



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH A MINING PERMIT.

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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5 October 2015
Report #: 2749c/MP/S/R4

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 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.

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1 OBJECTIVE OF THE SCOPING PROCESS

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

- a) identify the relevant policies and legislation relevant to the activity;
- b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
- d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- e) identify the key issues to be addressed in the assessment phase; (f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- f) Identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

2 Contact Person and correspondence address

2.1 Details of the EAP who prepared the report

Name of the Practitioner: Stephen van der Westhuizen and Jaques van der Vyver
Site Plan Consulting
Tel No: 021 854 4260; Fax No: 021 854 4321
E-mail address: steve@siteplan.co.za / Jaques@siteplan.co.za

2.2 The qualifications of the EAP

(With evidence attached as **Appendix 1**).

2.3 Summary of the EAP's past experience.

(EAP's curriculum vitae as **Appendix 2**)

3 Description of the property.

Farm Name:	Farm Jakhals Valley 99 Portion 3
Application area (Ha)	4.95ha
Magisterial district:	Sutherland
Distance / direction from nearest town	Sutherland is located about 5.8km north of the application area
Surveyor General Code	C0720000000009900003

4 Locality map

(Show nearest town, scale not smaller than 1:250000 attached as **below**).

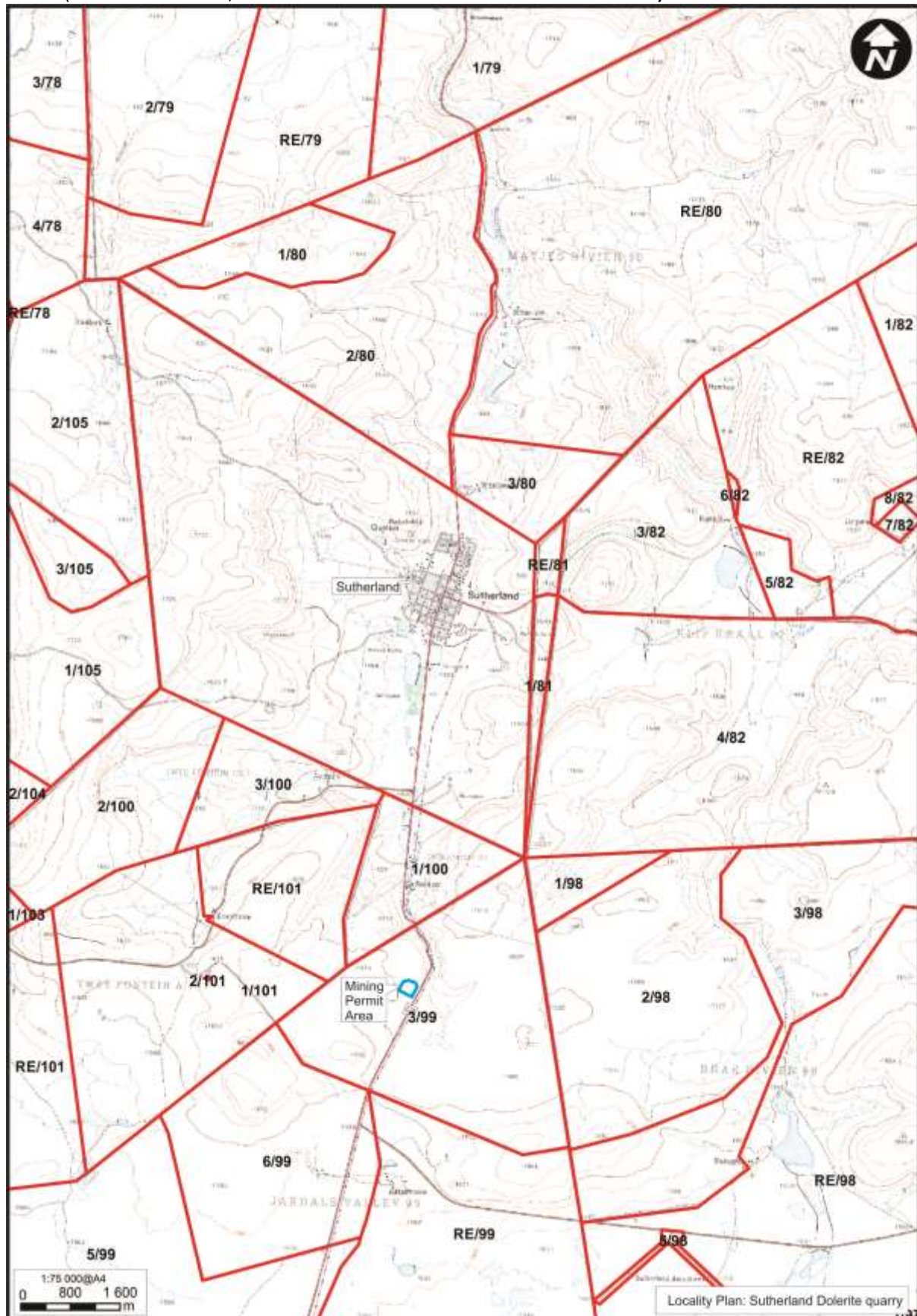


Figure 1: Locality Plan

5 Description of the scope of the proposed overall activity.

5.1 Background:

In order to provide suitable materials for the construction/maintenance of gravel access roads, crane platforms and most importantly concrete aggregate for the concrete bases to serve the wind energy projects currently underway south of Sutherland, Site Plan Consulting acting on behalf of Power Construction have identified this site which will meet the materials requirements for the project, and which is generally suitably isolated so as to largely remove any negative impacts on surrounding landowners/communities.

Given the extent of the project, the volume and range of materials required, further Mining Permit Applications will be undertaken to provide additional “soft”(weathered) rock for the construction projects, but given the scarcity of high quality hard rock sources to the south, this Mining Permit is sought primarily. Regarding alternative dolerite hard rock sources for concrete aggregate, it is noted that the site is chosen in one of the most southerly occurrences of dolerite (Refer Figure 2, inset from published 1:250 000 Geological Sheet 3220; Sutherland(Inset at 1:50 000))

Power Construction has thus appointed Site Plan Consulting CC to conduct the Applications on their behalf, which has entailed the lodging of this first Application with the Department Mineral Resources (DMR) Northern Cape (which has been completed) and now further entails the Scoping Phase of the assessment, involving identification and notification of Interested and Affected Parties (I&APs) in a public participation process, and which will further along in the process involve the Environmental Impact Assessment (EIA/EIR), identification of attenuation measures to limit impacts, and prescribing the environmental management in an Environmental Management Programme (EMP)

Regional Geology

As per attached Figure: Regional Geology Sutherland Quarry, (extract from Geological Survey sheet 3220 Sutherland; enlarged 1:250 000 to 1:50 000), Karoo dolerite sill underlies the site which dolerite is intruded into the Beaufort Mudstone country rock

Detailed geology

As per photo hereafter the dolerite outcrops over large areas of the site with only small surface weathered depressions between the various dolerite outcrops, with such weathered material expected to extend to a maximum 1.5m below surface.

Contour assessment of the sill in the road cuttings and old excavations reveals a minimum 20m thickness of the sill with no structural jointing or faulting which would dictate mining method. As such, the dolerite will provide excellent quality rock primarily for concrete aggregate for wind farm turbine bases and road material aggregates required for roads. Such road materials can however be sourced from alternative sites.



Photo 1: Current onsite condition of abandoned historic quarry

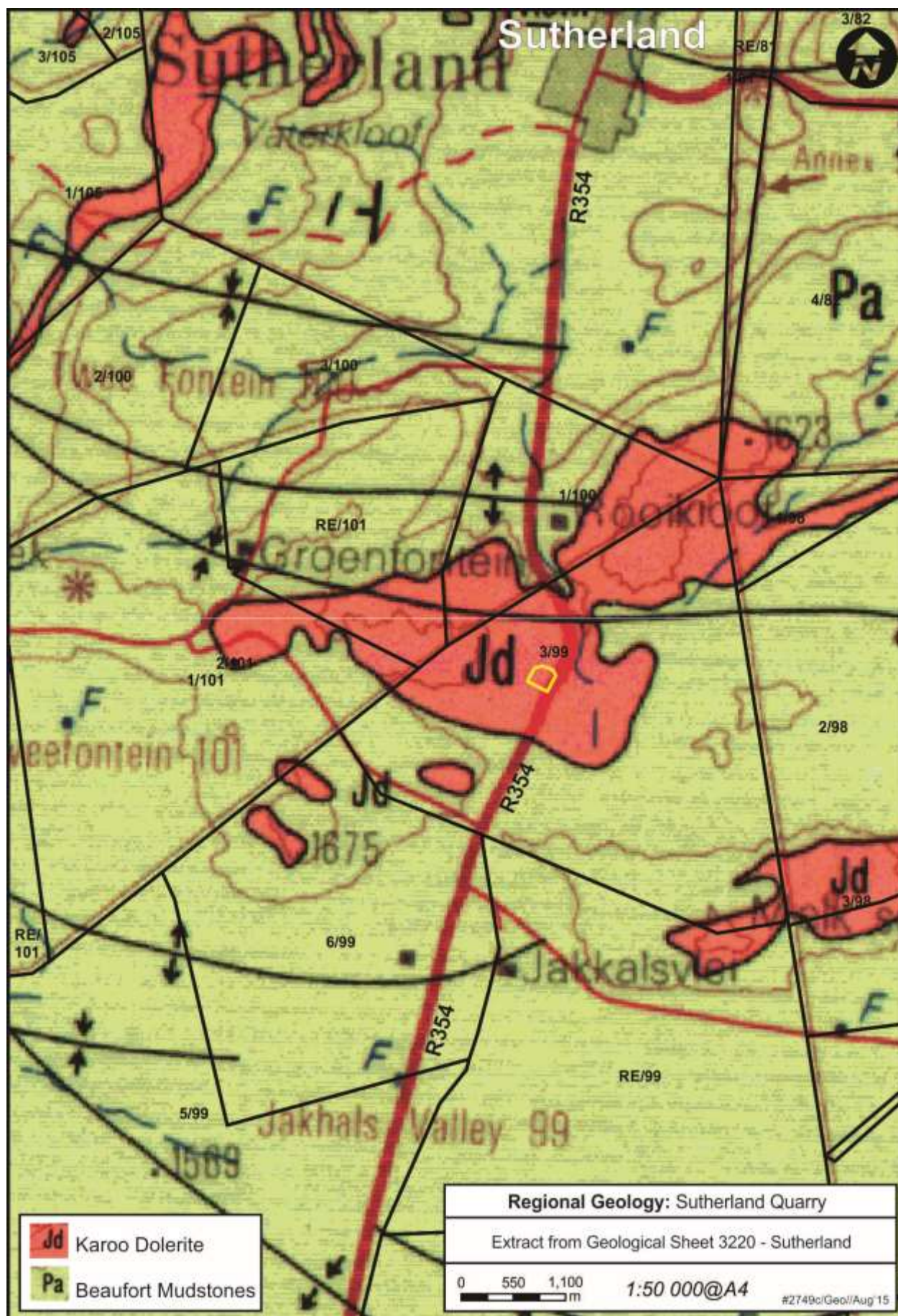


Figure 2: Regional Geology

5.2 The Mine Planning and considerations

Reconsideration of on-site activities given dust consideration

In light of the elements discussed, and through consultation with the Astronomy Management Agency and the South African Astronomical Observatory management team, a vast reduction in on-site activities is being considered, with the originally envisioned operations to be limited to only blasting and loading of shot rock, and with the materials transported directly from site to the construction sites which they will serve to be further processed at such sites, where such processing activity will pose no potential threat to the SALT.

Additionally, given dust generation considerations and the wishes of the land owner, strong preference is given the the use of the existing access gate but with upgraded intersection, and flagmen placed during despatch activities.

The excavation area of the proposed quarry is selected to mine from the existing abandoned excavation westwards in the dolerite sill, with overburden/"topsoil" varying between 0-1.5m (expected maximum). Accordingly, Topsoil from the topsoil patches will be dozed to topsoil berms for later re-use in rehabilitation while the overburden will be dozed to partially backfill the old excavation in close proximity to the R354 tar road.

As the excavation will occur in massive dolerite, the excavation will either be undertaken as a single 9-11m face, or as two benches to not exceed 20m depth.

As a safety consideration, an upper perimeter safety bench of 5m wide (with an upper perimeter face of max. 3m above it), will be provided together with a perimeter safety berm on surface to supplement fencing of the excavation in rehabilitation.

Site Informants

The following factors inform the mine plan and thus the reserve (from within the resource):

- Existing disturbed aspect, with little/ no rehabilitation having been conducted following historic mining activities,
- Hard rock outcropping of the target site, with very little vegetation present
- Whilst at suitable distance from the prospective sites, further the Sutherland site offers descending delivery road transport, which allays delivery costs (no uphill haulage of heavy loads).
- Dolerite is the most suitable material in terms of quality. The other identified hard rock sources were of Dwyka tillite along the N1 in the south, but such Dwyka tillite, while suitable, is of highly varying quality, and additionally the location of a suitable site is made highly difficult given the large game reserve activities around Matjiesfontein, with potential areas of mining being additionally highly visible to passing traffic on the N1 and needing additional access over the N1.
- The nearest option for concrete aggregate is to haul from Worcester with delivery costs in the order of R600.00/ton

The following figures set out the envisioned operation as set out in the Draft Scoping Report together with current revision of activities under finalization:

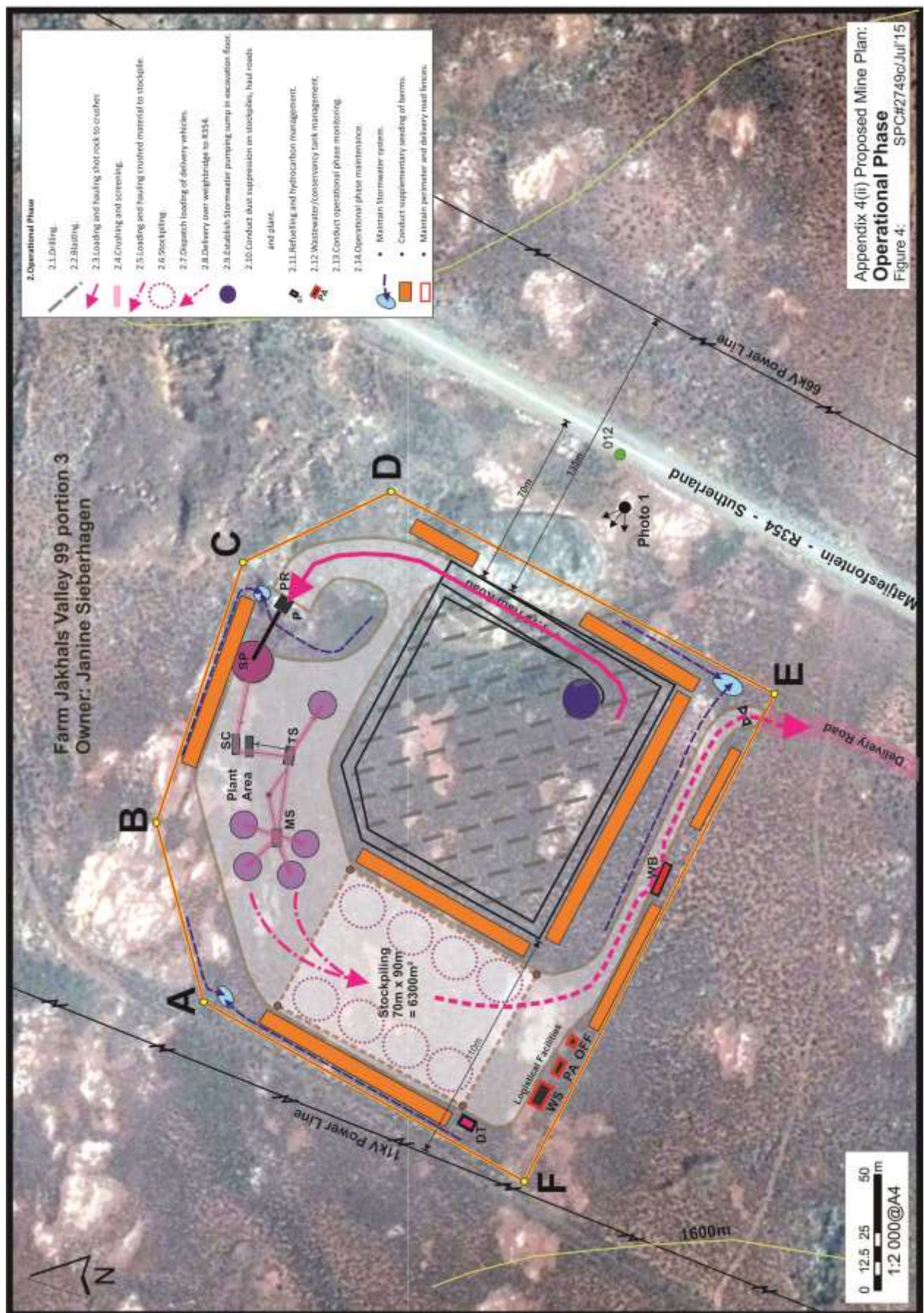


Figure 3: Proposed Site (mine) layout plan (Operational Phase) as set out in Draft Scoping Report and now under revision

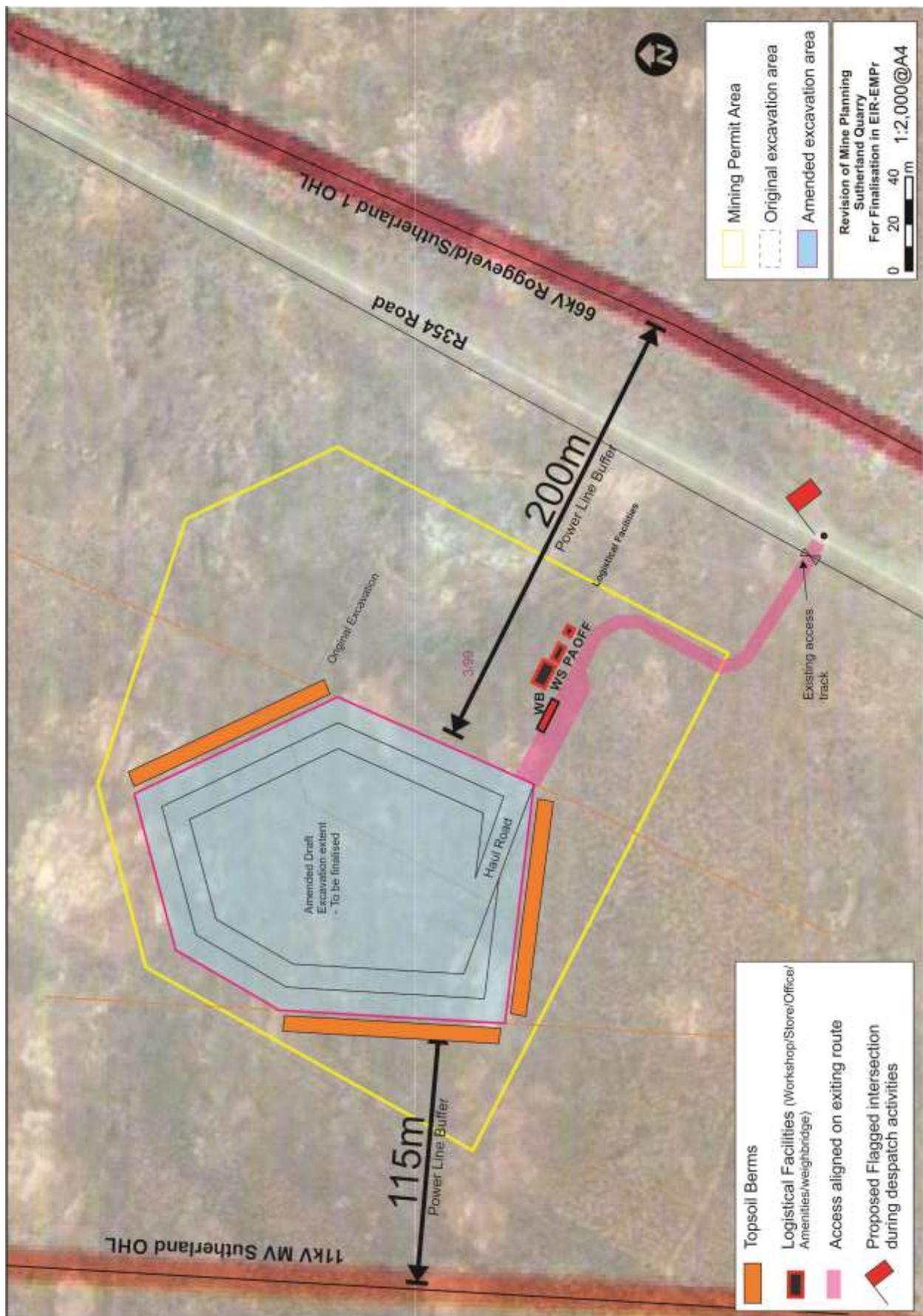


Figure 4: Current (mine) layout planning under revision for finalization, given inputs from Eskom, SAAO and Land owner

Reserves

As per the regional geology plan, the resource offered by this dolerite sill is massive (millions of m³) with the quarry only occupying a minor portion.

