mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: Great Karoo Prospecting (Pty) Ltd

REFERENCE NUMBER: EC30/5/1/3/2/1010107MP – Tsitsikamma Borrow Pit 4

SPC REFERENCE #2696
Farm Diep Riviers Mond 358 portion 8 remainder

ENVIRONMENTAL MANAGEMENT PLAN

SUBMITTED
IN TERMS OF SECTION 39 AND OF REGULATION 52 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002,
(ACT NO. 28 OF 2002) (the Act)

STANDARD DIRECTIVE

Applicants for prospecting rights or mining permits, are herewith, in terms of the provisions of Section 29 (a) and in terms of section 39 (5) of the Mineral and Petroleum Resources Development Act, directed to submit an Environmental Management Plan strictly in accordance with the subject headings herein, and to compile the content according to all the sub items to the said subject headings referred to in the guideline published on the Departments website, within 60 days of notification by the Regional Manager of the acceptance of such application. This document comprises the standard format provided by the Department in terms of Regulation 52 (2), and the standard environmental management plan which was in use prior to the year 2011, will no longer be accepted.

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1 IDENTIFICATION OF THE APPLICATION IN RESPECT OF WHICH THE ENVIRONMENTAL MANAGEMENT PLAN IS SUBMITTED.

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2 Background to the Project

This Mining Permit Application comes due to the need to acquire materials to serve in the construction of the Tsitsikamma Community Wind Farm Project, currently under establishment between the towns of Clarkson and Humansdorp in the Eastern Cape. As construction contractor to this project, Haw and Inglis, through its empowered subsidiary Great Karoo Prospecting (Pty) Ltd has identified this Application Area as one of six borrow pit sites of which the finally selected sites together can meet the materials requirements for the project, with their primary use being in providing the materials for the access roads and crane platform constructions of the wind farm.

Given the above background to the project, this Mining Permit, together with the other 5 Mining Permits under Application by Great Karoo Prospecting, are considered within the context of the large-scale construction activities which they will serve, and their impacts on the surrounds are thus assessed in relation to the wider activities of the Wind Farm Construction.

This “soft rock” Borrow Pit 4 will be mined as a wedge-shaped soft materials borrow pit primarily through direct loading by excavator to delivery trucks or if required loading and in-pit crushing/screening by tracked mobile plant before delivery, to provide a portion of the natural G5 and crushed sub-base (G4) for the access roads and platforms of the wind turbines.

The relative proximity to the wind farm project (via either the DR01755 public gravel road and R102 or southward gravel road), the suitable geology of scree slope deposits associated with elevated quartzite ridges and hill slopes, and the previously tilled status of the site favoured its selection as Borrow Pit 4.

3 Locality

As shown in Figure 1 below, Borrow Pit 4 is located on the Farm Diep Riviers Mond 358 portion 8 remainder, immediately adjacent to the east/west public gravel road DR01755 from the R102 to Elandsjagt Dam and Cape St. Francis

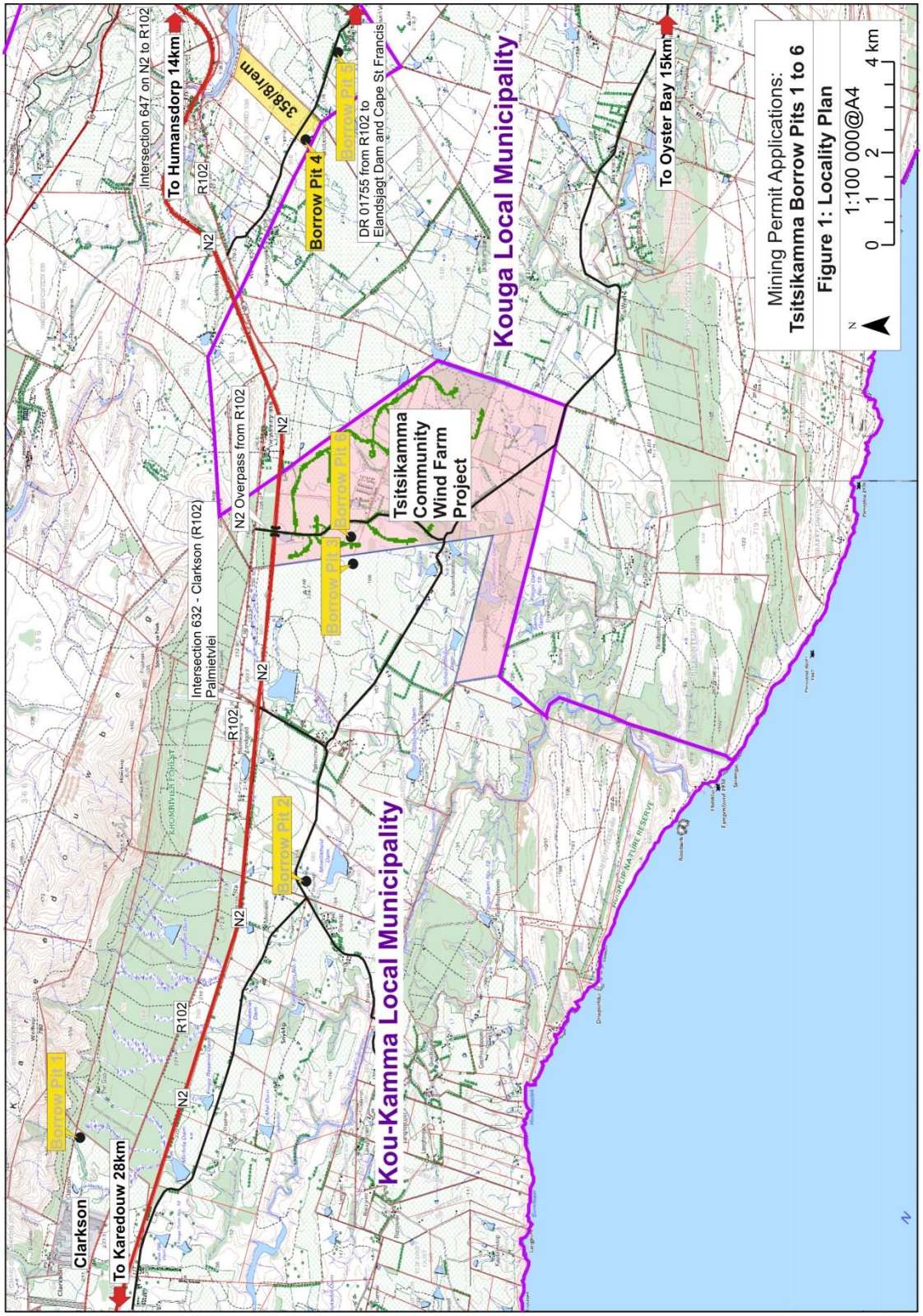


Figure 1: Locality

4 REGULATION 52 (2): Description of the environment likely to be affected by the proposed prospecting or mining operation

4.1 The environment on site relative to the environment in the surrounding area.

On site (as seen in Figure 3 overleaf)

Targeting soft material, the pit development will generally facilitate final perimeter sloping to maximum 1:3, with replacement of perimeter-berm stored topsoil to reinstate the grazing capacity of much of the 1.5ha area.

Should coarse gravels or hard rock be encountered within the pit, in-pit crushing and screening of such material may be required, and localised ad-hoc blasting may facilitate smoothing of the excavation floor or perimeter slope where such rock is encountered, but such blasting will not be the norm and would be conducted in full liaison with the landowner should it be required

In order to target the best scree gravels, the pit is of necessity located as close to the hard rock slope of the low ridge as possible. While this location presents visual exposure, the soft materials will allow pit perimeter sloping and the envisioned approach to borrow pit development and rehabilitation will only cause a temporary visual impact, following which the retained and re-used topsoil, together with revegetation by a combination of fynbos seed and seed-mix of the landowners choice and favourable climate will facilitate visual rehabilitation of the site within a 3-year period

Given the high visual exposure of the site, a strip(block)-mining process from West to East will be applied, thereby permitting the shortest possible exposure of the smallest possible area at a time, and will also initiate disturbance at maximum distance from the farmstead.

The current on-site use of the site is grazing of recovering veld in previously tilled area and more natural veld area.
Close interpretation of the Google^{tm} imagery and the findings of the specialist botanical report in Appendix G confirm that much of the site was previously tilled but showing some recovery of indigenous vegetation.

The site is adjacent to a currently tilled field to its north.

A western boundary access to the DR01755 using the existing perimeter field track has been chosen as access to the site, as this will facilitate delivery at maximum distance from the farmstead.

The floor will be sloped to allow drainage as shown in cross section in Figure 4.

Photo 1: View of the Mining Permit area from the adjacent DR01755 gravel road.

