11: Measures to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
SITE ACCESS & SITE ESTABLISHMENT	CONSTRUCTION	Total footprint is 5ha	<p>Impact 1: Soil erosion & soil compaction</p> <ul style="list-style-type: none"> • After clearing, the affected area shall be stabilized to prevent any erosion or sediment runoff. Stabilized areas shall be demarcated accordingly. • Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces. • Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and stormwater run-off. • Top soil shall be removed separately and stockpiled separately from other soil base layers. • Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. • Topsoil storage areas must be convex and should not exceed 2m in height. • Topsoil must be treated with care, must not be buried or in any other way be rendered unsuitable for further use (e.g. by mixing with spoil) and precautions must be taken to prevent unnecessary handling and compaction. • In particular, topsoil must not be subject to compaction greater than 1 500 kg/m² and must not be pushed by a bulldozer for more than 50 metres. Trucks may not be driven over the stockpiles. • Reduce drop height of material to a minimum. • Temporarily halt material handling in windy conditions. • A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit. • Compacted areas that are not required for access shall be scarified after use during decommissioning and rehabilitation. <p>Impact 2: Water resources (Groundwater)</p> <ul style="list-style-type: none"> • Oils and lubricants must be stored within sealed containment structures. • Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. • When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. 	<p>NEMA Section 2 Principles</p> <p>Environmental Authorisation</p>	<p>Start of activity and continuous as mining progresses over the site during construction period (site access and site establishment activities)</p> <p>Upon cessation of each activity where applicable.</p> <p>Immediately in the event of spills</p>

		<ul style="list-style-type: none"> • Machinery must be kept in good working order and regularly inspected for leaks. • A spill kit will be available on each site where mining activities are in progress. • Any spillages will be cleaned up immediately and treated in the bio-cells (soil farms) which are located on the adjacent mine. • Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. • Waste separation must be undertaken if practical for recycling • Provide all workers with environmental awareness training and comply with the requirements of the EMPr. • Provide a bin at the site and provide a mobile ablution facility. 		
		<p>Impact 3: Impact on Biodiversity</p> <ul style="list-style-type: none"> • Soil disturbance caused by vegetation clearing will provide suitable conditions for the establishment and spreading of alien invasive vegetation. • Removal of alien invasive vegetation if required, is a positive impact, and will benefit the ecological functioning. • The only identified land use is small stock grazing and due to the restoration in land use and small scale of the operation mining will not have any additional impact and the land will revert back to its former use grazing with an improvement in production. 		
		<p>Impact 4: Contamination & Pollution</p> <ul style="list-style-type: none"> • Oils and lubricants must be stored within sealed containment structures if kept on site. • Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. • When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. • Machinery must be kept in good working order and regularly inspected for leaks. • A spill kit will be available on each site where mining activities are in progress. • Any spillages will be cleaned up immediately. • Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. • Waste separation must be undertaken if practical for recycling • Provide all workers with environmental awareness training. • Provide a bin at the site. • Regularly dispose of any solid waste at a municipal waste disposal site. • Ensure all workers comply with the requirements of the EMPr. Provide a mobile ablution facility. 		
		<p>Impact 5: Visual landscape</p> <ul style="list-style-type: none"> • The construction areas shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall be kept orderly. • Restrict working hours to normal work day hours with no work over weekends when holidays occur to minimize hauling trucks along access roads. 		
		<p>Impact 6: Emissions</p> <ul style="list-style-type: none"> • The Contractor shall adhere to the local by-laws and regulations regarding the noise and associated hours of operations. • The Contractor shall limit noise levels (e.g. install and maintain silencers on machinery). The provisions of SANS 1200A Sub clause 4.1 regarding “built-up” area shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas. • Construction and demolition activities generating output of 85dB or more, shall be limited to normal working hours and not allowed during weekends to limit the impact 		

			<p>of noise of neighbours. Should the Contractor need to work outside normal working hours, the surrounding neighbours shall be informed prior to the work taking place.</p> <ul style="list-style-type: none"> No amplified music shall be allowed on site. On public roads adjacent to the site vehicles shall adhere to municipal and provincial traffic regulations including speed limits. Vehicles used on site for the construction related activities shall be maintained and in a good working condition so as to reduce emissions. Stockpiles must be maintained (covered where necessary) to avoid wind erosion of the material. Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces. 		
			<p>Impact 7: Heritage resources</p> <ul style="list-style-type: none"> Refer to Appendix G. The specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented. The Interim Comment from the South African Heritage Resources Agency (SAHRA) is attached at Appendix D. 		
			<p>Impact 8: Socio-economic</p> <ul style="list-style-type: none"> Employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling) 		
Excavation of Kaolin; movement of vehicles on site; waste generation and management	OPERATION	Total footprint is 5ha: average depth of 6 metres	<p>Impact 1: Soil erosion, soil compaction & geological sequence</p> <ul style="list-style-type: none"> After clearing, the affected area shall be stabilized to prevent any erosion or sediment runoff. Stabilized areas shall be demarcated accordingly. Incremental clearing of vegetation should take place to avoid unnecessary exposed surfaces. Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and stormwater run-off. Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. Reduce drop height of material to a minimum. Temporarily halt material handling in windy conditions. A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit. Compacted areas that are not required for access shall be scarified after use during decommissioning and rehabilitation. No industrial or mine waste is generated during the mining process. Processing shall include the spreading of Kaolin to dry out where after it will be screened and bagged to be sold as a FoT product. Product stockpiles shall form part of the drying area that shall also serve as a dispatch yard. Primary processing shall include screening by means of a "trommel screen" provided as part of the adjacent operation so no Fine Residue Dumps (FRD) will be created. Mining shall be in the form of a cut and fill operation where overburden will be backfilled in mined out sections and covered with topsoil as excavations advance. Mixing of the geological sequence of sediment will be avoided and at final closure oversize material and low grade Kaolin will first be backfilled into the excavation 	NEMA Section 2 Principles Environmental Authorisation	<p>During the estimated 5 year lifespan of the mine.</p> <p>Start of activity and continuous as mining progresses over the site during operational period.</p> <p>Upon cessation of each activity where applicable.</p> <p>Immediately in the event of spills.</p>

			<p>before covering with available topsoil. Due to a shortage of topsoil the white Kaolin will still be visible above surface after rehabilitation but with the natural movement of the dune sand will be covered naturally.</p> <ul style="list-style-type: none"> • Re-shaping of landscape and topography to form shallow depressions. 		
			<p>Impact 2: Water resources (groundwater)</p> <ul style="list-style-type: none"> • Oils and lubricants must be stored within sealed containment structures. • Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. • When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. • Machinery must be kept in good working order and regularly inspected for leaks. • A spill kit will be available on each site where mining activities are in progress. • Any spillages will be cleaned up immediately and treated in the bio-cells (soil farms) which are located on the adjacent mine. • Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. • Waste separation must be undertaken if practical for recycling • Provide all workers with environmental awareness training and comply with the requirements of the EMPr. • Provide a bin at the site and provide a mobile ablution facility. 		
			<p>Impact 3: Impact on Biodiversity</p> <ul style="list-style-type: none"> • Refer to Appendix C, which indicates that existing farm tracks will be used. • The mining area and stockpile areas must be demarcated and the footprint contained within the demarcated area. • Mining areas to be limited to blocks of 0.5Ha at a time with progressive rehabilitation. • The annual rehabilitation plan must be implemented. • Remove alien invasive vegetation, and ensure ongoing alien vegetation clearing in the area. • No indigenous plants outside of the demarcated work areas may be damaged. • The noise and vibration caused by the earthmoving equipment will disturb smaller animals. These will move away whilst operations are in progress. Should any animals be encountered these should be moved away by a suitably trained nature conservation officer, if necessary. 		
			<p>Impact 4: Contamination & Pollution</p> <ul style="list-style-type: none"> • Oils and lubricants must be stored within sealed containment structures if kept on site. • Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. • When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. • Machinery must be kept in good working order and regularly inspected for leaks. • A spill kit will be available on each site where mining activities are in progress. • Any spillages will be cleaned up immediately. • Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. • Waste separation must be undertaken if practical for recycling • Provide all workers with environmental awareness training. • Provide a bin at the site. • Regularly dispose of any solid waste at a municipal waste disposal site. • Ensure all workers comply with the requirements of the EMPr. 		

			<ul style="list-style-type: none"> Provide a mobile ablation facility. <p>Impact 5: Visual landscape</p> <ul style="list-style-type: none"> Maintain the height of the stockpile areas at a maximum of 2 metres. The site shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall be kept orderly. Restrict working hours to normal work day hours with no work over weekends when holidays occur to minimize hauling trucks along access roads. The impact is insignificant given the small scale of the activities and the isolation of the site. The impact is temporary and after mining the excavations will be sloped, all oversize material and overburden will be backfilled, top soiled and allowed to re-vegetate naturally resulting in an even depression with no residual impact. <p>Impact 6: Emissions</p> <ul style="list-style-type: none"> Ensure Kaolin hauling is during normal working hours and not on weekends No amplified music shall be allowed on site. On public roads the vehicles shall adhere to municipal and provincial traffic regulations including speed limits. Vehicles used on site for the construction related activities shall be maintained and in a good working condition so as to reduce emissions. Ensure bagged Kaolin is properly secured for hauling. <p>Impact 7: Heritage resources</p> <ul style="list-style-type: none"> Refer to Appendix G. The specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented. The interim Comment from the South African Heritage Resources Agency (SAHRA) is attached at Appendix D, and the formal letter from Dr Almond has been supplied. <p>Impact 8: Socio-economic</p> <ul style="list-style-type: none"> Employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling) 		
Final Rehabilitation and removal of temporary infrastructure	DECOMMISSIONING	Less than 5ha	<ul style="list-style-type: none"> Implementation of Final Rehabilitation, Decommissioning and Mine Closure Plan. Compacted areas shall be scarified after use during decommissioning and rehabilitation. Any stored topsoil shall be spread over the scarified surface. Ongoing removal of alien invasive vegetation. After mining the excavations will be sloped, all oversize material and overburden will be backfilled, top soiled and allowed to re-vegetate naturally resulting in an even depression with no residual impact. 	NEMA Section 2 Principles Environmental Authorisation	

13.9 Impact Management Outcomes

Table 12: Impact Management Outcomes

ACTIVITY (whether listed or not listed).	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Site access	Disturbance of biodiversity	Biodiversity in an CBA2 and River FEPA sub-catchment	Construction	Remedy through restriction and rehabilitation	Impacts minimised and mitigated.
				Remedy through restriction and rehabilitation	
	Soil compaction and erosion	Soil resource		Control through monitoring and management	End use objectives achieved through rehabilitation.
Site establishment, including waste generation and management	Visibility	Visual intrusion	Construction	Control through monitoring and management	Impacts minimised and mitigated.
	Emissions (dust, noise & vehicles)	Noise & Air quality		Control through monitoring and management	
	Disturbance of biodiversity	Biodiversity in an CBA2 and River FEPA sub-catchment		Remedy through restriction and rehabilitation	End use objectives achieved through rehabilitation.
	Soil, sand and groundwater contamination, soil compaction and disturbance	Soil and water resources		Remedy through restriction and rehabilitation & control through monitoring and management	
	Destruction or loss of Heritage resources	Cultural and Heritage		Avoidance by relocation of activity if required	
Excavation of Kaolin, loading and hauling, waste generation and management	Visibility	Visual	Operation	Control through monitoring and management	Impacts minimised and mitigated.
	Emissions (dust, noise & vehicles)	Noise & Air quality		Control through monitoring and management	
	Disturbance of biodiversity	Biodiversity in an CBA2 and River FEPA sub-catchment		Remedy through restriction and rehabilitation	End use objectives achieved through rehabilitation.

	Soil, sand and groundwater contamination, soil compaction and geological sequence disturbance	Soil and water resources		Remedy through restriction, rehabilitation and control through monitoring and management	
	Destruction or loss of Heritage resources	Cultural and Heritage		To be determined by SAHRA as required.	
Rehabilitation of the mining area, including removal of temporary infrastructure	Dust emissions (vehicle entrained dust)	Soil resource	Decommissioning	Control through monitoring and management	Impacts minimised and mitigated.
	Soil erosion due to slow recovery of vegetation	Soil resource & biodiversity		Remedy through restriction and rehabilitation & control through monitoring and management	End use objectives achieved through rehabilitation.

13.10 Impact Management Actions

Table 13: Impact Management Actions

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Site access	Disturbance of biodiversity	Remedy through restriction and rehabilitation	Concurrently with site access activities	Remain within the ambit of the Mining Permit Programme and Environmental Authorisation
	Soil compaction and erosion	Control through monitoring and management	Upon cessation of activity	
Site establishment, including waste generation and management	Visibility	Control through monitoring and management		
	Emissions (dust, noise & vehicles)	Control through monitoring and management		
	Disturbance of biodiversity	Remedy through restriction and rehabilitation		
	Soil, sand and groundwater contamination, soil compaction and disturbance	Remedy through restriction and rehabilitation & control through monitoring and management		
	Destruction or loss of Heritage resources	Impact avoided; permit submission for removal or destruction of resource subject if required.		

Excavation of Kaolin; movement of vehicles on site; waste generation and management	Visibility	Control through monitoring and management	Concurrently with site access activities	Remain within the ambit of the Mining Permit Programme and Environmental Authorisation
	Emissions (dust, noise & vehicles)	Control through monitoring and management		
	Disturbance of biodiversity	Remedy through restriction and rehabilitation		
	Soil, sand and groundwater contamination, soil compaction and geological sequence disturbance	Remedy through restriction and rehabilitation & control through monitoring and management		
	Destruction or loss of Heritage resources	Impact avoided; permit submission for removal or destruction of resource if required.		
Rehabilitation of the mining area, including removal of temporary infrastructure	Dust emissions (vehicle entrained dust)	Control through monitoring and management	Upon cessation of activity	Remain within the ambit of the Mining Permit Programme and Environmental Authorisation
	Soil erosion due to slow recovery of vegetation	Remedy through restriction and rehabilitation & control through monitoring and management		

14 FINANCIAL PROVISION

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

- Objective 1 - To create a safe and rehabilitated post-mining environment:
 - Ensure safe mining area with no potentially dangerous areas like deep excavations.
 - Topsoil to be stockpiled and replaced during decommissioning and closure, and rehabilitation.
- Objective 2 - To minimise pollution or degradation of the environment:
 - Provide sufficient information and guidance to plan the mining activities in a manner that would reduce impacts as far as practically possible.
 - Limit residual environmental impact with no surface water or soil contamination by ensuring that no fuel or oil spills occur in the mining area.
 - Ensure that no solid waste or rubble is dumped on the site.
 - Ensure that portable toilets are used.
- Objective 3 – To minimise impacts on the community and to provide optimal post-mining social opportunities:
 - Ensure that workers remain within the mining permit area.
 - Operate during normal working hours only.
 - Minimise the generation of noise and dust.
 - Respond rapidly to any complaints received.
 - Minimal negative aesthetic impact
 - Optimised benefits for the social environment

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

The closure objectives as included in this Final BAR and in the Rehabilitation, Decommissioning and Mine Closure Plan (**Appendix F**), was made available to Interested and Affected Parties and consulted with the landowner.

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

Refer to the Rehabilitation, Decommissioning and Mine Closure Plan, which includes the Environmental Risk Assessment in **Appendix F**.

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

The closure objectives are to return the land disturbed by mining activities back to its original condition. The rehabilitation plan provides the detail on how this will be achieved as detailed in **Appendix F**.

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

Refer to Part A, Section 11.2 of this report.

14.6 Confirm that the financial provision will be provided as determined

Refer to Part A, Section 11.4 of this report.

14.7 Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting

Table 14: Mechanisms for Monitoring Compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
All mining activities	All commitments contained in the BA Report and accompanying EMPr.	Ensure commitments made within the approved BAR and EMPr are being adhered to.	Site Manager and EAP.	Annual Undertake and submit an environmental performance audit to DMR
Site access and site establishment	Visual inspection of soil erosion and/or compaction	All exposed areas, access roads and soil stockpiles must be monitored for erosion on a regular basis, specifically after rainfall events.	Site Manager and Independent EAP	Weekly, and after rain-fall events Weekly monitoring reports to be signed-off by the Site Manager Corrective action to be confirmed and signed-off by the Site Manager. Consolidated monthly monitoring reports (including confirmation of corrective action taken, with photographic evidence) to be submitted to the Site Manager.
Kaolin Mining	Visual inspection of biodiversity impacts	Visual inspection of mining activities and other possible secondary impacts <ul style="list-style-type: none"> Control and prevent the development of new access tracks. Control and prevent growth of alien vegetation in cleared areas and on stockpiles. Standard waste management practices must be implemented to prevent contamination and littering. All spill incidents will be reported and corrective action taken in accordance with an established spill response procedure. 	Site Manager & Contractor (or sub-contractors)	Daily Weekly monitoring reports to be signed-off by the Site Manager. Corrective action to be confirmed and signed-off by the Project Site Manager. Consolidated monthly monitoring reports (including confirmation of corrective action taken, with photographic evidence) to be submitted. Report incidents in terms of the relevant legislation, including the MPRDA, NWA and NEMA.
	Visual inspection of soil			
	Visual inspection of waste management, housekeeping and maintenance.			
Closure & Rehabilitation	Re-vegetation; stability; profile; Soil erosion; Alien invasive species	Inspection of all rehabilitated areas to assess whether soil erosion is occurring and to implement corrective action where required.	Site Manager	Bi-Annual A final audit report for site closure must be submitted to the DMR for approval.

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

An external environmental performance audit and the EMPr performance assessment shall be conducted annually interchangeably by an independent environmental assessment practitioner.

15 ENVIRONMENTAL AWARENESS PLAN

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

Environmental awareness and training includes:

- 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.
- Training verification and record keeping.

Before commencement of the mining activities all employees and contractors who are involved with such activities should attend relevant induction and training. It is standard practice for employees and the employees of contractors that will be working on a new project or at a new site to attend an induction course where the nature and characteristics of the project and the site are explained.

The training course should include key information abstracted from the EMPr pertaining to the potential environmental impacts, the mitigation measures that will be applied, the monitoring activities that will be undertaken and the roles and responsibilities of contractors' and personnel.

The EMPr document will also be made available to attendees.

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

Environmental risks and how to manage them are dealt with in the induction course referred to in Section 15.1 above. Should an incident of environmental pollution or damage occur it will be analysed and appropriate prevention and/or mitigation measures developed. These measures will be added to the EMPr and conveyed to the relevant personnel.

All unplanned incidents with the potential to cause pollution or environmental degradation or conflict with local residents will be reported to the Mineral Resources Manager within 24 hours.

Hydrocarbon Spills

Hydrocarbon spills that are considered to be emergency incidents are large-scale spills (cover a surface area >1m²), resulting from situations such as: a leaking diesel bowser; an oil drum that is knocked over; and, large spillages from equipment.

Activities that are involved in the clean-up of such instances include:

- The containment of the spill;
- The removal of all contaminated material; and,
- The disposal (at a licensed hazardous disposal facility) or bioremediation (at a licensed facility) of this material.

Fire

There is the potential for fire to occur in the following locations of the mining site:

- Veld fires across vegetated areas; and
- Vehicles and equipment.

Veld fires: Any person who observes the fire must report it to the fire brigade immediately and then to their supervisor. If possible, additional personnel may be sent to contain the fire, but only if the lives of the personnel will not be endangered.

Vehicles and Equipment: Fire extinguishers will be available at the site where mining activities will take place and in the vehicles. All staff members will be trained in the use of fire-fighting equipment.

15.3 Specific information required by the Competent Authority

Not applicable at this stage.

16 UNDERTAKING

The EAP herewith confirms

- | | |
|--|---|
| The correctness of the information provided in the reports | X |
| The inclusion of comments and inputs from stakeholders and I&APs | X |
| The inclusion of inputs and recommendations from the specialist Heritage, Paleontological and Cultural report where relevant; and | X |
| 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. | X |



Signature of the environmental assessment practitioner:

Green Direction Sustainability Consulting (Pty) Ltd

Name of company:

30 January 2017

Date:

-END-

17 APPENDIX A: CV OF EAP

Summary of the Environmental Assessment Practitioner's past experience

Jennifer Barnard has been registered with the South African Council for Natural Scientific Professions since 2009, and was awarded certification as an Environmental Assessment Practitioner (EAP) by the Interim Certification Board of South Africa in 2010. She has worked on numerous Environmental Impact Assessments, both in South Africa and the United Kingdom and has considerable experience in the preparation and compilation of Environmental Impact Reports, Environmental Management Programmes, Environmental Audits, and Environmental Management Frameworks, including construction monitoring where required. She has been working in the environmental consultancy field for 20 years, and prior to that in the KwaZulu-Natal Provincial Local Government and Development Planning (Environmental Planning and Policy Division) for 5 years.

Specific examples of private consultancy EAP experience include:

- Project Manager and Lead EAP of the Eskom Transnet Coal Link Suite of Projects (in terms of the NEC2 Contract with EIA project value of R6 million), which spanned both Mpumalanga and KwaZulu-Natal;
- Project Manager and Lead EAP of two SANRAL Road Upgrades on the N7, that included Borrow Pits; and,
- EAP for various Basic Assessments and EIAs in the Northern Cape for agricultural activities, and related Water Use General Authorisation Risk Matrices.

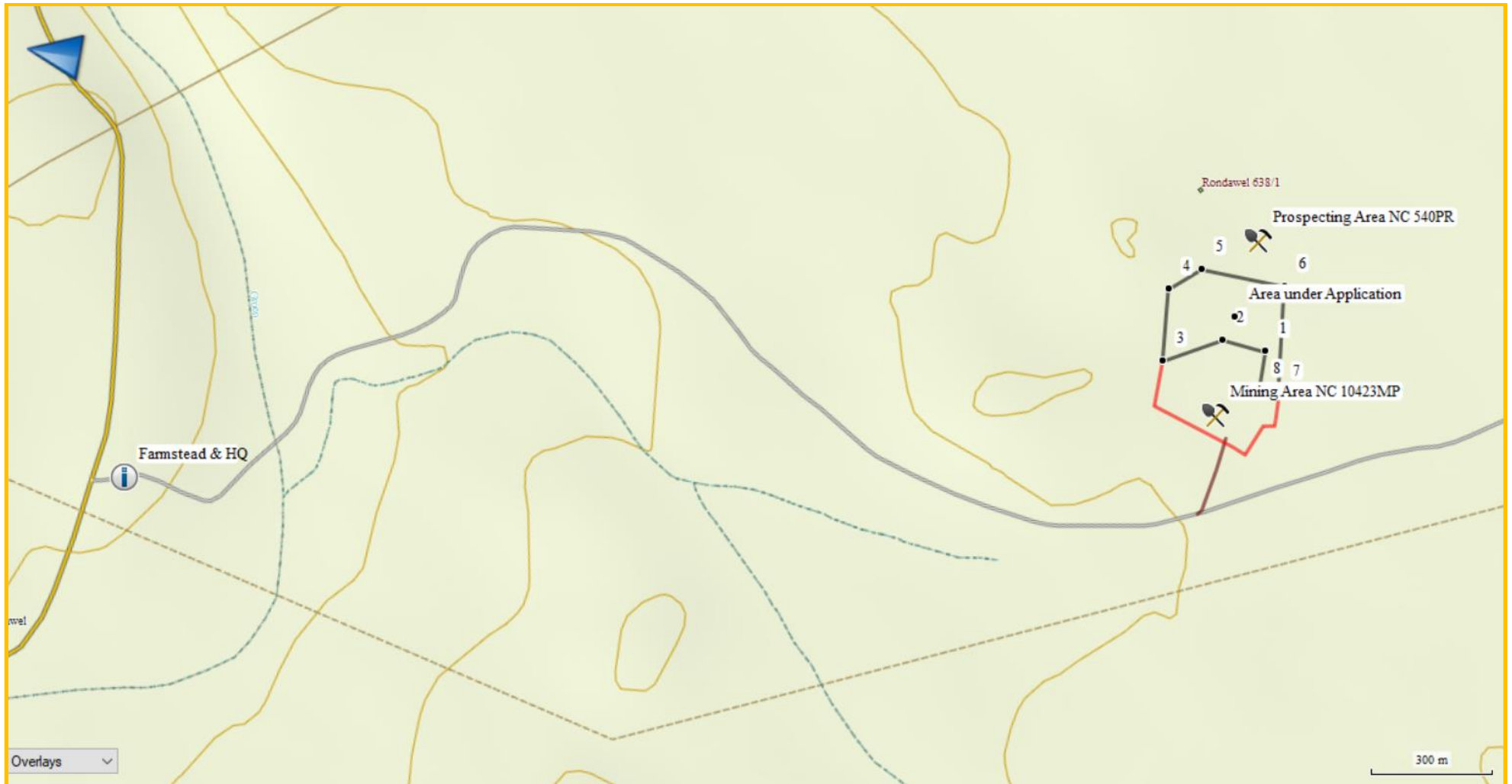
18 Appendix B1: Locality Map



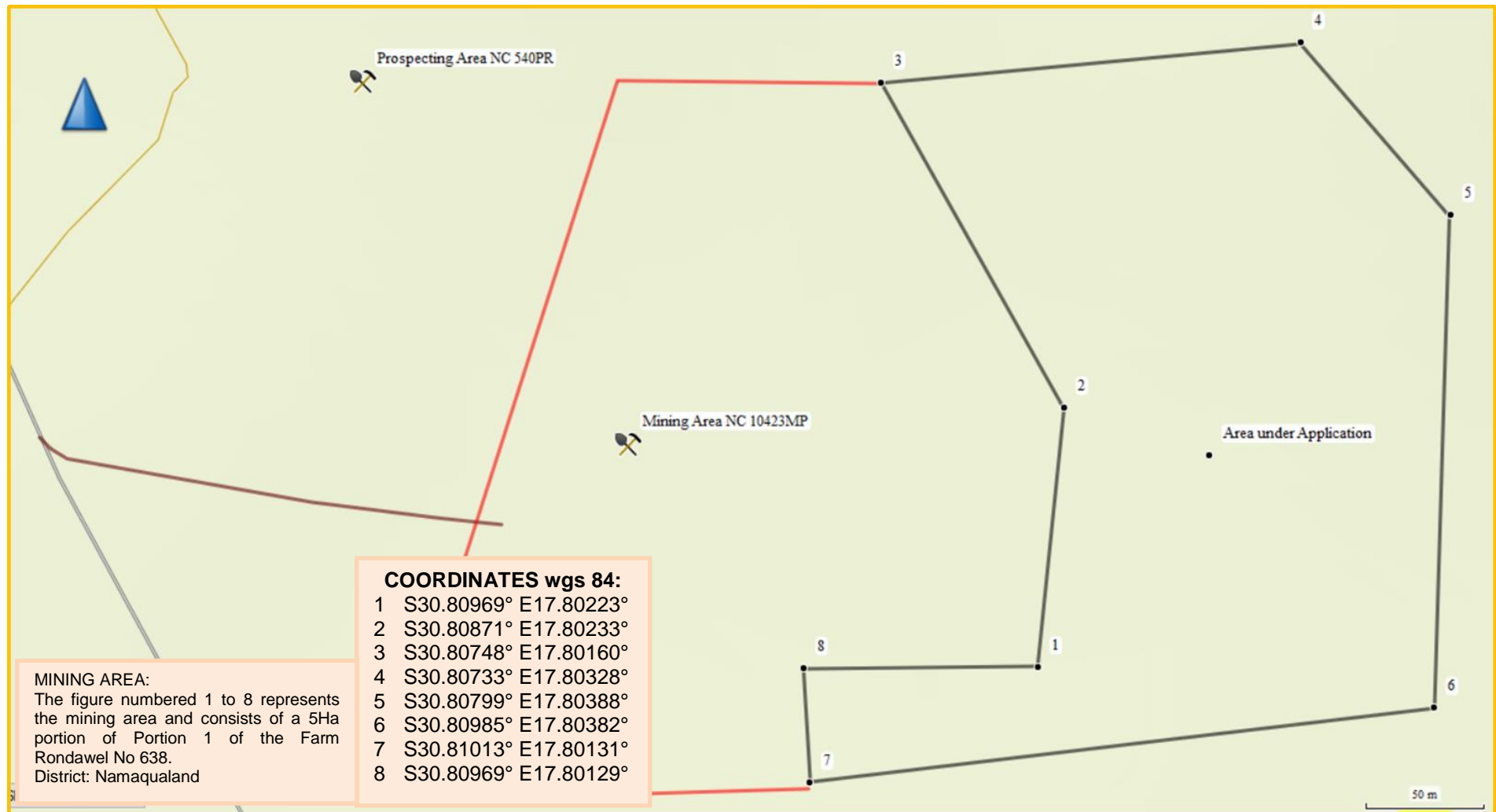
19 Appendix B2: Locality Map of Proposed Project Site within Portion 1 of Farm Rondawel 638