The table below reflects the reserves per product type which can be produced:

Material	Area	Horizon	Depth of mining	Tight m ³	Loose m ³ (1.4 buking factor)	Tons (2.8SG)
Topsoil for re-use	45000m ²	0.3m ²	Dozed to berms	13500m ³		
Overburden	13700m ²	0-1.5m	Average 1.0m	13700m ³		
G2-G5 Base course	103571m ²		10m	53571m ³	75000m ³	150000 tons
Concrete aggregate	103571m ²			50000m ³	70000m ³	140000 tons
TOTAL Hard Rock	103571m²		10m	103571m³	145000m³	290000 tons

This table represents areas based on a single 9-11m (average 10m) face

5.3 Mining Method and Processing

Mining is to be conducted as a standard open cast operation as follows:

(Note: it is currently envisioned that no crushing or screening will take place on site (activities for removal of consideration indicated in red))

1. Establishment Phase (Read with Figure 3)
1.1. Demarcate use areas, permit boundary, delivery road and fence site and delivery road.
1.2. Construct Delivery Road with side and mitre drains and Bell-mouth on R354.
1.3. Remove topsoil from demarcated to topsoil berms for later re-use.
1.4. Dig Stormwater cut-off channels and detention ponds.
1.5. Establish steel-banded diesel tank of <20,000 liters.
1.6. Establish logistical facilities including office, personal amenities and workshop/store containers. .
1.7. Construct primary ramp
1.8. Establish fixed crushing and screening plant (or alternatively mobile tracked plant).
1.9. Grass seed the topsoil berms.
1.10. Conduct establishment phase monitoring.
2. Operational Phase (Read with Figure 4)
2.1. Drilling.
2.2. Blasting.
2.3. Loading and hauling shot rock to crusher.
2.4. Crushing and screening.
2.5. Loading and hauling crushed material to stockpile.
2.6. Stockpiling.
2.7. Dispatch loading of delivery vehicles.
2.8. Delivery over weighbridge to R354.
2.9. Establish Stormwater pumping sump in excavation floor.
2.10. Conduct dust suppression on haul roads and plant.
2.11. Refuelling and hydrocarbon management.
2.12. Wastewater/conservancy tank management.
2.13. Conduct operational phase monitoring.
2.14. Operational phase maintenance.
(i) Maintain Stormwater system.
(ii) Conduct supplementary seeding of berm.
(iii) Maintain perimeter and delivery road fences.
(iv) Continuous ad hoc eradication of alien vegetation
3. Decommissioning Phase (read with Figure 5)
3.1. Conduct any required trim blasting to upper safety bench.
3.2. Remove all steel plant and structures.
3.3. Remove plant concrete footing and retaining wall and stack concrete neatly in north-east excavation floor corner.
3.4. Consolidate retained stock neatly in designated area.

3.5.	Rip/scarify hardened/compacted surfaces.
3.6.	Spread topsoil from berms over designated areas and upper safety bench.
3.7.	Construct safety berm and trench around excavation perimeter and install livestock proof fence and danger signpost.
3.8.	Ensure Stormwater trenches and detention ponds are operational.
3.9.	Grass seed re-topsoiled areas.
3.10.	Remove logistical facilities (containers), diesel tank and weighbridge.
3.11.	Conduct hydrocarbon decontamination.
3.12.	Remove perimeter fence.
3.13.	Either retain or remove delivery road (to landowner's decision) by scarification, tops-oiling and grass seeding (retain bell-mouth).
3.14.	Conduct final performance assessment for closure.
3.15.	Lodge Closure Application
3.16.	Allow quarry floor to flood as a reed bed during the rainy season (retain haul road for access to floor).
4.	Aftercare Period
4.1.	Remove alien vegetation (except pasture species), if present
4.2.	Monitor revegetation success, with follow-up seeding if required

6 Listed and specified activities

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1:10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site and attach as **Appendix 4**.

Refer also Figures 3, 4 and 5.

(Note: it is currently envisioned that no crushing or screening will take place on site (activities for removal of consideration indicated in red))

NAME OF ACTIVITY	Aerial extent of Activity (Ha or m ²)	LISTED ACTIVITY (Mark with an X where applicable or affected)	APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorization is required in terms of the Waste Management Act). (Mark with an X)
Application for Mining Permit	4.95ha	X	GNR983: Activity # 21	
1. Establishment Phase				
1.1. Demarcate use areas, permit boundary, delivery road and fence site and delivery road.	Using visible poles or alternative demarcation system. Not danger tape.			
1.2. Construct Delivery Road with side and mitre drains and Bell-mouth on R354.	+340m. width 6m		GNR 985: Activity #4	
1.3. Remove topsoil from demarcated to topsoil berms for later re-use.	4.95ha	X	GNR 985: Activity # 12 (NOTE: GNR 983. Activity # 27 does not apply)	
1.4. Dig Stormwater cut-off channels and detention ponds.				
1.5. Establish steel-banded diesel tank of <20,000 liters.	26m ²			
1.6. Establish logistical facilities including office, personal amenities and workshop/store containers. .	79m ²			
1.7. Construct primary ramp	360m ²			
1.8. Establish fixed crushing and screening plant (or alternatively mobile tracked plant).			GNR 984: Activity #21	
1.9. Grass seed the topsoil berms.				
1.10. Conduct establishment phase monitoring.	4.95ha Mining Permit Area			

2. Operational Phase				
2.1. Drilling.	1.37ha			
2.2. Blasting.	1.37ha			
2.3. Loading and hauling shot rock to crusher.	1.37ha			
2.4. Crushing and screening.	Plant	X	GNR 984: Activity #21	
2.5. Loading and hauling crushed material to stockpile.	Plant			
2.6. Stockpiling.	0.63ha			
2.7. Dispatch loading of delivery vehicles.				
2.8. Delivery over weighbridge to R354.		X	GNR 985: Activity #4	
2.9. Establish Stormwater pumping sump in excavation floor.	1.37ha			
2.10. Conduct dust suppression on haul roads and plant.	4.95ha Mining Permit Area			
2.11. Refuelling and hydrocarbon management.	4.95ha Mining Permit Area			
2.12. Wastewater/conservancy tank management.				
2.13. Conduct operational phase monitoring.	4.95ha Mining Permit Area			
2.14. Operational phase maintenance.	4.95ha Mining Permit Area			
(v) Maintain Stormwater system.	4.95ha Mining Permit Area			
(vi) Conduct supplementary seeding of berm.				
(vii) Maintain perimeter and delivery road fences.	4.95ha Mining Permit Area			
(viii) Continuous ad hoc eradication of alien vegetation	Operational	4.95ha and immediate surrounds	Topographical controls	
3. Decommissioning Phase				
3.1. Conduct any required trim blasting to upper safety bench.	1.37ha			
3.2. Remove all steel plant and structures.	Plant			
3.3. Remove plant concrete footing and retaining wall and stack concrete neatly in north-east excavation floor corner.	Plant			
3.4. Consolidate retained stock neatly in designated area.	0.63ha			
3.5. Rip/scarify hardened/compacted surfaces.	4.95ha Mining Permit Area			
3.6. Spread topsoil from berms over designated areas and upper safety bench.	4.95ha Mining Permit Area			
3.7. Construct safety berm and trench around excavation perimeter and install livestock proof fence and danger signpost.	1.37ha			
3.8. Ensure Stormwater trenches and detention ponds are operational.	4.95ha Mining Permit Area			
3.9. Grass seed re-topsoiled areas.	4.95ha Mining Permit Area			
3.10. Remove logistical facilities (containers), diesel tank and weighbridge.				
3.11. Conduct hydrocarbon decontamination.	4.95ha Mining Permit Area			
3.12. Remove perimeter fence.	4.95ha Mining Permit Area			
3.13. Either retain or remove delivery road (to landowner's decision) by scarification, tops-oiling and grass seeding (retain bell-mouth).	+340m			
3.14. Conduct final performance	4.95ha Mining Permit Area			

assessment for closure.				
3.15.	Lodge Closure Application	4.95ha Mining Permit Area	X	GNR983: Activity # 22. Only applicable at time of closure
3.16.	Allow quarry floor to flood as a reed bed during the rainy season (retain haul road for access to floor).	1.37ha max		
4.	Aftercare Period			
4.1.	Remove alien vegetation (except pasture species), if present	4,95ha and immediate surrounds		
4.2.	Monitor revegetation success, with follow-up seeding if required	4.95ha		

7 Description of the activities to be undertaken

(Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity)

Refer Para 5 and 6 above.

8 Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
(A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are	(i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	(E.g. In terms of the National Water Act:- Water Use License has/has not been applied for).
National Environmental Management Act	Entire document including public participation	Environmental Authorization from DMR as competent authority
Mineral and Petroleum Resources Development Act	Template for Scoping Report	DMR application and process
Namakwa District Map of Critical Biodiversity Areas	Need and Desirability (Para 9)	End Use informant
EIA Guideline and Information Document Series' "Guideline on Need and Desirability	Need and Desirability (Para 9)	Guideline for information utilized in this document
EIA Guideline 5 Assessing alternatives and impacts	Cumulative Impact Assessment (Para 9.2.1)	Guideline for information utilized in this document
NEMWA	Not applicable	No application for Waste Licence
Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector. Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, South African Mining and Biodiversity Forum, And South African National Biodiversity Institute. 2013.	Need and Desirability (Para 9)	Tool to facilitate the sustainable development of South Africa's mineral resources in a way that enables regulators, industry and practitioners to minimise the impact of mining on the country's biodiversity And ecosystem services.
Astronomy Geographic Advantage Act (Act 21 of 2007)	Para 14.1.9: Dust	The development requires agreement by the Management Authority, following tabling of an assessment of risk and

		attenuation measures
Revised Draft IDP of the Karoo Hoogland Municipality 2015-2016.	Part 6.6.10	The Authority is the Astronomy Management Authority (AMA) and additionally discussion with the Head: Small Telescopes Operations.

9 Need and desirability of the proposed activities.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

The EIA Guideline and Information Document Series' "Guideline on Need and Desirability" dated August 2010 has been used to consider this aspect.

Important: The actual mining takes place in the short term and as a result the need and desirability **should not only** focus on the actual mining phase of this site's lifespan but also concentrate on the long term / permanent post mining land use proposal.

The guideline referred to above provides a list of 15 questions which are aimed at addressing the issue of need and desirability. The questions have been copied below with the consideration of each question as it relates to this application immediately following each question.

Need refers to timing of a project whilst desirability is defined to consider the placing of the activity. The first port of call in considering need and desirability is a determination of how the proposed project fits in with the Municipal Integrated Development Plan (IDP).

9.1 Need ('timing'):

Question 1: *Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority? (I.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP).*

9.1.1 Conservation status of the site

Refer the following figures 5 and 6:

The site of the proposed quarry is noted as CBA2 by the Namakwa District Municipality and the Karoo Hoogland Municipality, with the Karoo Hoogland Municipality Land Management Classification key as follows:

Land Use category	Biodiversity Criteria	Land Management objectives	Conservation management	Extensive game farming	Priority areas for stewardship and veld restoration programmes	Extensive livestock production	Rural recreation development	Rural (communal settlement)	Dryland crop cultivation	Intensive animal farming (e.g. dairy, piggeries)	Irrigated crop cultivation	Urban and business development	Major/Extensive Development Projects	Linear Engineering Structures	Water projects and transfers	Underground Mining	Surface Mining, Dumping and dredging
CBA2: Important	Other areas known to	Maintain near-natural	1	1	1	1	2	2	3	3	3	3	3	2	2	1	3

areas	be of high biodiversity value	landscapes with no or limited loss of biodiversity pattern and limited loss of ecosystem processes	
1	Recommended activity		
2	Restricted activity		
3	Unsuitable activity		

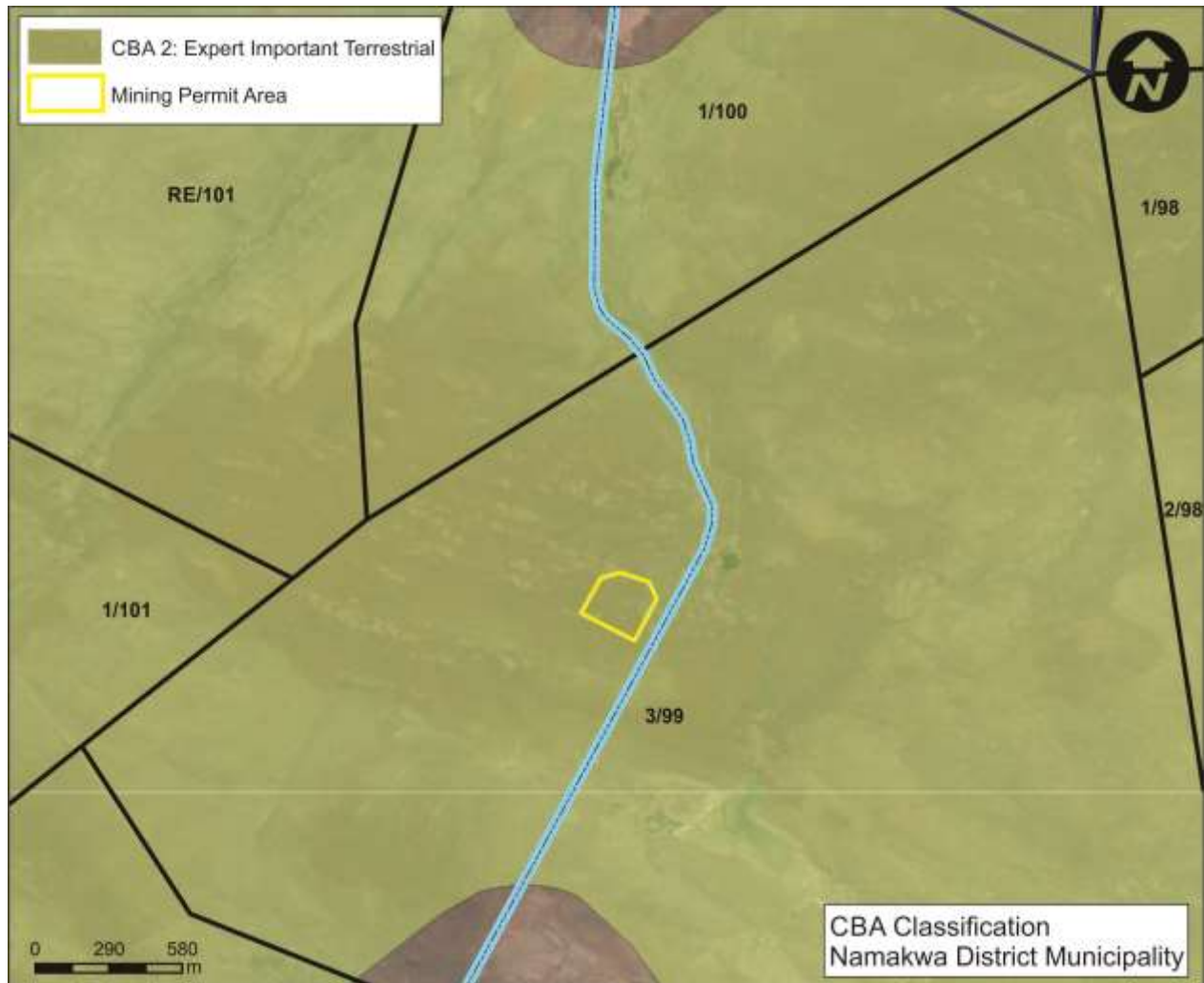


Figure 5: CBA Classification of the site, as per Namakwa District Municipal

While we do note and accept this, we do further note the following classification as taken from the Mining Biodiversity guideline documentation as prepared by all state departments (Developed by the Departments of Environmental affairs and Mineral resources; with inputs from :Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines South African, Mining and Biodiversity Forum, South African National Biodiversity Institute, Grasslands Programme - with funding from the United Nations Development, Programme Global Environment Facility, WWF South Africa, Endangered Wildlife Trust, Centre for Sustainability in Mining and Industry, CapeNature, Mpumalanga Parks and Tourism Agency, De Beers, AngloGold Ashanti, Anglo American, Richards Bay Minerals, Centre for Environmental Rights, Centre for Applied Legal Studies, deVilliers Brownlie Associates, Department of Water Affairs, Live4Design, National Union of Mineworkers, Solidarity, UASA.

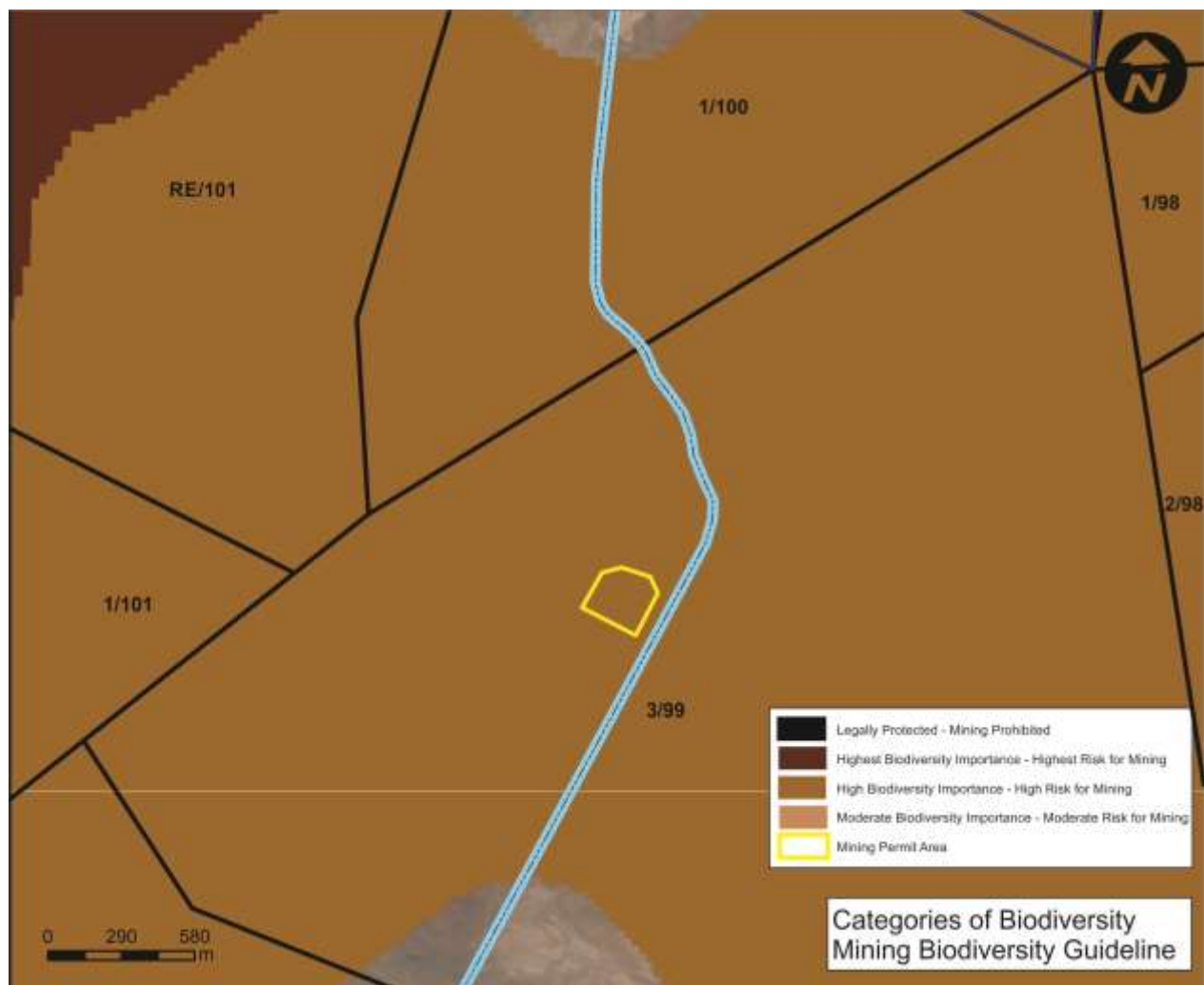


Figure 6: Mining and Biodiversity Guideline

C. High biodiversity importance	<ul style="list-style-type: none"> Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves) Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas) Other identified priorities from provincial spatial biodiversity plans High water yield areas Coastal Protection Zone Estuarine functional zone 	<ul style="list-style-type: none"> High risk to mining 	<p>These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, for maintaining important ecosystem services for particular communities or the country as a whole.</p> <p>An environmental impact assessment should include an assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity.</p> <p>Mining options may be limited in these areas, and red flags for mining projects are possible.</p> <p>Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.</p> <p>Note that the status of buffer areas of WHS is subject to a current intra-governmental process. If this recognises buffers areas as having the same status as the core areas in terms of mining, then the guidelines will need to be revised. The implications for existing mines would need to be clarified.</p>
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Of specific note is the following:

“An environmental impact assessment should include an assessment of optimum, sustainable land use for a particular area and will determine the significance of the impact on biodiversity.”