Photo 2: The mining permit application area for Borrow pit 4 on the farm Diep rivier mond 358/8.The foreground shows recently ploughed lands and the background more natural, but heavily disturbed, degraded Tsitsikamma sandstone fynbos

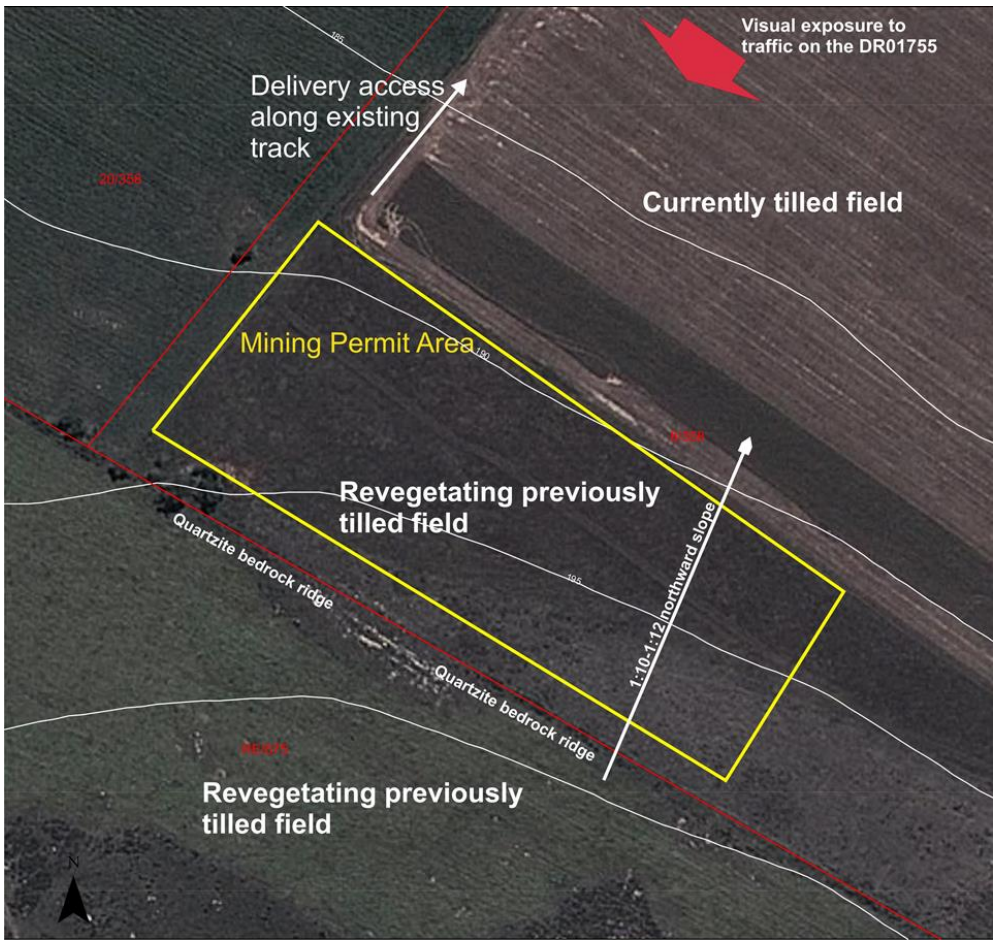


Figure 3: On-site land use and environmental informants

Surrounding

Figure 2 overleaf shows the cadastral boundaries of the Applicant property and surrounding properties, with their farm numbers, namely:

- Farm 358/20 (west) and Farm 675/rem (south) – Basson Familie Trust
- Farm 678/1 (east) – Steynberg Boerdery Trsut
- Farm 818(consolidated) (south) Kliprug Familie Trust

The relevant surrounding land uses to be considered in the assessing of potential impacts hereafter include the following:

i) The extensive vacant grazing land immediately surrounding the permit area on the Applicant property and surrounding properties
ii) The adjacent tilled field to the immediate north
iii) The DR01755 public gravel road adjacent to the site at a distance of 230m
iv) The closest distance of 480m to the nearest residences being on 678/1 to the east
v) Further residences on 675/remainder of Basson Familie Trust at 760m

Borrow Pit 4 will be excavated in a virgin landscape, and will be visible from the DR01755 public road. It must however be borne in mind that this is a “soft material” pit, allowing gentle sloping, retopsoiling and revegetation of the pit perimeter and as such, the mining will be visually very similar to standard farmland preparation activities as conducted in the area (tilling, harvesting).

Additionally, given the high visual exposure of the site, during the operation a strip/block mining process from west to east will be applied, thereby permitting the shortest possible exposure of the smallest possible area at a time.

Given that the site is at closest 230m to the northern public road, and the possibility of certain blasting of quartzite ridges in the floor being required, any possible blasting would require temporary (20minute) closure of the road, which road closure would be conducted by the contractor who is au fait with construction traffic control, and who would liaise with the relevant traffic authorities in respect of all borrow pit access/traffic control.

Any blasting would only be conducted subject to the prescriptions of a blasting risk assessment in respect of both fly rock and ground vibration.

As the closest buildings are in excess of 480m from the site, both fly rock and ground vibration damage to such buildings is not expected but ground vibration and fly rock will be monitored for each blast.

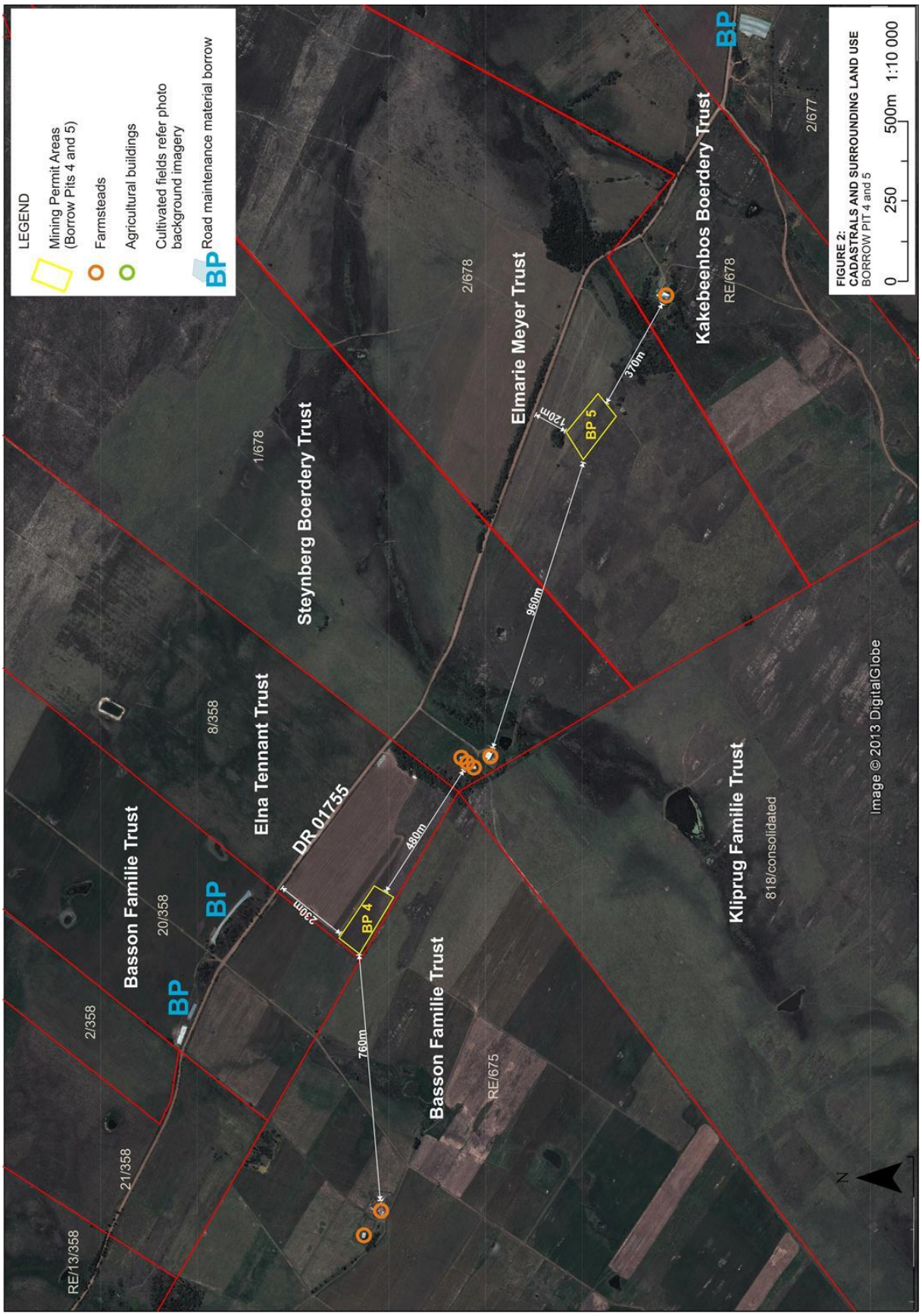


Figure 2: Cadastrals and Surrounding Land Use

4.2 The specific environmental features on the site applied for which may require protection, remediation, management or avoidance.