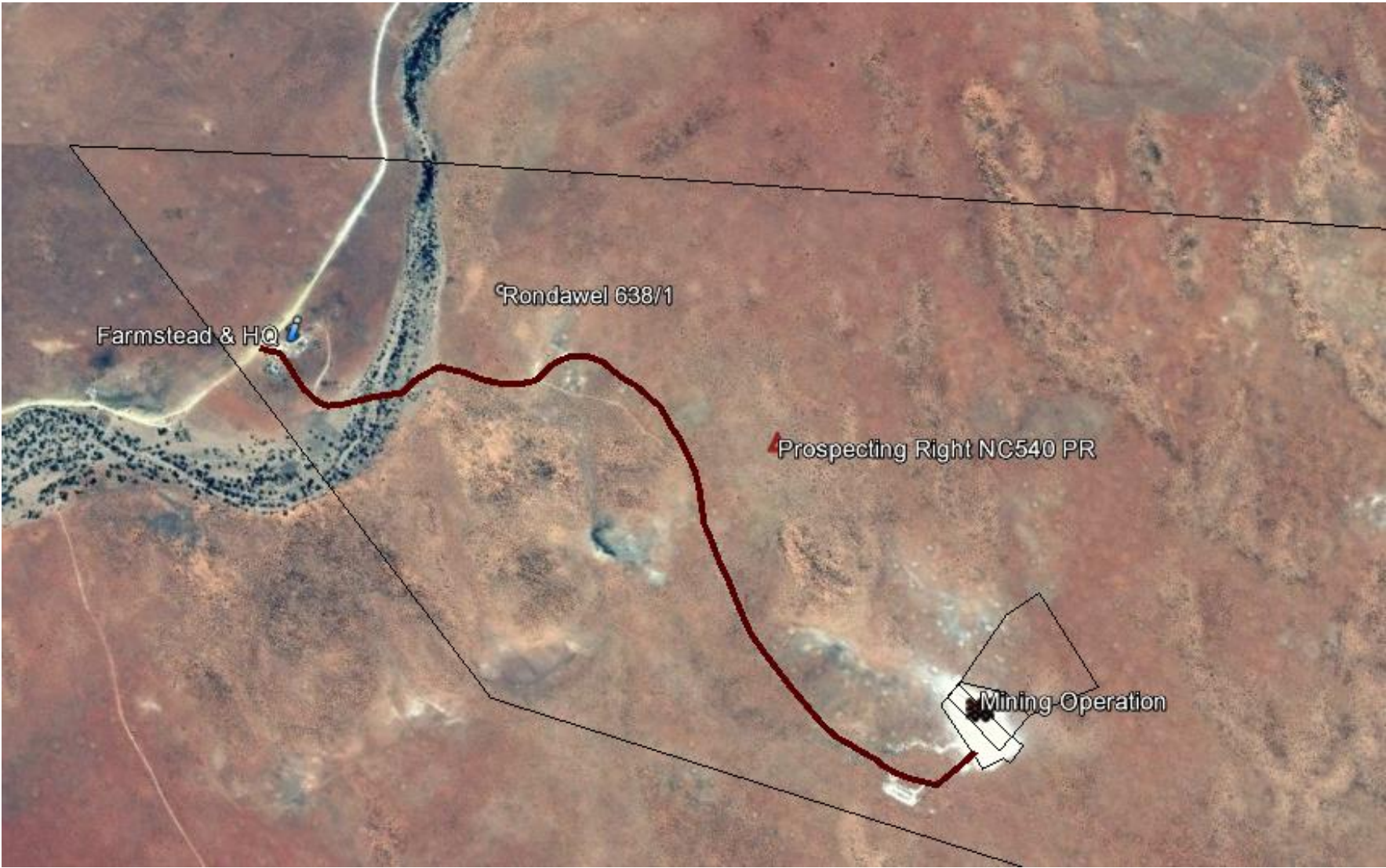
20 Appendix B3: Locality Map showing Access to Proposed Project Site & in relation to other mining permits and prospecting rights



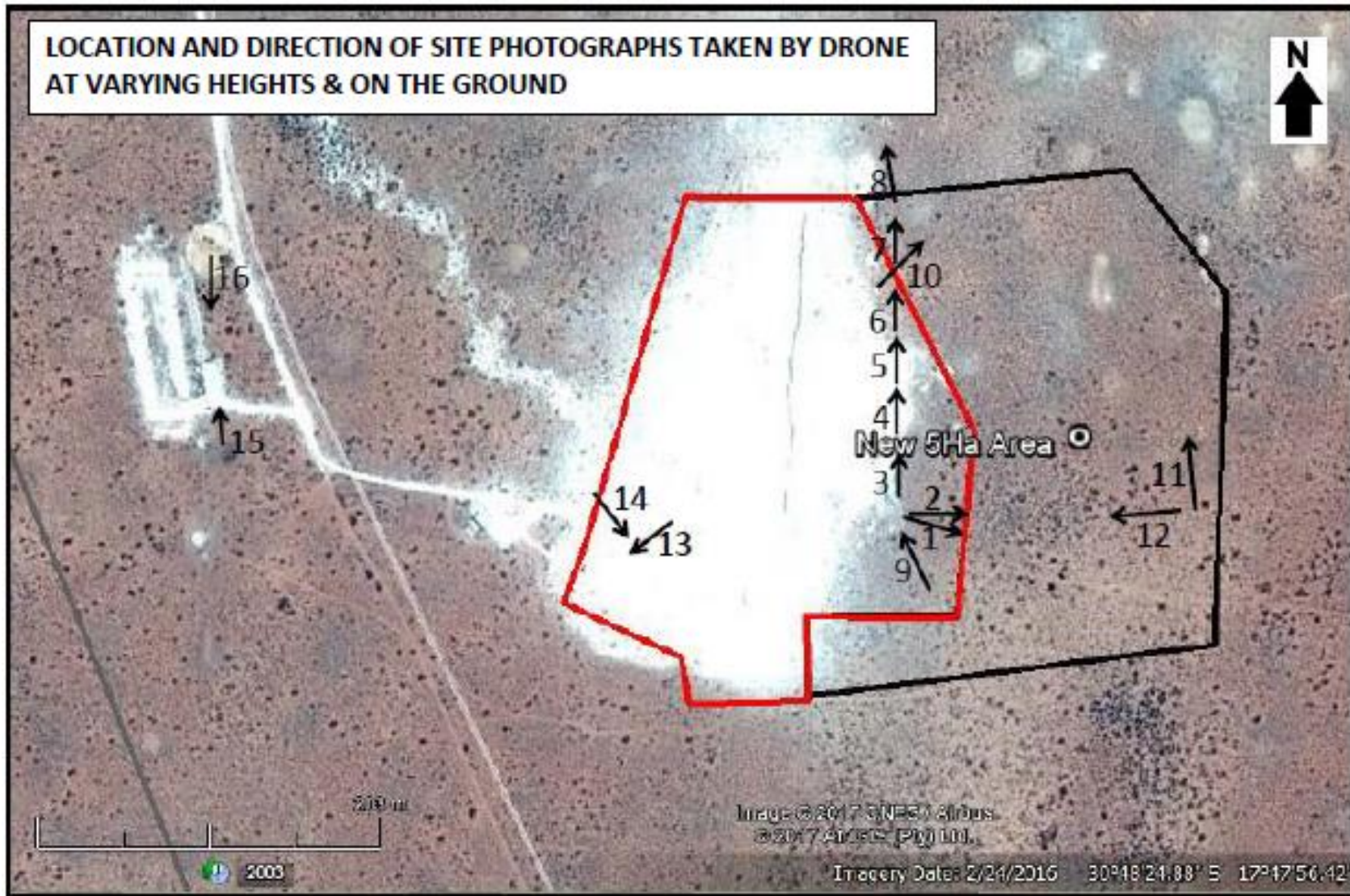
20 Appendix B4: Mine Layout with Co-ordinates











21 Appendix B5: Mine locality in relation to prospecting operation company HQ and access



22 Appendix B6: Site Photographs



	<p>Photograph 1:</p> <p>Aerial view in a south-easterly direction of the proposed project area adjacent to the existing mining site.</p>
	<p>Photograph 2:</p> <p>Aerial view in an easterly direction of the proposed project area.</p>
	<p>Photograph 3:</p> <p>Aerial view in a northerly direction of the proposed project area adjacent to the existing mining site.</p>
	<p>Photograph 4:</p> <p>Aerial view in a northerly direction of the proposed project area adjacent to the existing mining site, showing the existing topsoil and rock stockpiles for the existing mine, sequential to photograph 3.</p>

	<p>Photograph 5:</p> <p>Aerial view in a northerly direction of the proposed project area adjacent to the existing mining site, showing more of the existing topsoil and rock stockpiles for the existing mine; sequential to photograph 4.</p>
	<p>Photograph 6:</p> <p>Aerial view in a northerly direction of the proposed project area adjacent to the existing mining site, showing the northern most extent of the existing topsoil and rock stockpiles for the existing mine; sequential to photograph 5.</p>
	<p>Photograph 7:</p> <p>Aerial view in a northerly direction sequential to photograph 6.</p>
	<p>Photograph 8:</p> <p>Aerial view in a north-westerly direction sequential to photograph 7.</p>



Photograph 9:

Aerial view in a south-easterly direction of the proposed mining area.



Photograph 10:

Aerial view of the northern stockpiles of the existing mine, and of the northern boundary area of the proposed new mine.



Photograph 11:

View in a northerly direction from the eastern most edge of the new mining area looking towards the existing mine.



Photograph 12:

View in a westerly direction from the eastern most edge of the new mining area looking towards the existing mine.



Photograph 13:

View of the Backhoe Actor that runs back and forth to crush the kaolin into a powder form.



Photograph 14:

View of the Backhoe Actor loading a bag of kaolin onto the truck for hauling off site.



Photograph 15:

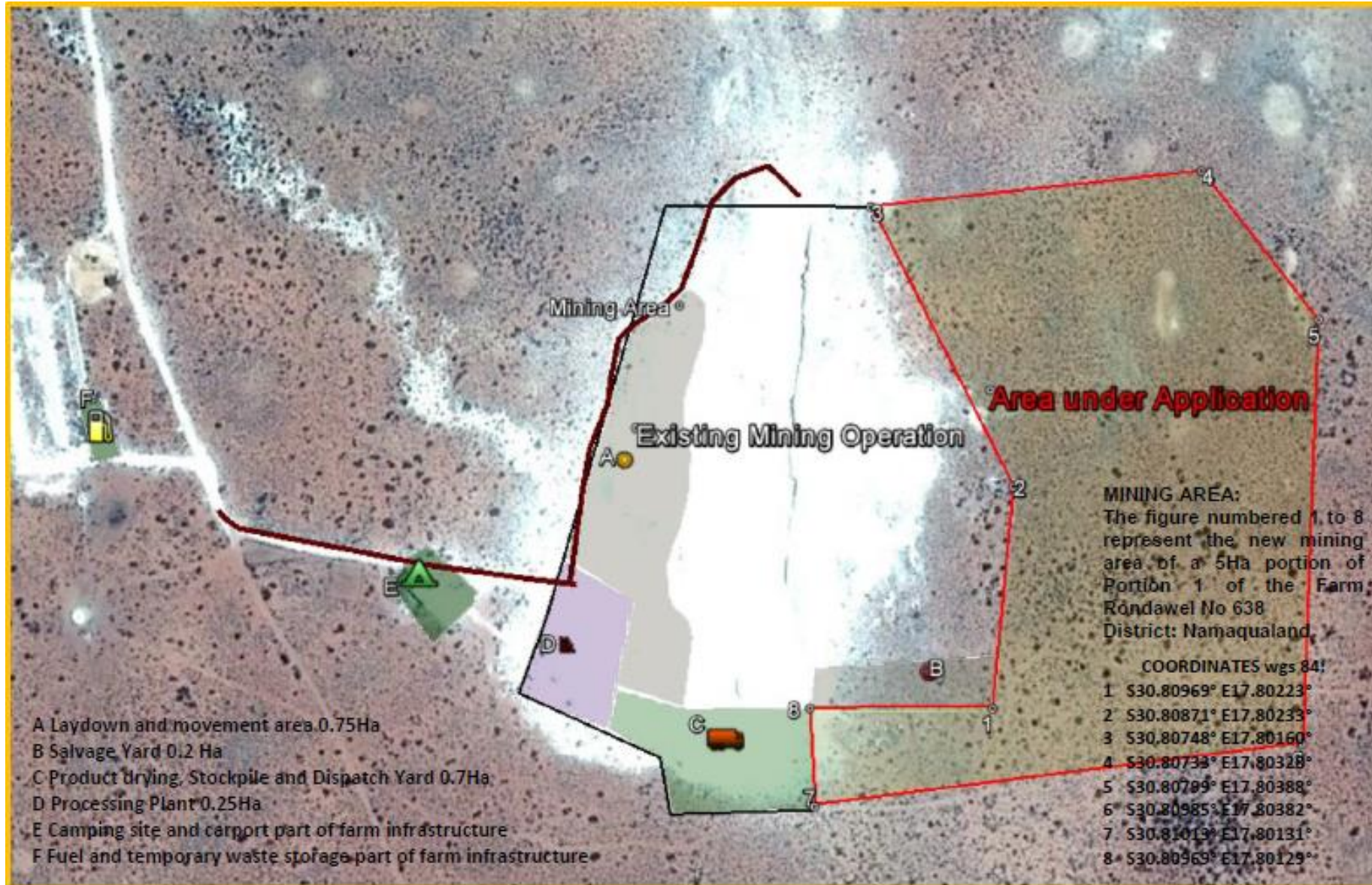
View of the bunded area for the diesel bowser and parking area for the Front End Loader.



Photograph 16:

View of the materials storage area, neatly separated and bundled. Soil farm areas for spillages of hazardous substances are located closer to the diesel bowser bunded area.

23 Appendix C: Site Plan



24 Appendix D: Public Participation Process Report

24.1 DMR PPP Consultation Summary

SUMMARY OF PUBLIC PARTICIPATION PROCESS

APPLICATION: PROPOSED KAOLIN MINING PERMIT APPLICATION: PORTION 1 OF FARM RONDAWEL 638, KAMIESBERG LOCAL MUNICIPALITY, NAMAQUA DISTRICT MUNICIPALITY, NORTHERN CAPE

NAME OF APPLICANT: IMVUSA KAOLIEN (PTY) LTD

REFERENCE NO.: NCS 30/5/1/1/2/1 (10638) MP

1. ADVERTISEMENT:

- Die Plattender: 27 October 2017 (English)

Response: None received to advertisement

Name	Date	Response	Reply
N/A			

2. NOTICE LETTERS & BID:

Registered Letters Hand Delivered, Record of Registration and Comments & Responses

Name	Date	Registered	Comments	Reply
ADJACENT LANDOWNERS				
Mr. A.A. Nieuwoudt	28/10/2017	Requested to be Registered	None received.	NA
Ms. J.S. Nieuwoudt		NA		
Ms. M.J Kotze				
Mr. G.S Nieuwoudt				
Mr. R. Barkhuizen		Requested to be Registered		
Mrs. E.A. Nieuwoudt Rodabel Boerdery CC				

Invusa Kaolin (Pty) Ltd Mining Permit Portion 1 Rondawel No 638, Namaqualand -
 MINING BASIC ASSESSMENT: Consultation Proof

ORGANS OF STATE			Project Announcement	Draft BAR & EMP		Proof PO #	Register I&A Party	Outcome EA & Appeal
No.	Surname	Initials		Hard Copy	Website			
1	Ndzumo	Ms. Onwable	E-mail	0	1		Yes	E-mail
2	Towell	Ms. Jolene	E-mail	0	1		Yes	E-mail
3	Fortuin	Mr Christiaan	E-mail	0	0		No	NA
4	Cloete	Mr Joseph	E-mail	0	0		No	NA
5	October	Mr Leon	E-mail	0	0		No	NA

LANDOWNER/NEIGHBORS			Project Announcement	Draft BAR & EMP		Received Signature	Register I&A Party	Outcome EA & Appeal
No.	Surname	Initials		Hard Copy	Website			
1	Nieuwoudt	Mr A.A.	Per hand	0	1		Yes	E-mail
2	Nieuwoudt ID 3704100004088	Ms J.S.	Per hand	1	0			E-mail
3	Kotze 5702250044084 Nieuwoudt	Ms M.J.	Per hand	1	0			E-mail
4	6810025163086 Barkhuizen	Mr G.S.	Per hand	1	0			E-mail
5	621230004088 EM Nieuwoudt	MR. R.	Per hand	1	0			E-mail
6	Rodabel Boerdery CC	Ms. E.M.	Per hand	1	0		Yes	E-mail

an.nieuwoudt1@telkom
 SA. net
 sophia.guerchouse@telkom
 SA. net

Tel no: (027) 5311054
 ID 6201145027080
 elma@linerece.co.za

OTHER			Project Announcement	Draft BAR & EMP		Received Signature	Register I&A Party	Outcome EA & Appeal
No.	Surname	Initials		Hard Copy	Website			
1	Nieuwoudt	Ms E.M.	Per hand	0	1		No	E-mail
2	Joseph	Mrs M.	Per hand	1	1		Yes	E-mail

elma@linerece.co.za

Statutory bodies: Notice of project emailed with BID attached

Name	Date	Response	Reply
Ms. Onwabile Ndzumo: Department of Environment and Nature Conservation (DENC)	30/10/2017	No response received.	NA
Ms. Jolene Towell: Department of water & Sanitation			
Mr. Christiaan Fortuin: Namakwa District Municipality: Municipal Manager			
Mr. Joseph Cloete: Kamiesberg Local Municipality: Municipal Manager			
Mr. Leon October: Department of Agriculture, Land Reform & Rural Development; Siyanda District			

Public meeting/s: None held

Name	Date	Response	Reply
NA			



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

REPORT ON THE RESULTS OF CONSULTATION

WITH COMMUNITIES AND INTERESTED AND AFFECTED PARTIES

AS REQUIRED IN TERMS OF SECTIONS, 16(4)(b) or 27 (5) (b) OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (ACT 28 of 2002), AND IN ACCORDANCE WITH THE STANDARD DIRECTIVE FOR THE COMPILATION THEREOF AS PUBLISHED ON THE OFFICIAL WEBSITE OF THE DEPARTMENT OF MINERAL RESOURCES.

NAME OF APPLICANT: IMVUSA KAOLIEN (PTY) LTD

REFERENCE NUMBER: NCS 30/5/1/1/2/1 (10638) MP

A. Definitions

'consultation' means a two way communication process between the applicant and the community or interested and affected party wherein the former is seeking, listening to, and considering the latter's response, which allows openness in the decision making process.

'community' means a group of historically disadvantaged persons with interest or rights in a particular area of land on which the members have or exercise communal rights in terms of an agreement, custom or law: Provided that, where as a consequence of the provisions of the Act negotiations or consultations with the community are required, the community shall include the members or part of the community, directly affected by prospecting or mining, on land occupied by such members or part of the community.

'Interested and affected' parties include, but are not limited to; –

- (i) Host Communities
- (ii) Landowners (Traditional and Title Deed owners)
- (iii) Traditional Authority
- (iv) Land Claimants
- (v) Lawful land occupier
- (vi) The Department of Land Affairs,
- (vii) Any other person (including on adjacent and non-adjacent properties) whose socio-economic conditions may be directly affected by the proposed prospecting or mining operation
- (viii) The Local Municipality,
- (ix) The relevant Government Departments, agencies and institutions responsible for the various aspects of the environment and for infrastructure which may be affected by the proposed project.

1. Methodology applied to consultation

1.1. Name the community or communities identified, or explain why no such community was identified

The proposed project site is located on a privately owned farm.

1.2. Specifically state whether or not the Community is also the landowner

No the community is not the landowner.

1.3. State whether or not the Department of Land Affairs has been identified as an interested and affected party

Yes the Northern Cape Department of Reform and Rural Development was contacted.

1.4. State specifically whether or not a land claim is involved

No land claim is registered against the property.

1.5. Name the Traditional Authority identified

No Traditional Authority is affected.

1.6. List the landowners identified by the applicant.

NAME	PROPERTY DESCRIPTION
Mr. A.A. Nieuwoudt	Portion 1 Rondawel No 638
Ms. J.S. Nieuwoudt	Remainder Rondawel No 638
Ms. M.J Kotze	Portion 4 Rondabel No 542
Mr. G.S Nieuwoudt	Farm 657 Prev 542/2 & 541/4
Mr. R. Barkhuizen	Remainder De Dam No 541
Mrs. E.A. Nieuwoudt	Rodabel Boerdery CC Portion 1 De Dam No 541

1.7. List the lawful occupiers of the land concerned

The lawful occupier is Mr. A.A. Nieuwoudt.

1.8. Explain whether or not other persons' (including on adjacent and non-adjacent properties) socio-economic conditions will be directly affected by the proposed prospecting or mining operation and if not, explain why not.

The main land use in the area is agricultural livestock grazing.

The kaolin mining is considered to be a temporary land use where after the land use will revert back to its pre-mining status. Productivity of the land with regard to grazing is very low due to the arid conditions and the kaolin mining will have no impact on the productivity of the area. The existing kaolin mine provides employment, and the extension of this mine will provide job security and ongoing kaolin material supply.

1.9. Name the Local Municipality identified by the applicant

Kamiesberg Local Municipality

1.10. Name the relevant Government Departments, agencies and institutions responsible for the various aspects of the environment and for infrastructure which may be affected by the proposed project.

The Department of Mineral Resources is responsible for ensuring that the extraction of the mineral resource will take place in a sustainable manner, and that the rehabilitation and closure thereof is carried out according to the Closure Plan that they approve as part of the Basic Assessment Process.

SAHRA ensures that heritage resources are protected and that specialist reports are prepared, the conditions of which need to be included in the Environmental Authorisation where relevant.

No water resources are affected by this project. The Department of Water and Sanitation was however, included in the list of I&AP in the project notification process.

There is no infrastructure in close proximity to the proposed mining operation.

1.11. Submit evidence that the landowner or lawful occupier of the land in question, and any other interested and affected parties including all those listed above, were notified.

Refer to **Appendix D** in the FBAR. Registered letters were hand delivered on the 28th October 2017; an email notification sent on the 30th October 2017; an advert placed in the local newspaper, the Die Plattender on 27th October 2017; and Site Notices were placed at the gate entrance to the farm and at various public locations in the area.

2. Description of the existing status of the cultural, socio-economic or biophysical environment, as the case may be, prior to the proposed prospecting or mining operation.

2.1.1. Confirm that the identified and consulted interested and affected parties agree on the description of the existing status of the environment

A copy of the Draft Scoping report was made available to the landowner and all other interested parties for comment. The only (interim) comment received was from SAHRA, which requested a formal paleontological letter of exemption from Dr. John Almond. This letter dated 30 January 2018 with geological map has been included after the AIA report, which is attached as **Appendix G**.

2.1.2. Describe the existing status of the cultural environment that may be affected

The main cultural activity is livestock grazing and the kaolin mining is considered to be a temporary land use where after the land use will revert back to its pre-mining status. Productivity of the land with regard to grazing is very low due to the arid conditions and the kaolin mining will have no impact on the productivity of the area.

2.1.3. Describe the existing status of any heritage environment that may be affected

Refer to the Archaeological Impact Assessment Report attached at **Appendix G**. The report concluded that: "An ephemeral scatter of stone artefacts was observed in the proposed new 5Ha extension of the kaolin mine, associated with an exposed silcrete outcrop. Other lithic material was noted in secondary context in the spoil heaps east of the current mining area. The lithic material consists of a mixture of silcrete ESA (Early Stone Age) and MSA (Middle Stone Age) flakes, cores and blades as well as isolated LSA (Late Stone Age) quartz flaked pieces. No non-lithic material was observed in the existing mine or in the expansion area.

The very limited amount of LSA material suggests that it is unlikely that LSA burials will be uncovered.

There is no historic built environment in the identified mining area."

The specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented.

The following recommendations are made:

- A once off monitoring visit is suggested during the expansion of the mine in the vicinity of the exposed silcrete outcrop (S30.80829 E17.80289) at such time that stripping reaches that area, to record the presence (or not) of buried surfaces containing stone artefacts;
- The relevant heritage authority must be notified if any heritage resources (including burials) are uncovered during mining expansion.

The Interim Comment from SAHRA is attached at **Appendix D**. A formal paleontological letter was required from Dr. John Almond. This letter dated 30 January 2018 with geological map has been included after the AIA report, which is attached as **Appendix G**.

2.1.4. Describe the existing status of any current land uses and the socio-economic environment that may be directly affected

Most of the arid areas are used for livestock grazing.

2.1.5. Describe the existing status of any infrastructure that may be affected.

There are existing farm tracks on the landowner's property that will be accessed by the vehicles and rehabilitated afterwards to the pre-mining status. The existing infrastructure established for the existing kaolin mine will be used. There is no other infrastructure on the landowner's property that will be affected.

2.1.6. Describe the existing status of the biophysical environment that will be affected, including the main aspects such as water resources, flora, fauna, air, soil, topography etc.

Refer to the Basic Assessment Report, Section 8.

2.1.7. Provide any relevant additional information.

There is no additional information that has been brought to the attention of the EAP during the Public Participation Process considered to be relevance to the proposed application.

DMR highlighted in their letter dated 31 October 2017 that Farlospace (PTY) Ltd with DMR Reference NC 30/5/1/1/2/12012PR is an affected part and should be consulted. Refer to **Appendix D**.

3. The anticipated environmental, social or cultural impacts identified.

3.1. Confirm that the community and identified interested and affected parties have been consulted and that they agree that the potential impacts identified include those identified by them.

Refer to **Appendix D**.

No comments or concerns were received, other than the Interim Comment from SAHRA.

3.1.1. Provide a list and description of potential impacts identified on the cultural environment.

Refer to the Archaeological Impact Assessment Report attached at **Appendix G**. The report concluded that: "An ephemeral scatter of stone artefacts was observed in the proposed new 5Ha extension of the kaolin mine, associated with an exposed silcrete outcrop. Other lithic material was noted in secondary context in the spoil heaps east of the current mining area. The lithic material consists of a mixture of silcrete ESA (Early Stone Age) and MSA (Middle Stone Age) flakes, cores and blades as well as isolated LSA (Late Stone Age) quartz flaked pieces. No non-lithic material was observed in the existing mine or in the expansion area.

The very limited amount of LSA material suggests that it is unlikely that LSA burials will be uncovered.