“Mining options may be limited in these areas, and red flags for mining projects are possible. “

“Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.”

As this report forms the Scoping Phase of a full EIA/EIR Assessment in terms of the NEMA under the auspices of the Department Mineral Resources in terms of the MPRDA, the Application for this Mining Permit is fully acceptant of the specifications for this CBA area, and we do note the following information as evidence toward the approval of this Mining Permit:

- a. The identified site has been historically mined and additionally has been poorly/not rehabilitated to date. While this area classifies within CBA 2, **further mining of the site within strict approval limits and Environmental Management guidelines does offer the opportunity to remediate the site to a higher degree.**
- b. Utilization of an already-degraded site should always be preferential to the mining of virgin sites, and our earmarking of such a previously disturbed site specifically aims to additional to providing suitable reserves, to limit the development footprint over further undisturbed areas.
- c. It is noted that the rock sought under this Mining Permit, Dolerite forming a dolerite sill, occurs in this area wholly within the CBA2 classification. Given the scarcity of high quality hard rock sources in this area south of Sutherland to Matjiesfontein, not utilizing a suitable source will occur high penalties in regard to costs (in the order of an additional R600.00/ton) incurred importing suitable materials from far afield, (as far as Worcester), high wear on the road networks, especially the N1 with increased road traffic accident risk given the extended trucking distances.
- d. Mining under this Mining Permit would only allow 2 to maximum 5 years of activity, and while altering the environment of the site, does not exclude future reintegration into wilderness or conservation use.

9.1.2 Site within the context of the Sutherland Central Astronomy Advantage Area (SCAA)

As shown in Figure 12a, the site is located within the SCAA, proclaimed in terms of the Astronomy Geographic Advantage Area Act (21 of 2007) and managed by the Astronomy Management Authority, all of which has the objective of, in this case, protecting the Southern African Large Telescope (SALT) from interference by atmospheric dust. Accordingly the Act, together with the revised Draft IDP 2015-2016 for Karoo Hoogland Municipality, seeks to limit dust generation in the area of jurisdiction as shown in Figure 12a.

In essence, all dust generation activities are discouraged from establishing within the proclaimed area and while the Draft Regulations in terms of the Act have not yet been published, the Draft IDP lists 9 control mechanisms of which the following extract is being considered in this application:

- “1. All developments including industrial, domestic, sporting, cultural and tourism shall be subject to standards determined by the management authority to assess potential impact on the observing conditions at the core site.*
- 7. Open cast mining is prohibited*

8. Other mining and constructing activities shall be agreed to with the management authority after the receipt of assessment”;

With a view to submitting a full assessment of dust risk to the management authority (Astronomy Management Authority).

As point of departure in respect of dust, we note the following:

- (i) The quarry will not represent traditional long term mining per se, but be a very short term contract quarry to serve short term wind energy facility construction projects.
- (ii) The site has been chosen for many positive locational reasons other than the consideration of dust impact on the SALT, and hence the challenge is focussed on minimizing activities on the site to meet the basic requirements of the wind farm construction,
- (iii) Implementing maximum dust attenuation measures which are well established in the quarry industry.
- (iv) The Scoping Process into the EIA and EMP preparation will therefore fully address the matter of dust risk reduction and include tabling of a dust management report to the Astronomy Management Authority and to the Head; Small Telescope Operations as part of the I&AP process.

To date full consultation with the AMA and South African Astronomical Observatory have been undertaken and a revision of the Mining operational layout is being considered to alleviate any potential for impact.

Question 2: *Should development concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?*

Yes. The primary driving force behind the Application for this Mining permit is the absence of available commercially produced aggregate in the area, and the distribution of suitable rock for construction aggregate sources in proximate locations to wind farm projects in this region. We must again emphasise the costs incurred with long distance hauling of materials from further afield, together with the associated damage to the transport infrastructure and road safety risk escalation posed by such long distance transport will be weighed up against the negative elements of establishing a temporary quarry in the region. The transport cost, road damage, and road safety risk impacts are ultimately borne by the consumers of this region. Materials sources for construction are a fundamental requirement for maintenance and upgrade projects, and given the huge investment in this region currently for the Construction of the various Wind Energy Facilities and the economic benefit brought about by such, the Development of a proximate source of high quality aggregate for the projects is of fundamental importance.

Question 3: *Does the community/area need the activity and the associated land use concerned (is it a societal priority)? This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate)*

This questions deals with “justifiable economic development” and it should lead to the conclusion of whether the project serves the community in the broader sense. There are 2 points to consider in this respect:

1. From a financial point of view: The mining of this site will lead to cheaper construction materials to projects occurring within the region.
2. The site is relatively far-removed from any community as to render the impact from mining (i.e. biophysical) on a community negligible in all respects other than the consideration of dust on the SALT, and as such the development cannot be seen to be inappropriate at this time. The only impacts on surrounding land users are the minimal visual impact occurring during operational activities and the road closure conditions which will occur during blasting. Both are of minimal concern given the very limited timeframe of activity for both, the road closure especially being for only 20 minutes, at most once every month, but likely once every 6-8 weeks, and will be similar to Stop/Go road closure conditions as effected during road contracts all over the country.

Question 4: *Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?*

All necessary systems are in place. Operations will be completely mobile in nature and do not require any on-site infrastructure. In order to rely on electrical power instead of diesel generated power (a preferred option in term so the SALT Consideration of air pollution) application will be made to ESKOM for a transformer connection from the adjacent 11kV power line.

Question 5: *Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)?*

There is no need for placement of services or infrastructure by the municipality in terms of this application or post mining proposals.

Question 6: *Is this project part of a national programme to address an issue of national concern or importance?*

No.

9.2 Desirability ('placing'):

Question 7: *Is the development the best practicable environmental option for this land/site?*

According to NEMA the "best practicable environmental option" means the option that provides the most benefit and causes the least damage to the environment *as a whole*, at a cost acceptable to society, in the long term as well as in the short term. In determining the best practicable environmental option, adequate consideration must also be given to opportunity costs.

The envisioned practicable option by the relevant authorities is as conservation/wilderness use, but again we must see this site in perspective of its current condition in comparison to its wider surrounds. Again we note the following:

- a. The identified site has been historically mined and additionally has been poorly/not rehabilitated to date. While this area classifies within CBA 2, **further mining of the site within strict approval limits and Environmental Management guidelines does offer the opportunity to remediate the site to a higher degree.**
- b. Utilization of an already-degraded site should always be preferential to the mining of virgin sites, and our earmarking of such a previously disturbed site specifically aims to additional to providing suitable reserves, to limit the development footprint over further undisturbed areas.
- c. It is noted that the rock sought under this Mining Permit, Dolerite forming a dolerite sill, occurs in this area wholly within the CBA2 classification. Given the scarcity of high quality hard rock sources in this area south of Sutherland to Matjiesfontein, not utilizing a suitable source will occur high penalties in regard to costs incurred importing suitable materials from far afield, high wear on the road networks of the area, and reduced safety given the extended trucking distances.
- d. Mining under this Mining Permit would only allow 2 to maximum 5 years of activity, and while altering the environment of the site, does not exclude future reintegration into wilderness or conservation use.

Given the historic use and degradation of the site, its suitability for development in lieu of further damage to more sensitive areas is self-evident.

Question 8: *Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF as agreed to by the relevant authorities.*

No. Mining (temporary contract quarrying) under this Mining Permit would only allow 2 to maximum 5 years of activity, and while altering the environment of the site, does not exclude future reintegration into wilderness or conservation use.

Question 9: *Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?*

No. Mining under this Mining Permit would only allow 2-5 years of activity, and while altering the environment of the site, does not exclude future reintegration into wilderness or conservation use.

Question 10: *Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context).*

Yes:

- a. The identified site has been historically mined and additionally has been poorly/not rehabilitated to date. While this area classifies within CBA 2, **further**

mining of the site within strict approval limits and Environmental Management guidelines does offer the opportunity to remediate the site to a higher degree.

- b. Utilization of an already-degraded site should always be preferential to the mining of virgin sites, and our earmarking of such a previously disturbed site specifically aims to additional to providing suitable reserves, to limit the development footprint over further undisturbed areas.
- c. It is noted that the rock sought under this Mining Permit, Dolerite forming a dolerite sill, occurs in this area wholly within the CBA2 classification. Given the scarcity of high quality hard rock sources in this area south of Sutherland to Matjiesfontein, not utilizing a suitable source will occur high penalties in regard to costs incurred importing suitable materials from far afield, high wear on the road networks of the area, and reduced safety given the extended trucking distances.
- d. Mining under this Mining Permit would only allow 2 to maximum 5 years of activity, and while altering the environment of the site, does not exclude future reintegration into wilderness or conservation use.

Question 11: *How will the activities or the land use associated with the activities applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?*

In terms of Heritage, the site will be subject to a Notification of Intent to Develop (NID), lodged in terms of Section 38 of the National Heritage Act, to SAHRA.

In terms of the natural environment, a specialist botanist will be tasked with assessment of the site, and will be tasked with providing full inputs to this Scoping report and all further documentation.

Question 12: *How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)?*

It is of importance to note that the site operations will be conducted strictly in accordance with the Mine Health and Safety Act (Act 29 of 1996)

This site is located so distant from any residence or community as to render any impact in terms of health and well-being absolutely negligible.

The nearest adjacent residences is some 1.5km from the excavation, which puts it far outside of the danger radius of blast vibration and fly rock.

In terms of sense of place, the post mining excavation will not be visible from the public road which runs through a road cutting past the site, refer Photo 2.



Photo 2: View of the site from the R354 road cutting, looking west (Photo: Google Street View)

Question 13: *Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?*

No. This issue is dealt with in question 3 above.

Question 14: *Will the proposed land use result in unacceptable cumulative impacts?*

No. Refer para 9.2.1 below.

9.2.1 Cumulative Impact Assessment

The assessment of cumulative impacts on a site specific basis is often a complex operation. The aim of this impact analysis is ultimately to determine at which point the combined impacts from several operations (similar or dissimilar) in the area will affect the environment or part thereof to such a negative degree that the project should not be allowed to proceed.

Always remember that mining is a place-bound operation (as opposed to say housing or shopping development which is less dependent on geology or other place-bound factors).

The following is an amended procedure sourced from [http://www.eiatoolkit.ewt.org.za/documents/DEAT/guidelines/ AT_EIA_Guideline5_Assessing_alternatives_and_impacts.doc](http://www.eiatoolkit.ewt.org.za/documents/DEAT/guidelines/AT_EIA_Guideline5_Assessing_alternatives_and_impacts.doc)

Types of cumulative impacts

Additive impact: Impacts of the same nature from different operations (e.g. excessive groundwater abstraction from several operations in the same area result in a severe drawdown effect)

Interactive impact: where a cumulative impact is the result of a combination of different impacts to cause a new kind of impact. This kind of impact can be:

- Countervailing – the net adverse effect is less than the sum of the individual impacts (e.g. pumping clear water into a polluted water resource).
- Synergistic – when the impacts work together to develop a sum of different impacts results in an impact which is greater than the individual impacts.

Methodology used in assessing cumulative impact/s

Determine extent of cumulative impacts:

- Identify potentially significant cumulative impacts associated with the proposed activity
- Establish the geographic scope of the assessment
- Establish the timeframe of the analysis
- Identify other activities affecting the environmental resources of the area

Describe the affected environment:

- Characterise the resources identified above in terms of their response to change and ability to withstand stress
- Define a baseline condition that provides a measuring point for the environmental resources that will be acted upon

Assess the cumulative impacts:

- Determine the magnitude or significance of cumulative impacts

Recommend mitigation measures.

So, using the aforementioned procedure as headings, herewith an assessment of the cumulative impacts arising from this operation:

At this stage of pre-Scoping we present the following perspectives on these matters.

Determining the extent of the cumulative impacts:

Identification of potentially significant impacts:

Proposed operations of this type could conceivably result in the following cumulative impacts:

Vegetation: Based on our assessment to date of the published literature, it is expected that the Specialist botanical assessment will find that impact on vegetation will be Low.

Noise: As there are no other mining operations within earshot of any community, and this operation is very temporary in nature, there can be no cumulative impact from this small operation.

While **blast noise** will be widespread, it will be subject of mitigation measures as later described, and is of very limited duration and will occur only very sporadically (maximum of once per month during operational activity).

Dust:

i) General: Dust is unlikely to present any impact on any residential area or immediately surrounding land use given the distances involved. Refer Figure 8.

ii) Impact on the R354 Road: Dust generation by the quarry will be limited to not have any significant impact on road users and there are no other surrounding dust generators to raise the cumulative impact.

iii) **Impact on the SALT:** The quarry will raise the cumulative dust impact of the Region on the SALT and hence dust attenuation commitments will be maximised to minimise such cumulative impact, which is the aim of the Act. The on-site operational considerations are currently being adapted in this regard.

Socio-economic impacts: This cumulative impact of the mining operations in the area is a beneficial impact in that it will ensure staff employment, albeit minimal.

Agriculture: We again note the low agricultural potential of the site due to the widespread hard rock outcrops related to materials sought under the envisioned mining, and which precludes this site from full successful integration into grazing, but represents a small contribution to cumulative grazing loss.

Geographic Scope of assessment:

Impact aspect	Geographic scope
Vegetation	NA
Dust	Local area – no impact on any community
Noise	Local area - no impact on any community
Socio-economic	Minor benefit to local employment pool
Agriculture	Minor loss of agricultural grazing land

Timeframe of analysis

The proposed project will take place over a period of approximately 2 years (extendable to a maximum of 5 years). The timeframe of the analysis would typically depend on the nature of the impact being assessed:

- 1) Life-of-mine impacts to be assessed are noise, dust and socio-economic impact.
- 2) In respect of surface mining there is always a residual permanent impact in the form of alteration in topography. In this case, the footprint area of the excavation to 10m deep in hard rock will be permanently lost to grazing and will post-rehabilitation fulfil a conservation/environmental role as bird nesting site typical of similar abandoned quarries.

Other activities impacting on environmental resources in the area

No other activities noted in the immediate vicinity

Resource characterization

This section aims to characterise the environmental resources in terms of their ability to withstand additional stress.

Noise: As discussed, there is no additional noise impact, given both the isolation of the site. While blast noise will be widespread, it will be subject of mitigation measures as later described, and is of very limited duration and will occur only very sporadically (once per month during operational activity)

Dust: Refer as described above.

Magnitude and significance of cumulative impacts

Vegetation: Very Low

Noise: Very Low.

Air Quality: Refer as described above

Socio-economic: No significant impact (minor benefit)

10 Period for which the environmental authorisation is required

A mining Permit is sought to allow for mining for a period of 2 years, with the MPRDA allowing for three consecutive annual renewal periods if required. As such, Environmental Authorization is sought for 5 years, to allow for potential lengthened lifespan or delayed onset of activities. However in light of the intended minimising of dust impact on the SALT, the period of crushing operation will be reduced and defined to a minimum during the Scoping exercise.

11 Description of the process followed to reach the proposed preferred site.

NB!! – This section is not about the impact assessment itself; It is about the determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

Refer Figure 8 following. The site payout shown in Figures 3,4 and 5 are based on the site assessment which is best reflected in Figure 8; Site Planning Informants.

For the purpose of the Application, a Draft Site Layout Plan had been prepared taking into consideration the definition of the project as at the time of lodging the application, and responds to the environmental, built infrastructure (public road, electrical lines), visual exposure and mining operational considerations.

However, given discussions with Eskom and the Astronomy management agencies are large deviation from the envisioned operations is being considered, which will:

- Remove all processing operations from the site (with only blasting, loading taking place
- Revised excavation area, to provide buffer distance between the Eskom power lines running east and west of the site.



Figure 7: Original Site Planning Informants

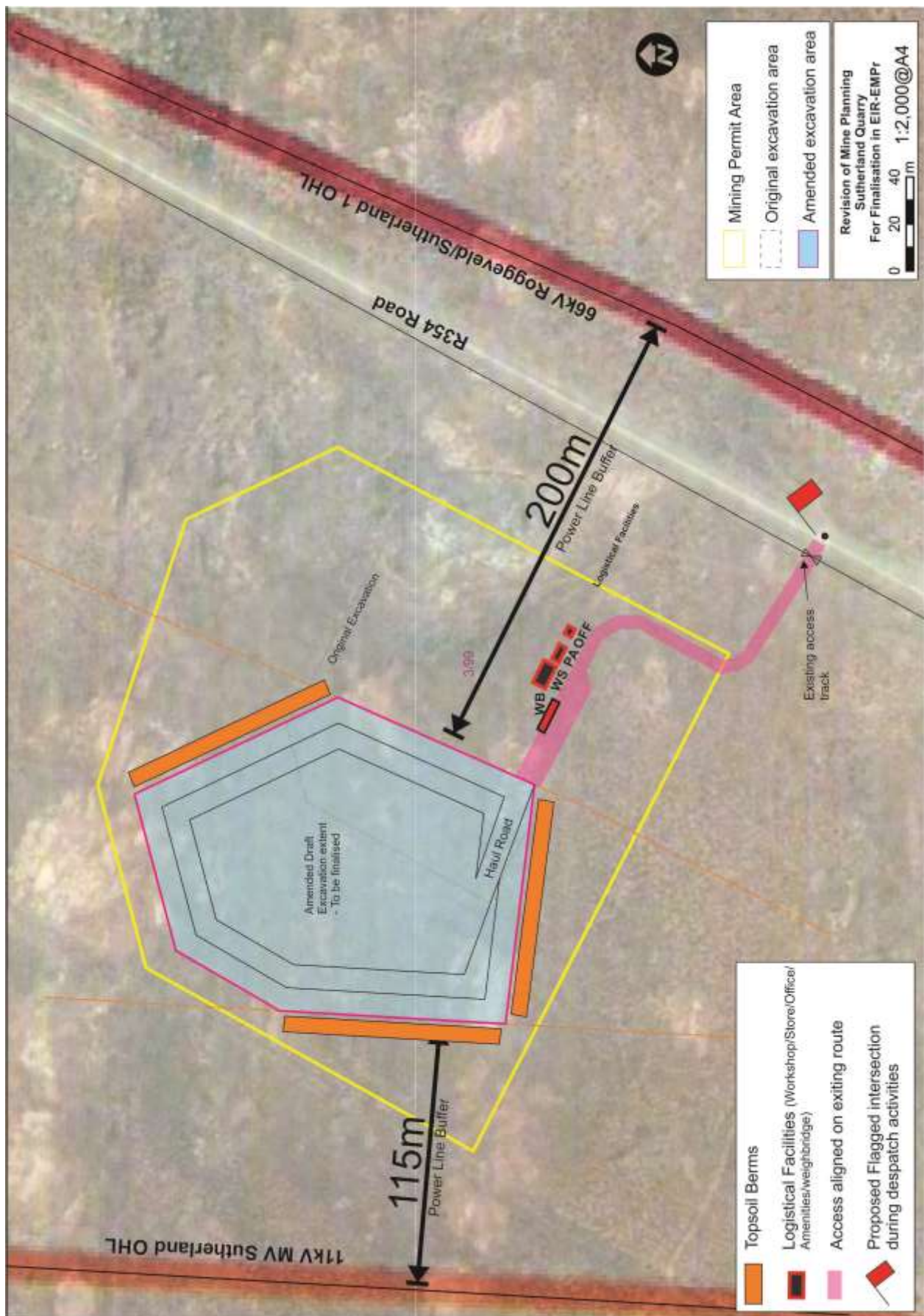


Figure 8: Revised Mine Planning indicative excavation area – Draft only at this stage.