Given the topography and historic tilling of portion of the site, the main environmental elements of the site as evident in the aerial photo background of Figure 3 are limited to:

4.2.1 Vegetation

The vegetation was the subject of specialist botanical input. The full report is contained in Appendix G. Search and rescue/transplant of recovered species, most notably geophytes, as well as the retention of seed bank with topsoil is prescribed, as standard practise.

All vegetation outside of the required disturbance area is classified under a No-go perimeter are as shown in Figure 4 and shall be demarcated to prevent personnel and equipment movement in such areas.

4.2.2 Topsoil

Given the existence of a good topsoil profile on site, topsoil dozing to perimeter topsoil berm stockpiles (photo 4) as prescribed in Figure 4 shall be undertaken in the establishment phase of the mining. Decommissioning rehabilitation as in Figure 4 and 5 prescribes the replacement of such topsoil together with its retained seed and bulb bank on the final perimeter slopes and floor of the excavation.

4.2.3 Visual Impact

Given the north facing slope towards the nearby public road with direct visual exposure as in the earlier photo 1, the matter of ensuring site rehabilitation to reduce post-mining visual impact is a focus of this EMP in terms of Mining Method especially relating to shaping of final pit perimeters to facilitate reintegration of the site into the agriculturally modified but largely undisturbed visual envelope.

4.2.4 Access

In order to reduce the impact of delivery traffic (noise and dust) on the residences to the east, an alternative new access point onto the DR01755 is proposed, however making use of an existing farm access track down the side of the cultivated field, and entering the DR01755 at a point with improved sight distance by comparison to the access point currently used at the eastern end of the field.

4.3 Map showing the spatial locality of all environmental, cultural/heritage and current land use features identified on site.

Refer foregoing Figure 3: On site land use and environmental informants

4.4 Confirmation that the description of the environment has been compiled with the participation of the community, the landowner and interested and affected parties.

The public participation process was exhaustive and part of that process was the preparation of a so-called "Background Information Document" (BID). Such document is included in full in Appendix A.

The BID document was hand delivered to the landowner and emailed to the adjacent landowners following telephonic discussion.

Additionally, the Applicant conducted personal discussion with the representative of the landowner using the BID documents listing and description of environmental elements of the site as background.

In order to reach the general public, a notice of the Application was placed in the local newspaper, The Kouga Express, along with hard copies of the BID document made available at the Humansdorp Public library and on the Site Plan Consulting website for perusal, with the BID being emailed to identified I&AP's as well as persons who requested registration as I&AP's.

5 REGULATION 52 (2) (b): Assessment of the potential impacts of the proposed ~~prospecting or~~ mining operation on the environment, socio-economic conditions and cultural heritage.

5.1 Description of the proposed mining operation.

5.1.1 The main mining activities (e.g. access roads, topsoil storage sites and any other basic ~~prospecting~~ design features)

The overall Mine Layout Plan for the establishment and production phases of the Borrow pit is reflected in Figure 4 hereafter in para. 5.2.2 to reveal the following:

a) A 1.49ha area as the Mining Permit Area accommodating the wedge-cut excavation to be developed in two phased blocks, thereby facilitating concurrent rehabilitation of Phase 1 with the mining of Phase 2 and initiating mining as far west as possible, ie furthest from nearest dwelling to the east (in excess of 500m).

b) Mining of the 1-4.5m deep (average 3m deep) scree gravel will take place by either of the two following processes or combination of both:

   i. Direct loading of G5/G6 material by excavator to delivery trucks which will leave the site via the designated access road to the DR01755, **or**

   ii. Excavator loading of the material into the hopper of a mobile (tracked) crushing and screening plant as seen in photo 3 below.

Photo 3: Typical mobile tracked in-pit crusher on another contract by the Applicant

iii. Such plant will either simply screen the excavated material into oversize which is returned for crushing to provide the enhanced G4 grade material or stockpiled for loading as the finer G5 material.
The screened and/or crushed material which is stockpiled by the mobile plant will continuously be loaded by front end loader to delivery trucks for delivery as in b)(i) above.
The tracked mobile plant will move along on the newly developed excavation floor to facilitate direct loading by the excavator.

iv. Alternatively the in-situ material may be dozed to a stockpile where such dozing facilitates the required blending to achieve the enhanced G5 grade and in such case the product will be loaded from the dozed stockpile by front end loader into delivery trucks as per photo 5 hereafter.

c) Additionally, in the event of blasting being required to remove hard rock encountered in the excavation to ensure a regular smooth floor, such drilled and blasted rock will either be loaded into the crushing and screening plant for crushing OR be loaded directly as shot-rock for transport to the construction project site where a central crusher will crush material delivered from any of the selected Borrow Pits.

d) The diagrams and photos below reflect the essence of the mining methods and the subsequent rehabilitation through perimeter sloping and re-topsoiling of the slope and pit floor (refer photos 6 and 7).

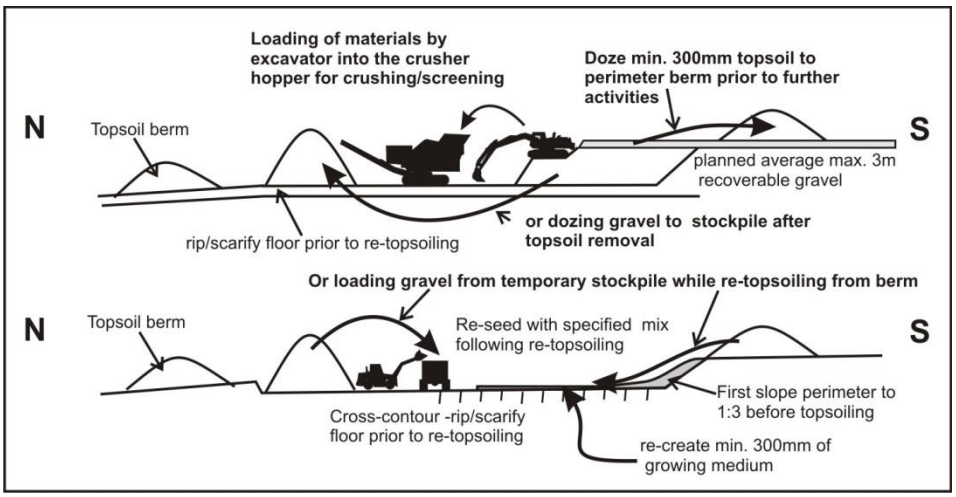


Photo 4: Example of temporary perimeter topsoil stockpiles (berms)

Photo 5: Example of product loading by front-end loader

Photo 6: Example of growing medium/topsoil replacement in a gravel pit

Photo 7: Example of perimeter sloping to 1:3 following retopsoiling and revegetation of a typical wedge-shaped excavation in "soft" materials

e) In the event of screening taking place on site, a front-end loader will continuously load product from the small product stockpile into delivery vehicles for transport to the wind farm construction site and there will be no bulk stockpiling on site. G4/G5/G6 material will be delivered directly onto the road or platform construction on the wind farm site.

f) The Applicant (contractor to the wind farm project) will operate from a main contractor's yard on the wind farm where he will have all logistical facilities of project office, workshops and stores with diesel storage facility, to serve the contract site and provide service and maintenance to the external Borrow Pit sites. The only logistical facilities required in the Borrow Pit 4 Mining Area will be an office/stores container and mobile chemical toilet.

Photo 8: Typical rented mobile chemical toilet

g) No diesel tank is consequently planned on site, as a diesel bowser operated from the main contractor's yard at the project will provide diesel to all plant in the mining permit area on a daily basis. Similarly the mobile plant maintenance vehicle will visit the site daily to conduct greasing and other minor maintenance on the equipment.

h) For any repairs of significant nature the respective plant will be removed by low-bed to the workshop at the contractor's yard of the wind farm project, where such repairs will be conducted.

Environmental indicators incorporated into the mine layout plan include:

a) Alignment of the delivery road on the existing farm perimeter track incurring no additional environmental impact on natural systems

b) Construction of an improved safe access road intersection with a 20m long bell-mouth and with bush clearance to facilitate 100m uninhibited site distance of approaching traffic on the public gravel road together with danger signposting on the gravel road warning of "heavy vehicles crossing ahead"

c) Location of the mining permit area within the footprint of previously tilled and heavily grazed area but with recognition of the level of natural vegetation reestablishment, being addressed by a full botanical assessment and specialist prescriptions

d) Demarcation and fencing of the mining permit area prior to on-site activity, together with No-Go area demarcation.

e) Construction of up-contour stormwater cut-off drain leading to a stormwater detention pond (note: given the quartzite ridge, very low levels of run-off over the pit edge are expected).

f) Pre-disturbance dozing of topsoil and vegetation (with bulbs and seedbank) to perimeter berm topsoil stockpiles for re-use during rehabilitation.