There is no historic built environment in the identified mining area."

The specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented.

The following recommendations are made:

- A once off monitoring visit is suggested during the expansion of the mine in the vicinity of the exposed silcrete outcrop (S30.80829 E17.80289) at such time that stripping reaches that area, to record the presence (or not) of buried surfaces containing stone artefacts;
- The relevant heritage authority must be notified if any heritage resources (including burials) are uncovered during mining expansion.

The Interim Comment from SAHRA is attached at **Appendix D**. A formal paleontological letter from Dr. John Almond was requested. This letter dated 30 January 2018 with geological map has been included after the AIA report, which is attached as **Appendix G**.

3.1.2. Provide a list and description of potential impacts identified on the heritage environment, if applicable.

Refer 3.1.1 above.

3.1.3. Provide a list and description of potential impacts identified on the socio- economic conditions of any person on the property and on any adjacent or non-adjacent property who may be affected by the proposed prospecting or mining operation.

The proposed extension to the existing kaolin mining operation will continue to have a positive impact on the socio-economic environment in the form of job security and material supply. The main land use in the area is livestock grazing.

3.1.4. Provide a list and description of potential impacts (positive & negative) identified on: employment opportunities, community health, and community proximity.

The proposed extension to the existing kaolin mining operation will continue to have a positive impact on the socio-economic environment in the form of job security and material supply. The main land use in the area is livestock grazing.

3.1.5. Provide a list and description of potential impacts identified on the biophysical environment including but not be limited to impacts on: flora, fauna, water resources, air, noise, soil etc.

This impact assessment only deals with significant impacts of the proposed kaolin mining and the overall impact on the biophysical environment is considered to be insignificant. The implementation of the mitigating and management measures prescribed in the EMPr will address all the existing impacts and after implementation of the mitigating measures most impacts can be classified as insignificant.

3.1.6. Provide a description of potential cumulative impacts that the proposed operation may contribute to considering other identified land uses which may have potential environmental linkages to the land concerned.

The only identified land use is agriculture with livestock grazing and due to the temporarily nature of the kaolin mining the operation has limited negative cumulative impacts, and will be managed in accordance with the approved EMPr . In addition, the Rehabilitation, Decommissioning and Closure Plan addresses the progressive rehabilitation of each section as soon as it has been mined, and is also binding on the Applicant once approved by DMR.

4. Land use or development alternatives, alternative means of carrying out the proposed operation, and the consequences of not proceeding with the proposed operation.

4.1. Provide a list of and describe any alternative land uses that exist on the property or on adjacent or non-adjacent properties that may be affected by the proposed mining operation.

The proposed extension to the existing kaolin mining operation will continue to have a positive impact on the socio-economic environment in the form of job security and material supply.

The main land use in the area is livestock grazing.

4.2. Provide a list of and describe any land developments identified by the community or interested and affected parties that are in progress and which may be affected by the proposed mining operation.

The area is farmland that is not close to any settlement and no land development projects are in progress.

4.3. Provide a list of and describe any proposals made in the consultation process to adjust the operational plans of the mine to accommodate the needs of the community, landowners and interested and affected parties.

Comments were not received, other than from SAHRA. The operational plans of the mine were not required to be amended.

4.4. Provide information in relation to the consequences of not proceeding with proposed operation

There will no supply of kaolin for the medical industry.

There will be no guaranteed job security.

5. Description of the process of engagement referred to in 3.2.1 and 3.2.2 above with identified communities, landowners and interested and affected parties.

5.1. Provide a description of the information provided to the community, landowners, and interested and affected parties to inform them in sufficient detail of what the prospecting or mining operation will entail on the land, in order for them to assess what impact the prospecting will have on them or on the use of their land;

No comments were received.

5.2. Provide a list of which of the identified communities, landowners, lawful occupiers, and other interested and affected parties were in fact consulted.

Refer to Appendix D.

5.3. Provide a list of their views raised in regard to the existing cultural, socio-economic or biophysical environment, as the case may be.

Refer to Section 7.7 in the FBAR and Table 3.

No comments were provided.

5.4. Provide a list of their views raised on how their existing cultural, socio-economic or biophysical environment potentially will be impacted on by the proposed prospecting or mining operation.

Refer to Section 5.3 above.

5.5. Provide list of any other concerns raised by the aforesaid parties.

No concerns were provided.

5.6. Provide the applicable minutes and records of the consultations as appendices.

No meetings were held.

5.7. Provide information with regard to any objections received.

The completed Registration Forms are attached at Appendix D9.

Any objections received against the proposed kaolin mining operation following the Environmental Authorisation will be dealt with by DMR.

6. Describe the most appropriate means to carry out the proposed operation with due accommodation of the issues raised in the consultation process.

No new issues were raised during the consultation process conducted on the DBAR. The impacts and associated mitigation measures have been included in the FBAR and EMPr and the operation will be carried out under cover of the legal requirements according to the approved EMPr, and the approved Final Rehabilitation, Decommissioning and Closure Report.

C. IDENTIFICATION OF THE REPORT

The report on the results of consultation must, at the end of the report include a certificate of identification as follows;

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises the results of consultation as contemplated in Section 16 (4) (b) or 27 (5) (b) of the Act, as the case may be.	
Full Names and Surname	Paula Weideman
Identity Number	6608220012086

.....END....

24.2 Correspondence with DMR



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DMR 10

Private Bag X 16 Springbok, 8240; Tel: 0277128160; Fax: 0277121959
1st Floor Hopley Building, Van der Stel Street, Springbok 8240

Enquiries: Deidre Karsten Ref No: NCS 30/5/1/1/2/1 (10638) MP
E-mail address: Deidre.Karsten@dmr.gov.za
Mine Environmental Management

IMVUSA KAOLIEN (Pty) Ltd

Private Bag x308

DURBANVILLE

7551

Attention: J.A. Barnard

email: jenny@greendirection.co.za

ACKNOWLEDGEMENT OF AN APPLICATION FOR ENVIRONMENTAL AUTHORISATION LODGED IN TERMS OF SECTION 24 OF NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998) READ WITH REGULATION 19 OF THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 FOR PROSPECTING RIGHT AND RELATED INFRASTRUCTURAL ACTIVITIES ON PORTION 1 OF THE FARM RONDAWEL NO 638 SITUATED IN THE MAGISTERIAL DISTRICT OF NAMAQUALAND NORTHERN CAPE REGION.

1. I refer to the abovementioned matter and confirm that your application for an Environmental Authorisation herein referred to as "EA" lodged on **23 October 2017** is hereby acknowledged.
2. You are advised to submit a basic assessment report within 90 days from the date that you have lodged this application. Your ninety (90) days will lapse on 12th February 2018. Please note that this inclusive of weekends but exclusive of public holidays and the period between 15 December 2017 and 05 January 2018.

Acknowledgement of application for Environmental Authorization :
NCS 30/5/1/3/3/2/1(10638) MP

Page 1

3. Acknowledgement of your application does not grant you permission to commence with Prospecting activities. Commencement of a listed activity without an environmental authorisation constitutes an offence in terms of Section 49A (1) (a) of NEMA, 1998 (Act 107 of 1998) as amended and upon conviction for such an offence, a person is liable to a fine not exceeding R10 million or to imprisonment for a period not exceeding ten years, or to both such fine and such imprisonment.

Hope that this letter will receive your utmost attention. Please quote this office file number for any correspondence as reference.


.....

REGIONAL MANAGER: MINERAL REGULATION

NORTERN CAPE REGION

DATE 26/10/2017.....

Please quote this office file number for any correspondence as reference

Acknowledgement of application for Environmental Authorization :
NCS 30/5/1/3/3/2/1(10638) MP

Page 2



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

Private Bag X 14, Springbok, 8240, Cnr Van der Stel & Van Riebeck street, 1st Floor Hoply Centre, Springbok, 8241
Tel: 027 7122 8160 Fax: 027 712 1959 Email: jasper.nieuwoudt@dmr.gov.za, Ref: NC30/5/1/2/2/10638 MP

From: Mineral Regulation Enquiries: Jasper Nieuwoudt

E-Mail: elma@finlego.co.za

Invusa Kaolien (Pty) Ltd
PO Box 308
DURBANVILLE
7551

Dear Sir/Madam

APPLICATION FOR A MINING PERMIT IN TERMS OF SECTION 27 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002): A PORTION OF PORTION 1 OF THE FARM RONDAWEL NO 638, ADMINISTRATIVE DISTRICT OF NAMAQUALAND.

I refer to the abovementioned matter and I confirm that your application for a Mining Permit to mine for **Kaolien (Clay)** in terms of Section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) has been accepted.

In terms of section 27(5) of the MPRDA you must consult in the prescribed manner with the landowner, lawful occupier and any interested and affected party and include the result of the consultation in the relevant environmental reports.

Kindly take note that you are required to consult with the Department of Land Affairs if the land is state owned and in the event that the land is subject to land restitution, to consult the office of the Commission on Restitution of Land Rights

and submit a copy to the Regional Office the results of such consultation on or before **30 January 2018**.

The following company is an affected party and should be consulted:

FarloSPACE (Pty) Ltd - NC 30/5/1/1/2/12012 PR

Any person operating without a Prospecting Right, Mining Right or Mining Permit will be in contravention of Section 5(4) of the MPRDA and would be guilty of an offence in terms of the relevant Act.

Take note further that failure to submit the documents as requested and failure to adhere to the timeframes as stipulated above amounts to non-compliance with the provision of the Act and will therefore lead to your application being recommended for refusal without further notification to you.

Yours faithfully



**REGIONAL MANAGER
NORTHERN CAPE REGION**

DATE: 31 October 2017

BACKGROUND INFORMATION DOCUMENT (BID)

PROPOSED KAOLIN MINING PERMIT APPLICATION: PORTION 1 OF FARM RONDAWEL 638, KAMIESBERG LOCAL MUNICIPALITY, NAMAQUA DISTRICT MUNICIPALITY, NORTHERN CAPE

25 October 2017

DMR REF.: NCS 30/5/11/2/1(10638) MP

INTRODUCTION

The Applicant, Imvusa Koalien (Pty) Ltd proposes to mine Kaolin on Portion 1 of Farm Rondawel 638 located in the Kamiesberg Local Municipality, Namaqua District Municipality, Northern Cape. Refer to the Locality Map at Figure 1.

This BID aims to:

- ✓ Provide a description of the project.
- ✓ Briefly describe the potential environmental impacts.
- ✓ Describe what the Basic Assessment process entails.
- ✓ Provide information on how you can participate.

PROJECT DESCRIPTION

The proposed Kaolin mining area is situated on a 5ha section on Portion 1 of the Farm Rondawel 638. The Kaolin mining operation is to be carried out by the Applicant, Imvusa Koalien (Pty) Ltd. It must be noted that this operation is an extension of an existing operation (NC 10423MP) under cover of a separate environmental authorization and approved Decommissioning, Rehabilitation and Closure Plan with the necessary financial provision.

Kaolin clay that is to be mined is an inert material that is non-toxic and not affected by weathering. Kaolin residues are typically benign from a pollution point of view.

Mining will be in the form of a simple process that only includes an opencast quarry with excavation, loading and hauling of Kaolin. The depth of the excavations will be less than 6 meters and no infrastructure or services will be developed as technical resources will be shared with the adjacent mining operation. The areas allocated for mining and stockpiling would first be stripped of all available topsoil. This topsoil would be stockpiled separately for later use when the quarry is rehabilitated. Any overburden in the form of low grade Kaolin and rocks will be removed and stockpiled separately for later use when the quarry is rehabilitated. Due to a shortage of topsoil the white Kaolin will still be visible above surface after rehabilitation but with the natural movement of the dune sand, will be covered naturally. Processing will take place by screening and Kaolin is sold as a FoT product without any refinery. No tailings are generated during the mining process. The estimated footprint of the excavation is 5Ha and at final closure the sides of the excavation will be profiled to form an even depression.

The duration required for the Kaolin mining is an initial 2 years with the potential to extend the permit by an additional 3 years. Normally there is also a time delay in the granting of applications for renewal therefore a total period of 10 years may be required.

Refer to the Proposed Site Plan included as Figure 2.

Construction Phase:

- Access to the mine works will be via the Garies-Groenriviermond public road and existing farm tracks as shown in Figure 2.
- Existing farm tracks will be used as haul roads and no new roads will be developed.
- No process water is used in the mining process.
- No electricity is used in the mining area.
- No infrastructure is present or will be required due to the small scale and simple mining method and the infrastructure of the adjacent mining operation will be shared, such as the supply of electricity from a mobile genset contained in a bunded generator bay with spill prevention measures.
- Waste management facilities will be shared with the adjacent mining operation and a temporary storage area for used lubrication products and other hazardous chemicals is provided for the collection of the small volume of waste before it is removed to the company headquarters.
- A service and wash bay is also provided for as part of the adjacent mining operation together with a bio-cell (soil farm).
- A bunded fuel supply with service apron is also provided as part of the adjacent mining operation.

Operational Phase:

- Mining will be in the form of a roll over operation and mining blocks will be restricted to 0.5 Ha and maximum 6m deep, and walls will be developed in benches not exceeding 3m high.
- Large scale excavations and kaolin stockpiling will be undertaken by an excavator and one ADT that is on site on an ad hoc basis. This operation will only involve the loading and hauling of raw Kaolin. Only one Excavator and one ADT will be used for excavating, loading and hauling and no processing will take place.
- The only surface disturbance except for the mining excavation, will be a temporary stockpile area for topsoil as it will be re-used on a cut and fill basis.
- The depth of the mining operations will be less than 5m as the Kaolin outcrop at the surface with less than 1m overburden consisting mostly of low grade Kaolin.
- Mining will be in the form of a cut and fill operation where overburden will be backfilled in mined out sections and covered with topsoil as excavations advance.
- No industrial or mine waste is generated during the mining process. Processing only includes the spreading of Kaolin to dry out where after is screened a bagged to be sold as a FoT product.
- Product stockpiles form part of the drying area that also serves as a dispatch yard.
- Primary processing only includes screening by means of a "trommel screen" provided as part of the adjacent operation so no Fine Residue Dumps (FRD) will be created.
- All overburden will be backfilled and the excavations profiled to form an even depression before topsoil is replaced and no waste dumps will be created above surface.

1

mining site's Head Quarters at the main farm building on the property.

- Only minor repairs are done on site at the service bay provided for as part of the adjacent operation or for emergency repair a PVC lining and drip trays are used and accidental spills are cleaned up immediately by removing of the contaminated soil. The small volume of contaminated soil will be treated in the bio-cell (soil farm) and only one excavator (TLB) and tractor trailer unit is used in the mining process that is transported to the Applicant's headquarters for major repairs.

Decommissioning and Closure Phase:

Planning for closure and restoration from the beginning of an operation makes the process easier; waste can be removed as it is created; excavation can be planned so that topography restoration is less complicated; and, topsoil can be re-used at shorter intervals. The decommissioning and closure phase at the end of the life of the mine will consist of implementing the Final Rehabilitation, Decommissioning and Closure Plan, included in the DBAR.

SITE PHOTOGRAPHS (9 OCTOBER 2017)



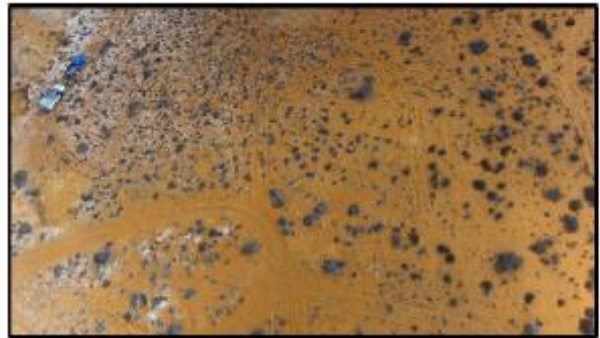
Photograph 1: View in a northerly direction from the eastern most edge of the new mining area looking towards the exiting mine.



Photograph 2: View in a westerly direction from the eastern most edge of the new mining area looking towards the exiting mine.



Photograph 3: Drone aerial view (northerly direction) of the proposed project area adjacent to the existing mining site.



Photograph 4: Drone aerial view (south-easterly direction) of the proposed mining area.



Photograph 5: Drone aerial view (northerly direction) of the proposed project area adjacent to the existing mining site, showing the existing topsoil and rock stockpiles for the existing mine.

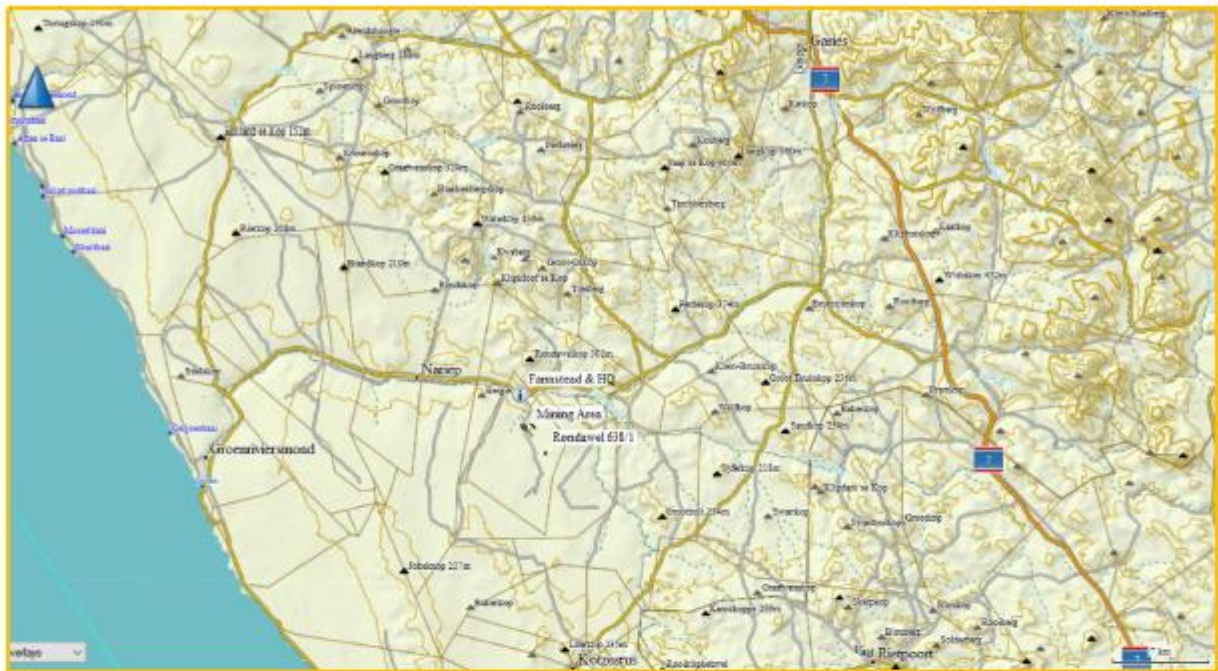


Figure 1: Locality Plan showing location of the Proposed Mining Permit Application to the south-west of Kakamas-South



Figure 2: Site Plan for the Proposed Kaolin Mining Site

ALTERNATIVES

It is a requirement of NEMA that feasible and reasonable alternatives are considered, including the "No Go" option. The layout and technology of the proposed Kaolin mining project has been determined by the shape, position and orientation of the mineral resource to be mined, as shown in Figure 2 above.

There are no reasonable or feasible: location; activity; site layout; technology; or, operational alternatives due to the basic mining methods that are applicable to Kaolin mining.

POTENTIAL ENVIRONMENTAL IMPACTS

The following **potential environmental impacts** have been identified and assessed in the Draft BAR:

- Biodiversity (wildlife and vegetation) disturbance from mining in an area demarcated as a Critical Biodiversity Area 2 (CBA 2:- means that this area is potentially degraded or represents secondary vegetation); and River Freshwater Ecosystem Priority Area (FEPA) sub-catchment.
- Noise, dust and vehicle emission from the machinery and vehicles on site, and general mining activities.
- Visual impact of the Kaolin mining operations.
- Soil erosion from removal of topsoil, soil compaction from repeated use of access tracks, and mixing of geological sequence.
- Sand, soil and groundwater contamination from hydrocarbon spills.
- Socio-economic impact on job security, employment creation and economic spin-offs; including the provision of Kaolin for industrial and medical uses (positive impacts).

THE BASIC ASSESSMENT PROCESS

Sections 24 and 44 of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) make provision for the promulgation of regulations that identify activities which may not commence without an Environmental Authorisation (EA) issued by the competent authority, in this case, the Department: Mineral Resources (DMR).

The EIA Regulations, 2014 (Government Notice (GN) R982, which came into effect on 8 December 2014), as amended by GNR 327 (dated 7 April 2017), promulgated in terms of NEMA, govern the process, methodologies and requirements for the undertaking of EIAs in support of EA applications. The EIA Regulations are accompanied by Listing Notices (LN) 1-3 that list activities that require EA. The EIA Regulations, 2014 as amended, sets out two alternative authorisation processes. Depending on the type of activity that is proposed, either a

Basic Assessment (BA) process or a Scoping and Environmental Impact Reporting (S&EIR - also referred to as an EIA) process is required to obtain EA. LN 1 and LN3 list activities that require a BA process, while LN 2 lists activities that require S&EIR.

The proposed project triggers activities identified in terms of LN1 of the EIA Regulations, 2014 as amended by GNR 327 (dated 7 April 2017), thus requiring a BA process:

- ✓ Activity 21: Any activity including the operation of that activity which requires a mining permit in terms of section 27 of MRPDA, including - associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing.
- ✓ Activity 22: The decommissioning of any activity requiring - a closure certificate in terms of section 43 of the MRPA.
- ✓ Activity 27: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.
- ✓ Activity 28: Commercial or industrial developments where such land was used for agriculture on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.

Before commencing with the project, the Applicant is thus required to appoint an independent Environmental Assessment Practitioner (EAP) to undertake a BA process and to obtain authorisation in terms of NEMA from the competent authority (DMR).

The BA Process:

- ✓ Submission of the Application Form to DMR.
- ✓ Preparation of this Background Information Document (BID); registered letters & BID to adjacent landowners; and Project Notice with BID to Organs of State.
- ✓ Preparation of the Draft Basic Assessment Report (DBAR), Environmental Management Programme Report (EMPr), and Closure Report.
- ✓ The availability of these reports will be advertised for the 30 day comment period, with a copy placed in the nearest library. Site notices will be placed, and a copy of the reports will be made available on the EAP's website (www.greendirection.co.za). The public consultation undertaken will be recorded in the Final BAR, which will be submitted to DMR for consideration.

Refer to **Figure 3** for the Basic Assessment process flow diagram.

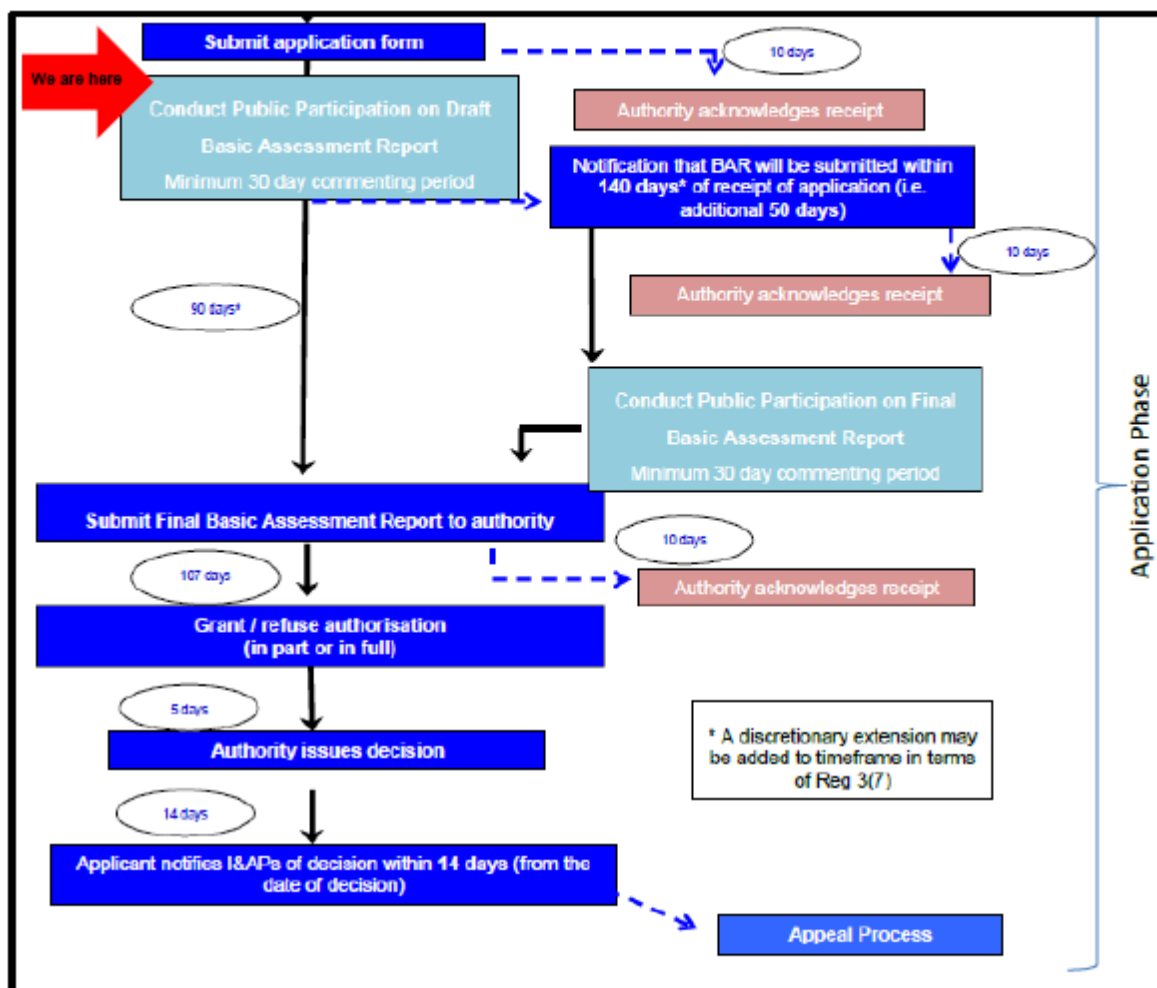


Figure 3: Process Flow Diagram for a Basic Assessment Process

HOW CAN YOU PARTICIPATE?

If you or your organisation would like to be involved in the BA process please submit your contact details for registration as an Interested & Affected Party (I&AP) on our database and submit your written comments on the attached form, by 30 November 2017 as per the details below. Only registered I&APs will continue to be informed about the BA process.

REGISTER OR PROVIDE YOUR WRITTEN COMMENT TO:

Green Direction Sustainability Consulting (Pty) Ltd
 Postnet Somerset Mall; Suite 922; Private Bag X15; Somerset West; 7130
 Email: jenny@greendirection.co.za

The Reports are available on www.greendirection.co.za/documents

The 30 day comment period is from 1 November 2017 to 30 November 2017.

Please refer to the above DMR reference number in your submission, and provide your name, contact details (preferred method of notification, e.g. email), and indication of any direct business, financial, personal or other interest, in the application.