12 Details of all alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to the following. Remember that the public participation process may reveal additional alternatives:

12.1 Property on which or location where it is proposed to undertake the activity;

Site Plan Consulting undertook an investigation into potential materials sources in the area, with primary focus being appropriate sources for supplying materials to the various wind farm projects undergo between Matjiesfontein and Sutherland. Refer attached plan showing. While no details are inferred herein given strategic importance of such projects, we declare that a thorough investigation of the greater area was undertaken through on-site visual assessments of the region, together with consultation of geological sheets and Googletm Imagery. In terms of hard rock sources this site was identified as serving the purpose, given:

- Existing disturbed aspect, with little/ no rehabilitation having been conducted following historic mining activities,
- Hard rock outcropping of the target site, with very little vegetation present
- Whilst further from the prospective projects than other potential sites, it offers descending delivery road, which allays delivery costs (no uphill haulage of heavy loads).
- Dolerite is the most suitable material in terms of quality. The other identified hard rock sources were of Dwyka tillite to the south, but such Dwyka tillite while suitable is of highly varying quality, and additionally the local extent of such reserves are associated with large game reserve activities around Matjiesfontein, with potential areas of mining being additionally highly visible to passing traffic.
- Delivery traffic from the site will pose a much lower risk of traffic safety and a lower impact on road maintenance than the alternatives of long distance hauling from existing commercial sources or other suitable geological alternatives.

12.2 Type of activity to be undertaken;

Construction aggregate mining is the activity to be undertaken.

12.3 Design or layout of the activity;

The layout of the excavation was based on a full geological assessment of the area and on-site assessment of:

- Current condition of the site, with focus on reuse of old disturbance footprints
- Ecological status and sensitivity of the site
- Surface geological analysis of the site
- Visual considerations of the site in relation to the wider region

12.4 Technology to be used in the activity;

Standard mining practice of such small scale mining operations as established in the industry is followed, with the use of the following machinery:

- Recover and loading of softer weathered rock with **excavator**
- **Percussion drill-rig** use in drilling of blast holes in fresh hard rock
- **Best available blast design** will be applied at the site to minimize fly rock and dust generation by blasting.
- **Excavator** loading of blasted rock
- **Either Fixed Plant or Tracked Mobile Crusher** with conducting of primary processing by means of screening and crushing to required materials specifications. In the interest of minimizing dust generation it appears probable that a fixed plant on which maximum dust attenuation can be achieved, will be the preferred alternative
- Delivery by means of **Trucks** to consumers

At this stage of public participation and consultation it is envisaged that no crushing plant will be active on site, with primary blasted rock to be transported directly to the project construction sites which it is to serve. This alleviates fully any impacts of Dust on the SALT as well as processing plant noise on surrounding land users.

12.5 Operational aspects of the activity;

Refer Figure 5 and Paragraphs 5.2 and 6.

While optional construction of a new access road and intersection to the R354 was under consideration, input from various parties, inclusive of the land owner has indicated thae favoring of the existing access track, but using a flagman during all delivery periods given the short site distance offered at this current intersection.

This decision will ultimately however be informed by the Roads Department and intersection shall be implemented to their satisfaction.

12.6 Option of not implementing the activity.

Primarily, the aspect of no-go project goes against the principle of optimization of resource as espoused in the MPRDA, and in this case the negative impact considerations do not justify a no-go project option.

Additionally, in terms of materials requirements to serve the wind energy facility construction projects, no available commercial aggregate sources in the vicinity lead to exorbitant costs due to importation of materials from other sources (Oudtshoorn, Robertson, Worcester), as well as increased traffic of the already dangerous N1 national route by heavy duty trucks, and additional wear on transport infrastructure.

13 Details of the Public Participation Process Followed

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

Refer Figure 9 Overleaf.

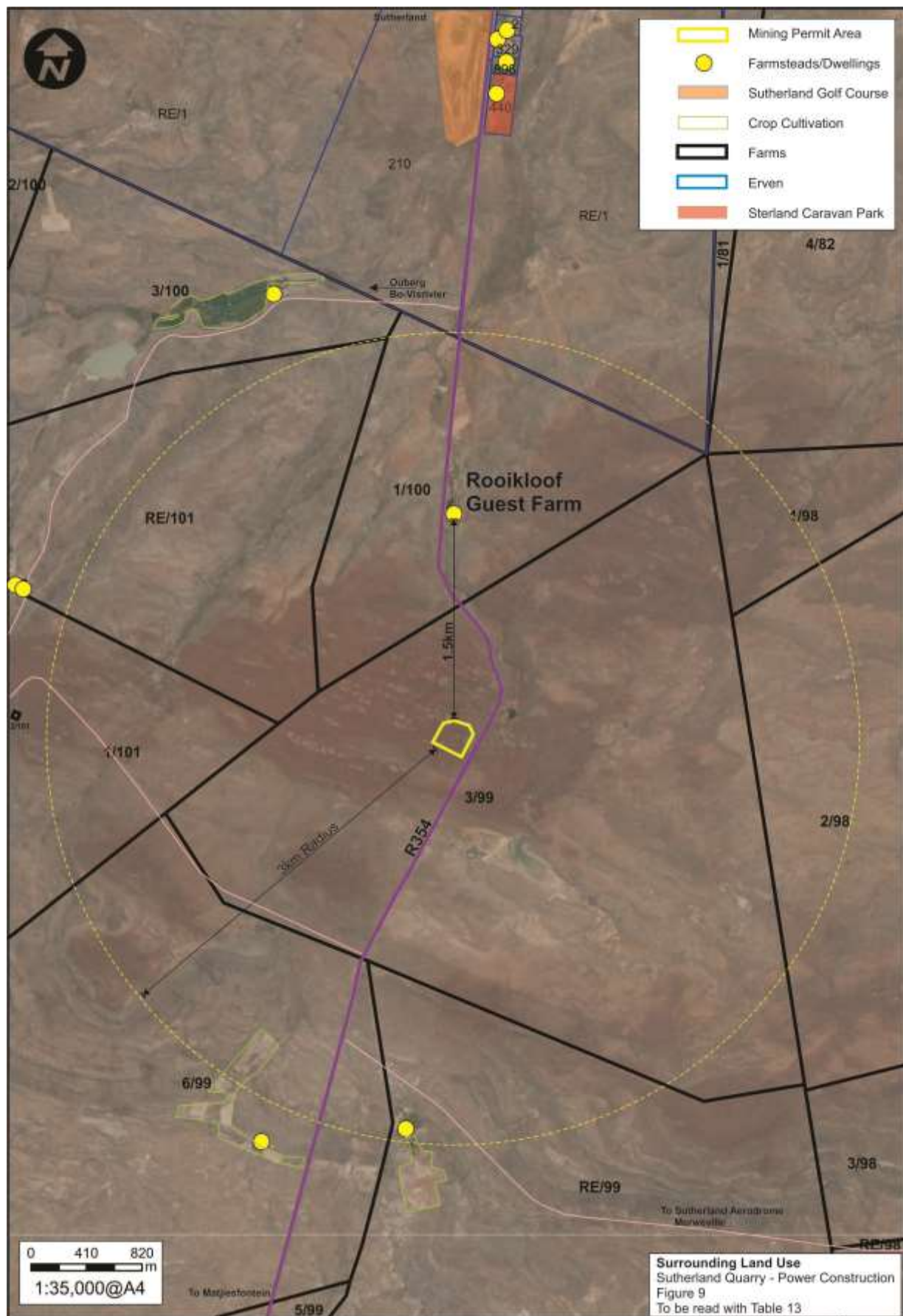


Figure 9: Surrounding Land Use. To be read with Table 13

The Public Participation Process includes the following:

- Notification of the Land owner and immediately adjacent land owners (refer figure 10 Surrounding land use for Farm localities) by means of drop-off for collection at the local cooperative and telephonic notification, or hand delivered notification letters and copies; all with copies of the Draft Scoping Report, and personal discussion by the Application with the land owner by the applicant (Representative to date, with meeting with land owner scheduled for **5 October 2015**).
- Erection of A2-size posters at two points along the Application property boundary, along the R354
- Posting of bilingual (English/Afrikaans) newspaper advertisement in the “Noordwester” Local newspaper.
- Placing of Response forms and copies of the Draft Scoping Report at the Sutherland Public Library (referred to in the newspaper advertisements)
- Posting by Registered mail of Notification letters and copies of the Draft Scoping Report to Commenting Authorities/Departments.

Refer Table 13 overleaf; list of correspondents and issues raised (to be completed during Scoping Phase)

Table 13: Preliminarily Identified Interested and Affected Parties – Sutherland Quarry Mining Permit

Farm Name	Registered Owner	Representative	Response/Comment	Applicant response
Farm Jakhals Valley 99 portion 3	Janine Sieberhagen		Preliminary discussions with Family memnber. Indicated concern over the potential operations, specifically noise and dust and Preference that no new roadway be constructed	Contemplated revision of on-site activities to limit operations
100 portion 1			Meeting arranged for 5 October 2015. Feedback to be provided on receipt.	
99 portion 6	Johann du Toit		No response to date – will be appended on receipt	
99 remainder	Selous Trust	Louis du Toit	No response to date– will be appended on receipt	
98 portion 2	Anneline Stadler		No response to date– will be appended on receipt	
98 portion 1	Adam Keuler Boerdery PTY LTD	Adam Keuler	No response to date– will be appended on receipt	
82 portion 4		Gert Keuler		
81 portion 1				
Erf 1 Remainder	Sutherland Municipality	Karoo Hoogland Municipality	Refer Below	Refer Below
101 remainder	Jacobus Alewyn Van der Merwe		No response to date– will be appended on receipt	
101 portion 1	De list Trust		No response to date– will be appended on receipt	
Department	Designation	Representative	Response/Comment	Applicant response
Department Environment and Nature Conservation	EIA Administration	EIA Administration	No response to date– will be appended on receipt	
Karoo hoogland Municipality	Municipal manager	Gustav von Mollendorf	Registered as affected party. Notification of changes to Land Use Legislation to be undertaken to authorise utilisation of the Area for mining	Accepted such information. Land Use Authorisation is pending and will be handled by Specialist consultants Setplan Settlement Planning Services
Karoo hoogland Municipality	Ward Councillor Ward 4	Jeremiah Davids	No response to date– will be appended on receipt	
Karoo hoogland Municipality	Deputy Director; Infrastructure	Frannie Lotter	No response to date– will be appended on receipt	
Department Water Affairs	Chief Director: Northern Cape	Mr A Abrahams	No response to date– will be appended on receipt	
Agriculture, land reform and rural development	Head of Department	Mr. Viljoen Mothibi Secretary C Fortune	No response to date– will be appended on receipt	
Regional land claims commission: Free State and Northern Cape	Acting Chief Director: Land Restitution Support (Northern Cape Province)	Ryan Oliver	No Land claims in respect of the property	Noted
Department Transport, Roads and Public Works	Head of Department	Mr K Nogwili Secretary Ms N Corns	No response to date– will be appended on receipt	
Department Science and Technology	Director: Astronomy Management Authority(AMA) Department of Science and Technology	Mere Kgampe deputy director: Ms Nametshego Gumbi	AMA would like to advise Site Plan Consulting and Power Construction (PTY) Ltd to follow the development of the AGA Act declaration and regulations and respond to any requirements for authorization that may be prescribed. It needs to be pointed out that there may be protection requirements for dust and light pollution caused by the mining activities within the declared astronomy advantage areas	Noted. Application is being conducted with full consultation from SAAO and AMA and revision of the mining area planning is underway given these inputs.
South African Astronomical Observatory	Head: Small Telescope Operations	Dr Ramatholo Sefako	Stephen van der Westhuizen met Dr R Sefako and Petri Vaisanen on Friday 4 September. Potential Impacts are: a. After-hours lights which will not be permitted	What this implies for the hard rock quarrying project is that we would a. Limit production to concrete stone only b. Truck most materials directly off-site using the non-concrete

			<p>b. Air-suspended dust fraction which will interfere with light penetration to the telescope and will settle on the mirrors, with high cost of cleaning and damage.</p> <p>Concerns over protecting the installation are that certain of the telescopes are internationally owned but run by SAAO, and quality cannot be compromised.</p> <p>Preclusion of mining is the primary aim of legislation and there is concern that this form of mining should not create a precedent for others to follow. In response to that we would have to be sure to show significant compromise in the definition of the quarrying to ensure absolute minimum dust generation and no after-hours illumination.</p> <p>Appreciative of the attenuation measures we can apply and potentially adapting the quarrying activities to target only concrete stone, thereby limiting the duration and volume of mining and crushing in the context that the temporary quarrying with full attenuation and definite commitment to implement and monitor when contained in the envisaged assessment report would be positively considered by them in the matter of risk which attenuated dust could pose to the telescope installation.</p>	<p>aggregate material on the construction sites either with crushing at the Karusa sites or direct use.</p> <p>c. Totally reducing stockpiling on site, and general logistical activities.</p> <p>d. Preferably using the existing gate instead of a long gravel delivery road, through buy-in to a flagged intersection instead of the 350m safe line of sight distance.</p> <p>e. Blasting under favourable wind conditions.</p> <p>f. Full application of dust attenuation measures including:</p> <ul style="list-style-type: none"> - Water cart wetting. - Sprinkler wetting. - Sprinkler and mist spray application on the crushing and screening plant. - Avoidance of activities on the days of unfavourable wind direction. - This implies a plant type on which such dust attenuation can be installed <p>(covered transfer points, wind protection of conveyers, drop points and tip points with sprinklers.</p> <p>The further option of only doing drilling and blasting on the site and hauling loaded blasted rock to crushing at the project sites, which would avoid the dust risk</p>
ESKOM	Land and Rights; Land Development and Environment	Shaun Swanepoel	<p>I hereby inform you that Eskom approves the proposed work indicated on your drawing in principle subject to the following. This approval is valid for 12 months only, after which reapplication must be made if the work has not yet commenced.</p> <p>a) The following building and tree restriction on either side of centre line of overhead power line must be observed: Voltage Building restriction either side of centre line 11kV 9.0 m</p> <p>b) No construction work may be executed closer than 6 (SIX) metres from any Eskom structure or structure-supporting mechanism.</p> <p>c) No work or no machinery nearer than the following distances from the conductors: Voltage Not closer than: 11kV 3.0 m 66kV 3.2 m</p> <p>d) Natural ground level must be maintained within Eskom reserve areas and servitudes.</p> <p>e) That a minimum ground clearance of the overhead power line must be maintained to the following clearances: Voltage Safety clearance above road: 11kV 6.3 m 66kV 6.9 m</p> <p>f) That existing Eskom power lines and infrastructure are acknowledged as established infrastructure on the properties and any rerouting or relocation would be for the</p>	<p>Agreed upon and incorporated into the current revision of the mining operational Layout. Compliance with all Eskom measures to be implemented and enforced by the pending EMPr for the site.</p>

			<p>cost of the applicant/developer.</p> <p>g) That Eskom rights or servitudes, including agreements with any of the landowners, obtained for the operation and maintenance of these existing power lines and infrastructure be acknowledged and honoured throughout its lifecycle which include, but are not limited to:</p> <p>i. Having 24 hour access to its infrastructure according to the rights mentioned in (a) above,</p> <p>ii. To perform maintenance (structural as well as servitude – vegetation management) on its infrastructure according to its maintenance programmes and schedules,</p> <p>iii. To upgrade or refurbish its existing power lines and infrastructure as determined by Eskom,</p> <p>iv. To perform any other activity not listed above to ensure the safe operation and maintenance of the Eskom power lines or infrastructure.</p> <p>h) Eskom must have at least a 10m obstruction free zone around all pylons (not just a 10m radius from the centre).</p> <p>i) Eskom shall not be liable for the death or injury of any person, or for loss of or damage to any property, whether as a result of the encroachment or use of the area where Eskom has its services, by the applicant, his/her agent, contractors, employees, successors in title and assignee.</p> <p>j) The applicant indemnifies Eskom against loss, claims or damages, including claims pertaining to interference with Eskom services, apparatus or otherwise.</p> <p>k) Eskom shall at all times have unobstructed access to and egress from its services.</p> <p>l) Any development which necessitates the relocation of Eskom's services will be to the account of the developer.</p>	
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14 The Environmental attributes associated with the sites: Baseline Environment

14.1 Type of environment affected by the proposed activity.

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

The following notes the existing environment together with potential impacts where highly relevant

14.1.1 Topography (Refer Figure 10: Regional Topography and Figure 3 of the site for site contours)

The entire Mining Permit area is on ground rising gently toward the southwest, increasing some 5m over its northeast-southwest length.

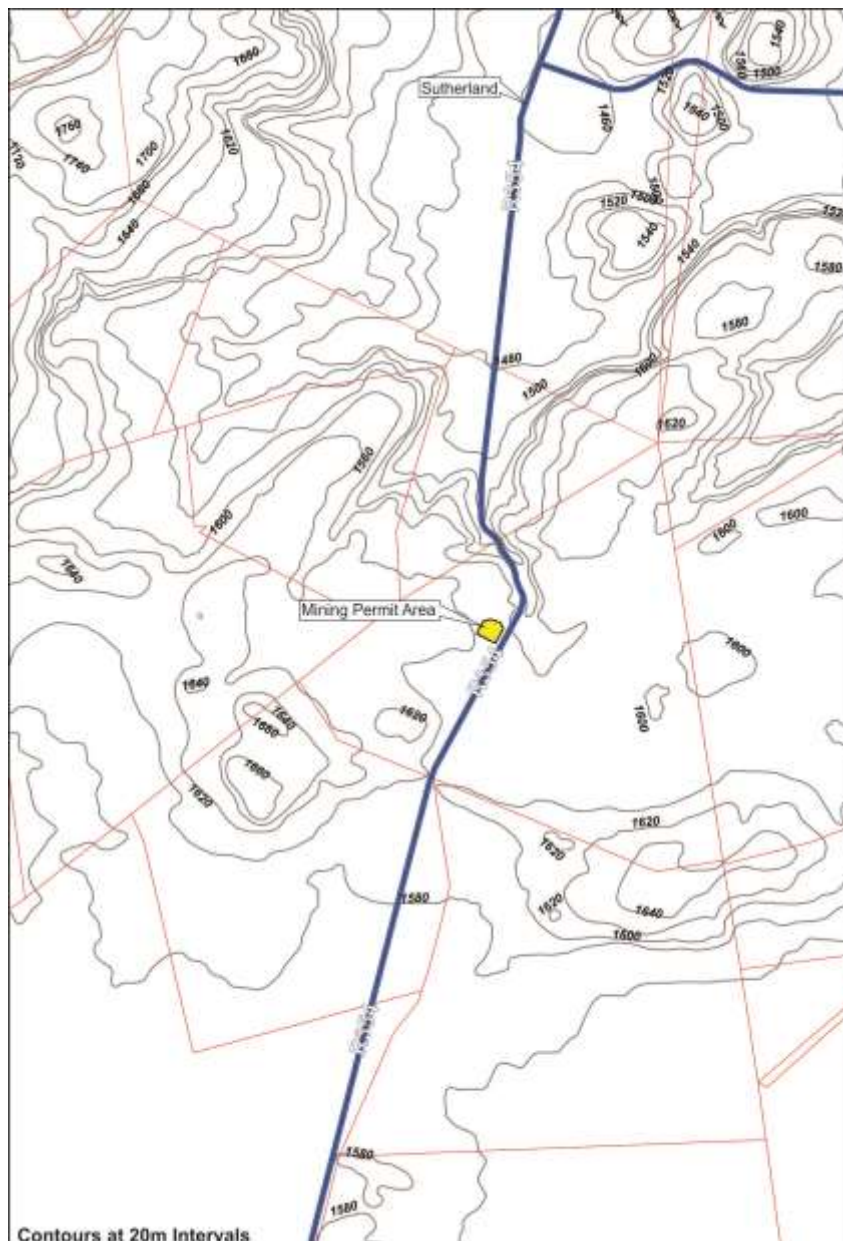


Figure 10: Regional Topography

14.1.2 Visual Impact

Refer photos 3 to 6 hereafter.