The mining activity is planned to be completed within a 24 month "life of mine" (with maximum renewable total lifespan of 5 years). Once mining ceases, disturbed surfaces will be rehabilitated, as shown diagrammatically on the Mine Layout Plan (Figure 4) cross-section inset, most notably with the following features:

- Perimeter sloped to 1:3 gradient.
- Retention of the stormwater cut-off drain to limit erosion of replaced topsoil on the southern slope by stormwater sheet flow
- Scarification of all compacted surfaces prior to topsoil replacement to form a key between the substrate and the replaced topsoil.
- Replacement of topsoil to minimum 300mm deep over all disturbed areas
- Followed by seeding to reinstate vegetation on site

5.2 Hydrocarbon management

As fuel will be despatched from the contractor's main camp on the wind farm construction site to refill the mining permit area equipment and as maintenance vehicles will similarly visit the site on a daily basis, the hydrocarbon management for the site is limited to the following:

Vehicle /pipe or transfer pump leaks:
Vehicles and equipment must be checked on a daily basis for oil/diesel/hydraulic fluid leaks. Drip trays must be available on site and should any oil/fuel/lubricant leak from the equipment, then such leaked fluid is to be collected via the drip trays into drums for transport to Oilkol or similar depot for recycling.

Should such leaked oil contaminate the topsoil, then such topsoil and oil must be removed from site and spread on a concreted area where it can be treated with a commercial product such as Spillsorb^{tm}.

On-site repairs: All repairs other than minor repairs (such as replacement of hydraulic hoses etc and daily greasing and oil top-up) will take place off-site in the workshop at the contractor's main camp.

Emergency repairs on site:
In the event of a breakdown repair being required in the field, the staff are trained and will again be instructed in the use of drip trays and suitable funnels (not to drain oil into the sand) for filling and draining of lubricants and the staff shall be provided with such equipment to prevent oil contamination.

In addition:

- Used/replaced filters, hoses, belts, cloths, etc. are to be placed in the designated bins at the Mobile site store container for removal from site and disposal through the contractor's main workshop on the wind farm

project site. Used filters are not to be buried at the site of repair (nor discarded in adjacent veld).

- In the event of accidental intense soil contamination, the contaminated soils are to be removed and placed in suitable bags or drums for disposal at a licensed facility or depot, and any remant contamination to be treated with the appropriate commercial decontaminant in the Spillsorb^{tm} or other range.

All staff involved in mobile plant operation and maintenance are to be made aware of these oil and lubricant procedures. Staff will be given environmental induction training on the:

- Deleterious effects of oil / fuel on the environment
- Handling of oil leaks onto soil

General Provisions

- All operators are to check their equipment for leaks and report such leaks on a daily basis (before and after morning start up, at lunch break and when parking the equipment for overnight shutdown).
- No used oils are to be used as dust suppressants on manoeuvring areas. Used oils will be deposited in the used oil drums at the equipment container.

5.2.1 Plan of the main activities with dimensions

Refer Figure 4 overleaf.

5.2.2 Description of construction, operational, and decommissioning phases.

(Listed and Shown in Figure 4 and Figure 5 overleaf)