REGISTRATION & COMMENT FORM

PROPOSED KAOLIN MINING PERMIT APPLICATION:
PORTION 1 OF FARM RONDAWEL 638, KAMIESBERG LOCAL MUNICIPALITY,
NAMAQUA DISTRICT MUNICIPALITY, NORTHERN CAPE
DMR REF.: NCS 30/5/1/1/2/1 (10638) MP

PLEASE REGISTER MY CONTACT DETAILS ON THE DATABASE FOR FURTHER CORRESPONDENCE

YES

NO

NAME:

ORGANISATION:

POSTAL ADDRESS

EMAIL:

TELEPHONE NO.:

FAX. NO.:

COMMENTS

INDICATION OF ANY DIRECT BUSINESS, FINANCIAL, PERSONAL OR OTHER INTEREST IN THE APPLICATION

SEND YOUR COMMENTS BY 30 NOVEMBER 2017 VIA EMAIL OR POST

jenny@greendirection.co.za

Postnet Somerset Mall; Melcksloot Village; Suite 922; P/Bag X15;
Somerset West; 7130

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24.4 Newspaper Advertisement in "Die Plattelander"

<p>Bylaag [DIE PLATTELANDER - NUUS VIR ALMAL OP DIE N-7 & N-14] 27 Oktober 2017</p>	
<h3>LPM TECHNICIAN REQUIRED FOR GOLDRUSH SLOTS NORTHERN CAPE</h3> <p>REF: TECH/03/2017</p> <p>The position will be based at Namakwa District and the incumbent must be willing to relocate. The incumbent will report directly to the National Technical Manager.</p> <p>REQUIREMENTS:</p> <ul style="list-style-type: none"> • N3 Electronics Engineering or Electrical Engineering • Driving experience of 3-5 years • Knowledge of Mining Industry • Knowledge of Customer Service <p>The candidate should be willing to travel long distances, work long hours including alternate weekends</p> <p>SALARY: Negotiable</p> <p>CLOSING DATE: 03 November 2017</p> <p>For more details contact Xolisa: 0767692056 Submit detailed CV's including certified copies of qualifications and Driver's License to: xolisa.mgomeni@goldrushgroup.co.za; thapelo.seameco@goldrushgroup.co.za; francina.matthews@goldrushgroup.co.za</p> <p>Hand Deliver at No 22 Phakamile Mabija Street, Kimberley, Goldrush Slots. Kindly indicate the reference number. Short-listed candidates will be subjected to a reference, criminal records and ITC check.</p> <p>PLEASE NOTE: IF YOU DO NOT HEAR FROM US 7 DAYS AFTER THE CLOSING DATE, CONSIDER YOUR APPLICATION UNSUCCESSFUL</p>	 <p>WHATEVER HE GROWS UP TO BE... HE WILL GROW UP THANKS TO YOU</p> <p>Sometimes we can make the most amazing things happen - even when we're not around.</p> <p>And that's what a legacy gift to the Children's Hospital Trust is for. We can do it all because behind every four little patients in the wards of the Red Cross the Memorial Children's Hospital, it can be new medical equipment, up-to-date hospital facilities, provide professional medical training and it will help to save the lives of children just like Keano Moko, so that they become living examples of your legacy.</p> <p>Without Circle of Life, leave a legacy for the children at the Red Cross the Memorial Children's Hospital by making the Children's Hospital Trust a beneficiary in your Will. Call +27 21 884 7800 or visit www.childrenshospitaltrust.co.za</p> 
 <p>BASIC ASSESSMENT PUBLIC PARTICIPATION PROCESS DMR REFERENCE NO.: NCS 30/5/1/1/2/1(1063B) MP</p> <p>BASIC ASSESSMENT FOR THE PROPOSED KAOLIN MINING PERMIT APPLICATION ON A 5ha PORTION OF PORTION 1 FARM RONDAWEL No 638, KAMIESBERG LOCAL MUNICIPALITY, NORTHERN CAPE</p> <p>On behalf of the Applicant, Inwasa Kaolien (Pty) Ltd, notice is hereby given of the commencement of the Public Participation Process and the availability of the Draft Basic Assessment Report (DBAR) and Draft Environmental Management Programme Report (EMPR) for the proposed sand mining permit application on a 5ha portion of Portion 1 of the Farm Rondawel No 638. The Basic Assessment process is undertaken in terms of the Minerals and Petroleum Resources Development Act, Act 28 of 2002, the National Environmental Management Act, Act 107 of 1998 and Environmental Impact Assessment Regulations (EIA) of 2014 (as amended).</p> <p>EIA Regulations Listed Activities: Listing Notice 1 of 2014 (as amended by GNR 327 of 7 April 2017)</p> <ul style="list-style-type: none"> • Activity 21: Open cast mining and primary processing (5ha) • Activity 22: The decommissioning and closure of the mining site (5ha) • Activity 27: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation • Activity 28: Mining and stockpile area where the total land to be developed is bigger than 1 hectare <p>Opportunity to participate / Invitation to comment: Interested and/or Affected Parties should submit written comments to Green Direction Sustainability Consulting (Pty) Ltd on or before 30 November 2017 to the contact details below: Postnet Somerset Mall, Melcksloot Village, Suite 922, Private Bag X15, Somerset West, 7130 Email: enrv@greendirection.co.za</p> <p>A copy of the reports can be downloaded from www.govardb.org.za/da/document</p>	<h1>NAMA KHOI MUNISIPALITEIT</h1> <p>KENNISGEWING NR 06/2017</p> <h2>VOORWERPE OOR ELEKTRIESE LYNE</h2> <p>24 OKTOBER 2017</p> <p>Die munisipaliteit ondervind nog steeds probleme met drade en ander voorwerpe wat oor oorhoofse lyne gegooi word en wat lei tot kragonderbrekings.</p> <p>Een voorbeeld hiervan is die kragonderbreking in Okiep verlede naweek wat ook veroorsaak het dat toerusting beskadig is.</p> <p>Ons wil dus 'n ernstige beroep doen op die publiek om te help om sulke situasies te voorkom en sulke gevalle waar persone geïdentifiseer kan word by die munisipaliteit en SAPD aan te meld.</p> <p>Vertrou u vind dit in orde</p> <p>B. Love Waarnemende Munisipale Bestuurder Privaatsak X22 SPRINGBOK 8240</p>  <p>Telefoonnummer: 027 71 88100 Faks nummer: 027 71 21635</p>

24.5 Registered Letters and Proof of Delivery



Green Direction Sustainability Consulting (Pty) Ltd
Postnet Somerset Mall
Shop 1B; Melcksloot Village
Suite 022; Private Bag X15
Somerset West
7130

30 October 2017

Dear Interested and/or Affected Party

**PROJECT ANNOUNCEMENT:
BASIC ASSESSMENT FOR THE PROPOSED KAOLIN MINING PERMIT APPLICATION
ON A 5Ha PORTION OF PORTION 1 FARM RONDAWEL No 638, KAMIESBERG
LOCAL MUNICIPALITY, NORTHERN CAPE**

DMR REFERENCE NO.: NCS 30/5/1/1/2/1 (10638) MP

In terms of Government Notice Regulations (GNR) 983, 984 and 985 of 8 December 2014 of the National Environmental Management Act (Act 107 of 1998) as amended by GNR 324, 325, 326 and 327 of 7 April 2017 (referred to as the **EIA Regulations**) Environmental Authorisation from the Competent Authority, in this case the Department of Mineral Resources Northern Cape Region, is required prior to the undertaking of any activity triggered within GNR 983, 984 and/or 985, as amended.

In line with the EIA Regulations, Interested and/or Affected Parties (I&APs) must be notified and are requested to register for this project in order to receive future correspondence and/or to provide comments on issues of concern that will be considered during the Basic Assessment process.

Green Direction Sustainability Consulting (Pty) Ltd, as the independent Environmental Assessment Practitioner (EAP), will be managing the Basic Assessment and Public Participation Process for this proposed project.

Please find enclosed with this letter a Background Information Document (BID), which includes a Comment and Registration Form. The legislated 30-day comment period commences on 01 November 2017. You have until **30 November 2017** to register and submit your comments on this project. Please complete the Comment and Registration Form as indicated.

Should you have any queries please contact the undersigned as per the contact details on the BID.

Yours sincerely

A handwritten signature in black ink that reads "J. Barnard".

**Ms. Jennifer Barnard
Pr.Sci.Nat.; EAPSA
Green Direction Sustainability Consulting (Pty) Ltd**

Proof of hand delivery of Letters for adjacent neighbours on 28 & 29 October 2017

Imvusa Kaolin (Pty) Ltd Mining Permit Portion 1 Rondawel No 638, Namaqualand -
 MINING BASIC ASSESSMENT: Consultation Proof

ORGANS OF STATE								
No.	Surname	Initials	Project Announcement	Draft BAR & EMP		Proof PO #	Register I&A Party	Outcome EA & Appeal
				Hard Copy	Website			
1	Ndzumo	Ms. Onwabile	E-mail	0	1		Yes	E-mail
2	Towell	Ms Jolene	E-mail	0	1		Yes	E-mail
3	Fortuin	Mr Christiaan	E-mail	0	0		No	NA
4	Cloete	Mr Joseph	E-mail	0	0		No	NA
5	October	Mr Leon	E-mail	0	0		No	NA

LANDOWNER/NEIGHBORS								
No.	Surname	Initials	Project Announcement	Draft BAR & EMP		Received Signature	Register I&A Party	Outcome EA & Appeal
				Hard Copy	Website			
1	Nieuwoudt	Mr A.A.	Per hand	0	1		Yes	E-mail
2	Nieuwoudt ID 3704100004088	Ms J.S.	Per hand	1	0			E-mail
3	Kotze 5702250044084	Ms M.J.	Per hand	1	0			E-mail
4	Nieuwoudt 6810025163086	Mr G.S.	Per hand	1	0			E-mail
5	Barkhuizen 6212300044083	Mr C. MR R	Per hand	1	0			E-mail
6	EM Nieuwoudt Rodabel Boerdery CC	Ms. E.M	Per hand	1	0		Yes	E-mail

aanieuwoudt1@telkom
 sul. net
 sophia@nerchouse@telkom
 sul. net

Tel no: (027) 5311054
 ID 6201145027080
 elma@finerece.co.za

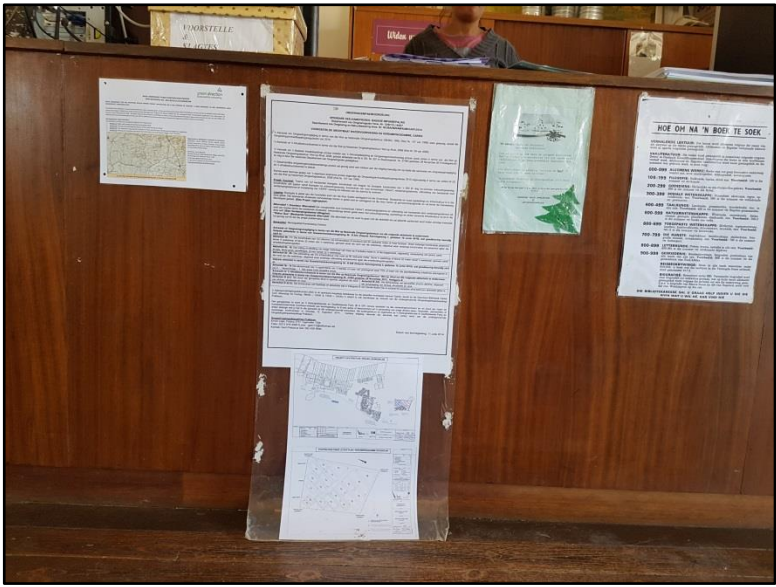
OTHER								
No.	Surname	Initials	Project Announcement	Draft BAR & EMP		Received Signature	Register I&A Party	Outcome EA & Appeal
				Hard Copy	Website			
1	Nieuwoudt	Ms E M	Per hand	0	1		No	E-mail
2	Joseph	Ms M	Per hand	1	1		Yes	E-mail

elma@finerece.co.za

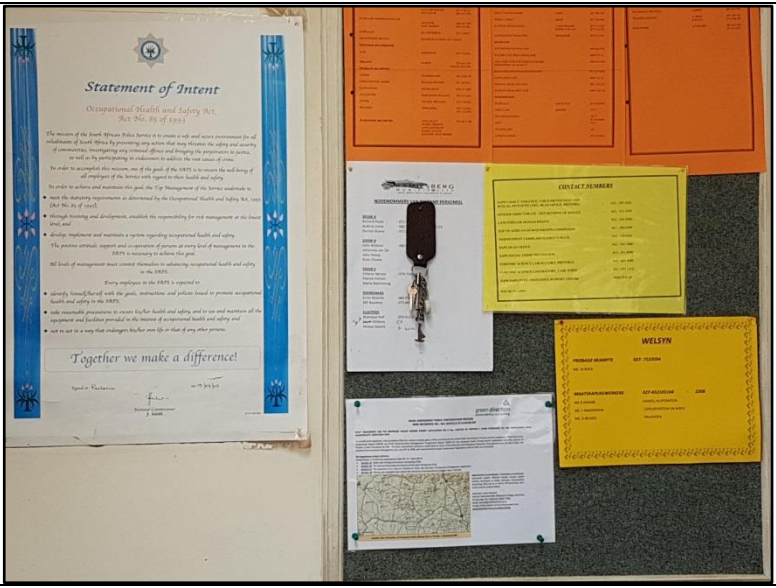
24.6 Proof of Site Notices & Site Notice Content



Site Notice 1: Attached to gate at farm entrance to proposed mining site on Portion 1 of Farm Rondawel 638



Site Notice 2: Attached to a notice board in the Garies Library



Site Notice 3: Attached to a notice board in the Garies Police Station

**BASIC ASSESSMENT PUBLIC PARTICIPATION PROCESS
DMR REFERENCE NO.: NCS 30/5/1/1/2/1(10638)MP**

BASIC ASSESSMENT FOR THE PROPOSED KAOLIN MINING PERMIT APPLICATION ON A 5Ha PORTION OF PORTION 1 FARM RONDAWEL No 638, KAMIESBERG LOCAL MUNICIPALITY, NORTHERN CAPE

On behalf of the Applicant, Imvusa Kaolien (Pty) Ltd, notice is hereby given of the commencement of the Public Participation Process and the availability of the Draft Basic Assessment Report (DBAR) and Draft Environmental Management Programme Report (EMPr) for the proposed Kaolin mining permit application on a 5ha portion of Portion 1 Farm Rondawel No 638. The Basic Assessment process is undertaken in terms of the Minerals and Petroleum Resources Development Act, Act 28 of 2002, the National Environmental Management Act, Act 107 of 1998 and Environmental Impact Assessment Regulations (EIA) of 2014 (as amended).

EIA Regulations Listed Activities:

Listing Notice 1 of 2014 (as amended by GNR 327 of 7 April 2017)

- **Activity 21:** Open cast mining and primary processing (5ha)
- **Activity 22:** The decommissioning and closure of the sand mining site (5ha)
- **Activity 27:** The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation
- **Activity 28:** Mining and stockpile area where the total land to be developed is bigger than 1 hectare



Locality Plan of location of Proposed Kaolin Mining Site on Portion 1 Rondawel 638

Opportunity to participate / Invitation to comment:
Interested and/or Affected Parties should submit written comments to Green Direction Sustainability Consulting (Pty) Ltd on or before 30 November 2017 to the contact details below:

Attention: Jenny Barnard
Postnet Somerset Mall; Melcksloot Village; Suite 922; Private Bag X15; Somerset West; 7130
Email: jenny@greendirection.co.za
A copy of the reports can be downloaded from www.greendirection.co.za/documents

24.7 Email notification of project

Jenny Barnard

From: Jenny Barnard <jenny@greendirection.co.za>
Sent: Monday, October 30, 2017 5:28 PM
To: 'onyndzumo@gmail.com'; 'Towell@dws.gov.za'; 'info@namakwa-dm.gov.za';
'mm@kamiesberg.co.za'; 'loctober@ncpg.gov.za'
Subject: Draft Basic Assessment Report for Comment: Imvusa Kaolien (Pty) Ltd Mining Permit
Application10638 MP
Attachments: BID Imvusa Kaolien Pty Ltd.pdf

Dear Interested and/or Affected Party

NOTICE OF DRAFT BASIC ASSESSMENT PUBLIC PARTICIPATION PROCESS

BASIC ASSESSMENT FOR THE PROPOSED KAOLIN MINING PERMIT APPLICATION ON A 5Ha PORTION OF PORTION 1 FARM RONDAWEL No 638, KAMIESBERG LOCAL MUNICIPALITY, NORTHERN CAPE: 10638 MP

On behalf of the Applicant, Imvusa Kaolien (Pty) Ltd, notice is hereby given of the commencement of the Public Participation Process and the availability of the Draft Basic Assessment Report (DBAR) and Draft Environmental Management Programme Report (EMPr) for the proposed Kaolin mining permit application on a 5ha portion of Portion 1 Farm Rondawel No 638. The Basic Assessment process is undertaken in terms of the Minerals and Petroleum Resources Development Act, Act 28 of 2002, the National Environmental Management Act, Act 107 of 1998 and Environmental Impact Assessment Regulations (EIA) of 2014 (as amended).

EIA Regulations Listed Activities:

Listing Notice 1 of 2014 (as amended by GNR 327 of 7 April 2017)

- **Activity 21:** Open cast mining and primary processing (5ha)
- **Activity 22:** The decommissioning and closure of the sand mining site (5ha)
- **Activity 27:** The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation
- **Activity 28:** Mining and stockpile area where the total land to be developed is bigger than 1 hectare

Please refer to the attached Background Information Document (BID) for more information.

Interested and/or Affected Parties should submit written comments to Green Direction Sustainability Consulting (Pty) Ltd on or before 30 November 2017 to the contact details below:

Attention: Jenny Barnard
Postnet Somerset Mall; Melcksloot Village; Suite 922; Private Bag X15; Somerset West; 7130
Email: jenny@greendirection.co.za

You can download the DBAR by clicking on this link below:

<http://greendirection.co.za/Documents/ArtMID/417/ArticleID/9/Draft-Basic-Assessment-Report-for-Imvusa-Kaolien-Pty-Ltd-Mining-Permit-Application-10638-MP-on-Portion-1-of-Farm-Rondawel-638-Kamiesberg-Local-Municipality>

Kind regards
Jenny

Jennifer Barnard
Pr Sci.Nat; EAPSA; New Buildings AP Green Star
Confronting Climate Change Carbon Footprint Assessor
SUSTAINABILITY CONSULTANT

Postnet Somerset Mall
Shop 1B; Melcksloot Village
Suite 922; Private Bag X15
Somerset West; 7130
+ 27 82 444 4364
www.greendirection.co.za



green direction
sustainability consulting

DMR highlighted in their letter dated 31 October 2017 that FarloSPACE (PTY) Ltd with DMR Reference NC 30/5/1/1/2/12012PR is an affected part and should be consulted. Refer to email inserted below sent to Mineral Resources on 31 October 2017.

From: Klaas Van Zyl <klaaskraalbos@gmail.com> Sent: Tue 10/31/2017 1:05 PM
To: Mineral Prospects; Jenny Barnard
Cc:
Subject: Draft Basic Assessment Report for Comment: Imvusa Kaolien (Pty) Ltd Mining Permit Application 10638 MP
Message: BID Imvusa Kaolien Pty Ltd.pdf

Dear Interested and/or Affected Party

NOTICE OF DRAFT BASIC ASSESSMENT PUBLIC PARTICIPATION PROCESS

BASIC ASSESSMENT FOR THE PROPOSED KAOLIN MINING PERMIT APPLICATION ON A 5Ha PORTION OF PORTION 1 FARM RONDAWEL No 638, KAMIESBERG LOCAL MUNICIPALITY, NORTHERN CAPE: 10638 MP

On behalf of the Applicant, Imvusa Kaolien (Pty) Ltd, notice is hereby given of the commencement of the Public Participation Process and the availability of the Draft Basic Assessment Report (DBAR) and Draft Environmental Management Programme Report (EMPr) for the proposed Kaolin mining permit application on a 5ha portion of Portion 1 Farm Rondawel No 638. The Basic Assessment process is undertaken in terms of the Minerals and Petroleum Resources Development Act, Act 28 of 2002, the National Environmental Management Act, Act 107 of 1998 and Environmental Impact Assessment Regulations (EIA) of 2014 (as amended).

EIA Regulations Listed Activities:

Listing Notice 1 of 2014 (as amended by GNR 327 of 7 April 2017)

Activity 21: Open cast mining and primary processing (5ha)
Activity 22: The decommissioning and closure of the sand mining site (5ha)
Activity 27: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation
Activity 28: Mining and stockpile area where the total land to be developed is bigger than 1 hectare

Please refer to the attached Background Information Document (BID) for more information.

Interested and/or Affected Parties should submit written comments to Green Direction Sustainability Consulting (Pty) Ltd on or before 30 November 2017 to the contact details below:

Attention: Jenny Barnard

Postnet Somerset Mall; Melcksloot Village; Suite 922; Private Bag X15; Somerset West; 7130

Email: jenny@greendirection.co.za

You can download the DBAR by clicking on this link below:

<http://greendirection.co.za/Documents/ArtMID/417/ArticleID/9/Draft-Basic-Assessment-Report-for-Imvusa-Kaolien-Pty-Ltd-Mining-Permit-Application-10638-MP-on-Portion-1-of-Farm-Rondawel-638-Kamiesberg-Local-Municipality>

Kind regards
Jenny

24.8 Interim Comment received from SAHRA

Kaolin mining on Ptn 1 Rondawel 638

Our Ref:



an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Natasha Higgitt
Tel: 021 462 4502
Email: nhiggitt@sahra.org.za
CaseID: 11756

Date: Tuesday November 21, 2017
Page No: 1

Interim Comment

In terms of Section 38(3), 38(8) of the National Heritage Resources Act (Act 25 of 1999)

Attention: Mr Dave Halkett
ACO Associates CC

Extension of existing Kaolin mining on Ptn 1 Rondawel 638, NC

Thank you for notifying SAHRA of the proposed kaolin mining activities on portion 1 of farm Rondawel 638, Kamiesberg local municipality, Namaqua district municipality, Northern Cape.

As the proposed development is undergoing an Environmental Authorisation (EA) Application process and National Environmental Management Act, No 107 of 1998 (NEMA), for activities that trigger the Mineral and Petroleum Resources Development Act, No 28 of 2002 (MPRDA)(As amended), it is incumbent on the developer to ensure that a Heritage Impact Assessment (HIA) is done as per section 38(3) and 38(8) of the National Heritage Resources Act, Act 25 of 1999 (NHRA). This must include the archaeological component (Phase 1) and any other applicable heritage components. The HIA must be conducted as part of the EA Application in terms of NEMA and the 2014 or 2017 NEMA EIA Regulations.

It is noted in the Background Information Document (BID) submitted by the Archaeology Contract Office (ACO) and the Draft Basic Assessment Report (DBAR) that an HIA is being prepared. SAHRA awaits the pending HIA and stresses that the FBAR should not be submitted to the Competent Authority without comments from SAHRA.

All environmental reports and appendices produced as part of the EA application process must be submitted to the SAHRIS Case file in order for an informed comment to be issued.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Our Ref:



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Department of Arts and Culture

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CaseID: 11756

Date: Tuesday November 21, 2017
Page No: 2

Natasha Higgitt
Heritage Officer
South African Heritage Resources Agency

Phillip Hine
Acting Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

ADMIN:
Direct URL to case: <http://www.sahra.org.za/node/408571>

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CaseID: 11756

Date: Tuesday January 09, 2018
Page No: 1

Interim Comment

In terms of Section 38(3), 38(8) of the National Heritage Resources Act (Act 25 of 1999)

Attention: Mr Dave Halkett
ACO Associates CC

Extension of existing Kaolin mining on Ptn 1 Rondawel 638, NC

Green Direction Sustainability Consulting (Pty) Ltd was appointed by Imvusa Koalien (Pty) Ltd to conduct an Environmental Authorisation (EA) Application in support of a Mining Permit Application for the proposed kaolin mining activities on portion 1 of farm Rondawel 638, Kamiesberg local municipality, Namaqua district municipality, Northern Cape. A draft Basic Assessment Report (BAR) has been submitted in terms of the National Environmental Management Act, No 107 of 1998 (NEMA), for activities that trigger the Mineral and Petroleum Resources Development Act, No 28 of 2002 (MPRDA)(As amended). The proposed activities includes the extension of existing mining activities to a depth of less than six meters, with no additional supporting infrastructure as the existing infrastructure will be used.

The Archaeology Contracts Office (ACO) was appointed to conduct the heritage component of the BAR.

Halkett, D, Robinson, J and Gribble, J. 2017. Heritage Impact Assessment for the extension of the 5 ha Kaolin Mine on portion 1 of the farm Rondawel 638, Namaqualand District, Northern Cape.

A total of seven heritage resources were identified within the current mining and proposed extension area. These include Early Stone Age (ESA), Middle Stone Age (MSA) and Later Stone Age (LSA) lithics. These resources were rated to be of low heritage significance. According to consultation with Dr John Almond, a palaeontological assessment was not deemed to be necessary due to the small size of the development and the lack of nearby major watercourses.

Recommendations provided in the report include the following:

- A once off monitoring visit is suggested during the expansion of the mine in the vicinity of the exposed silcrete outcrop (S30.80829E17.80289) at such time that stripping reaches that area, to record the presence (or not) of buried surfaces containing stone artefacts;
- The relevant heritage authority must be notified if any heritage resources (including burials) are uncovered during mining expansion.

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Interim Comment

The SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit does not accept the email excerpt provided in the background document and requests that an official letter of exemption for further palaeontological studies, which should at least contain a geological map of the area, or Palaeontological desktop Study inclusive of a field assessment be conducted for the project as the expansion of the mining activities is partially located within an area of very high palaeontological sensitivity. Additionally, all the BAR appendices must be submitted to the SAHRIS application so that an informed comment may be issued.