Photos 3 and 4 below reflect the topographic ridge lines as seen looking north and south respectively from the R354, which screen the site surface from direct visual exposure to the road user.



Photo 3: View of the site looking North (Photo: Google Street View)

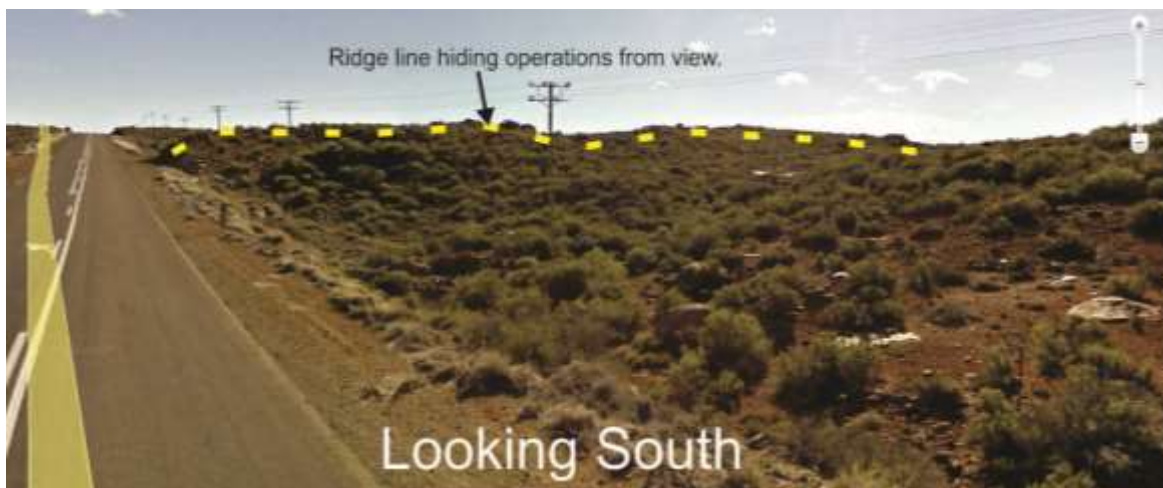


Photo 4: View of the site looking south (Photo: Google Street View)

Photo 5 on which the northern boundary of the mining permit area is superimposed, shows that the plant area will however be exposed to south-bound traffic views.



Photo 5: View of the site looking south-west, with previously proposed plant superimposed (Photo: Google Street View) (NOTE: revision of operational proposal indicates that no plant will be on-site, and as such no visibility as indicated in above photo, with the on-site activities to be limited to only blasting and loading within the excavation)

Photo 6 reflects how the existing road cutting screens the excavation from road views.



Photo 6: View of the site from the R354 road cutting, looking west (Photo: Google Street View)

14.1.3 Soil

As seen in the aerial photo image background to Figure 3, soils are restricted to the veld areas between the many rock outcrops (light coloured areas in image). Typical of weathered dolerite, the soil profile will yield dark upper soils, with moisture retaining clay content, overlying a granular partially weathered dolerite “grit”, both of which will provide good growing medium in quarry rehabilitation and are to be preserved in topsoil berms as per Figure 3, which berms accommodate removal of a minimum 300mm of soil from all areas to be disturbed.

14.1.4 Land Capability

The land is characterised by low agricultural capability (Grazing), with hard rock outcropping over much of the site, and the historic use of the site poorly/not rehabilitated and much in evidence. Refer Photo 1.

14.1.5 Natural Vegetation

While a specialist botanist is to be appointed, we note the following vegetation classification of the site, based on Mucina and Rutherford, 2012:

FRs3 – Roggeveld Shale Renosterveld, Karoo Renosterveld Bioregion.

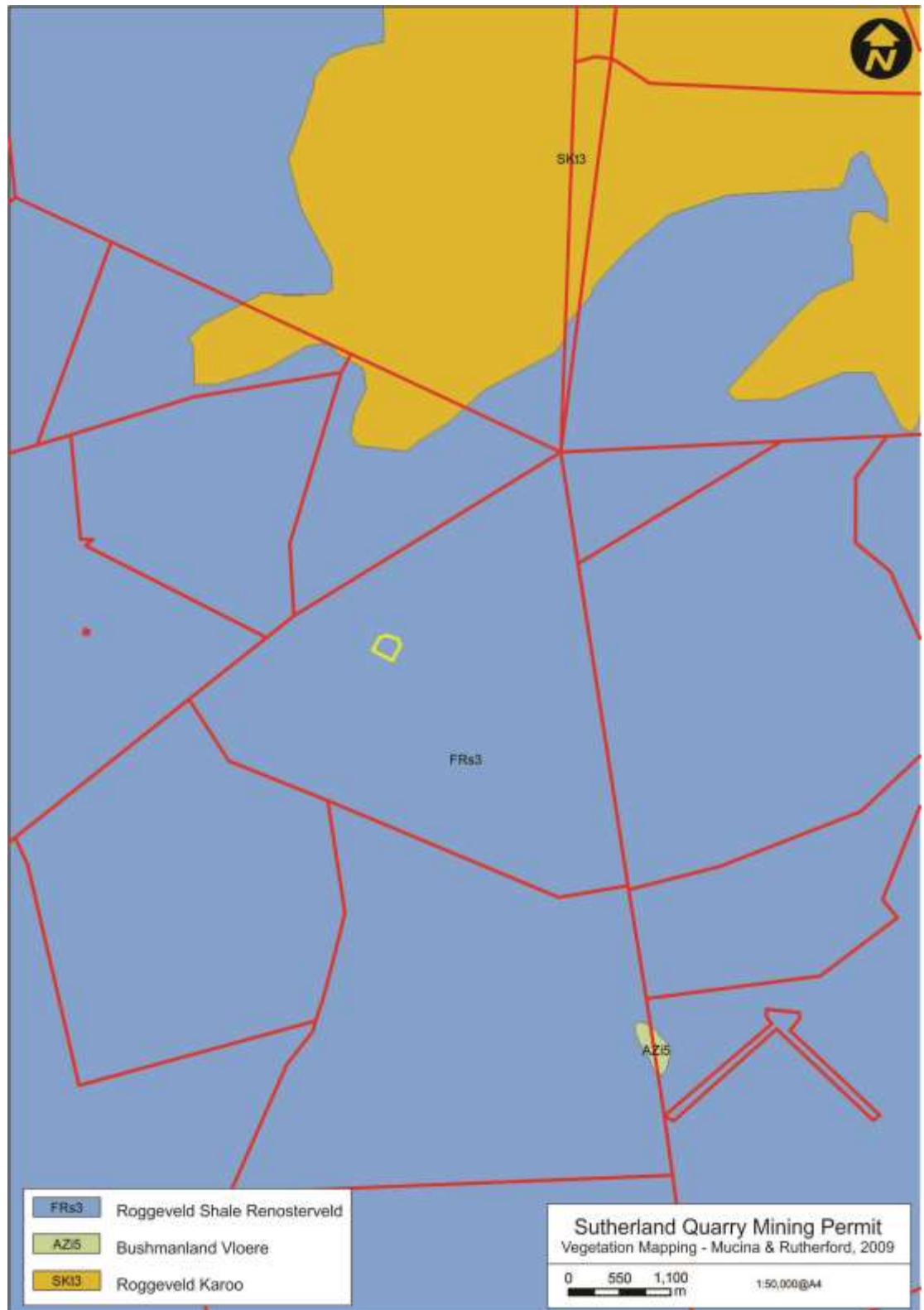


Figure 11: Original vegetation classification of the site, As per Mucina and Rutherford, 2012

14.1.6 Animal Life

Vast expanses of the same habitat surrounding the site provide a habitat suitable for species typical of the area. These include rodents (rats, mice, shrews etc.), reptiles (snakes) birds and insects. The large scale of the habitat type when compared to the extent of the proposed activities negates any significance of any impact in this regard.

Experience at many quarries in which Site Plan Consulting have been involved over the past 30 years reveals the following in respect of **quarrying impact** on mobile wildlife:

- Initial blasting in the short term scares away mammal and bird life but these soon return despite daily crusher and other activity noise and subsequent periodic blasting. (This comment is informed by the fact that a very successful bird park with bird hides visited by members of the Port Elizabeth ornithological clubs reports a broad diversity of species in the rehabilitated valley adjacent to the continued plant and excavation operation at Moregrove Quarry, Eastern Cape.
- Small buck footprints were found daily in the silt deposits in the proximity of the plant of the Outeniqua Quarry in George
- Leopard being sighted within the mining area during the active crushing plant construction period of Palmiet Quarry in the Western Cape, notable for being situated within the Kogelberg Biosphere Reserve
- Fish eagles nest and breed successfully every year in the same Bluegum tree immediately adjacent to the face-advance of Peak Quarry in Eerste River, despite immediately adjacent blasting and the direct line of sight, crusher noise and hauling activities
- Blue crane pairs observed nesting in the post-rehabilitation monitoring the first year following closure of a large “soft rock” calcrete borrow pit near Still Bay.
- Egyptian Geese which live year-round in the old Glencairn Quarry at Fish Hoek, western Cape, and which can be seen remaining unperturbed during and despite the use of the old quarry now being as a Firing Range for the False Bay Sports Shooting Club.
- Visits to temporarily abandoned quarries and old quarries with hard rock faces at numerous sites reveal almost immediate re-use of such sites by dassies and nesting birds (notably raptors, including owls).

14.1.7 Surface Water

The location of the site on a local watershed and hard rock nature of the site under consideration excludes any intrusion of rainfall other than by direct catchment by pending excavation. This status quo will be largely maintained over the Mining area, but such surface flow will be controlled by means of stormwater channels and siltation ponds to allay any potential risk of pollution. Following mining the excavation area itself will catch minimal surface water and its floor will flood to some extent during rainy seasons.

14.1.8 Ground Water

The site is situated on a regional plateau formed by a dolerite sill and deeply incised valley some 500m to the northeast. As such, with mining only contemplated to 10m or possible maximum 20m depth, there is no groundwater consideration on-site.

Only minimal seepage of recently penetrated rainfall through fractures in the rock face is likely to occur after rainfall episodes, adding to the direct catchment of rainfall to seasonally pond in the quarry floor.

14.1.9 Air Quality (Dust)

At present, the existing ambient dust levels are attributed to the following:

- Occasional vehicles on unsurfaced roads in the area
- Minimal agricultural activities surrounding the site (primarily livestock movement)

The consideration of dust in this application relates to two distinct aspects of dust impact, namely that on coarse fallout dust and fine airborne (suspended) dust.

- a. Fallout dust:** ie the coarser, heavier fraction of dust generally associated with dust impact of quarry activities on surrounding users, which dust levels are well recorded in the industry by downwind settling of dust in wet-receiving containers, and measured monthly to be expressed in mg/m²/day.

Given the number of monitoring station results of pre-attenuation and post-attenuation monitoring the reduced levels of fallout dust over distance and the efficiency of attenuation measures in achieving fallout dust reduction are well known to the consulting team and will be considered in the context of the site during the Scoping exercise and the results of this assessment expressed in the Environmental Impact Report (EIR) and circulated to relevant I&APs to whom this information will be important.

- b. Airborne/suspended dust:** ie the very fine fraction, which as opposed to fallout dust, remains suspended in the air for lengthy periods and distances downwind. As this dust fraction is the mining industry's concern regarding lung diseases, its levels of occurrence in the working areas are monitored quantitatively and can serve as the basis for considering the airborne dust emission from the site in respect of the SALT consideration.

It is noted that dust impact is a well-known element which the quarry industry faces and accordingly the industry has developed numerous attenuation measures which it applies under appropriate circumstances to minimise dust impact either in respect of fallout dust or airborne/suspended dust, and in many cases both.

As further background in approaching the matter of dust impact on the SALT, the reader is referred to Figure 12 hereafter which shows the proposed permit site some 16.6km west-southwest of the SALT site, and superimposes the west-south-westerly wind vector under which the SALT is downwind of the quarry site.

As per the wind rose as inset on figure 12 and shown overleaf in detail in extract from the Wind Atlas for South Africa (WASA) , such west-south-westerly winds account for some 10% of wind in the Sutherland area. While the high incidence of west, northwest, northeast and easterly winds amounting to some 60% of winds, will blow quarry generated suspended dust out of the surrounds of the SALT.

Regarding fallout dust: While normal quarry dust is considered within the SANS 1929:2004 Dust Fall Standards and even to the recognition that certain enterprises need to operate within “band 3” by virtue of “the practical operation of the enterprise...” provided that the best available control technology is applied for the duration”, given the dust sensitivity of the site the dust fallout standards hereafter will not be relied upon and the long term target set for the industry of 300mg/m²/day is set as the target for this site which in experience of the consulting team will require the dedicated attention to and application of all available attenuation measures available.

“DUST FALL STANDARDS SANS 1929:2004

4.8 Dust Deposition

4.8.1 General

The four-band scale to be used in the evaluation of dust deposition is given in 4.8.2 and target, alert and action levels indicated in 4.8.3. Permissible margins of tolerance are outlines in 4.8.4 and exceptions noted in 4.8.5

4.8.2 Evaluation Criteria for Dust Deposition

Dust deposition rates shall be expressed in units of mg m² day⁻¹ over a 30-day averaging period. Dust deposition shall be evaluated against a four-band scale as presented in Table 9.

Table 9 – Four-band scale evaluation criteria for dust deposition

Band number	Band description label	DUSTFALL RATE (D) (mg /m ² /day ¹ 30-day average)	Comment
1	Residential	$D < 600$	Permissible for residential and light commercial.
2	Industrial	$600 < D < 1\ 200$	Permissible for heavy commercial and industrial.
3	Action	$1\ 200 < D < 2\ 400$	Requires investigation and remediation if two sequential months lie in this band, or more than three occur in a year.
4	Alert	$2\ 400 < D$	Immediate action and remediation required following the first exceedance. Incident report to be submitted to relevant authority.

4.8.3 Target, Action and Alert Thresholds are given in Table 10

Table 10 – Target, action and alert thresholds for dust deposition

Level	DUSTFALL RATE (D) (mg/ m ² /day ¹ 30-day average)	Averaging period	Permitted frequency of exceedances
Target	300	Annual	
Action residential	500	30 days	Three within any year, no two sequential months
Action industrial	1 200	30 days	Three within any year, no two sequential months.
Alert threshold	2 400	30 days	None. First exceedance requires remediation and compulsory report to authorities.

4.8.4 Margin of Tolerance

An enterprise may submit a request to the authorities to operate within Band 3 (ACTION Band), as specified in Table 9, for a limited period, providing that this is essential in terms of the practical operation of the enterprise (for example the final removal of a tailings deposit) and provided that the best available control technology is applied for the duration.

No margin of tolerance will be granted for operations that result in dust fall rates which fall within Band 4 (ALERT Band) as specified in Table 9.

4.8.5 Exceptions

Dust falls that exceed the specified rates but that can be shown to be the result of some extreme weather or geological event shall be discounted for the purpose of enforcement and control. Such event might typically result in excessive dust fall rates across an entire metropolitan region, and not be localised to a particular operation. Natural seasonal variations, such as dry windy period during the Highveld spring will not be considered extreme events for this definition”

The following wind rose reflects the prevailing wind regime for the area:

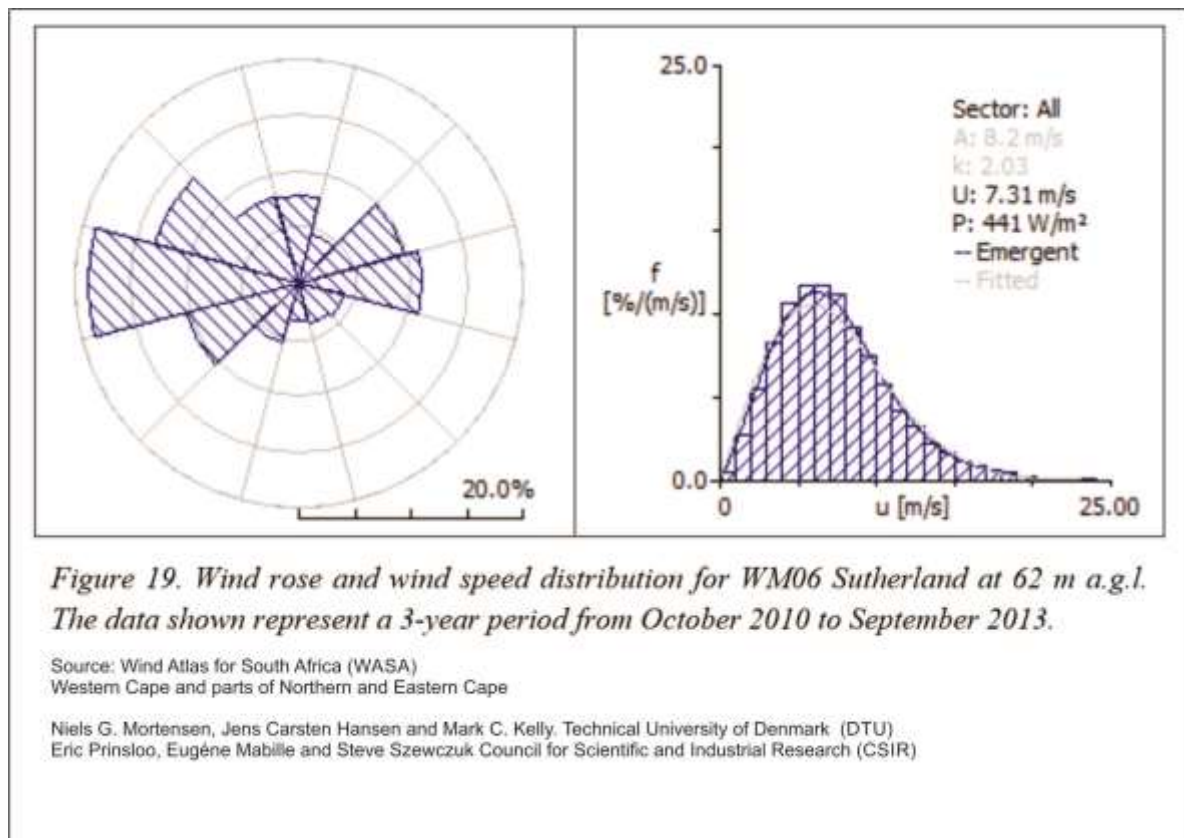


Figure: Wind rose: Sutherland

As background for the reader, the following table outlines where hard rock quarrying dust is generated and what related attenuation measures are applied to such generation activities:

Dust generation activities/areas/points	Related attenuation measures
Site preparation, including dozing of topsoil to berms, delivery road construction, digging of stormwater channels, and construction of the primary ramp.	Pre-wetting of areas prior to earthmoving
Drilling.	All rigs equipped with dust extraction equipment
Blasting (we note that as opposed to sedimentary rocks, dolerite is generally a low dust generator).	Blast design shall be designed to optimize rock fracturing with minimal air blast. Furthermore, blasting can be scheduled for suitable day or time of day when wind favours dispersion of dust away from the SALT.
Loading and hauling of shot rock to crusher.	The blast pile can be wet by fire hose spraying from water cart prior to loading
Crushing and screening. (If in the interest of reduced dust emission quarry production is directed only at concrete aggregate sizes production and not road base coarse, water application will not clog screens and can therefore be liberally used on concrete stone production).	Water sprays and mist sprays on all tipping and conveyer belt transfer points, screens and conveyor discharges to surge pile and stockpiles.
Stockpiling (As above, liberal application of water by sprinklers can be applied to concrete aggregate stockpiles without affecting material quality).	Agricultural-type water sprinklers on stockpiles and removal of non-concrete aggregate production material from site to reduce on-site stockpiles of dust generating materials.
On site maneuvering and dispatch trucking	Combination of water cart wetting of all maneuvering and roadways and sprinkler installations along gravel delivery route and past the weigh bridge.