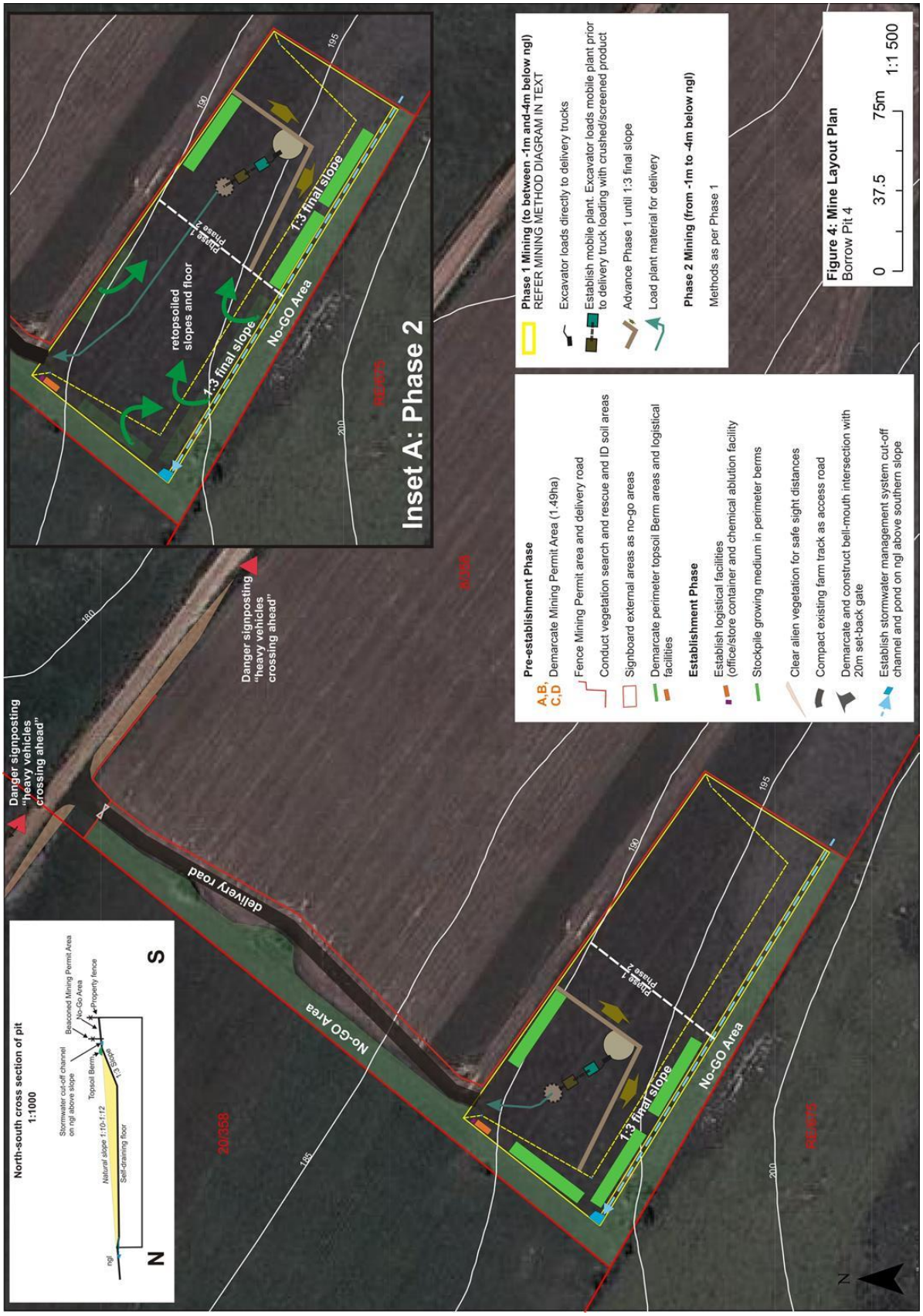


Figure 4: Proposed mine layout plan

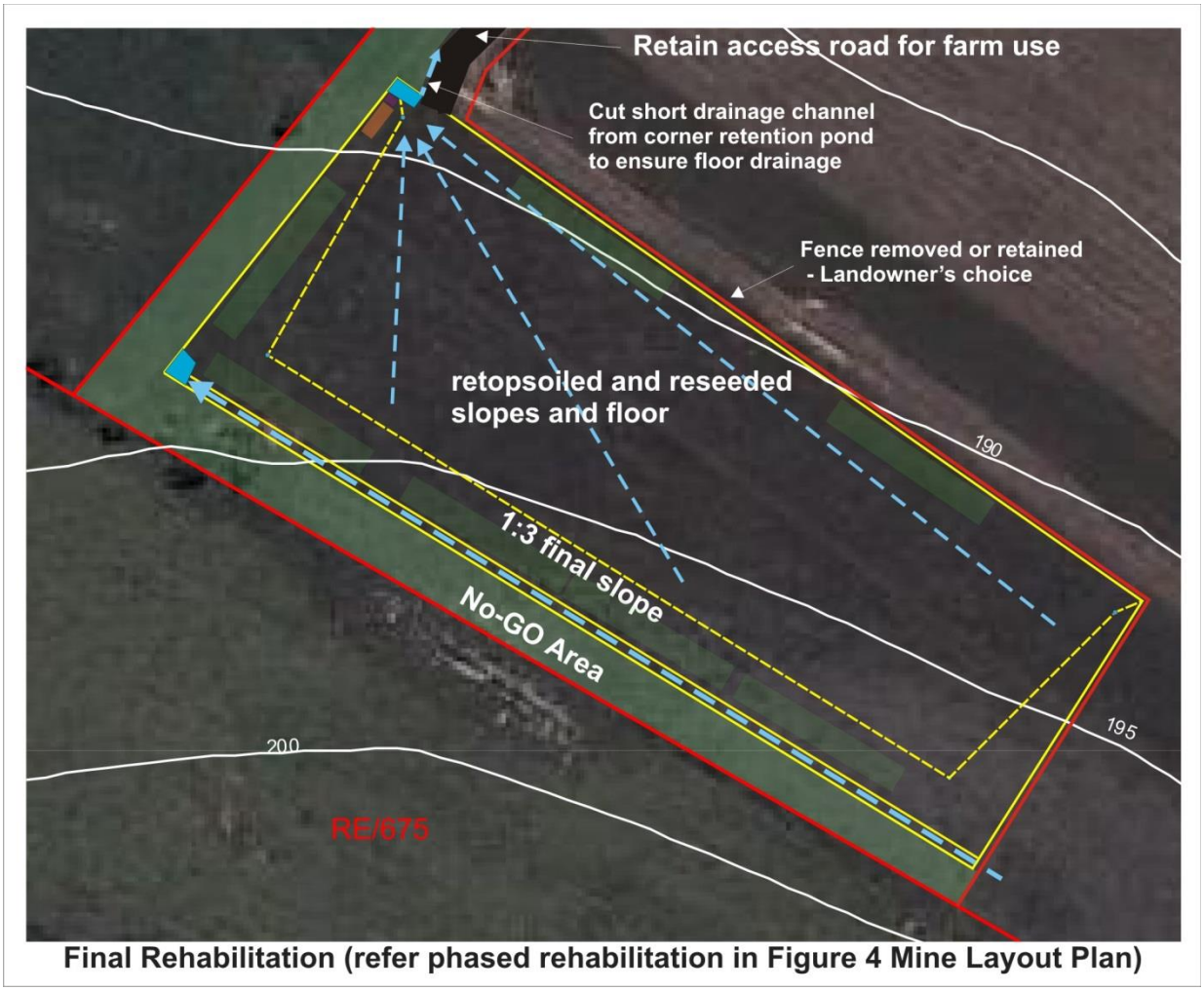


Figure 5: Final Decommissioning Rehabilitation

5.2.3 Listed activities (in terms of the NEMA EIA regulations)

In respect of the Mining Permit Area, including mobile plant in-pit crushing the following applies:

a) Number R544 Listing Notice 1 (Requiring a **Basic Assessment**):

- Activity 20: Any activity requiring a Mining Permit in terms of Section 27 of the Mineral and Petroleum Resources Development Act 2002(Act No.28 of 2002), or renewal thereof
- Activity 23: Transformation of vacant land to... "industrial use", outside urban area where total area to be transformed is bigger than 1ha but less than 20ha

Such listing calls for a basic assessment be done, which is included in this Mining Permit Application process as the EIA of the proposed operation.

As the Minister of the Department of Mineral Resources (DMR) is identified by NEMA as the Competent Authority, the entire Application process will be dealt with i.t.o. the MPRDA guidelines to be considered in the EIA/EMP phase of this Application in respect of the listed activities 20 and 23 above.

While not a listed activity as it does not fall within a CBA, the site does present re-establishing natural vegetation following previous tilling of the site, and a botanical assessment is contained in Appendix G hereto, ex Sean Privett 2013.

5.3 Identification of potential impacts

5.3.1 Potential impacts per activity and listed activities.

The list of potential environmental impacts considered in respect of the mining activities is follows:

1: Soil
2: Topography
3: Visual Impact
4: Animal life
5: Land Capability
6: Surface Water
7: Ground Water
8: Natural Vegetation
9: Air quality (Dust)
10: Noise

5.3.2 Potential cumulative impacts.

Definition: "The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions"

Given the generally undisturbed nature of surrounding areas other than than two small mined out borrow pits along the DR01755, the Development of Borrow Pit 4 together with Borrow Pit 5 some 1.5km to the east as shown in Figure 2 represent a cumulative mining impact in the area.

However, the small scale of all of these activities, their limited time frame and the ease of rehabilitation of the sites, long term cumulative impact is very limited.

5.3.3 Potential impact on heritage resources

The mining activity will be limited to predominantly previously disturbed areas (agricultural tilling and grazing), and as such the chance of any archaeological/ cultural finds are minimal, and no impact is expected.

Notwithstanding the above a Phase 1 assessment of both Palaeontology and archaeology has been conducted to satisfy the National Heritage Act. While not yet received the Archaeologist, Mrs K. van Ryneveld of Archaeomaps has advised telephonically that no significant finds have been encountered, and her full report, as well as the report by archaeologist Rob Gess, will be appended hereto as Appendix H on receipt.

5.3.4 Potential impacts on communities, individuals or competing land uses in close proximity.

(If no such impacts are identified this must be specifically stated together with a clear explanation why this is not the case.)

In order to minimise reduction of the agricultural potential, the borrow pit is placed outside of the current cultivated field immediately to its north

Given the distances involved (distances of 480m to the nearest residences as seen in Figure 2) the impact on such residences will be extremely low or negligible, limited to:

1. Dust
2. Noise

Given the proximity of the public road, the following impacts will occur on road users of the adjacent public road:

1. Visual Impact
2. General nuisance factor of temporary road closures which may be required on ad hoc occasions for 20minutes during blasting.

Socio-economic Impact

The applicant is an existing construction company, with an existing core labour force, but will employ additional local labour. As such, the Mining Permit will not bring about any negative change to the socio-economic impact of the area but will hold the positive impact of extending the period of permanent employment of its own employees and the additional employment of local job seekers from the local villages of Clarkson and Kruisfontein/Humansdorp by a minimum of 2 years (and will in principle avoid employing farm labour from surrounding farms or farming projects). No persons will live on the site, and only an overnight security guard will be pesent after hours if requried.

5.3.5 Confirmation that the list of potential impacts has been compiled with the participation of the landowner and interested and affected parties,

Yes. A public participation process has been completed and part of that process was the preparation of the "Background Information Document" (BID). The BID document was made available to all parties as basis for comment – Refer Appendix A for copy of the BID and parts 10 and 11 of this EMP for full description of the public participation process.

The Applicant conducted personal discussion with the representative of the landowner using the BID documents listing and description of environmental elements of the site as background.

Additionally, this completed EMP will be emailed to the landowner and any registered I&AP in addition to the distribution by the DMR to State and Parastatals for consideration of the impacts.

5.3.6 Confirmation of specialist report appended.

It is noted that this Environmental Management Plan was prepared by:

i) Stephen van der Westhuizen who is himself a specialist in most aspects of small mine development and rehabilitation as he has significant experience in this regard, and
ii) Ecologist, Jaques van der Vyver, both of Site Plan Consulting.

The services of:

- specialist botanist (Mr Sean Privett of Fynbos Ecoscapes) have been employed (His full botanical report is attached as Appendix G, and its prescriptions for management of on-site vegetation form part of this EMP)
- Specialist archaeologist Karen van Ryneveld and palaeontologist Rob Gess whom conducted the Phase 1 Heritage assessments as attached hereto in Appendix H.

In addition to the above, the documentation which served the Granted Environmental Authorisation and EIA/EMPR of the nearby Tsitsikamma Wind Farm (which construction the sought borrow Pit will serve), was consulted to further inform the compilation of this EMP, specifically in regard to the Avian Impact Assessment conducted by Avisense Consulting.

6 REGULATION 52 (2) (c): Summary of the assessment of the significance of the potential impacts and the proposed mitigation measures to minimise adverse impacts.

6.1 Assessment of the significance of the potential impacts

6.1.1 Criteria of assigning significance to potential impacts

Significance		***Criteria***
Negative	Significant (S)	• Recommended level always exceeded with associated widespread community action • Disturbance to areas that are pristine, have conservation value, are important resource to humans and will be lost forever • Complete loss of land capability • Destruction of rare or endangered specimens • May affect the viability of the project
	Moderate (M)	• Moderate measurable deterioration and discomfort • Recommended level occasionally violated – still widespread complaints • Partial loss of land capability • Complete change in species variety or prevalence • May be managed • Is insignificant if managed according to EMP provisions
	Minor/ (I) Insignificant[1]	• Minor deterioration. Change not measurable • Recommended level will rarely if ever be violated • Sporadic community complaints • Minor deterioration in land capability • Minor changes in species variety or prevalence
Positive	Minor	• Improvements in local socio-economics
	Significant	• Major improvements in local socio-economics with some regional benefits

b) The **duration** is classified as
- Permanent (post-closure)
- Life of Mine (LOM)
- Temporary

c) The **probability** is ranked as
- Definite/Certain
- Possible
- Unlikely

[1] Note there is another level known as negligible. This is more than no impact but does not justify any further comment.