Further comments will be issued upon receipt of the above requested information.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

Natasha Higgitt
Heritage Officer
South African Heritage Resources Agency

Phillip Hine
Acting Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

ADMIN:

Direct URL to case: <http://www.sahra.org.za/node/408571>

25 Appendix E: Impact Assessment Tables

Table 1: Impact Assessment during Construction Phase

CONSTRUCTION PHASE: SITE ACCESS AND SITE ESTABLISHMENT		
Potential Impact and risk: Loss of topsoil, increased dust levels, and soil compaction	IMPACT 1: SOIL EROSION & SOIL COMPACTION: The clearing of areas for new access tracks and the mining of kaolin will result in the removal of existing vegetation and topsoil, which will disturb the soil increasing the potential for soil erosion by wind and loss of soil in the event of rainfall. Soil compaction will result from repeated use of access tracks.	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of Impact:	Negative	N/A
Extent and duration of impact:	Site and Short term	N/A
Consequence of impact or risk:	Loss	N/A
Probability of occurrence:	Probable	N/A
Degree to which the impact may cause Irreplaceable loss of resources:	Low	N/A
Degree to which the impact can be reversed:	Reversible	N/A
Indirect impacts:	Dust impacting on adjacent vegetation and causing a nuisance to workers. Compaction of topsoil where vehicles drive outside demarcated areas damages seed bank and habitat for invertebrates.	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium	
Degree to which the impact can be avoided:	High	N/A
Degree to which the impact can be managed:	High	N/A
Degree to which the impact can be mitigated:	High	N/A
Proposed mitigation:	<ul style="list-style-type: none"> After clearing, the affected area shall be stabilized to prevent any erosion or sediment runoff. Stabilized areas shall be demarcated accordingly. Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces. Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and potential stormwater run-off. Top soil shall be removed separately and stockpiled separately from other soil base layers. The stockpile areas for topsoil are temporary as they will be re-used on a cut and fill basis. Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. Topsoil storage areas must be convex and should not exceed 2m in height. Topsoil must be treated with care, must not be buried or in any other way be rendered unsuitable for further use (e.g. by mixing with spoil) and precautions must be taken to prevent unnecessary handling and compaction. In particular, topsoil must not be subject to compaction greater than 1 500 kg/m² and must not be pushed by a bulldozer for more than 50 metres. Trucks may not be driven over the stockpiles. Reduce drop height of material to a minimum. Temporarily halt material handling in windy conditions. 	N/A

	<ul style="list-style-type: none"> A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit. Compacted areas that are not required for access shall be scarified after use during decommissioning and rehabilitation. 	
Residual Impacts:	Potential loss of invertebrates that live in the top layers of the soil.	N/A
Cumulative impact post mitigation:	Low	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low	N/A
Potential Impact and risk: Potential Impacts on Water Resources	IMPACT 2: WATER RESOURCES: Potential for ground water pollution due to oil spills during routine maintenance of equipment. No surface water resources are in close proximity to the proposed mining site.	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of impact:	Negative	N/A
Extent and duration of impact:	Site & Short term	N/A
Consequence of impact or risk:	Loss	N/A
Probability of occurrence:	Unlikely	N/A
Degree to which the impact may cause irreplaceable loss of resources:	Low	N/A
Degree to which the impact can be reversed:	Reversible	N/A
Indirect impacts:	Rainfall is very seldom and evaporation rate is very high. Indirect impacts on surface water are very unlikely.	N/A
Cumulative impact prior to mitigation:	Low	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low	
Degree to which the impact can be avoided:	Medium	N/A
Degree to which the impact can be managed:	High	N/A
Degree to which the impact can be mitigated:	High	N/A
Proposed mitigation:	<ul style="list-style-type: none"> Oils and lubricants must be stored within sealed containment structures. Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. Machinery must be kept in good working order and regularly inspected for leaks. A spill kit will be available on each site where mining activities are in progress. Any spillages will be cleaned up immediately and treated in the bio-cells (soil farms) which are located on the adjacent mine. Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. Waste separation must be undertaken if practical for recycling Provide all workers with environmental awareness training and comply with the requirements of the EMPr. Provide a bin at the site and provide a mobile ablution facility. 	N/A
Residual Impacts:	Disposal of contaminated soil on site in bio-cells requires existing infrastructure, which are already available on the adjacent mine.	N/A

Cumulative impact post mitigation:	Very Low	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Very Low	N/A
Potential Impact and risk: Potential Impacts on Biodiversity	IMPACT 3: LIMITED LOSS OF NATURAL VEGETATION AND ECOLOGICAL FUNCTIONING IN AN CRITICAL BIODIVERSITY AREA 2 (CBA 2) AND RIVER FEPA SUB-CATCHMENT: The proposed mining area footprint of 5ha will be cleared, mined and rehabilitated with the topsoil from the site, resulting in a temporary impact on localised ecological functioning.	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of impact:	Negative	N/A
Extent and duration of impact:	Site & Short term	N/A
Consequence of impact or risk:	Loss	N/A
Probability of occurrence:	Definite	N/A
Degree to which the impact may cause Irreplaceable loss of resources:	Low	N/A
Degree to which the impact can be reversed:	Reversible	N/A
Indirect impacts:	<ul style="list-style-type: none"> • Soil disturbance caused by vegetation clearing will provide suitable conditions for the establishment and spreading of alien invasive vegetation. • Removal of alien invasive vegetation if required, is a positive impact, and will benefit the ecological functioning. • The only identified land use is small stock grazing and due to the restoration in land use and small scale of the operation mining will not have any additional impact and the land will revert back to its former use grazing with an improvement in production. 	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium	N/A
Degree to which the impact can be avoided:	Medium	N/A
Degree to which the impact can be managed:	High	N/A
Degree to which the impact can be mitigated:	High	N/A
Proposed mitigation:	<ul style="list-style-type: none"> • Refer to Appendix C, which indicates the proposed 5Ha area for mining and the existing farm tracks that will be used wherever possible. The existing adjacent mine's operational infrastructure will be used for the new proposed mine. • Remove alien invasive vegetation and ensure ongoing alien vegetation clearing in the area. • No indigenous plants outside of the demarcated work areas may be damaged. • The noise and vibration caused by the earthmoving equipment will disturb smaller animals (e.g. snakes). These will move away whilst operations are in progress. Should any animals be encountered these should be moved away by a suitably trained nature conservation officer, if necessary. 	N/A
Residual impacts:	Impact on ecological functioning will be at a local level during the construction process, and for a short time period, with sequential rehabilitation using the site's topsoil. The only identified land use is small stock grazing and due to the restoration in land use and small scale of the operation mining will not have any additional impact and the land will revert back to its former use grazing with an improvement in production. The clearing of alien invasive vegetation is a positive impact.	N/A

Cumulative Impact post mitigation:	Low	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low	N/A
Potential Impact and risk: Contamination & Pollution	IMPACT 4: POTENTIAL FOR SOIL CONTAMINATION AND SOLID WASTE POLLUTION DURING CONSTRUCTION PHASE:	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of Impact:	Negative	N/A
Extent and duration of impact:	Site & Short term	N/A
Consequence of impact or risk:	Loss	N/A
Probability of occurrence:	Possible	N/A
Degree to which the impact may cause irreplaceable loss of resources:	Low	N/A
Degree to which the impact can be reversed:	Reversible	N/A
Indirect impacts:	Windblown litter will cause visual blight. Hydrocarbons are toxic and will cause vegetation die-back and soil poisoning.	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium	N/A
Degree to which the impact can be avoided:	High	N/A
Degree to which the impact can be managed:	High	N/A
Degree to which the impact can be mitigated:	High	N/A
Proposed mitigation:	<ul style="list-style-type: none"> • Oils and lubricants must be stored within sealed containment structures of the demarcated areas of the adjacent mine. • Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. • When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. • Machinery must be kept in good working order and regularly inspected for leaks. • A spill kit will be available on each site where mining activities are in progress. • Any spillages will be cleaned up immediately. • Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. • Waste separation must be undertaken if practical for recycling • Provide all workers with environmental awareness training. • Provide a bin at the site. • Regularly dispose of any solid waste at a municipal waste disposal site. • Ensure all workers comply with the requirements of the EMPr. • Provide a mobile ablution facility. 	N/A
Residual Impacts:	A lack of waste food management encourages vermin.	N/A
Cumulative impact post mitigation:	Low	N/A
Significance rating of impact after mitigation	Low	N/A

(e.g. Low, Medium, Medium-High, High, or Very-High)		
Potential Impact and risk: Potential Impacts on Visual Landscape	IMPACT 5: VISUAL INTRUSION: Caused by the front end loader, topsoil stockpiles, cleared areas, and movement of trucks on site during preparation of site access and site establishment. The site is however, remote and rural in nature with very few receptors (people) as it is located on private property.	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of impact:	Negative	N/A
Extent and duration of impact:	Site & Short term	N/A
Consequence of impact or risk:	Loss	N/A
Probability of occurrence:	Definite	N/A
Degree to which the Impact may cause Irreplaceable loss of resources:	Low	N/A
Degree to which the Impact can be reversed:	Reversible	N/A
Indirect impacts:	There are few indirect impacts as the area is remote and rural, with no people (receptors) living near the site.	N/A
Cumulative impact prior to mitigation:	Low	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low	N/A
Degree to which the Impact can be avoided:	Medium	N/A
Degree to which the Impact can be managed:	Medium	N/A
Degree to which the Impact can be mitigated:	Medium	N/A
Proposed mitigation:	<ul style="list-style-type: none"> The construction areas shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall be kept orderly. Restrict working hours to normal work day hours with no work over weekends when holidays occur to minimize hauling trucks along access roads. 	N/A
Residual impacts:	Good housekeeping will ensure a neat and well maintained construction area reducing visual impact.	N/A
Cumulative impact post mitigation:	Very Low	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Very Low	N/A
Potential Impact and risk: Potential Impacts on Social, and Biophysical Environments	IMPACT 6: EMISSIONS (DUST, VEHICLES & NOISE): Noise and dust will be created by mining equipment (e.g. front end loaders) and vehicles, which will emit Greenhouse Gases.	
	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE

Nature of Impact:	Negative	N/A
Extent and duration of impact:	Local & Short Term	N/A
Consequence of impact or risk:	Loss	N/A
Probability of occurrence:	Definite	N/A
Degree to which the impact may cause irreplaceable loss of resources:	Low	N/A
Degree to which the impact can be reversed:	Reversible	N/A
Indirect Impacts:	<ul style="list-style-type: none"> Carbon emissions from vehicle exhausts have a negative impact on the ozone layer. Local residents along the access tracks and roads would be impacted on by noise, dust and vehicle emissions during the construction activities. Increase in Greenhouse Gas Emissions from vehicles. 	N/A
Cumulative impact prior to mitigation:	Low	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low	N/A
Degree to which the impact can be avoided:	Medium	N/A
Degree to which the impact can be managed:	Medium	N/A
Degree to which the impact can be mitigated:	Medium	N/A
Proposed mitigation:	<ul style="list-style-type: none"> The Contractor shall adhere to the local by-laws and regulations regarding the noise and associated hours of operations. The Contractor shall limit noise levels (e.g. Install and maintain silencers on machinery). The provisions of SANS 1200A Sub clause 4.1 regarding "built-up" area shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas. Construction and demolition activities generating output of 85dB or more, shall be limited to normal working hours and not allowed during weekends to limit the impact of noise of neighbours. Should the Contractor need to work outside normal working hours, the surrounding neighbours shall be informed prior to the work taking place. No amplified music shall be allowed on site. On public roads adjacent to the site vehicles shall adhere to municipal and provincial traffic regulations including speed limits. Vehicles used on site for the construction related activities shall be maintained and in a good working condition so as to reduce emissions. Stockpiles must be maintained (covered where necessary) to avoid wind erosion of the material. Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces. 	N/A
Residual Impacts:	Carbon emissions have impact on climate change.	N/A
Cumulative impact post mitigation:	Very Low	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Very Low	N/A
Potential Impact and risk: Potential Impacts on Heritage, Paleontological and Cultural landscape	IMPACT 7: POTENTIAL FOR HERITAGE, PALAEOLOGICAL AND CULTURAL IMPACTS: Refer to Appendix G. The specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented.	

ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of impact:	Neutral	N/A
Extent and duration of impact:	Site & Long term	N/A
Consequence of impact or risk:	Loss	N/A
Probability of occurrence:	Definite	N/A
Degree to which the impact may cause irreplaceable loss of resources:	Low	N/A
Degree to which the impact can be reversed:	Irreversible	N/A
Indirect impacts:	Excavations provide opportunities to observe buried surfaces containing stone artefacts.	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium	N/A
Degree to which the impact can be avoided:	High	N/A
Degree to which the impact can be managed:	High	N/A
Degree to which the impact can be mitigated:	High	N/A
Proposed mitigation:	The following recommendations are made by the Specialist's: A once off monitoring visit is suggested during the expansion of the mine in the vicinity of the exposed silcrete outcrop (S30.80829; E17.80289) at such time that stripping reaches that area, to record the presence (or not) of buried surfaces containing stone artefacts; The relevant heritage authority must be notified if any heritage resources (including burials) are uncovered during mining expansion.	N/A
Residual impacts:	Dependent upon whether or not heritage resources are encountered and on the recommendations to be implemented.	N/A
Cumulative impact post mitigation:	Medium (-)	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (-) Rating provided by Specialists.	N/A
Potential impact and risk: Potential Impacts on Socio-Economic Environment	IMPACT 8: CREATION OF EMPLOYMENT & JOB SECURITY DURING CONSTRUCTION PHASE WITH LOCAL AND REGIONAL ECONOMIC SPIN-OFFS	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of impact:	Positive	Negative
Extent and duration of impact:	Local, District and Short term	Local, District & Short Term
Consequence of impact or risk:	Gain	Loss
Probability of occurrence:	Definite	Definite
Degree to which the impact may cause irreplaceable loss of resources:	No Loss	Medium
Degree to which the impact can be reversed:	Irreversible (employment can be lost by an individual due to non-performance but the job provision is irreversible)	Reversible
Indirect impacts:	<ul style="list-style-type: none"> Upskilling Local economic spin-offs through increased income earned, and through purchasing of local materials 	<ul style="list-style-type: none"> No upskilling No local economic spin-offs due to lack of income earned, and limited supply of kaolin materials.

		<ul style="list-style-type: none"> Opportunity cost for landowner and applicant.
Cumulative impact prior to mitigation:	Medium (-)	Medium (-)
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low (-)	Medium (-)
Degree to which the impact can be avoided:	Very low	Medium
Degree to which the impact can be managed:	High	Medium
Degree to which the impact can be mitigated:	High	Medium
Proposed mitigation:	<ul style="list-style-type: none"> Employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling) 	No mitigation possible with No-Go alternative.
Residual impacts:	The upliftment of unemployed people, with positive impact on standard of living for their families. Increase in local building materials, which reduce economies of scale for building projects in the region, such as for the renewable energy sector.	No job creation or potential for upskilling of previously disadvantaged labour, and no supply of Kaolin.
Cumulative impact post mitigation:	Medium (+)	Medium (-)
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (+)	Medium (-)

Table 2: Impact Assessment during Operational Phase

OPERATIONAL PHASE		
Potential impact and risk: Loss of soil, increased dust levels, and soil compaction	IMPACT 1: SOIL EROSION, SOIL COMPACTION & GEOLOGICAL SEQUENCE: The mining of Kaolin will result in the removal of 1 metre of overburden and the sub-layers of Kaolin, with mixing of the geological sequence. Impacts are the potential for soil erosion by wind and loss of soil in the event of rainfall; soil compaction from repeated use of access tracks; and changes in the landscape and topography.	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of impact:	Negative	N/A
Extent and duration of impact:	Site & Long term	N/A
Consequence of impact or risk:	Loss	N/A
Probability of occurrence:	Definite	N/A
Degree to which the impact may cause irreplaceable loss of resources:	Medium	N/A
Degree to which the impact can be reversed:	Reversible	N/A
Indirect impacts:	<ul style="list-style-type: none"> Dust impacting on adjacent vegetation and causing a nuisance to workers. Compaction of topsoil damages seed bank and habitat for invertebrates. 	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium	N/A
Degree to which the impact can be	Medium	N/A

avoided:		
Degree to which the impact can be managed:	Medium	N/A
Degree to which the impact can be mitigated:	Medium	N/A
Proposed mitigation:	<ul style="list-style-type: none"> After clearing, the affected area shall be stabilized to prevent any erosion or sediment runoff. Stabilized areas shall be demarcated accordingly. Incremental clearing of vegetation should take place to avoid unnecessary exposed surfaces. Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and stormwater run-off. The stockpile areas for topsoil are temporary as they will be re-used on a cut and fill basis. Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. Reduce drop height of material to a minimum. Temporarily halt material handling in windy conditions. A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit. Compacted areas that are not required for access shall be scarified after use during decommissioning and rehabilitation. No industrial or mine waste is generated during the mining process. Processing shall include the spreading of Kaolin to dry out where after it will be screened and bagged to be sold as a FoT product. Product stockpiles shall form part of the drying area that shall also serve as a dispatch yard. Primary processing shall include screening by means of a "trommel screen" provided as part of the adjacent operation so no Fine Residue Dumps (FRD) will be created. Mining shall be in the form of a cut and fill operation where overburden will be backfilled in mined out sections and covered with topsoil as excavations advance. Mixing of the geological sequence of sediment will be avoided and at final closure oversize material and low grade Kaolin will first be backfilled into the excavation before covering with available topsoil. Due to a shortage of topsoil the white Kaolin will still be visible above surface after rehabilitation but with the natural movement of the dune sand will be covered naturally. Re-shaping of landscape and topography to form shallow depressions. 	N/A
Residual impacts:	<ul style="list-style-type: none"> Unmanaged soil erosion will result in loss of topsoil. Unmanaged dust will cause a nuisance and impact on the health of the workers. Visual change in landscape and topography following rehabilitation. 	N/A
Cumulative impact post mitigation:	Low	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low	N/A
Potential impact and risk: Potential Impacts on Water Resources	IMPACT 2: WATER RESOURCES: Potential for ground water pollution due to oil spills during routine maintenance of equipment. No surface water resources are in close proximity to the proposed mining site.	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of impact:	Negative	N/A
Extent and duration of impact:	Site	N/A
Consequence of impact or risk:	Loss	N/A

Probability of occurrence:	Unlikely	N/A
Degree to which the impact may cause irreplaceable loss of resources:	Low	N/A
Degree to which the impact can be reversed:	Irreversible	N/A
Indirect impacts:	<ul style="list-style-type: none"> Rainfall is very seldom and evaporation rate is very high. Indirect impacts on surface water are very unlikely. 	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium	N/A
Degree to which the impact can be avoided:	Medium	N/A
Degree to which the impact can be managed:	Medium	N/A
Degree to which the impact can be mitigated:	Medium	N/A
Proposed mitigation:	<ul style="list-style-type: none"> Oils and lubricants must be stored within sealed containment structures. Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. Machinery must be kept in good working order and regularly inspected for leaks. A spill kit will be available on each site where mining activities are in progress. Any spillages will be cleaned up immediately and treated in the bio-cells (soil farms) which are located on the adjacent mine. Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. Waste separation must be undertaken if practical for recycling Provide all workers with environmental awareness training and comply with the requirements of the EMPr. Provide a bin at the site and provide a mobile ablution facility. 	N/A
Residual impacts:	Disposal of contaminated soil on site in bio-cells requires existing infrastructure, which are already available on the adjacent mine.	N/A
Cumulative impact post mitigation:	Low	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low	N/A
Potential impact and risk: Potential Impacts on Biodiversity	IMPACT 3: LIMITED LOSS OF NATURAL VEGETATION AND ECOLOGICAL FUNCTIONING IN AN CRITICAL BIODIVERSITY AREA 2 (CBA 2) AND RIVER FEPA SUB-CATCHMENT: The proposed mining area footprint of 5ha will be cleared, mined and rehabilitated with the topsoil from the site, resulting in a temporary impact on localised ecological functioning. Transport of materials will be along existing access tracks resulting in little impact on ecological functioning at a local level during the operation phase. The machinery and trucks will disturb local fauna.	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of impact:	Negative	N/A
Extent and duration of impact:	Site & Short term	N/A

Consequence of impact or risk:	Loss	N/A
Probability of occurrence:	Definite	N/A
Degree to which the impact may cause irreplaceable loss of resources:	Low	N/A
Degree to which the impact can be reversed:	Irreversible	N/A
Indirect impacts:	<ul style="list-style-type: none"> • Soil disturbance caused by vegetation clearing will provide suitable conditions for the establishment and spreading of alien invasive vegetation. • Removal of alien invasive vegetation is a positive impact, and will benefit the ecological functioning. • The only identified land use is small stock grazing and due to the restoration in land use and small scale of the operation mining will not have any additional impact and the land will revert back to its former use grazing with an improvement in production. 	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium	N/A
Degree to which the impact can be avoided:	Low	N/A
Degree to which the impact can be managed:	High	N/A
Degree to which the impact can be mitigated:	High	N/A
Proposed mitigation:	<ul style="list-style-type: none"> • Refer to Appendix C, which indicates that existing farm tracks will be used. • The mining area and stockpile areas must be demarcated and the footprint contained within the demarcated area. • Mining areas to be limited to blocks of 0.5Ha at a time with progressive rehabilitation. • The annual rehabilitation plan must be implemented. • Remove alien invasive vegetation, and ensure ongoing alien vegetation clearing in the area. • No indigenous plants outside of the demarcated work areas may be damaged. • The noise and vibration caused by the earthmoving equipment will disturb smaller animals. These will move away whilst operations are in progress. Should any animals be encountered these should be moved away by a suitably trained nature conservation officer, if necessary. 	N/A
Residual impacts:	The only identified land use is small stock grazing and due to the restoration in land use and small scale of the operation mining will not have any additional impact and the land will revert back to its former use grazing with an improvement in production. The clearing of alien invasive vegetation is a positive impact, and will benefit the ecological functioning.	N/A
Cumulative impact post mitigation:	Low	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low	N/A
Potential impact and risk: Contamination & Pollution	IMPACT 4: POTENTIAL FOR SOIL CONTAMINATION AND SOLID WASTE POLLUTION DURING OPERATIONAL PHASE	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of impact:	Negative	
Extent and duration of impact:	Site & Short term	
Consequence of impact or risk:	Loss	
Probability of occurrence:	Possible	

Degree to which the impact may cause irreplaceable loss of resources:	Low	
Degree to which the impact can be reversed:	Reversible	
Indirect impacts:	Windblown litter will cause visual blight. Hydrocarbons are toxic and will cause vegetation die-back and soil poisoning.	
Cumulative impact prior to mitigation:	Medium	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium	
Degree to which the impact can be avoided:	High	
Degree to which the impact can be managed:	High	
Degree to which the impact can be mitigated:	High	
Proposed mitigation:	<ul style="list-style-type: none"> • Oils and lubricants must be stored within sealed containment structures of the demarcated areas of the adjacent mine. • Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. • When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. • Machinery must be kept in good working order and regularly inspected for leaks. • A spill kit will be available on each site where mining activities are in progress. • Any spillages will be cleaned up immediately. • Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. • Waste separation must be undertaken if practical for recycling • Provide all workers with environmental awareness training. • Provide a bin at the site. • Regularly dispose of any solid waste at a municipal waste disposal site. • Ensure all workers comply with the requirements of the EMPr. • Provide a mobile ablution facility. 	
Residual impacts:	A lack of waste food management encourages vermin.	
Cumulative impact post mitigation:	Low	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low	
Potential impact and risk: Potential Impacts on Visual Landscape	IMPACT 5: VISUAL INTRUSION: Caused by the machinery, topsoil and rock stockpiles, cleared areas, and movement of trucks on site. The site is however, remote and rural in nature with no receptors (people) as it is located on private property.	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of impact:	Negative	
Extent and duration of impact:	Site & Short term	
Consequence of impact or risk:	Loss	
Probability of occurrence:	Definite	
Degree to which the impact may cause irreplaceable loss of resources:	Low	
Degree to which the impact can be	Reversible	

reversed:		
Indirect impacts:	There are few indirect impacts as the area is remote and rural, with no people (receptors) living near the site.	
Cumulative impact prior to mitigation:	Low	
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low	
Degree to which the impact can be avoided:	Medium	
Degree to which the impact can be managed:	Medium	
Degree to which the impact can be mitigated:	Medium	
Proposed mitigation:	<ul style="list-style-type: none"> Maintain the height of the stockpile areas at a maximum of 2 metres. The site shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall be kept orderly. Restrict working hours to normal work day hours with no work over weekends when holidays occur to minimize hauling trucks along access roads. The impact is insignificant given the small scale of the activities and the isolation of the site. The impact is temporary and after mining the excavations will be sloped, all oversize material and overburden will be backfilled, top soiled and allowed to re-vegetate naturally resulting in an even depression with no residual impact. 	
Residual impacts:	Good housekeeping will ensure a neat and well maintained construction area reducing visual impact.	
Cumulative impact post mitigation:	Very Low	
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Very low	
Potential impact and risk: Potential Impacts on Social, and Biophysical Environments	IMPACT 6: EMISSIONS (DUST, VEHICLES & NOISE): Noise and dust will be created by mining equipment (e.g. front end loaders) and vehicles, which will emit Greenhouse Gases.	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of impact:	Negative	N/A
Extent and duration of impact:	Site and short term	N/A
Consequence of impact or risk:	Loss	N/A
Probability of occurrence:	Definite	N/A
Degree to which the impact may cause irreplaceable loss of resources:	Low	N/A
Degree to which the impact can be reversed:	Low	N/A
Indirect impacts:	<ul style="list-style-type: none"> Carbon emissions from vehicle exhausts have a negative impact on the ozone layer. Residents and occupants of work places along the access tracks and roads would be impacted on by noise, dust and vehicle emissions. 	N/A
Cumulative impact prior to mitigation:	Low	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low	N/A
Degree to which the impact can be avoided:	Medium	N/A

Degree to which the impact can be managed:	Medium	N/A
Degree to which the impact can be mitigated:	Medium	N/A
Proposed mitigation:	<ul style="list-style-type: none"> • Ensure Kaolin hauling is during normal working hours and not on weekends • No amplified music shall be allowed on site. • On public roads the vehicles shall adhere to municipal and provincial traffic regulations including speed limits. • Vehicles used on site for the construction related activities shall be maintained and in a good working condition so as to reduce emissions. • Ensure bagged Kaolin is properly secured for hauling. 	N/A
Residual impacts:	Dust settling on adjacent vegetation can impact on vegetative growth, which is a short-term impact until the rainfall season.	N/A
Cumulative impact post mitigation:	Very Low	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Very Low	
Potential impact and risk: Potential Impacts on Heritage, Paleontological and Cultural landscape	IMPACT 7: LIMITED POTENTIAL FOR HERITAGE, PALAEOLOGICAL AND CULTURAL IMPACTS: Refer to Appendix G. The specialists' reasoned opinion is that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented.	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of impact:	Neutral	N/A
Extent and duration of impact:	Site & Long term	N/A
Consequence of impact or risk:	Loss	N/A
Probability of occurrence:	Definite	N/A
Degree to which the impact may cause irreplaceable loss of resources:	Low	N/A
Degree to which the impact can be reversed:	Irreversible	N/A
Indirect impacts:	Excavations provide opportunities to observe buried surfaces containing stone artefacts.	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium	N/A
Degree to which the impact can be avoided:	High	N/A
Degree to which the impact can be managed:	High	N/A
Degree to which the impact can be mitigated:	High	N/A
Proposed mitigation:	The following recommendations are made by the Specialist's: A once off monitoring visit is suggested during the expansion of the mine in the vicinity of the exposed silcrete outcrop (S30.80829; E17.80289) at such time that stripping reaches that area, to record the presence (or not) of buried surfaces containing stone artefacts; The relevant heritage authority must be notified if any heritage resources (including burials) are uncovered during mining expansion.	N/A
Residual impacts:	Dependent upon whether or not heritage resources are encountered and on the recommendations to	N/A

	be implemented.	
Cumulative impact post mitigation:	Medium (-)	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (-) Rating provided by Specialists.	N/A
Potential impact and risk: Potential Impacts on Socio-Economic Environment	IMPACT 8: CREATION OF EMPLOYMENT & JOB SECURITY DURING OPERATIONAL PHASE WITH LOCAL AND REGIONAL ECONOMIC SPIN-OFFS	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE
Nature of impact:	Positive	Negative
Extent and duration of impact:	Local, district and Short term	Local, District & Short Term
Consequence of impact or risk:	Gain	Loss
Probability of occurrence:	Definite	Definite
Degree to which the impact may cause irreplaceable loss of resources:	No loss	Medium
Degree to which the impact can be reversed:	Irreversible (employment can be lost by an individual due to non-performance but the job provision is irreversible)	Reversible
Indirect impacts:	<ul style="list-style-type: none"> Upskilling Local economic spin-offs through increased income earned, and through purchasing of local materials required for the construction activities. 	<ul style="list-style-type: none"> No upskilling No local economic spin-offs due to lack of income earned, and limited supply of Kaolin materials. Opportunity cost for landowner and applicant.
Cumulative impact prior to mitigation:	Medium (-)	Medium (-)
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (-)	Medium (-)
Degree to which the impact can be avoided:	Very low	Medium
Degree to which the impact can be managed:	High	Medium
Degree to which the impact can be mitigated:	High	Medium
Proposed mitigation:	<ul style="list-style-type: none"> Employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling) 	No mitigation possible with No-Go alternative.
Residual impacts:	The upliftment of unemployed people, with positive impact on standard of living for their families. Increase in local building materials, which reduce economies of scale for building projects in the region, such as for the renewable energy sector.	No job creation or potential for upskilling of previously disadvantaged labour, and no supply or purchasing of local materials.
Cumulative impact post mitigation:	Medium (+)	Medium (-)
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (+)	Medium (-)