The following photos illustrate examples of these attenuation measures:



Photo 7: Water truck wetting of maneuvering areas



Photo 8: Sprinkler wetting of transfer and discharge points



Photo 9: Sprinkler system for wetting of haul roads

Reconsideration of on-site activities given dust consideration

In light of the elements discussed above, and through consultation with the Astronomy Management Agency and the South African Astronomical Observatory management team, a vast reduction in on-site activities is being considered, with the originally envisioned

operations to be limited to only blasting and loading of shot rock, with the materials transported directly from site to the construction sites which they will serve and to be further processed at such sites, where such processing activity will pose no potential threat to the SALT.

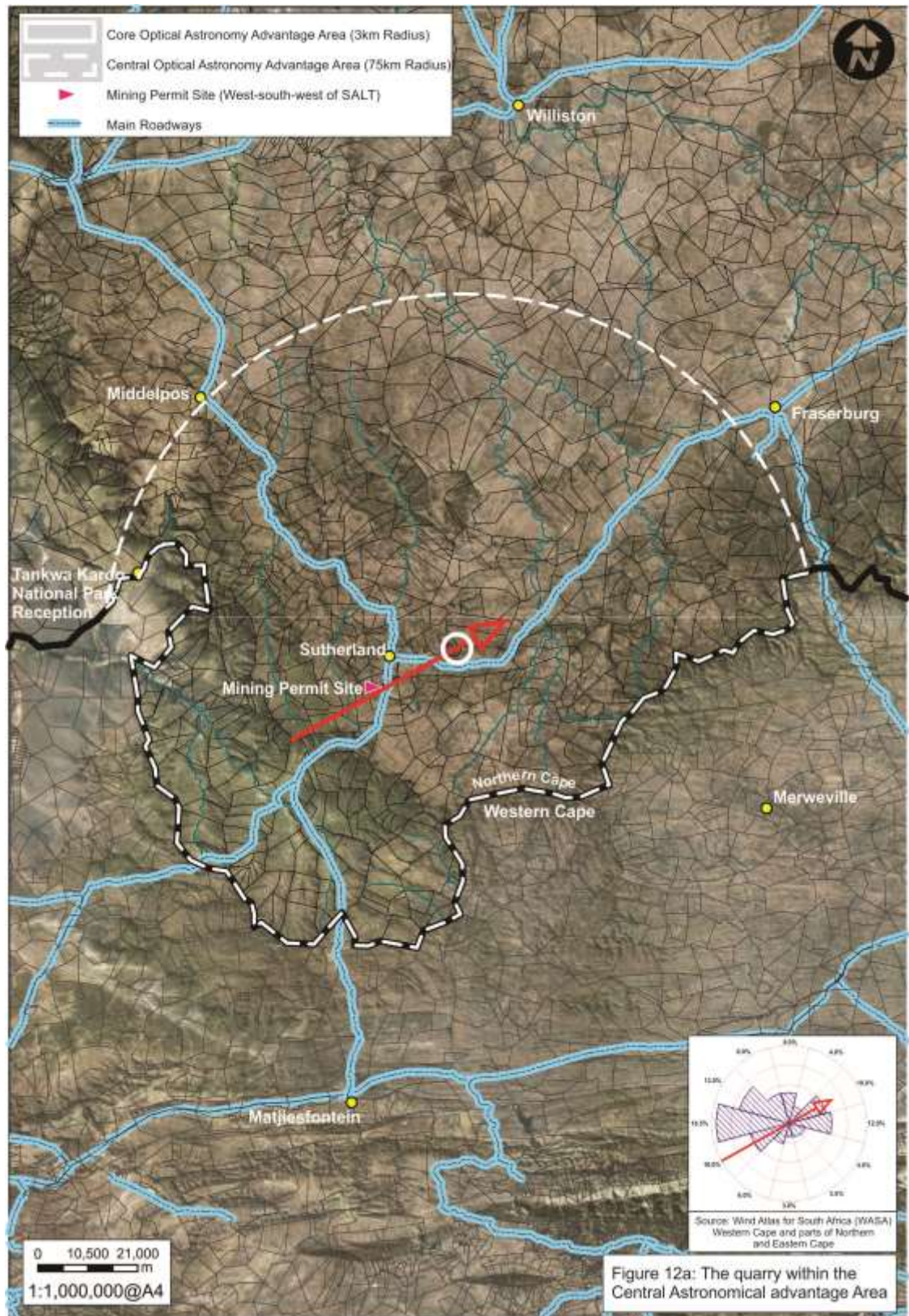


Figure 12: The quarry within the Central Astronomy Advantage Area

14.1.10 Noise

Current noise generating activities in the area are related to:

- Traffic on the directly adjacent R354 tarred public road (Matjiesfontein to Sutherland)
- Minimal agricultural activities

14.1.11 Archaeology/Heritage

In terms of Heritage, the site will be subject to a Notification of Intent to Develop (NID), to be lodged in terms of Section 38 of the National Heritage Act, to South African Heritage Resources Agency (SAHRA).

14.1.12 Traffic (Refer Figure 5)

The R354 directly adjacent to the proposed quarry carries low-traffic volumes.

Scoping will address the following aspects of R354 traffic:

(i) Temporary road closure for blasting

While the quarry is at closest some 70m from the road verge, quarrying at this distance from roads is a common occurrence for roads borrow pits. The primary traffic concern is the risk of fly rock on the road user, with the requirement that given the minimal distance, road closure will be required during times of blasting. Such closures will however occur only at maximum once/month, and will be of short duration (+/-20minutes), and will take place in accordance with the specifications laid down by the roads authority.

The licenced blaster in charge of the blast shall ensure that the road surface is free of fly rock before re-opening the road to traffic.

(ii) Dust impact on the road users

While crusher-generated airborne dust if un-attenuated can impair road user vision downwind of the crusher, in the case of this Sutherland quarry being located in a dust control area under the Astronomy Geographic Advantage Area Act, the level of dust control on the crushing plant will be so high that no dust level capable of causing road user vision impairment will occur.

(iii) Delivery vehicle ingress to and access from the site

The site assessment to date had originally proposed a new access point as shown in Figure 9, to give in excess of 350m unrestricted vertical and horizontal sight distance along the R354 and accordingly roads authority approval for such access point which will directly opposite an existing farm access. However through discussions with land owner representative and with SAAO(SALT) management it is clearly the favoured alternative to retain the existing access and merely upgrade it to better serve heavy traffic, with the placement of flagmen at the intersection during periods of despatch from site. This is to allow limitation of disturbance footprint over the property as well as to fully avoid the denudation of any surfaces which may potentially generate dust long-term.

As such the roads authority will be strongly urged to consider the favoured option of using the existing farm gate close to the quarry.

(iv) Traffic generation

Given the 160km return trip distance for delivery to the construction sites, the return time of trucks will be in the order of 2.5hrs, allowing maximum 4trips per vehicle per day, and using two delivery vehicles, will result in a traffic generation of maximum one (to maximum of two) heavy delivery vehicle/s per hour leaving the site.

While blasting and fly rock is not a current land use, it is listed here given the significance of its impact on the R354 and the activities on immediately surrounding land which are at present not subject to any such risk.

14.1.13 Blast Vibration and fly rock

As blast design is infinitely variable, and the prescriptions for blast impact consideration in mining require such impact to be based on risk, the impact of blast vibration is a factor of both method of blasting (blast design) and distance to affected infrastructure or persons.

The following infrastructure and surrounding uses of land have been identified as being subject to blast vibration and fly rock as shown in Figure 8: Site Planning Informants

- R354 Road at closest 70m from blasting
- The 66kV Eskom power line at closest 135m from blasting
- The 11kV Eskom power line at closest 110m from blasting

At Draft Scoping Level the following can be said:

- Through appropriate blast design **blast vibration can be managed to pose no threat**, based on numerous blast vibration records of other quarries.
- Fly rock** is legally acknowledged as being a potential impact within a radius of up to 500m. As such this operation will not impact on any surrounding farmsteads or other activity centres, but would impact on farm personnel and livestock who may be in close proximity to the quarry at the time of blasting (**which persons will by prescription of the EMP and the blasting regulations have been alerted well in advance of such blast, and the blaster shall ensure that all personnel and livestock are evacuated from the danger zone prior to blasting**).

Given the proximity of the R354 public road, blasting will require the temporary closure of the adjacent public gravel road for the time period immediately prior to and during blasting, ie ± 20 minutes. It is however noted that such blasting is to occur only maximum once/month.

(As the contractor will manage the site and is acquainted with temporary road closure for construction, such envisaged closure will be properly signposted and conducted so as to present no problems).

The quarry manager will notify adjacent landowners/managers of the intended date and time of the next blast in order that:

- i. The residents and personnel outside the danger area can expect the blast, and in so doing the startling effect of the blast by the air blast vibration can be reduced.
- ii. All farm personnel will avoid entering the danger radius during the period of the blast.

In accordance with the blasting code:

- iii. The blaster shall drive along the perimeter fences to inspect the adjacent lands to ensure that there are no persons or livestock within the blast radius
- iv. a hooter/siren will alert all persons in proximity of the pending blast

14.2 Description of the current land uses

No land use is evident over the site, and it is assumed at this stage Draft Scoping Stage that the farm is currently utilised for limited livestock grazing or wilderness use:

The following land uses surround the proposed site (Refer Figure 9).

- Widespread wilderness use and grazing of livestock
- Limited distant intensive agriculture as evidenced by the Aerial Imagery in Figure 9
- The distant Sutherland Golf course and caravan park to the north
- The closest community is that of Sutherland some 5.8km to the north,
- The Closest farmstead is of the adjacent farm 100 portion 1, some 1.5km to the north.
- The Rooikloof guest farm, with farmstead at 1.5km north of the proposed quarry site.
- OF SPECIAL CONSIDERATION: The South African Large Telescope (SALT) is situated 16.6km to the north-east of the site as per Figure 12a.

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

Refer Figure 1, Para 14.1 and 14.2 as well as para 5.

14.4 Environmental and current land use map.

(Show all environmental and current land use features)

Figure 1: Locality Plan	7
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15 Impacts identified

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability and duration of the impacts).

Step one is to identify applicable impacts, as per table below. Second step is to ascribe significance and details as per table thereafter.

(Note: it is currently envisioned that no crushing or screening will take place on site (activities for removal of consideration indicated in red))

Activity. This table identifies potential impacts but does not differentiate between negative or beneficial impacts.	Geology	Topography	Soil/ Topsoil	Visual	Land Capability	Vegetation	Surface Water	Ground Water	Animal Life	Noise	Air Quality (Dust)	Social/ Economic	Archaeology/ Cultural	Hydrocarbon Traffic /Access	Blast vibration	Fly Rock
Application for Mining Permit																
1. Establishment Phase																
1.1. Demarcate use areas, permit boundary, delivery road and fence site and delivery road.																
1.2. Remove topsoil from demarcated to topsoil berms for later re-use.																
1.3. Construct Delivery Road with side and mitre drains and Bell-mouth on R354.																
1.4. Dig Stormwater cut-off channels and detention ponds.																
1.5. Establish steel-bunded diesel tank of <20,000 liters.																
1.6. Establish logistical facilities including office, personal amenities and workshop/store containers. .																
1.7. Construct primary ramp																
1.8. Establish fixed crushing and screening plant (or alternatively mobile tracked plant).																
1.9. Grass seed the topsoil berms.																
1.10. Conduct establishment phase monitoring.																
2. OPERATIONAL PHASE ACTIVITIES																
2.1. Drilling.																
2.2. Blasting.																
2.3. Loading and hauling shot rock to crusher.																
2.4. Crushing and screening. (potential, envisioned to be removed from site consideration)																
2.5. Loading and hauling crushed material to stockpile. (potential, envisioned to be removed from site consideration)																
2.6. Stockpiling. (potential, envisioned to be removed from site consideration)																
2.7. Dispatch loading of delivery vehicles.																
2.8. Delivery over weighbridge to R354.																

Activity. This table identifies potential impacts but does not differentiate between negative or beneficial impacts.		Geology	Topography	Soil/ Topsoil	Visual	Land Capability	Vegetation	Surface Water	Ground Water	Animal Life	Noise	Air Quality (Dust)	Social/ Economic	Archaeology/ Cultural	Hydrocarbon Traffic /Access	Blast vibration	Fly Rock
2.9.	Establish Stormwater pumping sump in excavation floor.																
2.10.	Conduct dust suppression on haul roads and plant.																
2.11.	Refuelling and hydrocarbon management.																
2.12.	Wastewater/conservancy tank management.																
2.13.	Conduct operational phase monitoring.																
2.14.	Operational phase maintenance.																
(v)	Maintain Stormwater system.																
(vi)	Conduct supplementary seeding of berm.																
(vii)	Maintain perimeter and delivery road fences.																
(viii)	Continuous ad hoc eradication of alien vegetation																
3. Decommissioning Activities																	
3.1.	Conduct any required trim blasting to upper safety bench.																
3.2.	Remove all steel plant and structures.																
3.3.	Remove plant concrete footing and retaining wall and stack concrete neatly in north-east excavation floor corner.																
3.4.	Consolidate retained stock neatly in designated area.																
3.5.	Rip/scarify hardened/compacted surfaces.																
3.6.	Spread topsoil from berms over designated areas and upper safety bench.																
3.7.	Construct safety berm and trench around excavation perimeter and install livestock proof fence and danger signpost.																
3.8.	Ensure Stormwater trenches and detention ponds are operational.																
3.9.	Grass seed re-topsoiled areas.																
3.10.	Remove logistical facilities (containers), diesel tank and weighbridge.																
3.11.	Conduct hydrocarbon decontamination.																
3.12.	Remove perimeter fence.																
3.13.	Allow quarry floor to flood as a reed bed during the rainy season (retain haul road for access to floor).																
3.14.	Either retain or remove delivery road (to landowner's decision) by scarification, tops-oiling and grass seeding (retain bell-mouth).																
3.15.	Conduct final performance assessment for closure.																
3.16.	Lodge Closure Application																
4. AFTERCARE PERIOD																	
4.1.	Remove alien vegetation (except pasture species), if present																
4.2.	Monitor revegetation success, with follow-up seeding if required																

		Activity	Nature of impact	Extent	Duration	Probability	Significance	Extent to which impact can cause or be:		
								reversed	irreplaceable loss of resource	avoided, managed or mitigated
Application for Mining Permit										
1. Establishment Phase	Impacts									
1.1. Demarcate use areas, permit boundary, delivery road and fence site and delivery road.	Management									
1.2. Remove topsoil from demarcated to topsoil berms for later re-use.	Soil	Removal of upper topsoil/sands to perimeter stockpile berms	All available topsoil to an average depth of 300mm	Life of mine	Definite	Insignificant given low quality and prescribed re-use	No	If not removed	Refer Paragraph 22.9	
	Visual	Denuded appearance of the site together with active machinery	4.95ha Mining Permit Area	Life of mine	Definite	Insignificant given short term and the minimal visibility of the site	No	No	Refer Paragraph 22.9	
	Land capability	Retention of upper sands(topsoil) for use during rehabilitation	4.95ha Mining Permit Area	Until rehabilitation	Definite	Insignificant given low capability	Yes	No	Refer Paragraph 22.9	
	vegetation	To be fully determined by specialist	4.95ha	Temporary if remediation occurs	Definite	To be fully determined by specialist	To be fully determined by specialist	To be fully determined by specialist	Refer Paragraph 22.9	
	Animal Life	Larger animals will be displaced by the earthmoving activities. Sedentary species should be safely removed as and when encountered	4.95ha Mining Permit Area	Life of mine	Definite	Insignificant	No	No	Refer Paragraph 22.9	
	Noise	Noise generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9	
	Air quality	Dust generated by earthmoving equipment and haul trucks	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes.	No	Refer Paragraph 22.9	
	Archaeology/Cultural	To be fully determined by specialist	4.95ha	Permanent	Definite	To be fully determined by specialist	To be fully determined by specialist	To be fully determined by specialist	Refer Paragraph 22.9	
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9	
1.3. Construct Delivery Road with side and mitre drains and Bell-mouth on R354.	Soil	Removal of upper topsoil/sands to perimeter stockpile berms	All available topsoil to an average depth of	Life of mine	Definite	Insignificant given low quality and prescribed re-use	No	If not removed	Refer Paragraph 22.9	
	Noise	Noise generated by	Local	Duration of	Definite	Insignificant	No	No	Refer Paragraph 22.9	

		earthmoving equipment and haul trucks		activity for life of mine		(None on surrounding land users)			
	Air quality	Dust generated by earthmoving equipment and haul trucks	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes.	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
1.4. Dig Stormwater cut-off channels and detention ponds.	Surface Water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	4.95ha Mining Permit Area and surrounds	Life of mine	Definite	Significant mitigation measure	Yes	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
1.5. Establish steel-bunded diesel tank of <20,000 liters.	Surface water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	4.95ha Mining Permit Area and surrounds	Life of mine	Definite	Significant mitigation measure	Yes	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
1.6. Establish logistical facilities including office, personal amenities and workshop/store containers. .	Visual	active machinery and equipment on site	4.95ha Mining Permit Area	Life of mine	Definite	Insignificant given short term and the minimal visibility of the site	No	No	Refer Paragraph 22.9
	Surface water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	4.95ha Mining Permit Area and surrounds	Life of mine	Definite	Significant mitigation measure	Yes	No	Refer Paragraph 22.9
1.7. Construct primary ramp (potential, envisioned to be removed from site consideration)	Visual	Active machinery and equipment on site	4.95ha Mining Permit Area	Life of mine	Definite	Insignificant given short term and the minimal visibility of the site	No	No	Refer Paragraph 22.9
	Noise	Noise generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9
	Air quality	Dust generated by earthmoving equipment and haul	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes.	No	Refer Paragraph 22.9

		trucks							
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
1.8. Establish fixed crushing and screening plant (or alternatively mobile tracked plant). (potential, envisioned to be removed from site consideration)	Visual								Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
1.9. Grass seed the topsoil berms.	Soil	Decreases timeframe for revegetation	Berms	Until rehabilitation	Definite	Positive	Yes	No	Refer Paragraph 22.9
	Vegetation	Decreases timeframe for revegetation	Berms	Until rehabilitation	Definite	Positive	Yes	No	Refer Paragraph 22.9
	Air quality (dust)	Limits dust generation	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes	No	Refer Paragraph 22.9
1.10. Conduct establishment phase monitoring.	Ensures compliance in all aspects								
2. OPERATIONAL PHASE ACTIVITIES	Impacts								
2.1. Drilling.	Noise	Noise generated by drilling equipment	Local	Ad hoc during life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9
	Air quality	Dust generated by earthmoving equipment and haul trucks	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes.	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
2.2. Blasting.	topography	General lowering of the altitudinal profile of the site	Excavation edges and floors	Permanent	Definite	Significant	NA		Refer Paragraph 22.9
	Noise	Widespread startling effect of blast on surrounding land users	Widespread Surrounds	Temporary – short term, once/twice per month	Definite	Significant	No	No	Refer Paragraph 22.9
	Air quality	Dust generated by blasting	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes	No	Refer Paragraph 22.9
	Traffic Access	Mitigation measure – Closure of public road to prevent damage to public							Refer Paragraph 22.9
	Blast vibration	Structural damage to infrastructure	Widespread : +-500m	Ad hoc during life of mine	Potential	Significant	Yes	No	Refer Paragraph 22.9