6.1.2 Potential impact of each main activity in each phase, and corresponding significance assessment

6.1.2.1 Soil

Permanent loss of topsoil is generally considered a highly significant negative impact. As such, standard mining practise calls for removal and storage of such upper soils/sands in all areas of disturbance. Such topsoils, inclusive of the seedbank secured within them, are then used during post-mining rehabilitation to rehabilitate all disturbance footprints, with the replaced seedbank acting to rejuvenate the natural vegetation cover over these areas.

Given the geology of its location (within the scree gravel slopes of the northwest-southeast quartzitic ridge), there is sufficient topsoil on site and of a suitable quality that this site provides a high opportunity for successful rehabilitation and return to its grazing use post-mining, on condition that the rehabilitation methods prescribed in 6.2.2.1 be put in place, with the upper topsoil horizon being replaced above the underlying scree gravels.

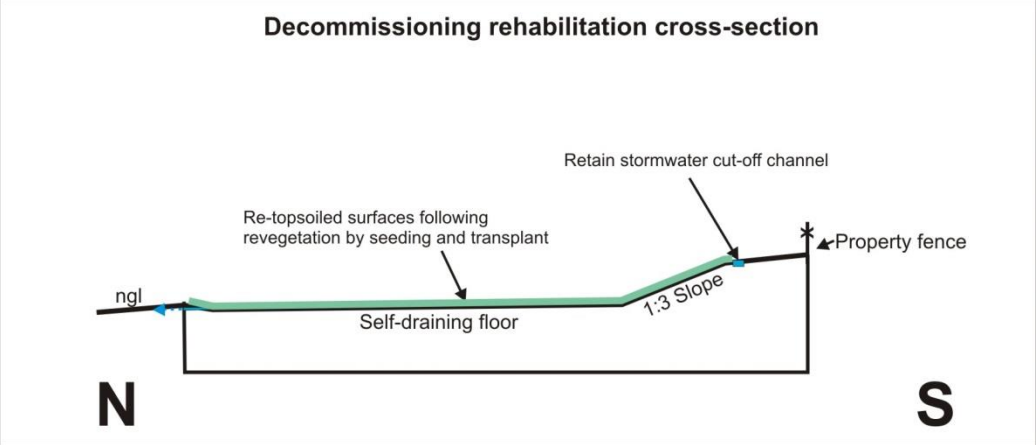
The specialist botanist/horticulturist was tasked with identifying soil handling methods to maximise eventual rehabilitation of the site. The full report is annexed as Appendix G.

Activity	*Spatial extent*	*Significance*	*Duration*	*Probability*	*Post-closure impact*
planned excavation	1.49ha	Insignificant given that it will be replaced during rehabilitation	Temporary	Definite	Available topsoil will be replaced on disturbed natural ground levels and the slopes and floor of the excavation, resulting in negligible post-closure impact

6.1.2.2 Topography

The quarry excavation will by necessity impact on the topography of the site. However as the excavation takes place in soft materials this allows the shaping of the excavation perimeter to a 1:3 slope with rounding of the edges to blend into the surrounding field.

The eventual proposed cross section through the excavation is as follows:



Activity	*Spatial extent*	*Significance*	*Duration*	*Probability*	*Post-closure impact*
Excavation	The final excavation will measure 200 x 70m	Low-Moderate	Permanent	Definite	Low but insignificant given prescribed rehabilitation

6.1.2.3 **Visual Impact**

Borrow Pit 4 will be excavated in a virgin landscape, and will be visible from the DR01755 public road. It must however be borne in mind that this is a "soft material" pit, allowing gentle sloping, retopsoiling and revegetation of the pit perimeter and as such the mining will be visually very similar to standard farmland preparation activities as conducted in the area (tilling, harvesting).(Refer photo 7 for an example of the low visual impact of perimeter-shaped, topsoiled and re-vegetating borrow pits).

Additionally, given the high visual exposure of the site, during the operation block/strip-mining process from west to east will be applied, thereby permitting the shortest possible exposure of the smallest possible area at a time.

Photo 9: View from theDR01755 gravel road (to St Francis Bay) showing the Borrow Pit 4 area and extent

Photo 10: Surrounding visual envelope of the Borrow Pit 4 area, showing the limited surrounding land use.

Activity	*Spatial extent*	*Significance*	*Duration*	*Probability*	*Post-closure impact*
Excavation Development	2x block phases of 100x70m each	Moderate-high during operation	Temporary, maximum 9 month continuous activity period	Definite	Permanent but insignificant
	On passing traffic	• Insignificant during operation given retained alien vegetation • Low to moderate after perimeter alien vegetation clearing	Temporary, maximum 9 month continuous activity period	Definite	Permanent but insignificant given prescribed sloping , topsoiling and revegetation to merge with surroundings

6.1.2.4 Animal life

The site is used for grazing and is directly adjacent to a cultivated field, with active agricultural activity during planting and harvesting, with little difference in disturbance from that of the intended mining.

Such agricultural fields and expanses of the natural vegetation surrounding the site provide a habitat suitable for species typical of the area. These include buck, rodents (mice, shrews etc), reptiles (snakes and tortoises), birds and insects.

The large scale of the surrounding habitat when compared to the extent of the proposed activity negates any significance of any impact in this regard. Furthermore the extent of the farm allows for relatively free migration of most animals. As is standard practise, an animal search and rescue will be undertaken prior to any activity on site, with specific attention to sedentary species.

Regarding avifauna, it is noted that during the site visits to date no large terrestrial bird species have been seen on the site or in the immediate surrounds. Notwithstanding these observations, the pre-disturbance search and rescue will pay specific attention to any occurrence of Blue Crane and Denham's Bustard.

Activity	*Spatial extent*	*Significance*	*Duration*	*Probability*	*Post-closure impact*
Excavation Development	Area of 1.49ha and immediate surrounds	Low (given current state of disturbance and small scale))	Temporary (as habitat will be largely reconstituted through rehabilitation	Definite	Insignificant (given vegetation recovery)

6.1.2.5 **Land Capability**

As the scree gravel excavations will take place in gravel soils, with reasonable topsoil profiles, their combined grazing agricultural/wilderness potential will largely be returned through planned growing medium reconstitution and revegetation.

Activity	*Spatial extent*	*Significance*	*Duration*	*Probability*	*Post-closure impact*
Excavation Development	Area of 1.49ha	Moderate	Temporary	Definite	Insignificant to Low (given growing medium reconstitution and vegetation recovery)

6.1.2.6 **Surface Water**

No surface water resources occur in, nor adjacent to, the Mining Permit Area and as such surface water will not be impacted in any way. The nearest drainage course is at closest 650m east of the site. The only intervention required on-site will be to limit any intense rain-episode surface sheet-flow eroding the southern 1:3 rehabilitated slope by means of an up-contour cut-off channel to be put in place during mining and retained post-mining.

6.1.2.7 **Ground Water**

The proposed excavation of 1.5ha and to an average depth of ±3m below the current ground level will not result in any impact on groundwater.

There will be no pumping or related discharge and consequently no provision for stormwater discharge needs to be made, and the excavation will pose no threat to down contour surface water quality.

6.1.2.8 **Natural Vegetation**

The following extract description of vegetation is as contained in the specialist botanist report (as contained in full in Appendix G):

"*The lower (eastern) third of borrow pit 4 has been recently ploughed and is characterised by weedy annuals and grasses. The upper (western) portion of the proposed mining area has more natural vegetation but this area has also been heavily impacted in the past. It does not appear to have been ploughed as there are a high number of geophytes (Haemanthus coccineus and Veltheimia capensis amongst*

others) but it is clear that it has been heavily impacted by cattle grazing and possibly bush cutting and/or shallow ripping. Velthemia capensis in the proposed Borrow Pit 4 The natural vegetation is dominated by Bobartia orientalis, Restio triticeus, Thamnochortus fruticosus, Muraltia sp, Helichrysum petiolare, Hermannia cf. hyssopifolia, Metalasia cf. pulchella, Metalasia densa, Themeda triandra, Aspalathus cf. nigra and Restio triticeus. The geophytes Kniphofia praecox, Haemanthus coccineus and Veltheimia capensis were recorded.

Owing to the past ploughing of the lower section and grazing and trampling impacts on the upper section the overall conservation value of the site can be classified as medium".