Table 3: Impact Assessment during Decommissioning and Closure Phase

DECOMMISSIONING & CLOSURE PHASE		
Potential impact and risk: Potential Impacts on Biophysical Environment	IMPACT 1: REHABILITATION OF MINED AND CLEARED AREAS: As per Rehabilitation, Decommissioning and Mine Closure Plan (Appendix F)	
ALTERNATIVE	ALTERNATIVE 1 (PREFERRED)	NO-GO ALTERNATIVE
Nature of impact:	Positive	N/A
Extent and duration of impact:	• Local & short term	N/A
Consequence of impact or risk:	Gain	N/A
Probability of occurrence:	Definitely	N/A
Degree to which the impact may cause irreplaceable loss of resources:	No loss	N/A
Degree to which the impact can be reversed:	Reversible	N/A
Indirect impacts:	<ul style="list-style-type: none"> Biodiversity of area and grazing for stock will improve due to improved soil properties mixed with low grade Kaolin. Fauna will return to the disturbed areas. 	N/A
Cumulative impact prior to mitigation:	Medium	N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium	N/A
Degree to which the impact can be avoided:	Very low (rehabilitation is mandatory)	N/A
Degree to which the impact can be managed:	High	N/A
Degree to which the impact can be mitigated:	High	N/A
Proposed mitigation:	<ul style="list-style-type: none"> Implementation of Final Rehabilitation, Decommissioning and Mine Closure Plan (Appendix F). Compacted areas shall be scarified after use during decommissioning and rehabilitation. Any stored topsoil shall be spread over the scarified surface. Ongoing removal of alien invasive vegetation as required. After mining the excavations will be sloped, all oversize material and overburden will be backfilled, top soiled and allowed to re-vegetate naturally resulting in an even depression with no residual impact. 	N/A
Residual impacts:	The only identified land use is small stock grazing and due to the restoration in land use and small scale of the operation mining will not have any additional impact and the land will revert back to its former use grazing with an improvement in production.	N/A
Cumulative impact post mitigation:	Very Low	N/A
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Very Low	N/A
Potential impact and risk: Potential Impacts on Socio-Economic Environment	IMPACT 2: CREATION OF EMPLOYMENT, JOB SECURITY WITH LOCAL AND REGIONAL ECONOMIC SPIN-OFFS DURING DECOMMISSIONING & CLOSURE PHASE	
ALTERNATIVE	PREFERRED AND ONLY ALTERNATIVE	NO-GO ALTERNATIVE

Nature of impact:	Positive	Negative
Extent and duration of impact:	Local, district and Short term	Local, District & Short Term
Consequence of impact or risk:	Gain	Loss
Probability of occurrence:	Definite	Definite
Degree to which the impact may cause irreplaceable loss of resources:	No loss	Medium
Degree to which the impact can be reversed:	Irreversible (employment can be lost by an individual due to non-performance but the job provision is irreversible)	Reversible
Indirect impacts:	<ul style="list-style-type: none"> Upskilling. Local economic spin-offs through increased income earned. 	<ul style="list-style-type: none"> No upskilling No local economic spin-offs due to lack of income earned, and limited supply of Kaolin materials. Opportunity cost for landowner and applicant.
Cumulative impact prior to mitigation:	Medium (-)	Medium (-)
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Low	Medium (-)
Degree to which the impact can be avoided:	Very low	Medium
Degree to which the impact can be managed:	High	Medium
Degree to which the impact can be mitigated:	High	Medium
Proposed mitigation:	<ul style="list-style-type: none"> Employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling) 	No mitigation possible with No-Go alternative.
Residual impacts:	The upliftment of unemployed people, with positive impact on standard of living for their families.	No job creation or potential for upskilling of previously disadvantaged labour, and no supply or purchasing of local materials.
Cumulative impact post mitigation:	Medium (+)	Medium (-)
Significance rating of impact after mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium (+)	Medium (-)

26 Appendix F: Rehabilitation, Decommissioning and Closure Plan

Final Rehabilitation, Decommissioning and Mine Closure Plan Including Environmental Risk Assessment JANUARY 2018

Imvusa Kaolien (Pty) Ltd
Portion 1 of Farm Rondawel 638, Kamiesberg Local Municipality

Reference No.: NCS 30/5/1/1/2/10638 MP

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1 INTRODUCTION

1.1 Background

This document serves to comply with regulation 11(1) of the NEMA Financial Regulations that states that the holder of a right or permit must ensure that a review is undertaken of the requirements for final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of operations as reflected in a final rehabilitation, decommissioning and mine closure plan; and remediation of latent or residual environmental impacts which may become known in the future, including the pumping and treatment of polluted or extraneous water, as reflected in an environmental risk assessment report.

The objectives of this final rehabilitation, decommissioning and mine closure plan is to to identify a post-mining land use that is feasible through-

- providing the vision (goals), objectives, targets and criteria for final rehabilitation, decommissioning and closure of the project;
- outlining the design principles for closure;
- explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation;
- detailing the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure;
- committing to a schedule, budget, roles and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure;
- identifying knowledge gaps and how these will be addressed and filled;
- detailing the full closure costs for the life of project at increasing levels of accuracy as the project develops and approaches closure in line with the final land use proposed; and
- outlining monitoring, auditing and reporting requirements.

1.2 Issues that have guided the development of the plan

The company identified three key closure goals for the final decommissioning and closure of the mining operation that are listed below.

- To create a safe and healthy post-mining environment with no residual environmental impact.
- To create a stable, free draining post mining landform, which is compatible with the surrounding landscape and which is capable of a productive land use that achieves a land capability equal to that of pre-mining conditions
- To provide optimal post-mining social opportunities

Each goal is supported by a suite of key objectives and activities which are elaborated on in section 3 of this review. Section 3 also describes how these objectives are planned to be met and elaborate on the implementation of certain risk mitigation actions, with risk assessment and mitigation being integral to the planning and executing of the rehabilitation and closure of the mine. Aftercare and maintenance of rehabilitated sites is often the difference between the ultimate successes or failure of rehabilitation and monitoring of rehabilitation will determine whether rehabilitation objectives and requirements are being achieved.

1.3 Context of the Mining operation

1.3.1 Mining Permit

The mining area is situated on Portion 1 of Farm Rondawel 638. The operation is to be carried out under cover of Mining Permit to be issued to Imvusa Kaolien (Pty) Ltd (Reg. 2017/362456/07) with file reference NCS 30/5/1/1/2/1 (10638) MP.

The operation is situated in the Kamiesberg Local Authority of the Kenhardt administrative district of the Northern Cape.

Portion 1 of Farm Rondawel 638 in the Northern Cape is registered in the names of Adriaan and Elizabeth Nieuwoudt (07/04/2003) by virtue of Title Deed T30303/2003.

The nearest town is Garies, which is located adjacent to the N7, and the site is located 33km in a south-westerly direction along existing farm roads and tracks, with an approximate locality of Latitude 30° 48' 31.82" S and Longitude 17° 48' 10.59"E (Diagram 1, 2 & 3).

1.3.2 Project Description

Mining is in the form of a simple process that only includes an opencast quarry with excavation, loading and hauling of Kaolin. The depth of the excavations will be less than 6 meters and no infrastructure or services will be developed as technical resources will be shared with the adjacent mining operation. The areas allocated for mining and stockpiling would first be stripped of all available topsoil. This topsoil would be stockpiled separately for later use when the quarry is rehabilitated. Any overburden in the form of low grade Kaolin and rocks will be removed and stockpiled separately for later use when the quarry is rehabilitated. Due to a shortage of topsoil the white Kaolin will still be visible above surface after rehabilitation but with the natural movement of the dune sand will be covered naturally. Processing will take place by screening and Kaolin is sold as a FoT product without any refinery. No tailings are generated during the mining process. The estimated footprint of the excavation is 5Ha and at final closure the sides of the excavation will be profiled to form an even depression.

1.3.3 Mine design map

Refer to Diagrams 1, 2 and 3.

No water or electricity is used in the mining operation. The existing infrastructure for the existing mine will be utilised for the proposed mine to be located adjacent to the existing mine as shown in Diagram 3 below. Existing farm tracks will be used as haul roads and no new roads will be developed.

Refer to section 6 for mine layout and quantification of closure elements.

Diagram 2: Access to the Site and position of Proposed Mine on Portion 1 of Farm Rondawel 638



Diagram 3: Site Plan showing Area under Application adjacent to the Existing Mine Operation.



1.3.4 Project description

1.3.4.1 Construction Phase

- Access and service roads: Access to the mine works will be via the Garies-Groenriviermond public road and existing farm tracks as shown in Diagram 3 above. Existing farm tracks will be used as haul roads and no new roads will be developed. The service roads will remain as part of farm improvement and the mine is only responsible for the maintenance of the road.
- Water supply: No process water is used in the mining process.
- Electricity supply: No electricity is used in the mining area.
- Logistics: No infrastructure is present or will be required due to the small scale and simple mining method and the infrastructure of the adjacent mining operation will be shared, such as the supply of electricity from a mobile genset contained in a bunded generator bay with spill prevention measures.
- Waste management facilities will be shared with the adjacent mining operation and a temporary storage area for used lubrication products and other hazardous chemicals is provided for the collection of the small volume of waste before it is removed to the company headquarters.
- A service and wash bay is also provided for as part of the adjacent mining operation together with a bio-cell (soil farm).
- A bunded fuel supply with service apron is also provided as part of the adjacent mining operation.

1.3.4.2 Operational Phase

- Mining will be in the form of a roll over operation and mining blocks will be restricted to 0.5 Ha and maximum 6 metres deep, and walls will be developed in benches not exceeding 3 metres high.
- Large scale excavations and kaolin stockpiling will be undertaken by an excavator and one ADT that is on site on an ad hoc basis. This operation will only involve the loading and hauling of raw Kaolin. Only one Excavator and one ADT will be used for excavating, loading and hauling and no processing will take place.
- The only surface disturbance except for the mining excavation, will be a temporary stockpile area for topsoil as it will be re-used on a cut and fill basis (Refer to Appendix C: Site Plan).
- The depth of the mining operations will be less than 5m as the Kaolin outcrop at the surface with less than 1m overburden consisting mostly of low grade Kaolin. The total area under excavation will approximately be 5Ha.
- Mining will be in the form of a cut and fill operation where overburden will be backfilled in mined out sections and covered with topsoil as excavations advance.
- No industrial or mine waste is generated during the mining process. Processing only includes the spreading of Kaolin to dry out where after is screened a bagged to be sold as a FoT product.
- Product stockpiles form part of the drying area that also serves as a dispatch yard.
- Primary processing only includes screening by means of a "trommel screen" provided as part of the adjacent operation so no Fine Residue Dumps (FRD) will be created.
- All overburden will be backfilled and the excavations profiled to form an even depression before topsoil is replaced and no waste dumps will be created above surface.
- Domestic or any other waste generated during the mining operation will be stored in a temporary storage area provided as part of the waste management and services of the adjacent operation from where it will be removed to the adjacent existing mining site's Head Quarters at the main farm building on the property.
- Only minor repairs are done on site at the service bay provided for as part of the adjacent operation or for emergency repair a PVC lining and drip trays are used and accidental spills are cleaned up immediately by removing of the contaminated soil. The small volume of contaminated soil will be treated in the bio-cell (soil farm) and only one excavator (TLB) and tractor trailer unit is used in the mining process that is transported to the Applicant's headquarters for major repairs.

1.3.4.3 Decommissioning and closure phase

Waste can be removed as it is created. Excavation can be planned so that topography restoration is less complicated. Topsoil can be re-used at shorter intervals. The decommissioning and closure phase at the end of the life of the mine will consist of implementing this Final Rehabilitation, Decommissioning and Closure Plan.

Planning for closure and restoration from the beginning of an operation makes the process easier; waste can be removed as it is created, excavation can be planned so that topography restoration is less complicated, and topsoil can be re-used at shorter intervals.

Site rehabilitation can make the land more valuable and attractive for resale. Additionally, establishing a closure strategy (and communicating that activity to the public) can help enhance the company's reputation as a socially-responsible operation. The decommissioning and closure phase at the end of the life of the mine will consist of implementing this final rehabilitation, decommissioning and closure plan.

2 REGULATORY REQUIREMENTS

2.1 Legal requirements

The original Final rehabilitation, decommissioning and mine closure plan was submitted in terms of regulations 53 and 54 relating to financial provision in the Mineral and Petroleum Resources Development Regulations, 2004 and approved as part of the Environmental Management Plan (EMP) submitted for the Kaolin mining operation. In terms of the transitional arrangements of the Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (NEMA Financial Regulation) that took effect on 20 November 2015 any actions undertaken in terms of regulations 53 and 54 relating to financial provision in the MPRDA Regulations, 2004 which can be undertaken in terms of a provision of the NEMA Financial Regulations must be regarded as having been undertaken in terms of the provision of these Regulations (Reg. 17(1)).

A financial provision approved in terms of the MPRDA Regulations, 2004 must also be regarded to be the financial provision approved in terms of the NEMA Financial Regulations (Reg. 17(4)).

One of the conditions in terms of Regulation 17 (4) is that a holder that operates in terms of a financial provision approved in terms of the Mineral and Petroleum Resources Development Act, 2002 at the time of the coming into operation of the NEMA Financial Regulations, must review and align such approved financial provision with the provisions of the NEMA Financial Regulations on an annual basis as set out in regulations 9 and 11, read with the necessary changes.

This review fulfils the requirements of the Final Rehabilitation, Decommissioning and Mine Closure Plan and the Environmental Risk Assessment Report required in terms of the NEMA (Act 107 of 1998) regulations.

Several pieces of legislation are applicable to mine closure. Importantly, public participation is an integral part of mine closure and the process followed needs to fulfil the requirements of all relevant legislation. The following government departments have been identified amongst others as playing a key role in the closure process:

- Department of Minerals Resources (DMR). Lead agent, facilitator of closure inspections and issues the closure certificate,
- Department of Water and Sanitation (DWAS). Lead agent for potential water related issues and signs off on the mine closure certificate. Cancellation of Water Use license.
- Provincial Department of Environment and Nature Conservation (DENC). Gives input into the closure plan and guides and monitors protection of the natural environment.
- The local municipality and district municipality. Gives input into the mine closure plan and interfacing thereof with their integrated development plan (IDP) of the local area.

2.2 Environmental Authorisation (EMP) requirements

The key closure objective described in the closure plan submitted as part of the EMP is to leave the site in as safe and self-sustaining a condition as possible and in a situation where no post-closure intervention is required to ensure that the rehabilitation measures prove successful. The aim is to ensure a stable environment that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof.

This will be achieved by leaving the site in a natural state containing no foreign debris or other materials. All scrap and other foreign materials will be removed from the area and disposed of as in the case of other refuse, whether these accrue directly from the mining operation or are brought on to the site.

This key closure objective is divided into three closure objectives as stated below.

Objective 1 - To create a safe and rehabilitated post-mining environment

- Ensure safe mining area with no potentially dangerous areas like deep excavations.
- Topsoil to be stockpiled and replaced during decommissioning and closure, and rehabilitation.

Objective 2 - To minimise pollution or degradation of the environment

- Provide sufficient information and guidance to plan the sand mining activities in a manner that would reduce impacts as far as practically possible.
- Limit residual environmental impact with no surface water or soil contamination by ensuring that no fuel or oil spills occur in the mining area.
- Ensure that no solid waste or rubble is dumped on the site.
- Ensure that portable toilets are used.

Objective 3 – To minimise impacts on the community and to provide optimal post-mining social opportunities

- Ensure that workers remain within the mining permit area.
- Operate during normal working hours only.
- Minimise the generation of noise and dust.
- Respond rapidly to any complaints received.
- Minimal negative aesthetic impact
- Optimised benefits for the social environment

3 FINAL DECOMMISSIONING AND CLOSURE OF MINING OPERATION

Concurrent or progressive rehabilitation is good practice and has advantages for the company as it reduces its overall financial exposure. Concurrent rehabilitation and remediation are provided for in the annual rehabilitation plan and contain information that defines activities on an annual basis and how these relate to the final closure vision, as detailed in this final rehabilitation, decommissioning and mine closure plan. Annual reviews in terms of regulations 6(a) and 11(1)(a) of the NEMA Financial Regulations, that form part of the Annual Environmental Audit, assesses what closure objectives and criteria are being achieved through the implementation of the plan.

Areas that are not covered during concurrent rehabilitation as described in the Annual Rehabilitation Plan that requires specific intervention as part of this final rehabilitation, decommissioning and mine closure plan are discussed below.

3.1 Infrastructure and Logistics area

3.1.1 Basic rehabilitation methodology¹

At the quarry satellite infrastructure and all logistics together with waste management facilities will be supplied by the existing mine and at the company HQ that is shared with the agricultural activities on the farm.

The main post closure objective for the infrastructure area is to leave the site in as safe and self-sustaining a condition as possible and in a situation where no post-closure intervention is required.

The aim is to ensure that the affected environment is maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. The aesthetic value of the area will also be reinstated.

The general approach adopted is the complete removal of all infrastructure and equipment and to reuse all infrastructures and equipment at another location by the company or as agricultural infrastructure.

- Redundant structures, buildings and civil foundations (down to one meter below surface for subsurface infrastructure) will be demolished and discarded.
- All steel structures and reinforcing will be discarded or sold as scrap.
- Building rubble will be used to fill remaining excavations and covered with overburden and topsoil.
- All redundant power lines and cable associated with power supply will be removed.

¹ Although the rehabilitation, decommissioning and closure of the existing infrastructure associated with the existing mine will be addressed under the relevant Mining Permit, it is included in this report for cross-referencing purposes.

- Service roads needs to be maintained and handed over to the landowner in a good state of repair and all redundant fences needs to be removed.
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the complete mining area and disposed of at the company HQ to be dealt with as part of the waste streams of the agricultural activities. No waste except building rubble will be buried and no waste will be burned on the site.

3.2 Burrow Pit and Waste Dumps

3.2.1 Basic rehabilitation methodology

Kaolin clay to be mined is an inert material that is non-toxic. The post closure objective according to the EMPr is to restore the land to its pre-mining land use taking into account the altered landform outside the mining area due to historic washing plant now used by the mine as part of logistical facilities.

- Post mining topography for the area will follow the original landform and all overburden will be backfilled before the area is profiled to form an even depression.
- Topsoil will be replaced on the back filled areas and re-vegetation of the disturbed areas will follow a process of natural plant succession starting with pioneer plants

The main closure objective therefore is to leave the site in as safe and self-sustaining a condition as possible and in a situation where no post-closure intervention is required. The aim is to ensure that the affected environment is maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. The aesthetic value of the area will also be reinstated.

The basic rehabilitation methodology will therefore only include reinstating the original profile of the natural topography by backfilling of all overburden and product stockpiles. Post mining topography for the area will follow the original landform shape and no waste dumps will or stockpiles will remain on site.

The compacted movement areas and dispatch yard will be screened for petrochemical spills and cleaned before it is ripped and leveled.

3.2.2 Risk sources

No underground workings will take place, only quarrying. Kaolin is non-toxic and an inert material which is not affected by weathering and Kaolin residues are typically benign from a pollution point of view.

No permanent high walls will be created as backfilling and sloping of the burrow pit to form an even depression will take place.

The risk sources in the context of the receiving environment with regard to the mine pit and waste dumps are shown in Diagram 3 and include the following:

- Opencast workings (including final voids and ramps)
- Overburden, cover, and/or "soft" material including topsoil;
- Other non-specification waste such as sub-economic lower grade ore;
- Surface disturbance; and
- Waste management practices leaving legacies that will require implementing of mitigation and management actions to limit the residual impact after mine closure.

3.3 Basic rehabilitation methodology

Objective 1 - To create a safe and healthy post-mining environment:

- Safe mining area
 - Walls will be developed in benches not exceeding 3m high.
 - Limit the depth of the excavation to a maximum of 6m deep.
 - Maintaining the affected environment in a stable condition that will not be detrimental to the safety and health of humans and animals.
 - Add backfilling with overburden.

- Limited residual environmental impact (No surface and/or groundwater contamination, waste management practices not creating or leaving legacies with a landscape that reduces the requirement for long term monitoring and management)
 - No waste in the form of dumps or structures will remain on surface after mine closure
 - No development of infrastructure and services will take place and facilities at the company headquarters will be used.
 - Unwanted steel, sheet metal and equipment needs to be removed from the mining area on a daily basis and no salvage yard will be established.
 - No temporary storage area for used lubrication products and other hazardous chemicals will be developed and waste must be disposed of at a collection point at the company headquarters on a daily basis.
 - Existing farm roads must be used for mining operations and where not possible the new roads or will be kept to a minimum.
 - Equipment used in the mining process will be adequately maintained in the workshops available at the company headquarters so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.
 - Accidental petro-chemical spills if any must be cleaned up immediately by removing the spillage together with the polluted soil and by disposing of them at the soil farm of the adjacent mine.

Objective 2 - To create a stable, free draining post mining landform, which is compatible with the surrounding landscape and which is capable of a productive land use that achieves a land capability equal to that of pre-mining conditions:

- Topsoil must be removed from virgin areas to be disturbed and vegetation cleared, keeping disturbance to the native vegetation to an absolute minimum.
- Any topsoil removed from roads and stockpile area must be stored separately for later reuse.
- Topsoil borrowing from the virgin areas to cover disturbed areas will not take place.
- All topsoil which is removed prior to any activity will be stockpiled in berms along with its resident seed bank and vegetation cover to an area above the proposed development.
- Movement of vehicles will be restricted to demarcated areas so as to keep the footprint of the mining operation to the absolute minimum.
- Movement of equipment must be restricted to existing roads and no ad hoc driving or turning outside demarcated loading and hauling areas will be allowed.
- All equipment and other items used during the mining operation needs to be removed from the site at final closure.
- All compacted areas due to stockpiling, loading and hauling will be ripped with erosion control measures.
- All stockpiles and leftover product must be removed or used to backfill the excavations
- Minimise the loss of land with agricultural potential: minimize footprint of disturbances to facilitate recovery of degrading patches into active patches through colonization of the patch by dispersing species (patch dynamics)
- Minimising footprint of disturbed areas including stockpile platforms and loading and hauling areas.
- Minimise loss of vegetation within the disturbance footprint: scarifying of all compacted areas as soon as possible for natural plant succession.
- Minimise disturbance of ecology due to loss of habitat and noise/visual/dust.

Objective 3 – To minimise impacts on the community and to provide optimal post-mining social opportunities:

- Ensure that workers remain within the mining permit area.
- Operate during normal working hours only.
- Minimise the generation of noise and dust.
- Respond rapidly to any complaints received.
- Minimal negative aesthetic impact
 - Minimise visual disturbance.
 - Waste material of any description, including receptacles, scrap, rubble and tyres, must be removed entirely from the mining area and disposed of at a recognised landfill facility, and will not be buried or burned on the site.
- Optimised benefits for the social environment
 - Maintain positive and transparent relationships with stakeholders and maintaining communication channels.

- Provide stakeholders including government authorities with relevant information as per legislative requirements.
- Undertaking environmental management in accordance with the approved EMPr and Closure Plan.
- Minimise noise disturbance: limiting earth moving to day time.
- Management of air emissions to minimise nuisance effects or health risk; implementation and maintenance of dust monitoring programs accompanied by dust suppression activities by spraying water and/or dust-allaying agents.
- Prevent long term changes in land use: revert back to grazing land where possible.

4 AFTERCARE AND MAINTENANCE

Maintenance of rehabilitated sites is often the difference between the ultimate successes or failure of rehabilitation and monitoring of rehabilitation will determine whether rehabilitation objectives and requirements are being achieved.

As the final phase in the project cycle, decommissioning may present positive environmental opportunities associated with the return of the land for alternative use and the cessation of impacts associated with operational activities. However, depending on the nature of the operational activity, the need to manage risks and potential residual impacts may remain well after operations have ceased. Examples of potential residual impacts and risks include erosion, slow recovery of vegetation, stock that has been abandoned (e.g. oil drums, scrap equipment) and old (unserviceable) structures.

The main closure objective is to hand back the rehabilitated properties to the respective landowners in a state that is fit for grazing, as close as possible to the original carrying capacity and to ensure that the affected environment is maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. The rehabilitation strategy is based on reinstating the original profile of the landscape and preparing the area for natural re-vegetation. The aim therefore is to leave the site in as safe and self-sustaining a condition as possible and in a situation where no post-closure intervention is required. Due to the specific nature of the mining operation no aftercare and maintenance were identified except for monitoring of erosion event over a period of 2 years.

5 RISK ASSESSMENT

5.1 Risk impact rating

ASSESSMENT CRITERIA	
NATURE	
Positive	Beneficial to the receiving environment
Negative	Harmful to the receiving environment
Neutral	Neither beneficial or harmful
EXTENT (GEOGRAPHICAL)	
Site	The impact will only affect the site
Local/ district	Will affect the local area or district
Province/region	Will affect the entire province or region
International and National	Will affect the entire country
CONSEQUENCE	
Loss/gain	The impact will result in loss or gain of resource
No loss/gain	The impact will result in no loss or no gain of resource
DURATION	
Construction period / Short term	Up to 3 years
Medium term	Up to 6 years after construction
Long term	More than 6 years after construction
PROBABILITY	
Definite	Impact will certainly occur (>75% probability of occurring)
Probable	Impact likely to occur (50 – 75% probability of occurring)
Possible	Impact may occur (25 – 50% probability of occurring)
Unlikely	Impact unlikely to occur (0 – 25% probability of occurring)
REVERSIBILITY	
Reversible	Impacts can be reversed though the implementation of mitigation measures
Irreversible	Impacts are permanent and can't be reversed by the implementation of mitigation measures
IRREPLACEABLE LOSS OF RESOURCES	
High	The impact is result in a complete loss of all resources
Medium	The impact will result in significant loss of resources
Low	The impact will result in marginal loss of resources
No Loss	The impact will not result in the loss of any resources
CUMULATIVE EFFECTS	
High	The impact would result in significant cumulative effects
Medium	The impact would result in moderate cumulative effects
Low	The impact would result in minor cumulative effects
SIGNIFICANCE RATINGS	
Very High	Major to permanent environmental change with extreme social importance.
High	Long term environmental change with great social importance.
Medium	Medium to long term environmental change with fair social importance.
Low	Short to medium term environmental change with little social importance.
Very low	Short-term environmental change with no social importance
None	No environmental change
Unknown	Due to lack of information
DEGREE TO WHICH IMPACT COULD BE AVOIDED/MANAGED/MITIGATED	
High	The impact could be significantly avoided/managed/mitigated.
Medium	The impact could be fairly avoided/managed/mitigated.
Low	The impact could be avoided/managed/mitigated to a limited degree.
Very Low	The impact could not be avoided/managed/mitigated; there are no mitigation measures that would prevent the impact from occurring.

At the time of final mine closure an application will be made to DMR for a mine closure certificate only when all risks have been confirmed as insignificant or medium and under control via management actions.

5.2 Risk Mitigation and Closure objectives

In addition to the goals and objectives for final decommissioning and mine closure as documented in section 2, the vision for the post closure land form is to leave the site in as safe and self-sustaining a condition as possible and in a situation where no post-closure intervention is required. The vision is to ensure that the affected environment is maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof and that the aesthetic value of the area will be reinstated.

For the vision to be realised the objectives and associated risk management strategies and mitigating measures described in section 3 needs to implemented, monitored and evaluated.

The aim with risk mitigation actions is to over time manage significant and medium risks to become insignificant, or at least medium and under control with management actions. Once achieved, a risk will continue to be monitored to confirm its insignificance rating as part of aftercare and maintenance as discussed in section 4.