			radius						
	Fly rock	Damage to infrastructure, danger to persons, livestock	Widespread: Max 500m	Ad hoc during life of mine	Potential	Significant	Yes	No	Refer Paragraph 22.9
2.3. Loading and hauling shot rock to crusher. (potential, envisioned to be removed from site consideration)	Noise	Noise generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9
	Air quality	Dust generation	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
2.4. Crushing and screening. (potential, envisioned to be removed from site consideration)	Noise	Noise generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9
	Air quality	Dust generation	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
2.5. Loading and hauling crushed material to stockpile. (potential, envisioned to be removed from site consideration)	Noise	Noise generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9
	Air quality	Dust generated by earthmoving equipment and haul trucks	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes.	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
2.6. Stockpiling. (potential, envisioned to be removed from site consideration)	Noise	Noise generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9
	Air quality	Dust generated by earthmoving equipment and haul trucks	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes.	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
2.7. Dispatch loading of	Noise	Noise generated by	Local	Duration of	Definite	Insignificant	No	No	Refer Paragraph 22.9

delivery vehicles.		earthmoving equipment and haul trucks		activity for life of mine		(None on surrounding land users)			
	Air quality	Dust generated by earthmoving equipment and haul trucks	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
2.8. Delivery over weighbridge to R354.	Noise	Noise generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9
	Air quality	Dust generated by earthmoving equipment and haul trucks	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes.	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
	Traffic Access	Increases safety	Adjacent R354 road	Life of mine	Definite	insignificant	Yes	No	Refer Paragraph 22.9
2.9. Establish Stormwater pumping sump in excavation floor.	Surface water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	4.95ha Mining Permit Area and surrounds	Life of mine	Definite	Significant mitigation measure	Yes	No	Refer Paragraph 22.9
2.10. Conduct dust suppression on haul roads and plant.	Surface water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	4.95ha Mining Permit Area and surrounds	Life of mine	Definite	Significant mitigation measure	Yes	No	Refer Paragraph 22.9
	Air quality	Positive mitigation measure – alleviates dust levels	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Positive	NA	NA	Refer Paragraph 22.9
2.11. Refuelling and hydrocarbon management.	Surface water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	4.95ha Mining Permit Area and surrounds	Life of mine	Definite	Significant mitigation measure	Yes	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
2.12. Wastewater/conservancy tank management.	Surface water	Control of surface water runoff and	4.95ha Mining	Life of mine	Definite	Significant mitigation	Yes	No	Refer Paragraph 22.9

		removal of potential for siltation/pollution of natural drainage channels	Permit Area and surrounds			measure			
2.13. Conduct operational phase monitoring.	Management								
2.14. Operational phase maintenance.	Management								
· Maintain Stormwater system.	Surface water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	4.95ha Mining Permit Area and surrounds	Life of mine	Definite	Significant mitigation measure	Yes	No	Refer Paragraph 22.9
· Conduct supplementary seeding of berm.	Vegetation	Decreases timeframe for rehabilitation	4.95ha Mining Area	Ad hoc during 1-year maintenance period	Possible if required	Significant	Yes	No	Refer Paragraph 22.9
	Air quality	Limits dust generation	4.95ha Mining Area	Ad hoc during 1-year maintenance period	Possible if required	Potentially significant	Yes	No	Refer Paragraph 22.9
· Maintain perimeter and delivery road fences.	Management								
· Continuous ad hoc eradication of alien vegetation	Vegetation	Alien vegetation eradication	4.95ha Mining Area	Ad hoc during 1-year maintenance period	Possible if required	Significant	Yes	No	Refer Paragraph 22.9
3. Decommissioning Activities	Impacts								
3.1 Conduct any required trim blasting to upper safety bench.	Noise	Widespread startling effect of blast on surrounding land users	Widespread Surrounds	Temporary – short term, once/twice per month	Definite	Significant	No	No	Refer Paragraph 22.9
	Air quality	Dust generated by blasting	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes	No	Refer Paragraph 22.9
	Traffic Access	Mitigation measure – Closure of public road to prevent damage to public							Refer Paragraph 22.9
	Blast vibration	Structural damage to infrastructure	Widespread : +-500m radius	Ad hoc during life of mine	Potential	Significant	Yes	No	Refer Paragraph 22.9
	Fly rock	Damage to infrastructure, danger to persons, livestock	Widespread: Max 500m	Ad hoc during life of mine	Potential	Significant	Yes	No	Refer Paragraph 22.9
3.2. Remove all steel plant and structures.	Management								
3.3. Remove plant concrete footing and retaining wall and stack concrete neatly in north-east excavation floor corner.	Noise	Noise generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9
	Air quality	Dust generated by earthmoving equipment and haul trucks	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes.	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if	Fully	No	Refer Paragraph 22.9

						remediated	reversible		
3.4. Consolidate retained stock neatly in designated area.	Noise	Noise generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9
	Air quality	Dust generated by earthmoving equipment and haul trucks	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes.	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
3.5. Rip/scarify hardened/compacted surfaces.	Noise	Noise generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9
	Air quality	Dust generation	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
3.6. Spread topsoil from berms over designated areas and upper safety bench.	Noise	Noise generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9
	Air quality	Dust generated by earthmoving equipment and haul trucks	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes.	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
3.7. Construct safety berm and trench around excavation perimeter and install livestock proof fence and danger signpost.	Noise	Noise generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9
	Air quality	Dust generated by earthmoving equipment and haul trucks	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes.	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
3.8. Ensure Stormwater trenches and detention ponds are operational.	Surface water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	4.95ha Mining Permit Area and surrounds	Life of mine	Definite	Significant mitigation measure	Yes	No	Refer Paragraph 22.9
3.9. Grass seed re-topsoiled areas.	land capability	Reduces timeframe for vegetation reestablishment	4.95ha Mining Permit Area	Until rehabilitation	Definite	Insignificant given low capability	Yes	No	Refer Paragraph 22.9
	vegetation	Reduces timeframe for vegetation reestablishment	4.95ha Mining Permit Area	Until rehabilitation	Definite	Insignificant given low capability	Yes	No	Refer Paragraph 22.9
	Air quality (dust)	Dust generation	Local and SALT at 16.6km	Duration of activity for life of mine	Definite	Potentially significant	Yes	No	Refer Paragraph 22.9
3.10. Remove logistical	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if	Fully	No	Refer Paragraph 22.9

facilities (containers), diesel tank and weighbridge.						remediated	reversible		
3.11. Conduct hydrocarbon decontamination.	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
3.12. Remove perimeter fence.	Management								Refer Paragraph 22.9
3.13. Allow quarry floor to flood as a reed bed during the rainy season (retain haul road for access to floor).	Surface water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	4.95ha Mining Permit Area and surrounds	Life of mine	Definite	Significant mitigation measure	Yes	No	Refer Paragraph 22.9
3.14. Either retain or remove delivery road (to landowner's decision) by scarification, tops-oiling and grass seeding (retain bell-mouth). (If retain no impact)	Visual	Denuded aspect if not maintained	Haul road	Temporary if removed	Potential	Insignificant	Yes	No	Refer Paragraph 22.9
	Land capability	Loss of land capability	1.3ha excavation Area	Permanent	Definite	Insignificant given low capability	Yes	No	Refer Paragraph 22.9
	vegetation	Loss of vegetation	1.3ha excavation Area	Permanent	Definite	Insignificant given low capability	Yes	No	Refer Paragraph 22.9
	Noise	Noise generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Insignificant (None on surrounding land users)	No	No	Refer Paragraph 22.9
	Air quality	Dust generated by earthmoving equipment and haul trucks	Local	Duration of activity for life of mine	Definite	Potentially significant	Yes.	No	Refer Paragraph 22.9
	Hydrocarbon	Potential Hydrocarbon leaks	Local	Until clean-up	Possible	Insignificant if remediated	Fully reversible	No	Refer Paragraph 22.9
3.15. Conduct final performance assessment for closure.	Ensures compliance in all aspects								
3.16. Lodge Closure Application	Ensures compliance in all aspects								
4. AFTERCARE PERIOD	Impacts								
4.1. Remove alien vegetation (except pasture species), if present	Land capability	Alien vegetation eradication	4.95ha Mining Area	Ad hoc during 1-year maintenance period	Possible if required	Significant	Yes	No	Refer Paragraph 22.9
	Vegetation	Alien vegetation eradication	4.95ha Mining Area	Ad hoc during 1-year maintenance period	Possible if required	Significant	Yes	No	Refer Paragraph 22.9
4.2. Monitor revegetation success, with follow-up seeding if required	Land capability	Full re-topsoiling with suitable material, followed by reseeding	4.95ha Mining Area	Ad hoc during 1-year maintenance period	Possible if required	Significant	Yes	No	Refer Paragraph 22.9
	Vegetation	Full re-topsoiling with suitable material, followed by reseeding	4.95ha Mining Area	Ad hoc during 1-year maintenance period	Possible if required	Significant	Yes	No	Refer Paragraph 22.9
	Air quality (dust)	Limits dust generation	4.95ha Mining Area	Ad hoc during 1-year maintenance period	Possible if required	Potentially significant	Yes	No	Refer Paragraph 22.9

16 Methodology used in determining the significance of environmental impacts

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

As an Application for the authorization of Mining activities, the first and foremost consideration is that of mining being a **place-bound activity**, reliant fully on the local geology and suitability of the site for mineral beneficiation.

The locality of the Site must thus be considered within this consideration together with the Mining Legislation which requires that an area is demarcated for Application prior to provision of any documentation, which area is then fixed and which does not offer option for revision once the Application process has commenced.

Given the above, a full assessment of the site prior to application is of utmost importance, and, full aspects of the site were assessed to guide the Site locality prior to Application, inclusive of geology, Social, and environmental considerations, and acting as an assessment of constraints, opportunities and feasibility of the envisioned development.

As the Mineral Legislation does not favour advertising of the project for public input prior to the Application, the pre-Application assessment will be herewith strengthened with further inputs from Interested and Affected Parties, but was based on specialist inputs from commencement.

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

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

All potential impacts of the operation have been addressed to date in paragraphs 14 and 15.

All comment regarding revision of the originally indicated Site Layout are currently assessed and the revision being conducted as indicated in figures 3 and 4.

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

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

Refer Paragraph 22.9.

Reconsideration of on-site activities given dust consideration

In light of the elements discussed, and through consultation with the Astronomy Management Agency and the South African Astronomical Observatory management team, a vast reduction in on-site activities is being considered, with the originally envisioned operations to be limited to only blasting and loading of shot rock, and with the materials transported directly from site

to the construction sites which they will serve to be further processed at such sites, where such processing activity will pose no potential threat to the SALT.

Additionally, given dust generation considerations and the wishes of the land owner, strong preference is given the the use of the existing access gate but with upgraded intersection, and flagmen placed during despatch activities.

19 The outcome of the site selection Matrix. Final Site Layout Plan

(Provide a final site layout plan as informed by the process of consultation with interested and affected parties)

Refer para 18 above. The site Layout is currently under revision and will be finalised for inclusion in the pending EIR-EMPr.

20 Motivation where no alternative sites were considered.

Not applicable.

21 Statement motivating the preferred site.

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

Refer Paragraph 11 and 12.

22 Plan of study for the Environmental Impact Assessment process

22.1 Description of alternatives to be considered including the option of not going ahead with the activity.

The sole alternative to the sought mining operation would be that of not proceeding with the operation. The considerations in respect of this option are discussed in paragraphs 9-12.

22.2 Description of the aspects to be assessed as part of the environmental impact assessment process

(The EAP must undertake to assess the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, Loading, hauling and transport, and mining activities such as Excavations, stockpiles, discard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)

The following activities and environmental aspects thereof will continue to be assessed during the EIA process:

1. Establishment Phase	Impacts	Was it provisionally assessed in the Draft Scoping Report	Status in the Final Scoping report
1.1. Demarcate use areas, permit boundary, delivery road and fence site and delivery road.	NA	NA	NA
1.2. Remove topsoil from demarcated to topsoil berms for later re-use.	Soil	Yes. Refer Part 15	No changes as yet

	Visual	Yes. Refer Part 15	No changes as yet
	Land capability	Yes. Refer Part 15	No changes as yet
	vegetation	Yes. Refer Part 15	No changes as yet
	Animal Life	Yes. Refer Part 15	No changes as yet
	Noise	Yes. Refer Part 15	No changes as yet
	Air quality	Yes. Refer Part 15	No changes as yet
	Archaeology/Cultural	Yes. Refer Part 15	No changes as yet
	Hydrocarbon	Yes. Refer Part 15	No changes as yet
1.3. Construct Delivery Road with side and mitre drains and Bell-mouth on R354.	Noise	Yes. Refer Part 15	Under Revision
	Soil	Yes. Refer Part 15	Under Revision
	Air quality	Yes. Refer Part 15	Under Revision
	Hydrocarbon	Yes. Refer Part 15	Under Revision
1.4. Dig Stormwater cut-off channels and detention ponds.	Surface Water	Yes. Refer Part 15	No changes as yet
	Hydrocarbon	Yes. Refer Part 15	No changes as yet
1.5. Establish steel-bunded diesel tank of <20,000 litres.	Surface water	Yes. Refer Part 15	No changes as yet
	Hydrocarbon	Yes. Refer Part 15	No changes as yet
1.6. Establish logistical facilities including office, personal amenities and workshop/store containers. .	Visual	Yes. Refer Part 15	No changes as yet
	Surface water	Yes. Refer Part 15	No changes as yet
1.7. Construct primary ramp	Visual	Yes. Refer Part 15	Under Revision
	Noise	Yes. Refer Part 15	Under Revision
	Air quality	Yes. Refer Part 15	Under Revision
	Hydrocarbon	Yes. Refer Part 15	Under Revision
1.8. Establish fixed crushing and screening plant (or alternatively mobile tracked plant).	Visual	Yes. Refer Part 15	Under Revision
	Hydrocarbon	Yes. Refer Part 15	Under Revision
1.9. Grass seed the topsoil berms.	Soil	Yes. Refer Part 15	No changes as yet
	Air quality (dust)	Yes. Refer Part 15	No changes as yet
	Vegetation	Yes. Refer Part 15	No changes as yet
1.10. Conduct establishment phase monitoring.	Ensures compliance in all aspects	Yes. Refer Part 15	No changes as yet
2. OPERATIONAL PHASE ACTIVITIES	Impacts	Was it provisionally assessed in the Draft Scoping Report	Status in the Final Scoping report
2.1. Drilling.	Noise	Yes. Refer Part 15	No changes as yet
	Air quality	Yes. Refer Part 15	No changes as yet
	Hydrocarbon	Yes. Refer Part 15	No changes as yet
2.2. Blasting.	Topography	Yes. Refer Part 15	No changes as yet
	Noise	Yes. Refer Part 15	No changes as yet
	Air quality	Yes. Refer Part 15	No changes as yet

			yet
	Traffic Access	Yes. Refer Part 15	No changes as yet
	Blast vibration	Yes. Refer Part 15	No changes as yet
	Fly rock	Yes. Refer Part 15	No changes as yet
2.3. Loading and hauling shot rock to crusher.	Noise	Yes. Refer Part 15	Under Revision
	Air quality	Yes. Refer Part 15	Under Revision
	Hydrocarbon	Yes. Refer Part 15	Under Revision
2.4. Crushing and screening.	Noise	Yes. Refer Part 15	Under Revision
	Air quality	Yes. Refer Part 15	Under Revision
	Hydrocarbon	Yes. Refer Part 15	Under Revision
2.5. Loading and hauling crushed material to stockpile.	Noise	Yes. Refer Part 15	Under Revision
	Air quality	Yes. Refer Part 15	Under Revision
	Hydrocarbon	Yes. Refer Part 15	Under Revision
2.6. Stockpiling.	Noise	Yes. Refer Part 15	Under Revision
	Air quality	Yes. Refer Part 15	Under Revision
	Hydrocarbon	Yes. Refer Part 15	Under Revision
2.7. Dispatch loading of delivery vehicles.	Noise	Yes. Refer Part 15	No changes as yet
	Air quality	Yes. Refer Part 15	No changes as yet
	Hydrocarbon	Yes. Refer Part 15	No changes as yet
2.8. Delivery over weighbridge to R354.	Noise	Yes. Refer Part 15	No changes as yet
	Air quality	Yes. Refer Part 15	No changes as yet
	Hydrocarbon	Yes. Refer Part 15	No changes as yet
	Traffic Access	Yes. Refer Part 15	No changes as yet
2.9. Establish Stormwater pumping sump in excavation floor.	Surface water	Yes. Refer Part 15	No changes as yet
2.10. Conduct dust suppression on haul roads and plant.	Surface water	Yes. Refer Part 15	No changes as yet
	Air quality	Yes. Refer Part 15	No changes as yet
2.11. Refuelling and hydrocarbon management.	Surface water	Yes. Refer Part 15	No changes as yet
	Hydrocarbon	Yes. Refer Part 15	No changes as yet
2.12. Wastewater/conservancy tank management.	Surface water	Yes. Refer Part 15	No changes as yet
2.13. Conduct operational phase monitoring.	Ensures compliance in all aspects	Yes. Refer Part 15	No changes as yet
2.14. Operational phase maintenance.	Ensures compliance in all aspects	Yes. Refer Part 15	No changes as yet
· Maintain Stormwater system.	Surface water	Yes. Refer Part 15	No changes as yet
· Conduct supplementary seeding of berm.	Vegetation	Yes. Refer Part 15	No changes as yet
	Air quality (Dust)	Yes. Refer Part 15	No changes as yet
· Maintain perimeter and delivery road fences.	Management	NA	No changes as yet
· Continuous ad hoc eradication of alien vegetation	Vegetation	Yes. Refer Part 15	No changes as yet
3. Decommissioning Activities	Impacts	Was it provisionally	Status in the

		assessed in the Draft Scoping Report	Final Scoping report
3.1. Conduct any required trim blasting to upper safety bench.	Noise	Yes. Refer Part 15	No changes as yet
	Air quality	Yes. Refer Part 15	No changes as yet
	Blast vibration	Yes. Refer Part 15	No changes as yet
	Fly rock	Yes. Refer Part 15	No changes as yet
	traffic Access	Yes. Refer Part 15	No changes as yet
3.2. Remove all steel plant and structures.	Management	NA	Under revision
3.3. Remove plant concrete footing and retaining wall and stack concrete neatly in north-east excavation floor corner.	Noise	Yes. Refer Part 15	Under revision
	Air quality	Yes. Refer Part 15	Under revision
	Hydrocarbon	Yes. Refer Part 15	Under revision
3.4. Consolidate retained stock neatly in designated area.	Noise	Yes. Refer Part 15	Under revision
	Air quality	Yes. Refer Part 15	Under revision
	Hydrocarbon	Yes. Refer Part 15	Under revision
3.5. Rip/scarify hardened/compacted surfaces.	Noise	Yes. Refer Part 15	No changes as yet
	Air quality	Yes. Refer Part 15	No changes as yet
	Hydrocarbon	Yes. Refer Part 15	No changes as yet
3.6. Spread topsoil from berms over designated areas and upper safety bench.	Noise	Yes. Refer Part 15	No changes as yet
	Air quality	Yes. Refer Part 15	No changes as yet
	Hydrocarbon	Yes. Refer Part 15	No changes as yet
3.7. Construct safety berm and trench around excavation perimeter and install livestock proof fence and danger signpost.	Noise	Yes. Refer Part 15	No changes as yet
	Air quality	Yes. Refer Part 15	No changes as yet
	Hydrocarbon	Yes. Refer Part 15	No changes as yet
3.8. Ensure Stormwater trenches and detention ponds are operational.	Surface water	Yes. Refer Part 15	No changes as yet
3.9. Grass seed re-topsoiled areas.	land capability	Yes. Refer Part 15	No changes as yet
	Air quality (dust)	Yes. Refer Part 15	No changes as yet
	vegetation	Yes. Refer Part 15	No changes as yet
3.10. Remove logistical facilities (containers), diesel tank and weighbridge.	Hydrocarbon	Yes. Refer Part 15	No changes as yet
3.11. Conduct hydrocarbon decontamination.	Hydrocarbon	Yes. Refer Part 15	No changes as yet
3.12. Remove perimeter fence.	Management	NA	No changes as yet
3.13. Allow quarry floor to flood as a reed bed during the rainy season (retain haul road for access to floor).	Surface water	Yes. Refer Part 15	No changes as yet
3.14. Either retain or remove delivery road (to landowner's decision) by scarification, tops-oiling and grass seeding (retain bell-mouth).	Visual	Yes. Refer Part 15	No changes as yet
	Land capability	Yes. Refer Part 15	No changes as yet
	vegetation	Yes. Refer Part 15	No changes as yet
	Noise	Yes. Refer Part 15	No changes as yet

			yet
	Air quality	Yes. Refer Part 15	No changes as yet
	Hydrocarbon	Yes. Refer Part 15	No changes as yet
3.15. Conduct final performance assessment for closure.	Ensures compliance in all aspects	NA	NA
3.16. Lodge Closure Application	Ensures compliance in all aspects	NA	NA
4. AFTERCARE PERIOD	Impacts	Was it provisionally assessed in the Draft Scoping Report	Status in the Final Scoping report
4.1. Remove alien vegetation (except pasture species), if present	Land capability	Yes. Refer Part 15	No changes as yet
	Vegetation	Yes. Refer Part 15	No changes as yet
4.2. Monitor revegetation success, with follow-up seeding if required	Land capability	Yes. Refer Part 15	No changes as yet
	Air quality (dust)	Yes. Refer Part 15	No changes as yet
	Vegetation	Yes. Refer Part 15	No changes as yet