Photo 11: The mining permit application area for Borrow pit 4 on the farm Diep Rivier Mond 358/8/rem.The foreground shows recently ploughed lands and the background more natural, but heavily disturbed, degraded Tsitsikamma sandstone fynbos

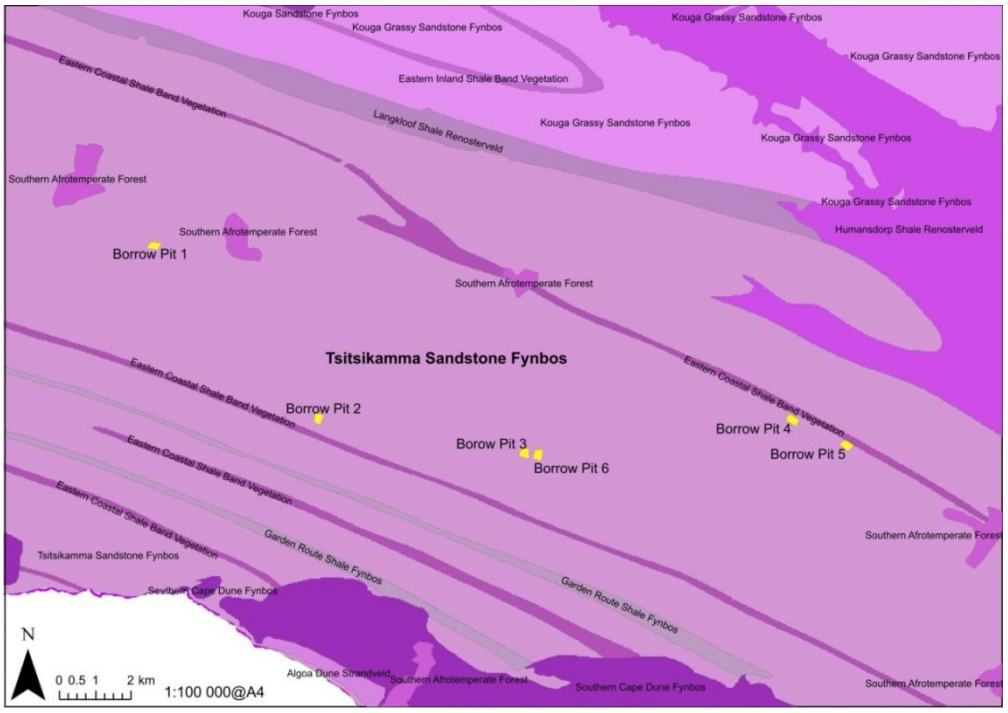


Figure 6: Original natural vegetation types in the region. The sites (yellow polygon) in Tsitsikamma sandstone fynbos: source SANBI – BGIS.

Conclusion of the Botanical assessment:

"Sites 4 & 5 have been moderately impacted by past and current agricultural activities and have medium conservation value. These sites could be mined but search and rescue and rehabilitation as described in this report must be implemented"

Activity	*Spatial extent*	*Significance*	*Duration*	*Probability*	*Post-closure impact*
Mining Permit area extension of excavation	Mining permit are measures 1.5ha	Medium	Temporary	Definitely	Low given rehabilitation

6.1.2.9 **Air quality (Dust)**

The following sources of dust will arise due to quarrying activity

- Excavation activities (excavator).
- Possible crushing and screening.
- Product loading.
- Delivery vehicles to the public road.

No weigh bridge will be located on-site as a central weigh bridge in the wind farm project area will serve all borrow pits.

As per Figure 2 (surrounding land use), the closest residences lie in excess of 480m to the south-east and 760m to the southwest of the site. Accordingly the potential dust impacts which could occur are from the direct loading but more so from crushing and screening plant and the 230m delivery to the gravel road traffic under dry conditions, which often prevail at the site. This is however similar to the consideration the landowner would give to annual ploughing of the adjacent field under similar dry windy conditions.

As the contractor will be active on the main construction site, where water carts will be available for despatch to the borrow pits, water cart wetting is identified as the attenuation measure to generally limit dust generated in the excavation and on the delivery road.

If however dust generation under wind conditions dispersing dust to impact on any adjacent land use occurs, the site manager shall temporarily terminate activities during such conditions.

Activity	*Spatial extent*	*Significance*	*Duration*	*Probability*	*Post-closure impact*
Mining Permit area	1.49ha	Moderate to high if not managed,	Temporary	Possible under specific wind conditions coupled to dry periods and specific high-dust generating activites	None following revegetation (no different to the adjacent ploughed cultivated field)

6.1.2.10 **Noise**

The following noise sources will occur during the envisaged life-of-mine:

- Loading by excavator of material to delivery vehicles or possible screening plant hopper

- Possible crushing and screening plant, which activity will be limited to daytime hours, Monday to Friday.
- Product loading and delivery vehicle generated noise

Loading, screening, hauling, and vehicle noise will be limited to the extent of the mine and activities will be limited to the hours between 07h00 and 18h00, weekdays only.

- Blasting; no blasting is envisaged but should a quartzite ridge be encountered in the excavation, such material would be blasted out and crushed to ensure avoidance of undulations in the final excavation floor.

As in the case of wind-dispersed dust impact, noise impact on the farmsteads at more than 480m to the south-East will be limited to wind-still conditions or low speed westerly wind conditions, as during all other wind directions noise and dust will be dispersed away from such farmsteads and during high wind speed conditions the wind noise in trees and roofs surrounding the farmsteads will exceed the dispersed mining noise.

Should basting be required, blast noise will have the most widespread impact on the surrounding land users. It is important to note that such blasting activities may seldom occur and in such event will be controlled in accordance with standard industry practices, namely:

- Avoid blasting under temperature inversion (mainly cold mornings)
- Avoid blasting under low cloud conditions
- Always try to blast at the same time of day so that it becomes expected by the residents and persons working in the veld
- Alerting of all surrounding land users by way of notifications/ telephone / SMS of envisaged blasting to reduce the startling effect of the basalt as at such distance the blast noise levels will pose no health threat to any affected persons.
- Warning signage will be erected along the public road should blasting be required.
- Temporary road closure for a period of 20minutes will occur given the risk of fly-rock impacting on traffic at the distance of 230m

It is noted that all activities will be limited to daylight working hours.

Activity	***Spatial extent***	***Significance***	***Duration***	***Probability***	***Post-closure impact***
Excavator loading and despatch	1.49ha and immediate surrounds	Low other than reverse safety bleeper	Life of mine	definite	None
Crushing and screening	1.49ha and immediate surrounds	Moderate	Possible periods in Life of mine	possible	None
Possible blasting	Startling effect within a radius of 1km	High startling impact –no health risk beyond 500m	Sporadically if required	Unlikely but possible	None

6.1.2.11 **Blast vibration and fly rock (in the event of blasting being required)**

a) Blast vibration – Blast vibration will have no negative impact given the large distances between the quarry and adjacent buildings (at closest 480m).
Blast transmissivity in the quartzite will be reduced by the prevalence of open north-south vertical joints characterising the adjacent quartzites in this area.
Despite this expectation of low blast vibration risk, all blasts will be monitored with recordal equipment placed at the closest residence on Farm 678/1.

b) Fly rock - Fly rock is legally acknowledged as being a potential impact within a radius of up to 500m. While the nearest residence is on the edge of this perimeter (at minimum 480m from mining edge but 520m from nearest possible blasting), this operation will not impact on any surrounding farmsteads or other activity centres, but could impact on farming 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**) , as well as on traffic of the DR01755 230m north of the site.

Given the proximity of the 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 general blasting is not envisaged, but in order to permit such possible blasting under the permission sought the impact of such blasting is hereby assessed.

Within the prescriptions of the mining legislation controlling blasting, the blaster will be tasked with evacuating all persons or livestock within the fly rock risk zone and with arranging the temporary traffic control on the DR 01755. (in this regard, Haw and Inglis as a large road contractor is au fait with such traffic control and will conduct it through their appropriate signposting and methods to be employed.)

Activity	***Spatial extent***	***Significance***	***Duration***	***Probability***	***Post-closure impact***
Possible blasting - vibration	Structural damage highly unlikely beyond 350m	Low beyond 350m	Sporadically if required	Unlikely but possible	None
Possible blasting – fly rock	Within 500m radius of blast	Low beyond 350m	Sporadically if required	Unlikely but possible	None

NOTE: The assessment of blast noise, vibration and fly rock risk is based on the experience of Site Plan Consulting monitoring of noise, fly rock and blast vibration at numerous quarries over the past 25 years, in the same Peninsula Sandstones in Port Elizabeth, Plettenberg bay, and Grabouw. It is further noted that blast impact can be fully controlled through appropriate blast design (charge/delay, stemming depth, etc) and accordingly the above low risk conclusions are reached, but the contractor will be cautioned to ensure that consideration is given to the surrounding uses in the preparation of the design of any blasts which may be contemplated.

6.1.3 Assessment of potential cumulative impacts

This Mining Permit is one of 6 Mining Permit Applications currently being sought in the greater area, from which the finally selected permit applications will together serve the greater Tsitsikamma Community Wind Farm construction project, of which two, namely BP4 and BP5 occur along the DR01755.

The limited extent of the site together with the temporary nature of this planned disturbance and the Low post-mining impact given the prescribed rehabilitation, negating significant cumulative impacts when considered together with that of Nearby Borrow Pit 5 1.5km to the south-east and the temporary public road maintenance borrow pits shown in Figure 2, yielding a low cumulative mining impact, which will be further reduced when the road borrow pits are rehabilitated as alternative future sources are established.