The closure process involves a series of actions, executed over a number of years as indicated in the annual closure plans, with continual monitoring, review and remedial actions (if required). Identified and assessed risks feed into mitigation actions (or primary tasks) of which successful implementation result in achievement of the mine closure goals and objectives.

Financial provision is made in section 6 to deal with these mitigating measures in case of temporary closure or sudden closure during the normal operation of the project or at final planned closure.

The identified risks and their levels are listed together with their associated mitigating actions in Table 1.1 and 1.2.

Table 1.1: Risks, risk levels and mitigating actions: Construction Phase

IMPACTS AND ASPECTS	RISK LEVEL AFTER MITIGATION: PREFERRED AND ONLY ALTERNATIVE	MITIGATING ACTIONS
<p>1. SOIL EROSION AND COMPACTION: The clearing of areas for new access tracks and the mining of kaolin will result in the removal of existing vegetation and topsoil, which will disturb the soil increasing the potential for soil erosion by wind and loss of soil in the event of rainfall. Soil compaction will result from repeated use of access tracks.</p>	<p>Low / Insignificant Risk</p>	<ul style="list-style-type: none"> • After clearing, the affected area shall be stabilized to prevent any erosion or sediment runoff. Stabilized areas shall be demarcated accordingly. • Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces. • Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and potential stormwater run-off. • Top soil shall be removed separately and stockpiled separately from other soil base layers. • The stockpile areas for topsoil are temporary as they will be re-used on a cut and fill basis. • Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. • Topsoil storage areas must be convex and should not exceed 2m in height. • Topsoil must be treated with care, must not be buried or in any other way be rendered unsuitable for further use (e.g. by mixing with spoil) and precautions must be taken to prevent unnecessary handling and compaction. • In particular, topsoil must not be subject to compaction greater than 1 500 kg/m² and must not be pushed by a bulldozer for more than 50 metres. Trucks may not be driven over the stockpiles. • Reduce drop height of material to a minimum. • Temporarily halt material handling in windy conditions. • A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access

		<ul style="list-style-type: none"> road and entering the site will be informed of the speed limit. • Compacted areas that are not required for access shall be scarified after use during decommissioning and rehabilitation.
<p>2. WATER RESOURCES: Potential for ground water pollution due to oil spills during routine maintenance of equipment. No surface water resources are in close proximity to the proposed mining site.</p>	Very Low / Insignificant Risk	<ul style="list-style-type: none"> • Oils and lubricants must be stored within sealed containment structures. • Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. • When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. • Machinery must be kept in good working order and regularly inspected for leaks. • A spill kit will be available on each site where mining activities are in progress. • Any spillages will be cleaned up immediately and treated in the bio-cells (soil farms) which are located on the adjacent mine. • Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. • Waste separation must be undertaken if practical for recycling • Provide all workers with environmental awareness training and comply with the requirements of the EMPr. • Provide a bin at the site and provide a mobile ablution facility.
<p>3. LIMITED LOSS OF NATURAL VEGETATION AND ECOLOGICAL FUNCTIONING IN AN CRITICAL BIODIVERSITY AREA 2 (CBA 2) AND RIVER FEPA SUB-CATCHMENT: The proposed mining area footprint of 5ha will be cleared, mined and rehabilitated with the topsoil from the site, resulting in a temporary impact on localised ecological functioning.</p>	Low / Insignificant Risk	<ul style="list-style-type: none"> • Refer to Diagram 3, which indicates the proposed 5Ha area for mining and the existing farm tracks that will be used wherever possible. The existing adjacent mine's operational infrastructure will be used for the new proposed mine. • Remove alien invasive vegetation and ensure ongoing alien vegetation clearing in the area. • No indigenous plants outside of the demarcated work areas may be damaged. • The noise and vibration caused by the earthmoving equipment will disturb smaller animals (e.g. snakes). These will move away whilst operations are in progress. Should any animals be encountered these should be moved away by a suitably trained nature conservation officer, if necessary.
<p>4. POTENTIAL FOR SOIL CONTAMINATION AND SOLID WASTE POLLUTION DURING CONSTRUCTION PHASE</p>	Low / Insignificant Risk	<ul style="list-style-type: none"> • Oils and lubricants must be stored within sealed containment structures of the demarcated areas of the adjacent mine. • Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. • When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. • Machinery must be kept in good working order and regularly inspected for leaks. • A spill kit will be available on each site where mining activities are in progress. • Any spillages will be cleaned up immediately. • Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. • Waste separation must be undertaken if practical for recycling • Provide all workers with environmental awareness training. • Provide a bin at the site. • Regularly dispose of any solid waste at a municipal waste disposal site. • Ensure all workers comply with the requirements of the EMPr. • Provide a mobile ablution facility.
<p>5. VISUAL INTRUSION: Caused by the front end loader, topsoil stockpiles, cleared areas, and movement of trucks on site during preparation of site access and site establishment. The site is however, remote and rural in nature with very few receptors (people) as it is located on private property.</p>	Very Low / Insignificant Risk	<ul style="list-style-type: none"> • The construction areas shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall be kept orderly. • Restrict working hours to normal work day hours with no work over weekends when holidays occur to minimize hauling trucks along access roads.
<p>6. EMISSIONS (DUST, VEHICLES & NOISE): Noise and dust will be created by mining equipment (e.g. front end loaders) and vehicles, which will emit</p>	Very low / Insignificant Risk	<ul style="list-style-type: none"> • The Contractor shall adhere to the local by-laws and regulations regarding the noise and associated hours of operations. • The Contractor shall limit noise levels (e.g. install and

Greenhouse Gases.		<p>maintain silencers on machinery). The provisions of SANS 1200A Sub clause 4.1 regarding "built-up" area shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas.</p> <ul style="list-style-type: none"> Construction and demolition activities generating output of 85dB or more, shall be limited to normal working hours and not allowed during weekends to limit the impact of noise of neighbours. Should the Contractor need to work outside normal working hours, the surrounding neighbours shall be informed prior to the work taking place. No amplified music shall be allowed on site. On public roads adjacent to the site vehicles shall adhere to municipal and provincial traffic regulations including speed limits. Vehicles used on site for the construction related activities shall be maintained and in a good working condition so as to reduce emissions. Stockpiles must be maintained (covered where necessary) to avoid wind erosion of the material. Incremental clearing of ground cover should take place to avoid unnecessary exposed surfaces.
7. HERITAGE, PALAEOANTHROPOLOGICAL AND CULTURAL IMPACTS: (Refer to Appendix G)	Medium (-) Low Risk	<ul style="list-style-type: none"> A once off monitoring visit is suggested during the expansion of the mine in the vicinity of the exposed silcrete outcrop (S30.80829; E17.80289) at such time that stripping reaches that area, to record the presence (or not) of buried surfaces containing stone artefacts; The relevant heritage authority must be notified if any heritage resources (including burials) are uncovered during mining expansion.
8. CREATION OF EMPLOYMENT & JOB SECURITY WITH LOCAL AND REGIONAL ECONOMIC SPIN-OFFS	Medium (+)	<ul style="list-style-type: none"> Employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling)

Table 1.2: Risks, risk levels and mitigating actions: Operational Phase

IMPACTS AND ASPECTS	RISK LEVEL AFTER MITIGATION: PREFERRED AND ONLY ALTERNATIVE	MITIGATING ACTIONS
<p>1. SOIL EROSION, SOIL COMPACTION & GEOLOGICAL SEQUENCE: The mining of Kaolin will result in the removal of 1 metre of overburden and the sub-layers of Kaolin, with mixing of the geological sequence. Impacts are the potential for soil erosion by wind and loss of soil in the event of rainfall; soil compaction from repeated use of access tracks; and changes in the landscape and topography.</p>	Low / Insignificant Risk	<ul style="list-style-type: none"> After clearing, the affected area shall be stabilized to prevent any erosion or sediment runoff. Stabilized areas shall be demarcated accordingly. Incremental clearing of vegetation should take place to avoid unnecessary exposed surfaces. Reasonable measures must be undertaken to ensure that any exposed areas are adequately protected against the wind and stormwater run-off. The stockpile areas for topsoil are temporary as they will be re-used on a cut and fill basis. Stockpiles should ideally be located to create the least visual impact and must be maintained to avoid erosion of the material. Reduce drop height of material to a minimum. Temporarily halt material handling in windy conditions. A speed limit of 30km/hour will be displayed and enforced through a fining system. All vehicle drivers using the access road and entering the site will be informed of the speed limit. Compacted areas that are not required for access shall be scarified after use during decommissioning and rehabilitation. No industrial or mine waste is generated during the mining process. Processing shall include the spreading of Kaolin to dry out where after it will be screened and bagged to be sold as a FoT product. Product stockpiles shall form part of the drying area that shall also serve as a dispatch yard. Primary processing shall include screening by means of a "trommel screen" provided as part of the adjacent operation so no Fine Residue Dumps (FRD) will be created. Mining shall be in the form of a cut and fill operation where overburden will be backfilled in mined out sections and covered with topsoil as excavations advance. Mixing of the geological sequence of sediment will be avoided and at final closure oversize material and low grade Kaolin will first be backfilled into the excavation before

		<p>covering with available topsoil. Due to a shortage of topsoil the white Kaolin will still be visible above surface after rehabilitation but with the natural movement of the dune sand will be covered naturally.</p> <ul style="list-style-type: none"> Re-shaping of landscape and topography to form shallow depressions.
<p>2. WATER RESOURCES: Potential for ground water pollution due to oil spills during routine maintenance of equipment. No surface water resources are in close proximity to the proposed mining site.</p>	<p>Low / Insignificant Risk</p>	<ul style="list-style-type: none"> Oils and lubricants must be stored within sealed containment structures. Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. Machinery must be kept in good working order and regularly inspected for leaks. A spill kit will be available on each site where mining activities are in progress. Any spillages will be cleaned up immediately and treated in the bio-cells (soil farms) which are located on the adjacent mine. Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. Waste separation must be undertaken if practical for recycling Provide all workers with environmental awareness training and comply with the requirements of the EMPr. Provide a bin at the site and provide a mobile ablution facility.
<p>3. LIMITED LOSS OF NATURAL VEGETATION AND ECOLOGICAL FUNCTIONING IN AN CRITICAL BIODIVERSITY AREA 2 (CBA 2) AND RIVER FEPA SUB-CATCHMENT: The proposed mining area footprint of 5ha will be cleared, mined and rehabilitated with the topsoil from the site, resulting in a temporary impact on localised ecological functioning. Transport of materials will be along existing access tracks resulting in little impact on ecological functioning at a local level during the operation phase. The machinery and trucks will disturb local fauna.</p>	<p>Low / Insignificant Risk</p>	<ul style="list-style-type: none"> Refer to Diagram 3, which indicates that existing farm tracks will be used. The mining area and stockpile areas must be demarcated and the footprint contained within the demarcated area. Mining areas to be limited to blocks of 0.5Ha at a time with progressive rehabilitation. The annual rehabilitation plan must be implemented. Remove alien invasive vegetation, and ensure ongoing alien vegetation clearing in the area. No indigenous plants outside of the demarcated work areas may be damaged. The noise and vibration caused by the earthmoving equipment will disturb smaller animals. These will move away whilst operations are in progress. Should any animals be encountered these should be moved away by a suitably trained nature conservation officer, if necessary.
<p>4. POTENTIAL FOR SOIL CONTAMINATION AND SOLID WASTE POLLUTION DURING OPERATIONAL PHASE</p>	<p>Low / Insignificant Risk</p>	<ul style="list-style-type: none"> Oils and lubricants must be stored within sealed containment structures of the demarcated areas of the adjacent mine. Any mechanical equipment maintenance must be undertaken on drip trays or UPVC sheets to prevent spills/ leaks onto the soil. When not in use, a drip tray must be placed beneath mechanical equipment and vehicles. Machinery must be kept in good working order and regularly inspected for leaks. A spill kit will be available on each site where mining activities are in progress. Any spillages will be cleaned up immediately. Waste materials generated on site must be stored in suitable lidded containers and removed off site to a suitable disposal facility. Waste separation must be undertaken if practical for recycling Provide all workers with environmental awareness training. Provide a bin at the site. Regularly dispose of any solid waste at a municipal waste disposal site. Ensure all workers comply with the requirements of the EMPr. Provide a mobile ablution facility.
<p>5. VISUAL INTRUSION: Caused by the machinery, topsoil and rock stockpiles, cleared areas, and movement of trucks</p>	<p>Very Low / Insignificant Risk</p>	<ul style="list-style-type: none"> Maintain the height of the stockpile areas at a maximum of 2 metres. The site shall be kept neat and tidy at all times. Equipment must be kept in designated areas and storing/stockpiling shall

on site. The site is however, remote and rural in nature with no receptors (people) as it is located on private property.		<ul style="list-style-type: none"> be kept orderly. Restrict working hours to normal work day hours with no work over weekends when holidays occur to minimize hauling trucks along access roads. The impact is insignificant given the small scale of the activities and the isolation of the site. The impact is temporary and after mining the excavations will be sloped, all oversize material and overburden will be backfilled, top soiled and allowed to re-vegetate naturally resulting in an even depression with no residual impact.
6. EMISSIONS (DUST, VEHICLES & NOISE): Noise and dust will be created by mining equipment (e.g. front end loaders) and vehicles, which will emit Greenhouse Gases.	Very Low / Insignificant Risk	<ul style="list-style-type: none"> Ensure Kaolin hauling is during normal working hours and not on weekends No amplified music shall be allowed on site. On public roads the vehicles shall adhere to municipal and provincial traffic regulations including speed limits. Vehicles used on site for the construction related activities shall be maintained and in a good working condition so as to reduce emissions. Ensure bagged Kaolin is properly secured for hauling.
7. HERITAGE, PALAEOLOGICAL AND CULTURAL IMPACTS: Refer to Appendix G.	Medium (-) Low Risk	<ul style="list-style-type: none"> A once off monitoring visit is suggested during the expansion of the mine in the vicinity of the exposed silcrete outcrop (S30.80829; E17.80289) at such time that stripping reaches that area, to record the presence (or not) of buried surfaces containing stone artefacts; The relevant heritage authority must be notified if any heritage resources (including burials) are uncovered during mining expansion.
8. CREATION OF EMPLOYMENT & JOB SECURITY WITH LOCAL AND REGIONAL ECONOMIC SPIN-OFFS	Medium (+)	<ul style="list-style-type: none"> Employment of local previously disadvantaged labour wherever possible, with provision of training (upskilling)

Documentation and monitoring results will be provided as objective evidence of achieving the objective as listed in Table 2 below. The criteria with the contents of these documents must comply with are also given in this table.

Table 2: Objective Evidence and Closure Criteria

Closure objective	Document scope	Author	Success criteria to be achieved (standard)
Slope stability	Inspection of the post-mining areas with the objective to identify unstable areas and formation of erosion gully's	Independent EAP	Post-mining area to be declared stable by DMR mine health and safety
No negative effect on surface water flow and waste management practices do not leave/create legacies	Inspection of the post-mining surface area with the objective to identify erosion and scouring due to flood event and storm water and sheet flow	Independent EAP	Post-mining area to be declared stable by DMR
	Assessment of the completeness of removal of mine waste	Independent EAP	Final performance assessment report to declare 100% removal of waste and equipment
Secured potentially Dangerous post-mining sites	Inspection of the post-mining surface area with the objective to identify unsafe areas	Independent EAP	Post-mining area to be declared safe by DMR
Increase in biodiversity	Report on the monitoring results with regard to succession tempo of total cover in comparison with virgin vegetation adjacent to mining area	Independent EAP	Total cover and species composition will need to be comparable to that of the adjacent virgin area
Soil stability	Monitoring results of erosion on steep slopes (20% gradient) and disturbed areas	Independent EAP	At the time of closure, soil loss will need to be stabilised over the whole previously disturbed area

Limited environmental impacts during demolition activities	Summary of all complaints received during demolition activities (if required) and follow up actions	Mine SHE Head, audited by independent EAP	Nuisance levels to be consistently on par with legislative standards after completion of demolition activities. All incidents older than 90 days to be investigated and feedback given to complainant
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6 ESTIMATED COST FOR REQUIREMENTS TO FULLY DECOMMISSION THE SITE

With the repeal of Section 41 of the MPRDA (Act 28 of 2002) that requires that the owner of a mine must make financial provision for the remediation of environmental damage, regulations pertaining to the financial provision for prospecting, exploration, mining or production operations under section 44, read with sections 24 of the National Environmental Management Act, 1998 (Act No.107 of 1998) were issued in 2015.

According to Regulation 6 an applicant must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for: (a) annual rehabilitation, as reflected in an annual rehabilitation plan; (b) final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of operations, as reflected in a final rehabilitation, decommissioning and mine closure plan; and (c) remediation of latent or residual environmental impacts which may become known in the future as reflected in an environmental risk assessment report.

6.1 Assessment of financial provision

The assessment of the financial provision requirements for annual rehabilitation in terms reg. 6(a) is provided for as part of the annual rehabilitation plan that form part of the annual environmental audit.

No remediation of latent or residual environmental impacts which may become known in the future were identified at this stage and financial provision in terms of reg. 6(c) are covered by the requirements for the actual costs of implementation of the measures required for final rehabilitation, decommissioning and closure of the mining operations at the end of the life of operations as reflected in this final rehabilitation, decommissioning and mine closure plan in terms of reg. 6(b).

The following risk based criteria and assumptions were used to calculate the final rehabilitation, decommissioning and closure cost:

- Return of land to its pre-mining land capability where possible
- All vehicles and equipment will be removed for salvage or resale
- A hazardous disposal site will not be constructed and all hazardous waste will be removed from site and transported to the company headquarters.
- Existing tracks will be used and new tracks must be restricted to the absolute minimum.
- All compacted areas due to hauling and stockpiling must be ripped to 300 mm
- The stockpile areas will not exceed the planned area footprint
- All disturbed and exposed surfaces will be covered with at least 150 mm of topsoil and re-vegetation must be allowed to take place naturally
- The general approach adopted for the drainage channel is to prevent attenuating or diverting any of the natural flow and reinstating the original profile of the access points and ensuring the hydrological integrity of the area.
- Topography to follow the original landform shape.

6.2 Quantified Closure elements

Earth Moving	Rental Rate	Fuel Cost	Total Cost
Equipment	/hour	& Delivery	/hour
Front End Loader - 30 Ton	R687.00	R429.00	R1,116.00
Bulldozer Cat D9R	R1,124.14	R429.00	R1,553.14
Excavator - 45 Ton	R687.00	R429.00	R1,116.00
Excavator - 30 Ton	R392.00	R286.00	R678.00
Excavator - 20 Ton	R322.00	R234.00	R556.00
Cat 14 H Grader	R453.00	R234.00	R687.00
Articulated Dump Truck - 30 Ton	R392.00	R182.00	R574.00
Tipper Truck 6m ³	R255.00	R156.00	R411.00
Tipper Truck 10m ³	R309.00	R182.00	R491.00
Manual Labour /hour	R25.00		

6.3 Calculation of Closure cost

For each closure element, various possible combinations of required rehabilitation work were identified and costs were calculated for each of these, based on quotations obtained from independent third party suppliers for earthmoving equipment rental and various other consumables. Rates used are industry related.

Cost Factor	Closure Element	Cost calculation				
1	Demolish and remove Buildings/Infrastructure including subsurface structures and bunded fuel storage - Salvage useable material, break structure and dispose in waste dump	Cost/h	Service hours	Labour	Total	
	Tipper Truck 10m ³ transport building rubble to excavation	R491.00	4.00	0	R1,964.00	
	Excavator - 20 Ton Demolish concrete and loading	R556.00	8.00	0	R4,448.00	
	Cleanup	R25.00	8.00	4	R800.00	
	Total				R7,212.00	
2	Remove waste from temporary storage and scrap from salvage yard	Cost/h	Service hours	Labour	Total	
	Tipper Truck 10m ³ transport to waste disposal site	R491.00	8.00	0	R3,928.00	
	Treat petrochemical in oil separator - washbay	R0.00	R2,000.00	R0.00	R2,000.00	
	Treat petrochemical in oil separator - fuel storage & apron washbay	R0.00	R1,000.00	R0.00	R1,000.00	
	Cleanup	R25.00	8.00	2	R400.00	
	Total				R7,328.00	
3	Final cleanup - remove all mining related waste walk through with landowner	Cost/h	Service hours	Labour	Total	
	Tipper Truck 10m ³ transport to waste disposal site	R491.00	8.00	0	R3,928.00	
	Cleanup	R25.00	8.00	2	R400.00	
	Total				R4,328.00	
4	Loading and transport of overburden and product stockpile for backfill > 80m	Load Vol m³	Loads/h	m³/h	R/h	R/m³
	Excavator cycle	1.2	120	144	R678.00	R4.71
	ADT cycle	17	7	119	R574.00	R4.82

	Total cost/m³					R9.53
5	Backfill and profiling pit slope 18° by means of dozing <80m	m²/h		Cost/h	R/m²	R/Ha
	Bulldozer Cat D9R	250		1553.14	R6.21	R9,648.98
	Total cost/Ha					R9,648.98
6	Spreading topsoil level area	m²/h	m³ Soil /m²	R/m³	R/m²	R/Ha
	Loading and transport of topsoil		5	R9.53	R1.91	R1,906.00
	Shaping Grader 140 K	1020		R0.67	R0.13	R1,347.06
	Total cost/Ha				R2.04	R3,253.06
7	Ripping and levelling	Speed	Ripper/Blade	h/Ha	R/h	R/Ha
	Grader 140 K	8	3.5	0.36	R687.00	R245.36
	Total cost/Ha					R245.36

6.4 Total estimated cost for requirements to fully decommission the mining site at final closure

Cost Factor 1				
Demolish and remove Buildings/Infrastructure including subsurface structures and banded fuel storage - Salvage useable material, break structure and dispose in waste dump				
Risk based criteria and assumptions with regard to rehabilitation				
The cement structures used as part of the waste management facilities of the mine will not form part of this final decommissioning, rehabilitation and closure plan.				
All other structures will be demolished and terracing and foundations removed to the lesser of 500 mm below the original ground level.				
Inert waste, which is more than 500 mm underground, such as pipes, will be left in place				
All services related to the mining operation, water supply lines and storage on site will have to be demolished				
Mining/Sampling Area	Unit	No Units	Unit Cost	Cost per Element
Logistical facilities 0.5 Ha	Areas	1.00	R7,212.00	R7,212.00
Processing plant 0.5 Ha	Areas	1.00	R7,212.00	R7,212.00
			Sub-Total	R14,424.00
Cost Factor 2				
Remove waste from temporary storage and scrap from salvage yard				
Risk based criteria and assumptions with regard to rehabilitation				
A hazardous disposal site will not be constructed and all hazardous waste will be removed from site and transported to the nearest licensed facility.				
Waste will be dispose/recycled every 3 month and there will never be more than 3 month worth of waste in the temporary storage areas				
Salvage Yard	Areas	1.00	R7,328.00	R7,328.00
Temporary waste storage area	Areas	1.00	R7,328.00	R7,328.00
			Sub-Total	R14,656.00
Cost Factor 3				
Final cleanup - remove all mining related waste walk through with landowner				
Risk based criteria and assumptions with regard to rehabilitation				
Removal of all structures and infrastructure not to be retained by the landowner in terms of section 44 of the MPRDA.				
All fixed assets that can be profitably removed will be removed for salvage or resale.				
Any item that has no salvage value to the mine, but could be of value to individuals, will be sold (zero salvage assumed in cost estimation) and the remaining treated as waste and removed from site.				
Areas less than 10 Ha	Areas	1.00	R4,328.00	R4,328.00
			Sub-Total	R4,328.00

Cost Factor 4				
Loading and transport of overburden and product stockpile for backfill > 80m				
Risk based criteria and assumptions with regard to rehabilitation				
Return of land to its pre-mining land capability where possible It is assumed that the post-mining pit stability and profile will be addressed as part of the operation and necessary remedial actions implemented prior to closure. Backfilling is done as part of operations. Excavations will be developed in segments < 0.5Ha to provide for concurrent rehabilitation as part of the annual rehabilitation plan.				
Leftover Product or low grade product	m ³	100.00	R9.53	R953.00
Sub-Total				R953.00
Cost Factor 5				
Backfill and profiling pit slope 18° by means of dozing <80m				
Risk based criteria and assumptions with regard to rehabilitation				
It is assumed that the post-mining pit stability and profile will be addressed as part of the operation and necessary remedial actions implemented prior to closure. Backfilling is done as part of operations. Excavations will be developed in segments < 0.5Ha to provide for concurrent rehabilitation as part of the annual rehabilitation plan.				
Backfill burrow pit boulders and overburden	Ha	1.00	R9,648.98	R9,648.98
Sub-Total				R9,648.98
Cost Factor 6				
Spreading topsoil level area				
Risk based criteria and assumptions with regard to rehabilitation				
All disturbed and exposed surfaces will be covered with at least 150 mm of topsoil and re-vegetation must be allowed to take place naturally Where topsoil is not available, the cost for in-situ remediation will be the same as the estimate for top soiling				
Product drying, Stockpile and Dispatch Yard	Ha	1.00	R3,253.06	R3,253.06
Laydown and movement area	Ha	1.00	R3,253.06	R3,253.06
Salvage Yard	Ha	0.50	R3,253.06	R1,626.53
Sub-Total				R8,132.65
Cost Factor 7				
Ripping and levelling Roads and all compacted areas				
Risk based criteria and assumptions with regard to rehabilitation				
All compacted areas due to hauling and stockpiling must be ripped to 300 mm Existing tracks will be used and no new roads will be developed. The stockpile and logistics area will not exceed the planned footprint.				
Product drying, Stockpile and Dispatch Yard	Ha	1.00	R245.36	R245.36
Laydown and movement area	Ha	1.00	R245.36	R245.36
Salvage Yard	Ha	0.50	R245.36	R122.68
Sub-Total				R613.40
Total estimated cost to fully decommission the mining site at final closure				R52,756.03

7 THE PUBLIC PARTICIPATION PROCESS

7.1 Principles and Objectives

The Public Participation Process (PPP) was designed to fulfil the requirements of several pieces of legislation applicable to mine closure. It forms an integral component of the mine closure process by affording Interested and Affected Parties (I&AP) the opportunity to identify environmental issues and concerns relating to the proposed closure, which they feel should be addressed. This is consistent with the provisions of the National Environmental Management Act (Act No. 107 of 1998), Section 2(4)(f), which states that "the participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured".

The objective of the mining operation public consultation process is to inform key stakeholders, I&APs and the general public about mine closure objectives and activities during the life of the mine.

The PPP was designed to provide sufficient and accessible information to I&APs in an objective manner to assist them to:

- Identify issues of concern, and provide suggestions for enhanced benefits and alternatives associated with mine closure,
- Identify risks not yet identified during the risk assessment exercise,
- Identify risks associated with mine closure and rehabilitation,
- Contribute local knowledge and experience,
- Verify that their issues have been considered.
- Comment on the Risk Assessment and Mine Closure Plan at the time of final decommissioning of the project, including the significance of potential risks that have been identified and associated impacts,
- Play an oversight role in the monitoring and evaluation of mine closure.

7.2 Stakeholder Identification and Project Data Base

Existing data bases were used to inform the list of stakeholders. Special consideration was given to ensure that organizations and individuals that had expressed interest in the activities of the operation, and those who are potentially affected by mine closure, were included on the data base. The following are principles which govern the PPP:

- Key stakeholder groups and the general public comprise the target audience in the development of the PPP.
- Providing information to lay people to allow them to contribute to and participate meaningfully in the process.
- Stakeholder participation is most effective when the proponent and the practitioner recognise, acknowledge and validate stakeholder values when designing a PPP (i.e. there should be no underestimation of the technical and professional competence of citizens).
- The recognition that in the current political climate of South Africa, consultation, empowerment and capacity building is particularly important.