22.3 Description of aspects to be assessed by specialists

The following specialists will be tasked with the studies to include the tabulated items (amongst others) in their brief:

Specialist field of study	Tasks to be undertaken/ Aspects covered in study	Has it been included in Final Scoping report / Status as at Final Scoping report
Air Quality (Dust)	Assessment of Dust in preparation of the assessment report to the AMA	Conducted herein and site operational revision underway, in consultation with AMA and SAAO
Heritage	Heritage practitioner has been tasked to prepare an assessment of the site	To be appended to documentation once received
Vegetation	Specialist Botanist has been tasked with a study to describe existing on site vegetation, to additionally assess the CBA mapping accuracy of the site, and then to provide inputs to rehabilitation / restoration methodology.	To be appended to documentation once received

22.4 Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

In this Scoping report the environmental aspects have been assessed based on the experience of the report compilers (Refer CV in Appendix 1 & 2). These will be further assessed and refined in the following ways:

- Consultation with / Call for comments from all Interested and Affected Parties (I&AP's)
- Call for specialist studies to include assessment on specific environmental elements.

The results of such further assessments are included in this Final Scoping Report and will be included in the pending EIR/EMP.

22.5 The proposed method of assessing duration and significance

As per Para 22.4.

22.6 The stages at which the competent authority will be consulted

The draft Scoping report was submitted to relevant State Departments. This final Scoping report is submitted to the competent authority (DMR) and such report contains the full details and results of the initial public participation as at date of lodgement. All further inputs will be forwarded to the DMR for appending to the Scoping Report as received.

The competent authority will decide on the implementation of the Plan of Study. If the applicant is given the go ahead to continue, then the EIA and EMP will be subject to public participation and finally lodged to the competent authority.

22.7 Particulars of the public participation process with regard to the Impact Assessment process that will be conducted

22.7.1 Steps to be taken to notify interested and affected parties

(These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h) (ii) herein).

Notification of I&AP's will take place in a system relative to their expected input as follows:

- 1) Landowner and adjacent surrounding land owners: Through personal consultation, telephonic, and provision of Draft Scoping Reports as background information.
- 2) General public: Through advertisement in local press, documentation prepared for perusal at the local public library, and Notice placed at entrance of application property
- 3) In addition, the relevant Government Departments will be contacted by Registered Mail in respect of the proposed project.

Note that all parties will have full access to the Scoping report and EIR/EMP (in final or draft form depending on timing of consultation).

22.7.2 Details of the engagement process to be followed.

(Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings and records of such consultation will be required in the EIA at a later stage).

All parties (except landowner and State Departments) will have to register their interest in the matter. This registration continues from now until finalisation of the EIR/EMP. (Land owner and State Departments will be deemed to be registered I&AP's)

All registered I&AP's will be kept abreast of the application and will be supplied with all relevant documentation as well as consultations (one on one), if they so wish.

All commenting periods will exceed 30 days as per the NEMA Regulations.

22.7.3 Description of the information to be provided to Interested and Affected Parties.

(Information to be provided must include the initial site plan and sufficient detail of the intended

operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land).

The information presented will depend on timing. Initially, the draft scoping report served as the basis for comment, followed by the draft EIA/EMP which when compiled will form the basis of consultation.

22.8 Description of the tasks that will be undertaken during the environmental impact assessment process.

The following tasks will need to be undertaken during the EIA process:

- Public participation will proceed as transparently and all-inclusive as possible. If the interest is sufficient then a Public Open Day will be held and if not, then all registered I&AP's will be kept informed and provided several opportunities to comment.
- Draft EIA / EMP will be compiled as basis for further consultation
- Specialist studies will be completed with the following required at this stage (this list may be modified as a result of public participation):
 - Botanist (despite the fact that very little indigenous vegetation is in place in the proposed affected areas)
 - Archaeology / Heritage: Heritage Practitioner has been requested to submit a specialist assessment

22.9 Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

1. Establishment Phase	Impacts	Mitigation Type	Potential for residual risk
1.1. Demarcate use areas, permit boundary, delivery road and fence site and delivery road.	NA	Management Measure	Reduces risk of exceeding established boundaries and Reduces risk of damaging sensitive natural vegetation
1.2. Remove topsoil from demarcated to topsoil berms for later re-use.	Soil	Retention of upper sands(topsoil) for use during rehabilitation	Yes, loss of topsoil will cause delayed onset of rehabilitation, and incur large costs involved with sources of imported soils
	Visual	Not Applicable during operation given Short term impact from limited visual envelope. Long term, full implementation of rehabilitation	None following rehabilitation
	Land capability	Retention of upper sands(topsoil) for use during rehabilitation	Insignificant loss of low land capability
	vegetation	To be assessed by specialist	To be assessed by specialist
	Animal Life	Search and rescue of sedentary species	None, change in habitat type but no preclusion of influx of animal life following mining
	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours (8am-pm)	None
	Air quality	Pre-wetting of areas prior to earthmoving	Potential if left denuded
	Archaeology/ Cultural	To be assessed by specialist	To be assessed by specialist
	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
1.3. Construct/upgrade	Noise	Ensure vehicle silencers are in operation.	None

Delivery Road with side and mitre drains and Bell-mouth on R354.		Limit activities to daylight working hours (8am-pm)	
	Air quality	Pre-wetting of areas prior to earthmoving	Potential if left denuded
	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
1.4. Dig Stormwater cut-off channels and detention ponds.	Surface Water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	None if implemented correctly.
	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
1.5. Establish steel-banded diesel tank of <20,000 litres.	Surface water	Control of surface water runoff and removal of potential for siltation of natural drainage channels	None if implemented correctly.
	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
1.6. Establish logistical facilities including office, personal amenities and workshop/store containers.	Visual	Considered to remove such activity from consideration Not Applicable during operation given Short term impact from limited visual envelope. Long term, full implementation of rehabilitation	None following rehabilitation
	Surface water	Considered to remove such activity from consideration Control of surface water runoff and removal of potential for siltation of natural drainage channels	None if implemented correctly.
1.7. Construct primary ramp	Visual	Considered to remove such activity from consideration Not Applicable during operation given Short term impact from limited visual envelope. Long term, full implementation of rehabilitation	None following rehabilitation
	Noise	Considered to remove such activity from consideration Ensure vehicle silencers are in operation. Limit activities to daylight working hours (8am-pm)	None
	Air quality	Considered to remove such activity from consideration Pre-wetting of areas prior to earthmoving	Potential if left denuded
	Hydrocarbon	Considered to remove such activity from consideration Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
1.8. Establish fixed crushing and screening plant (or alternatively mobile tracked plant).	Visual	Considered to remove such activity from consideration Not Applicable during operation given Short term impact from limited visual envelope. Long term, full implementation of rehabilitation	None following rehabilitation
	Hydrocarbon	Considered to remove such activity from consideration Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
1.9. Grass seed the topsoil berms.	Soil	Retention of upper sands(topsoil) for use during rehabilitation	Yes, loss of topsoil will cause delayed onset of rehabilitation, and incur large costs involved with sources of imported soils
	Air quality (Dust)	Limits Dust generation	Potential if left denuded
	Vegetation	Retention of seedbank	Loss will cause delayed onset of rehabilitation
1.10. Conduct establishment phase monitoring.	Ensures compliance in all aspects	Management Measure	Management Measure
2. OPERATIONAL PHASE ACTIVITIES	Impacts	Mitigation Type	Potential for residual risk
2.1. Drilling.	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours	None

		(8am-pm)	
	Air quality	All rigs equipped with dust extraction equipment	None
	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
2.2. Blasting.	Topography	Excavation according to approved Mine Plan	None
	Noise	The quarry manager will notify adjacent landowners /managers of the intended date and time of the next blast in order that the residents and personnel outside the danger area can expect the blast, and in so doing the startling effect of the blast by the air blast vibration can be reduced.	None
	Air quality	Blast design shall be designed to optimize rock fracturing with minimal air blast. Furthermore, blasting can be scheduled for suitable day or time of day when wind favours dispersion of dust away from the SALT	None
	Traffic Access	Temporary closure of the adjacent public gravel road for the time period immediately prior to and during blasting, ie ±20 minutes. Closure will be properly signposted and conducted so as to present no problems).	None
	Blast vibration	The quarry manager will notify adjacent landowners /managers of the intended date and time of the next blast in order that the residents and personnel outside the danger area can expect the blast, and in so doing the startling effect of the blast by the air blast vibration can be reduced.	None
	Fly rock	In accordance with the blasting code the blaster shall drive along the perimeter fences to inspect the adjacent lands to ensure that there are no persons or livestock within the blast radius, and a hooter/siren will alert all persons in proximity of the pending blast	None
2.3. Loading and hauling shot rock to crusher.	Noise	Considered to remove such activity from consideration Ensure vehicle silencers are in operation. Limit activities to daylight working hours (8am-pm)	None
	Air quality	Considered to remove such activity from consideration The blast pile can be wet by fire hose spraying from water cart prior to loading	None
	Hydrocarbon	Considered to remove such activity from consideration Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
2.4. Crushing and screening.	Noise	Considered to remove such activity from consideration Managed/ mitigated through ensuring silencers are in operation	None
	Air quality	Considered to remove such activity from consideration Water sprays and mist sprays on all tipping and conveyer belt transfer points, screens and conveyor discharges to surge pile and stockpiles.	None
	Hydrocarbon	Considered to remove such activity from consideration Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
2.5. Loading and hauling crushed material to stockpile.	Noise	Considered to remove such activity from consideration Ensure vehicle silencers are in operation. Limit activities to daylight working hours (8am-pm)	None
	Air quality	Considered to remove such activity from consideration Combination of water cart	None

		wetting of all manoeuvring and roadways and sprinkler installations along gravel delivery route and past the weigh bridge.	
	Hydrocarbon	Considered to remove such activity from consideration Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
2.6. Stockpiling.	Noise	Considered to remove such activity from consideration Ensure vehicle silencers are in operation. Limit activities to daylight working hours (8am-pm)	None
	Air quality	Considered to remove such activity from consideration Agricultural-type water sprinklers on stockpiles and removal of non-concrete aggregate production material from site to reduce on-site stockpiles of dust generating materials.	None
	Hydrocarbon	Considered to remove such activity from consideration Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
2.7. Dispatch loading of delivery vehicles.	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours (8am-pm)	None
	Air quality	Combination of water cart wetting of all manoeuvring and roadways and sprinkler installations along gravel delivery route and past the weigh bridge	None
	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
2.8. Delivery over weighbridge to R354.	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours (8am-pm)	None
	Air quality	Combination of water cart wetting of all manoeuvring and roadways and sprinkler installations along gravel delivery route and past the weigh bridge	None
	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
	Traffic Access	Upgraded access bell-mouth intersection or flagman control	None
2.9. Establish Stormwater pumping sump in excavation floor.	Surface water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	None if implemented correctly.
2.10. Conduct dust suppression on haul roads and plant.	Surface water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	None if implemented correctly.
	Air quality	Combination of water cart wetting of all manoeuvring and roadways and sprinkler installations along gravel delivery route and past the weigh bridge.	None
2.11. Refuelling and hydrocarbon management.	Surface water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	None if implemented correctly.
	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
2.12. Wastewater/conservancy tank management.	Surface water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	None if implemented correctly.
2.13. Conduct operational phase monitoring.	Ensures compliance in all aspects	Management Measure	Management Measure
2.14. Operational phase maintenance.	Ensures compliance in all aspects	Management Measure	Management Measure
• Maintain Stormwater	Surface water	Control of surface water runoff and removal	None if implemented

system.		of potential for siltation/pollution of natural drainage channels	correctly.
· Conduct supplementary seeding of berm.	Air quality	Prevention of dust generation	No
	Vegetation	Limits Dust generation	Potential if left denuded
· Maintain perimeter and delivery road fences.	Ensures compliance in all aspects	Management Measure	Management Measure
· Continuous ad hoc eradication of alien vegetation	Vegetation	Alien vegetation eradication	Yes, establishment of invasive vegetation
3. Decommissioning Activities	Impacts	Mitigation Type	Potential for residual risk
3.1. Conduct any required trim blasting to upper safety bench.	Noise	The quarry manager will notify adjacent landowners /managers of the intended date and time of the next blast in order that the residents and personnel outside the danger area can expect the blast, and in so doing the startling effect of the blast by the air blast vibration can be reduced.	None
	Air quality	Blast design shall be designed to optimize rock fracturing with minimal air blast. Furthermore, blasting can be scheduled for suitable day or time of day when wind favours dispersion of dust away from the SALT	None
	Traffic Access	Temporary closure of the adjacent public gravel road for the time period immediately prior to and during blasting, ie ±20 minutes. Closure will be properly signposted and conducted so as to present no problems).	None
	Blast vibration	The quarry manager will notify adjacent landowners /managers of the intended date and time of the next blast in order that the residents and personnel outside the danger area can expect the blast, and in so doing the startling effect of the blast by the air blast vibration can be reduced.	None
	Fly rock	In accordance with the blasting code the blaster shall drive along the perimeter fences to inspect the adjacent lands to ensure that there are no persons or livestock within the blast radius, and a hooter/siren will alert all persons in proximity of the pending blast	None
3.2. Remove all steel plant and structures.	Ensures compliance in all aspects	Management Measure	Management Measure
3.3. Remove plant concrete footing and retaining wall and stack concrete neatly in north-east excavation floor corner.	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours (8am-pm)	None
	Air quality	Pre-wetting of areas prior to earthmoving	None
	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.4. Consolidate retained stock neatly in designated area.	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours (8am-pm)	None
	Air quality	Agricultural-type water sprinklers on stockpiles and removal of non-concrete aggregate production material from site to reduce on-site stockpiles of dust generating materials. Removal of all stockpiles on completion of activities	None
	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.5. Rip/scarify hardened/compacted surfaces.	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours (8am-pm)	None
	Air quality	Pre-wetting of areas prior to earthmoving	Potential if left denuded

	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.6. Spread topsoil from berms over designated areas and upper safety bench.	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours (8am-pm)	None
	Air quality	Limits dust generation	Potential if left denuded
	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.7. Construct safety berm and trench around excavation perimeter and install livestock proof fence and danger signpost.	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours (8am-pm)	None
	Air quality	Pre-wetting of areas prior to earthmoving	None
	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.8. Ensure Stormwater trenches and detention ponds are operational.	Surface water	Control of surface water runoff and removal of potential for siltation/pollution of natural drainage channels	None
3.9. Grass seed re-topsoiled areas.	land capability	Reduces timeframe for vegetation reestablishment	Revegetation will occur at a much slower pace
	Air quality (dust)	Limits dust generation	Potential if left denuded
	vegetation	Reduces timeframe for vegetation reestablishment	Revegetation will occur at a much slower pace
3.10. Remove logistical facilities (containers), diesel tank and weighbridge.	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.11. Conduct hydrocarbon decontamination.	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.12. Remove perimeter fence.	Ensures compliance in all aspects	Management Measure	Management Measure
3.13. Allow quarry floor to flood as a reed bed during the rainy season (retain haul road for access to floor).	Surface water	NA	None
3.14. Either retain or remove delivery road (to landowner's decision) by scarification, tops-oiling and grass seeding (retain bell-mouth).	Visual	Not Applicable during operation given Short term impact from limited visual envelope. Long term, full implementation of rehabilitation	None following rehabilitation
	Land capability	NA	Loss of limited land capability over floor
	Vegetation	Reduces timeframe for vegetation reestablishment	Revegetation will occur at a much slower pace
	Noise	Ensure vehicle silencers are in operation. Limit activities to daylight working hours (8am-pm)	None
	Air quality	Pre-wetting of areas prior to earthmoving	None
	Hydrocarbon	Control and remedy through Hydrocarbon management protocol.	Although unlikely, there is a minor residual risk if leak goes unnoticed or is not remedied.
3.15. Conduct final performance assessment for closure.	Ensures compliance in all aspects	Management Measure	Management Measure
3.16. Lodge Closure Application	Ensures compliance in all aspects	Management Measure	Management Measure
4. AFTERCARE PERIOD	Impacts	Mitigation Type	Potential for residual risk
4.1. Remove alien vegetation (except pasture species), if present	Land capability	Alien vegetation eradication	Yes, establishment of invasive vegetation
	Vegetation	Alien vegetation eradication	Yes, establishment of invasive vegetation
4.2. Monitor revegetation success, with follow-up seeding if	Land capability	Full re-topsoiling with suitable material, followed by reseeding	Lengthened timeframes for recovery if not suitably

required			conducted
	Air quality (dust)	Limits dust generation	Potential if left denuded
	Vegetation	Full re-topsoiling with suitable material, followed by reseeded	Lengthened timeframes for recovery if not suitably conducted

Additionally, the following applies over Life-of-Mine

Employee movement on site	<ul style="list-style-type: none"> • Strict control of employee movement on site, • Enforcement within the Conditions of Employment of staff, regarding potential fines or dismissal should staff not stay within the bounds of activity. • Environmental Induction training of the staff, inclusive of : <ul style="list-style-type: none"> ○ Importance of the environmental, ○ Caution against polluting activities (use of veld as toilet, hydrocarbon management, danger of veld fires)
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23 Other Information required by the competent Authority

23.1 Compliance with the provisions of sections 24(4) (a) & (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:

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

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as **Appendix 3** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

Socio-economic impact occurs as a result of the following parties' socio-economic status being altered:

- Mining Company and employees: Guaranteed income for duration of the project.
- Consumer: Guaranteed supply of construction aggregate at pre-determined prices

Land Claims Commission response is awaited in respect of land claims over the property.

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

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

A specialist has been appointed to compile a specialist assessment. Such assessment and mitigation procedures will be incorporated into all further documentation.

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

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

Not Applicable.

25 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I Stephen van der Westhuizen herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected parties has been correctly recorded in the report.



Signature of the EAP

DATE: 1/9/2015

26 UNDERTAKING REGARDING LEVEL OF AGREEMENT

I **Stephen van der Westhuizen** herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders has been correctly recorded and reported herein.



Signature of the EAP

DATE: 1/9/2015