The process of involving stakeholders had three main objectives:

- Steps should be taken to ensure that stakeholder input into the project is relevant and representative.
- Stakeholders should be made aware of their objectives and role in the process,
- An efficient communication and feedback mechanism should be developed during the process to ensure that all stakeholders are kept informed of progress.

Stakeholders were drawn from the sectors outlined below:

- National (DWS, DMR), Provincial (DENC, DALR)
- Local Government (Local and District Municipalities)
- National Department of Transport

Names of persons and organisations will be added to or deleted from the database where appropriate.

8 WAY FORWARD

This Final Rehabilitation, Decommissioning and Mine Closure Plan will be reviewed on an annual basis to align such approved financial provision set out in regulations 9 and 11, of the NEMA Financial Regulations. Concurrent rehabilitation and remediation will be provided for in the annual rehabilitation plan and will contain information that defines activities on an annual basis and how these relate to the closure vision, as detailed in this final rehabilitation, decommissioning and mine closure plan.

When final planned closure is applied for the operation will submit a final environmental performance audit report to DMR as lead agent for final perusal with the objective to issue a closure certificate. At that point, the closure process, and associated public participation program, will close.

ARCHAEOLOGICAL IMPACT ASSESSMENT FOR THE EXTENSION OF THE 5 HA KAOLIN MINE ON PORTION 1 OF THE FARM RONDAWEL 638, NAMAQUALAND DISTRICT, NORTHERN CAPE

SAHRIS CASE: Still awaiting comment and number
DMR CASE: NCS30/5/1/1/2/1 (10638) MP

(Assessment conducted under Section 38 (8) of the
National Heritage Resources Act (No. 25 of 1999) as part of a Basic Assessment)

Prepared for

Klaas Van Zyl

On behalf of

Imvusa Kaolien (Pty) Ltd

November 2017



Prepared by

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1. INTRODUCTION

1.1 Scope and purpose of report

ACO Associates cc has been requested by Klaas Van Zyl on behalf of Invusa Kaolien (Pty) Ltd to undertake an Archaeological Impact Assessment, pertaining to the proposed extension of a kaolin mine on Farm Rondawel 638, west of the N7 on the west coast of South Africa (Figure 1). The archaeological survey was undertaken to determine if any pre-colonial or more recent historical heritage resources would be impacted by the extension of the kaolin mine by five hectares (Ha) to the east of the current active mine. The survey and reporting was undertaken by Mr D. Halkett assisted by Ms J. McIver and Mr J. Gribble of ACO Associates. The CV and declaration of the lead consultant are contained in Appendices 1 and 2.



Figure 1: The location of the property (blue polygon) in local geographical context. Groenrivier mouth clearly visible to the west and N7 to the east.

1.2 Project details

The site, showing the current mining area and extension is illustrated on Figure 2 while a photograph of the proposed extension area is shown in Plate 1.



Figure 2: A detail of the site showing existing kaolin mine (blue). The site for the proposed mine extension is shown in yellow.

1.3 Season, date and duration of site investigation

The Archaeological Impact Assessment was conducted. Our initial site visit took place on the 27th October 2017 but was erroneously located on land immediately east of the existing mine. On realising the problem, we returned to site on 7th November 2017 to examine the correct site.

The season had no impact on the outcome of the assessment and surface visibility was excellent due to sparse Sandveld vegetation. The current mine was active and we were able to inspect a section of the mine pit which exposed a stratigraphic section on the eastern side. We also observed prospecting drilling holes in the current mining area.

1.4 Background

During the early 1970's a kaolin deposit was discovered on the farm Rondawel when a borehole was drilled for water. Preliminary prospecting was done by the landowner and an ore body of good quality kaolin was confirmed. At the time mineral rights belonged to landowners and subsequently the owners of Rondawel secured a market for the kaolin and delivered their product to SAPPI for a period of eight years.

The kaolin was mined on the farm and transported in its raw state by truck to the nearest railway station and delivered by rail to its final destination. The kaolin in its natural form includes a certain percentage of rock. For kaolin to be profitable it needs to be beneficiated to a refined form before being transported. However, beneficiation of kaolin at the time could only be done by "washing" which removed the rock, but in a water scarce area such as Namaqualand this was not a viable option in the long term. In addition, government rebates for the transport of this raw material were halted and it became too expensive for the landowner to transport raw material by rail. As a result all activities on the mine ceased.

During the early 2000's the government changed the policy and legislation regarding mining rights, and landowners no longer owned the mining rights. The owner of the kaolin mine on Rondawel, however, applied for the relevant rights and was awarded such. Beneficiation was experimented with and a dry process was invented and patented for separating rock from the kaolin. This made it possible for kaolin to be extracted from the mine and sold commercially again.



Plate 1: The proposed 5Ha extension of the kaolin mine to the east of existing mine.

2. METHODOLOGY

2.1 Details of base data

The SAHRIS¹ database was examined to determine if any previous archaeological assessments of the property were available. None were found at the site or in the near vicinity. The data used for the report is thus current and based on information collected during site visits in October/November 2017.

2.2 Field assessment procedure

The co-ordinates of the proposed kaolin mine extension area were loaded onto a handheld GPS device to assist with accurately identifying the extent of the area on the ground during the survey. In addition to the GPS guidance, the extent of the site was also indicated to us by the director of FINCRETE Clay Material, Elma Nieuwoudt, who accompanied us on site on 27 October.

The field assessment consisted of an intensive walkover of the proposed 5Ha mine extension to identify any indications of surface or sub-surface archaeological resources (where these could be detected in disturbed areas or through bioturbation). Attention was also paid to the spoil heaps along the eastern edge of the current mine pit where archaeological material was noted having resulted from mining activities in the pit. The GPS track plots of the two walkovers are shown on Figure 3. Waypoints were entered into the GPS at the location of identified heritage resources and photographs were taken of the resource and surrounding landscape.

3. OBSERVATIONS

3.1 Identified sensitivities and heritage resources

Small scatters of stone artefacts were located on the surface in the proposed extension area, with the majority located around a naturally occurring silcrete outcrop (Table 1, Figure 3, Plate 3). A variety of Earlier Stone Age (ESA), Middle Stone Age (MSA) and a small amount of Later Stone Age (LSA) material was identified. The material consisted of cores, blades, flakes and chunks, predominantly on silcrete, which usually appears stratigraphically above the kaolin deposit. The surface of the landscape consists of a more recent red sand, of likely aeolian origin (and potentially Holocene in age?). A total of seven occurrences of heritage resources were identified in the current mining area and proposed extension area (Figure 3). These finds are described in detail in Table 1.

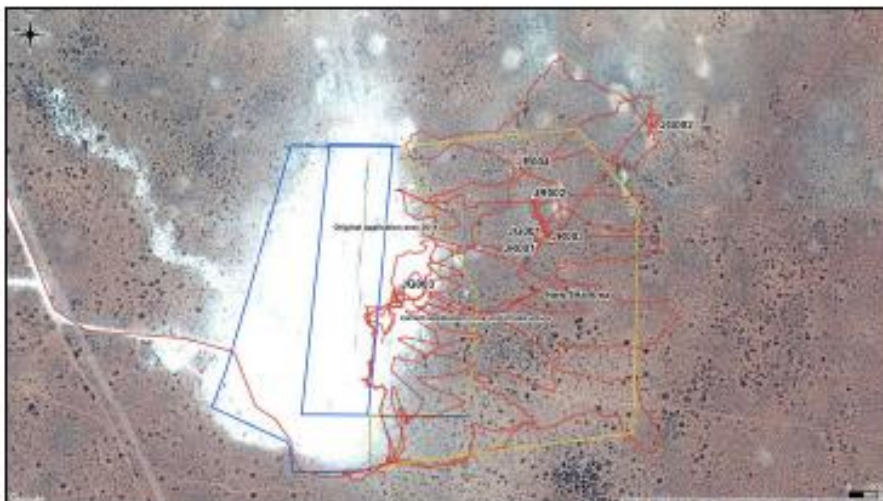


Figure 3: The GPS recorded tracks (red lines) and waypoints illustrating the survey for the proposed extension of the kaolin mine

¹ A database maintained by the South African Heritage Resources Agency containing, inter alia, information about development-led heritage projects

Table 1: Heritage Resources Identified

Waypoint	Lat	Lon	Description	Grading
JG001	-30.80821	17.80294	Scatter of artefacts surrounding the silcrete outcrop. Silcrete core (ESA ²), a silcrete flake and two possible flakes on quartz (MSA ³).	NCW
JG002	-30.80733	17.80408	Large ESA side-struck flake found embedded in the soil, amongst quartz exposure on the hillside. Located outside of the eastern edge of the mining area	NCW
JG003	-30.80865	17.80160	Collection of ESA and MSA stone artefacts on old spoil heaps alongside mining pit. The material is out of context, having been excavated out of the mine pit. Included are two core-like ESA pieces, a large ESA flaked piece, and a broken blade. The material appears to be lying on an old deflated surface that may have been exposed along with a silcrete outcrop in the past.	NCW
JR001	-30.80829	17.80289	Naturally occurring exposed outcrop of silcrete in primary position, (Plate 4). Probably similar to buried silcrete outcrops that have previously been found in the existing mining pit. Flaked silcrete found lying around the outcrop, flaked quartz	NCW
JR002	-30.80790	17.80287	Evidence of possible utilisation of the silcrete as seen on the northern extremity of the outcrop as flaking damage	NCW
JR003	-30.80825	17.80304	Evidence of possible utilisation of the silcrete as seen on the southern extremity of the outcrop as flaking damage	NCW
JR004	-30.80764	17.80271	Single quartz flake LSA ⁴	NCW

NCW – (Not conservation worthy) A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate (see Appendix 3 for grading categories)

² Early Stone Age
³ Middle Stone Age
⁴ Late Stone Age



Plate 2: A panoramic image facing southwest, showing the proposed extension area of the kaolin mine (existing mine seen in background).



Plate 3: Examples of stone artefacts identified on the existing kaolin mine and proposed extension area.



Plate 4: The exposed silcrete outcrop observed in the proposed extension area, and associated stone artefacts.

3.2 Existing impacts on sites and related observations

We were able to inspect an exposed section on the eastern side of the current active mining pit (Plate 5) in order to understand the stratigraphy and noted the following:

- Red dune sand (possibly Holocene age) - approximately 1.8m thick. This material makes up the surface deposit across the current mine site and the proposed extension area;
- Silcrete - fractured boulders. The depth of the silcrete deposit was not clear from this section. At the interface between the red sand and silcrete boulders we noted in situ humanly derived flakes of silcrete. These were carefully examined and are not the product of machine or other modern mechanical forces. This observation strengthens the idea that the exposed outcrop (JR002 and JR003) identified in the proposed mine extension area may have been exposed before the red sands settled and was utilised as a quarry for stone tool-making materials;
- Kaolin - the relationship between the kaolin and silcrete is unclear in this stratigraphic section. Kaolin forms as a by-product of granite decomposition (Johnson et al 2006). Information supplied by the mine and corroborated by the site visits indicates that the kaolin underlies the silcrete on the site, although the complexities – such as the apparent butting of kaolin and silcrete in Plate 5 were not possible to investigate.



Plate 5: A stratigraphic wall section identifying broadly the three main sedimentary deposits indicated by red lines (spoil heap, red aeolian sands, silcrete).

4. IMPACT ASSESSMENT

Table 2: Impact assessment - archaeological heritage

Impact Phase: Extension of the kaolin mine on the farm Rondawel – Archaeological Heritage							
Possible Impact or Risk for Stripping of overburden and mining of kaolin at AJA stage: Clearing and stripping of overburden sediment for the mining of kaolin may impact archaeological resources.							
	Extent	Duration	Intensity	Status	Significance	Probability	Confidence
Without Mitigation	L	H	L-	Negative	Medium	H	H
With Mitigation	L	H	L-	Negative	Medium	H	H
Can the Impact be reversed?						NO - Physical heritage resources are generally non-renewable.	
Will Impact cause irreplaceable loss of resources?						NO - The impact is negligible and considered acceptable given that resources are not in primary location, but rather are on ancient deflated land surfaces and not associated with any non-lithic material. Minimal scientific value.	
Can Impact be avoided, managed or mitigated?		YES- The impact is negligible and considered acceptable given the low numbers and significance of the identified archaeological/heritage resources. No mitigation is proposed but some basic monitoring is suggested.					
Mitigation measures to reduce residual risk or enhance opportunities: Once off monitoring required in respect to stripping of overburden to determine if old land surfaces with artefacts are present in the mining expansion area.							

5. CONCLUSIONS

An ephemeral scatter of stone artefacts was observed in the proposed new 5Ha extension of the kaolin mine, associated with an exposed silcrete outcrop. Other lithic material was noted in secondary context in the spoil heaps east of the current mining area. The lithic material consists of a mixture of silcrete ESA and MSA flakes, cores and blades as well as isolated LSA quartz flaked pieces. No non-lithic material was observed in the existing mine or in the expansion area.

The very limited amount of LSA material suggests that it is unlikely that LSA burials will be uncovered.

There is no historic built environment in the identified mining area.

5.1 Acceptability of the proposed activity with respect to heritage resources

It is our reasoned opinion that the current and proposed activities may be authorised. The archaeological resources are not highly significant in themselves, though context in relation to silcrete outcrops is of interest. There are no areas that need to be avoided or buffer zones that need to be implemented.

6. RECOMMENDATIONS

The following recommendations are made:

- A one off monitoring visit is suggested during the expansion of the mine in the vicinity of the exposed silcrete outcrop (S30.80829 E17.80289) at such time that stripping reaches that area, to record the presence (or not) of buried surfaces containing stone artefacts;
- The relevant heritage authority must be notified if any heritage resources (including burials) are uncovered during mining expansion.

7. REFERENCES

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APPENDIX 1: SPECIALIST CV

PERSONAL DETAILS

Name: Halkett, David John
Home Address: 6 Overton Court
151 High Level Road
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Telephone: 073 141 8606

Previous work Address: **Archaeology Contracts Office**
Department of Archaeology, University Of Cape Town, Private Bag
Rondebosch, 7701

Current work address: **ACO Associates cc**
Unit D17, Prime Park, 21 Mocke Road, Diep River 7800
Telephone (w): (021) 706 4104
Fax to e-mail (w): 086 603 7195

Date of Birth: 23.07.1958
Marital Status: Married
Nationality: South African
Home Language: English
Other Languages: Afrikaans
ID Number: 5807235148080

FORMAL QUALIFICATIONS

Matriculated	Pinelands High (matric exemption)	1976
Graduated	B.A. University of Cape Town	1980
	B.A. (Hons) (Archaeology) University of Cape Town	1982
	M.A. (Archaeology) University of Cape Town	1991

EXPERIENCE

Employment

Part time research asst	South African Museum (archaeology)	Nov-Feb 1978,1979
Student Ranger	Cape of Good Hope Nature Reserve	Dec-Feb 1980
National Service	SA Navy Rank: Sub-Lieutenant	1982-1984
Part time research asst	Spatial Archaeology Research Unit, UCT	1984
Junior Research Officer	Palaeoanthropology Research Unit, Wits	1997(part time appt.)
Principal Investigator	Archaeology Contracts Office, UCT	1988-2012
Director	ACO Associates cc.	2008-present

Other experience and professional memberships

- Secretary, Archaeology Field Club, UCT. 1979
- Chairperson, Archaeology Field Club, UCT. 1980
- Co-organiser of the Spatial Archaeology Research Unit workshop: Environments and Prehistory in the western Cape. 1984
- Archaeological advisor, National Monuments Council, Western Cape Regional Plans Committee. 1993 - 1999
- Member: Association of Southern African Professional Archaeologists (ASAPA)
- Member: Association of Southern African Professional Archaeologists (ASAPA): CRM section (PI level with accreditation for Stone Age, Coastal Shell Middens, Colonial Period, Rock Paintings, Industrial, Bone Accumulations)
- Committee member: Archaeology Standards Generating Body (SGB) for SAQA
- Member: South African Archaeological Society
- Committee member: Heritage Western Cape, Archaeology, Palaeontology and Meteorites Committee appointed 2003 - 2007, re-appointed 2007 – 2013
- Member: Heritage Western Cape , Integrated Assessment Review Committee, 2009 - 2013

- Forensic consultant: Missing Persons Unit: National Prosecuting Authority 2007

Awards

Dept of Cultural Affairs and Sport award for the Best Heritage Impact Assessment in the Western Cape for 2013/14.

Long term commercial projects

1997-2008 Directed all ACO cultural resource management activities for De Beers Namaqualand Mines

Peer Reviews

1997 Archaeological report prepared for Alpha Saldanha Cement project.

1999 Archaeological reports prepared for Namdeb.

Published Articles (relevant selection)

Avery, G., Halkett, D., Orton, J., Steele, T. & Klein, R. 2009. The Ysterfontein 1 Middle Stone Age Rockshelter and the Evolution of Coastal Foraging. *South African Archaeological Society Goodwin Series* 10: 66–89

Cruz-Urbe, K., Klein, R.G., Avery, G., Avery, D.M., Halkett, D., Hart, T., Milo, R.G., Sampson, C.G. & Volman, T.P. 2003. Excavation of buried late Acheulean (mid-quaternary) land surfaces at Duinefontein 2, western Cape province, South Africa. *Journal of Archaeological Science* 30, 559-575

Dewar, G., Halkett, D., Hart, T., Orton, J. & Sealy, J. 2006. Implications of a mass kill site of springbok (*antidorcas marsupialis*) in South Africa: hunting practices, gender relations, and sharing in the later stone age. *Journal of Archaeological Science* 33, 1266-1275

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Hine, P., Sealy, J., Halkett D. & Hart T. 2010. Antiquity of stone-walled tidal fish traps on the cape coast, South Africa. *South African Archaeological Bulletin* 65 (191): 35–44

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Klein, R.G., Cruz-Urbe, K., Halkett, D., Hart, T., Parkington, J.E. 1999. palaeoenvironmental and human behavioural implications of the Boegoeberg 1 late Pleistocene hyena den, northern Cape province, South Africa. *Quaternary Research* 52, 393-403

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Orton, J., Hart, T.J.G. and Halkett, D.J. 2005. Shell middens in Namaqualand: Two Later Stone Age sites at Rooiwalbaai, Northern Cape Province, South Africa. *South African Archaeological Bulletin*, 60 (181): 24-32

Orton, J. & Halkett, D. 2001. Microlithic denticulates on a mid-Holocene open site near Jakkalsberg in the Richtersveld, northern Cape province, South Africa. *Southern African Field Archaeology* 10, 19-22

Orton, J. & Halkett, D. 2010. Stone tools, beads and a river: two Holocene microlithic sites at Jakkalsberg in the northwestern Richtersveld, northern Cape, South Africa. *South African Archaeological Bulletin*, 65 (191):13-25

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Parkington, J.E., Poggenpoel, C., Halkett, D. and Hart, T. 2004. Initial observations on the middle stone age coastal settlement in the western Cape, South Africa. In: Conard N.J. ed. *Settlement Dynamics of the Middle Palaeolithic and Middle Stone Age Vol II*: 5-21. Kerns Verlag, Tübingen.

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Smith, A., Halkett, D., Hart, T. & Mütti, B. 2001. Spatial patterning, cultural identity and site integrity on open sites: evidence from Bloeddrift 23, a pre-colonial herder camp in the Richtersveld, northern Cape province, South Africa. *South African Archaeological Bulletin* 56 (173&174): 23-33

Wilson, M.L. & Halkett, D.J. 1981. The use of marine shell for decorating Cape coastal (Khoisan) pottery. *South African Archaeological Bulletin* 36: 43-44

Yates, R.J., Miller, D.E., Halkett, D.J., Manhire, A.H., Parkington, J.E. & Vogel J.C. 1986. A late mid-Holocene high sea level: a preliminary report on geo-archaeology at Elands Bay, western Cape Province, South Africa. *South African Journal of Science* 82: 164-165

Presentations and lectures (recent)

2007. In at the deep end. Lecture presented at the annual one day lecture series of the Archaeological Society of the Western Cape and the Friends of the Stellenbosch Museum.

2008. The landscape of early colonial burial in Cape Town: a walking tour of excavation sites and buildings of interest in Green Point. Presented during the ASAPA, Mid-conference excursion. With a guidebook compiled by Dave Halkett, Tim Hart, Liesbet Schietecatte, Erin Finnegan & Katie Smuts.

2009-2016. In at the deep end. Contract archaeology: a case study of mitigation a pre-colonial heritage site to be impacted by development. Presented as part of APG5086F - Conservation Disciplines and Practices, MPhil in Conservation of the Built Environment, University of Cape Town.

2009/2010. "In at the deep end" and "Middens of steel". Contract archaeology: case studies of mitigation of stone age and colonial heritage sites to be impacted by development. Presented as part of APG5086F - Conservation Disciplines and Practices, MPhil in Conservation of the Built Environment, University of Cape Town.

2009/2010/2011. Surveying, Measuring and Recording Archaeological Resources. Presented as part of APG5086F - Surveying, Measuring and Recording Heritage Resources, MPhil in Conservation of the Built Environment, University of Cape Town.

2011. ...Blowing In The Wind: Renewable energy projects - Challenges and opportunities for heritage resource management. Lecture presented at the annual one day lecture series of the Archaeological Society of the Western Cape and the Friends of the Stellenbosch Museum.

2012 "My Career in Archaeology". Part of the Centre for Higher Education and Development series on careers, UCT.

Referees

Prof. J. E. Parkington

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Prof. R. G. Klein

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Field/Consulting/Heritage Management Experience (relevant selection)

Halkett, D., Hart, T. & Parkington, J. 1994. Phase 2 archaeological excavations at the Namakwa Sands Project (first phase), Vredendal district, Namaqualand. Unpublished report prepared for Namakwa Sands. Archaeology Contracts Office, UCT.

Halkett, D. & Hart, T. 1997. An archaeological assessment of the coastal strip and a proposed heritage management plan for De Beers Namaqualand Mines, Vol 1&2. Prepared for De Beers Consolidated Mines: Namaqualand Mines. Archaeology Contracts Office, UCT.

Halkett, D. & Lanham, J. 1998. Report on an initial visit to assess the impact of mining on archaeological sites in the Richtersveld. Prepared for Trans Hex Mining Ltd. Archaeology Contracts Office, UCT.

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Halkett, D. 2001. An inspection and assessment of specific archaeological sites on De Beers owned properties – Namaqualand. Prepared for De Beers Consolidated Mines: Namaqualand Mines. Archaeology Contracts Office, UCT.

Halkett, D. 2002. Phase 1 archaeological survey: assessment of mining blocks in the BMC and KN areas, Namaqualand. Prepared for De Beers Consolidated Mines: Namaqualand Mines. Archaeology Contracts Office, UCT.

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Webley, L. & Halkett, D. 2014. Baseline heritage assessment: proposed aquaculture development at Brand Se Baai, Matzikama Municipality, Western Cape. Prepared for SRK Consulting (South Africa) (Pty) Ltd. ACO Associates cc.

Halkett, D. & Webley T. 2015. Heritage Impact Assessment: Elandsfontein Phosphate mining right on a Portion of Portion 2 And Portion 4 of the farm Elandsfontein 349, Saldanha. Prepared for Billet Trade (Pty) Ltd T/A Braaf Environmental Practitioners on behalf of Elandsfontein Exploration and Mining (Pty) Ltd. ACO Associates cc.

Halkett, D. & Webley, L. 2016. Heritage Impact Assessment of the proposed extension of the Tormin mine, west coast, South Africa. Prepared for SRK Consulting (South Africa) (Pty) Ltd. ACO Associates cc.

APPENDIX 2: SPECIALIST DECLARATION

3. THE INDEPENDENT PERSON WHO COMPILED A SPECIALIST REPORT OR UNDERTOOK A SPECIALIST PROCESS

D.J. HANKER, as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- have ensured that the names of all interested and affected parties that participated in terms of the specialist input/study were recorded in the register of interested and affected parties who participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

Note: The terms of reference must be attached.



Signature of the specialist:

ACO ASSOCIATES

Name of company:

14 NOVEMBER 2017

Date:

APPENDIX 3: GRADING CATEGORIES

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
I	Heritage resources with qualities so exceptional that they are of special national significance. Current examples: Robben Island	May be declared as a National Heritage Site managed by SAHRA.	Highest Significance
II	Heritage resources with special qualities which make them significant in the context of a province or region, but do not fulfil the criteria for Grade I status. Current examples: St George's Cathedral, Community House	May be declared as a Provincial Heritage Site managed by HWC.	Exceptionally High Significance
III		Such a resource contributes to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfill the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register. These resources are currently managed by HWC unless the local authority has been found competent and has been granted delegated authority.	
IIIA	Such a resource must be an excellent example of its kind or must be sufficiently rare. These are heritage resources which are significant in the context of an area.	This grading is applied to buildings and sites that have sufficient intrinsic significance to be regarded as local heritage resources; and are significant enough to warrant that any alteration, both internal and external, is regulated. Such buildings and sites may be representative, being excellent examples of their kind, or may be rare. In either case, they should receive maximum protection at local level.	High Significance
IIIB	Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree. These are heritage resources which are significant in the context of a townscape, neighbourhood, settlement or community.	Like Grade IIIA buildings and sites, such buildings and sites may be representative, being excellent examples of their kind, or may be rare, but less so than Grade IIIA examples. They would receive less stringent protection than Grade IIIA buildings and sites at local level.	Medium Significance
IIIC	Such a resource is of contributing significance to the environs. These are heritage resources which are significant in the context of a streetscape or direct neighbourhood.	This grading is applied to buildings and/or sites whose significance is contextual, i.e. in large part due to its contribution to the character or significance of the environs. These buildings and sites should, as a consequence, only be regulated if the significance of the environs is sufficient to warrant protective measures, regardless of whether the site falls within a Conservation or Heritage Area. Internal alterations should not necessarily be regulated.	Low Significance
NCW	A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate.	No further actions under the NHRA are required. This must be motivated by the applicant and approved by the authority. Section 34 can even be lifted by HWC for structures in this category if they are older than 60 years.	No research potential or other cultural significance

NATURA VIVA cc
Palaeontological Impact Assessments & Heritage Management,
Natural History Education, Tourism, Research

Attn: Mr David Halkett
 ACO Associates
 8 Jacobs Ladder
 St James, 7945

Date: 30 January 2018

PALAEONTOLOGICAL HERITAGE COMMENT:

**Rondawel Kaolien CC kaolin mine, Portion 1 Farm Rondawel 638,
 Namaqualand District, Northern Cape (Reference NC30/5/1/2/2/10638MP)**

The existing kaolin pit is located approximately 2.5 km south of the Groenrivier and 32 km SW of Garies, Namaqualand District, Northern Cape. The region is largely mantled by reddish aeolian sands of the Late Caenozoic (probably Pleistocene) **Koekenaap Formation** (Qkk, brown in Fig. 1) and **Hardevlei Formation** (Qh, blue in Fig. 1) (**West Coast Group**) (De Beer 2010). The kaolin deposits represent highly weathered underlying basement rocks of Precambrian age (**Namaqualand Metamorphic Province**) (Cornell *et al.* 2006). These kaolinitized bedrocks are entirely unfossiliferous and the mining project, including the rehabilitation phase, is consequently of no palaeontological heritage significance.

John E. Almond

Dr John E. Almond (Palaeontologist)
 Natura Viva cc
 Cape Town

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