6.2 Proposed mitigation measures to minimise adverse impacts

6.2.1 List of actions, activities, or processes that have sufficiently significant impacts to require mitigation

The following impacts are deemed significant enough to require mitigation:

1. Topsoil must be removed and temporarily stored in berms for replacement of the growing medium during rehabilitation.
2. The return of indigenous vegetation to the site is also deemed a requirement to eliminate post-mining visual impact and to reinstate current habitat, despite being impacted by grazing to date.
3. Noise, dust and fly rock are other aspects which will require mitigation measures be put in place to eliminate/reduce their risk of impact.

6.2.2 Concomitant list of appropriate technical or management options

6.2.2.1 Soils

The following topsoil management methodology is copied directly from the specialist botanical report (attached as Appendix G):

> *"Top soil stripping*
> *Successful rehabilitation is dependent on careful management of topsoil. Some 70-80% of all plant species found on these sites can returned if topsoil is conserved and replaced following mining. The top 300 mm of soil should be scraped separately and stockpiled for re-spreading following mining".*
>
> *"Top soil storage*
> *The top soil should be stored in berms on the perimeter of the site and covered in netting to reduce wind loss. The length of time that the topsoil is stored is critical as regeneration success diminishes with time as the seed store becomes depleted. If feasible the mining should be undertaken in stages whereby topsoil from the next stage is used to cover earlier stages as they are completed."*
>
> *"Final shaping*
> *Once mining of an area is completed the slopes must be graded and the floor of the mine ripped and topsoil returned by thinly spreading over the site. It is important that*

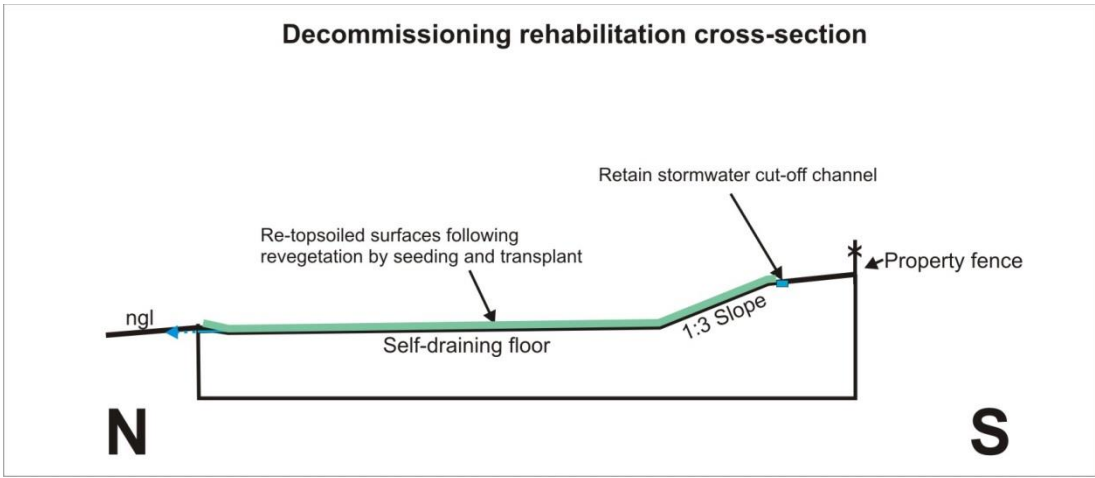
once mining is completed, the entire mine floor should be covered evenly with topsoil (even if this means a patchy spread, but across the entire floor"

"Returning top soil
Care must be taken to ensure that topsoil is evenly replaced on the floor and over the trimmed edges. Once topsoil has been returned the whole floor should be lightly scarified.

"Re-vegetation
Following scarification, all bulbs removed and stored should be returned to the floor. The seed must then be smoke treated and raked into the topsoil in the autumn."

6.2.2.2 Topography

As the excavation will not be backfilled, the topographic impact will be attenuated through rehabilitation shaping (1:3 perimeter sloping) combined with re-topsoiling and revegetation of all disturbance footprints to reintegrate the area fully into the surrounding topography and visual envelope.



6.2.2.3 Visual Impact

The proposed mining and rehabilitation incorporates the following measures to reduce visual impact in both the operational and post-mining periods:

1) Given the high visual exposure of the site, **during the mining operation** block/strip-mining process from west to east will be applied, thereby permitting the shortest possible exposure of the smallest possible area at a time. refer Figure 4 (including Inset A).

Photo 12: View from theDR01755 gravel road (to St Francis Bay) showing the Borrow Pit 4 area and extent

2) In order to reduce the **visual impact post-mining**, the excavation perimeter will be sloped to 1:3 with re-topsoiling and revegetation

Photo 13: Typical Borrow Pit rehabilitation in process, with full topsoil replacement and revegetation by pasture seeding on the floor of the excavation, and scarification of 1:3 side slope ready for hand seeding.

6.2.2.4 Animal Life

As is standard practise, an animal search and rescue will be undertaken prior to any activity on site, with specific attention to sedentary species.

Regarding avifauna, the pre-disturbance search and rescue will pay specific attention to any occurrence of especially Blue Crane (nesting between October and March) and Denham's Bustard (nesting throughout the year) nesting sites, in which event a specialist ornithologist will be consulted to assess the situation and prescribe attenuation measures, which may include rescheduling the use of the borrow pits to allow non-disturbance during occupation of any nest.

6.2.2.5 Land Capability

As the scree gravel excavations will take place in unconsolidated gravels, with reasonable topsoil profiles, their combined grazing agricultural/wilderness potential will largely be returned through planned growing medium reconstitution and revegetation. As such the following actions will be put in place to meet this aim:

1) The excavation is to be shaped in such a way as to maximise reintegration to its current grazing/wilderness function.
2) The topsoiling and revegetation programme proposed for the entire disturbance area will serve to reinstate grazing over the site.
3) Topsoil stockpiles (i.e. topsoil removed ahead of mining or placement of any facilities or stockpiles) are not to be placed on top of natural vegetation and must be placed within the planned disturbance footprint, with their reuse scheduled with final perimeter shaping.

6.2.2.6 Surface Water

The contamination of stormwater and avoidance of post-mining erosion will be avoided/ minimized through:

1) Strict adherence to the fuel management as per para 5.2 in the Mining Permit Area.
2) Directing internal drainage to a sump prior to discharge.
3) Provision of an up-contour stormwater cut-off channel as shown in Figures 4 and 5 to avoid sheet flow from higher lying area eroding the southern slope

6.2.2.7 Vegetation

The following measures must be put in place to minimize impact on vegetation and maximise restoration of natural vegetation post mining. Note that all of these measures are sourced directly from Privett report (attached as Appendix G):

1) "Site demarcation

The perimeter of the site to be mined must be clearly demarcated with visible posts at a maximum of 50m apart. No-go areas must be clearly demarcated and no access allowed into these areas during mining."

2) " Alien vegetation clearing

All alien vegetation, with the exception of the perimeter vegetation (when required for visual and dust screening during mining) must be removed prior to mining. The perimeter alien vegetation plus surrounding 50 m of alien vegetation must be cleared during decommissioning rehabilitation. This buffer area is important in reducing the chances of seed being brought back into the site during the early phases of rehabilitation when the disturbed ground is particularly vulnerable to re-introductions. The topsoil will be full of alien seed and at least three annual post-mining alien clearing follow ups must be built into the alien clearing program."

3) "Search and rescue

A qualified botanist/horticulturalist should remove all geophytes and other translocatable material from the site prior to excavation commencing. Material removed from site must either be stored in appropriate cool, dry, dark conditions for later replanting or be planted in suitable No-go areas. If used for rehabilitation then bulbs and rescued plants should be replanted once topsoil has been returned and scarified, but prior to seed introductions. Bulbs recorded on the sites include Tritoniopsis caffra, Haemanthus coccineus, Watsonia knysnana, Velthemia capensis and Kniphofia praecox. There is a high likelihood of other bulb species being present that were not visible owing to the season of sampling. Ideally bulbs should be marked in spring when they flower or are in leaf, but they should only be transplanted once their leaves have dried off (late summer/autumn). If stored under correct conditions these bulbs will all last for the duration of the mining operation."

4) " Seed Collecting

A qualified botanist/horticulturalist should carry out seed collections both on site and from surrounding vegetation. Collections should ideally be carried out in late summer when the majority of seeds are mature. The vegetation is currently mature and seeds will be available for most species in late summer. Additional seeds of Leucospermum cuneiforme, Protea mundii and Leucadendron salignum should be collected. These seeds should be smoke-treated prior to raking into topsoil post-mining."

6.2.2.8 **Ground Water**

Despite there being no impact expected on groundwater, avoidance of contamination of ground water will be achieved by:

1) Strict adherence to the Fuel management as per para 5.2. As the groundwater in this area can be assumed (given the quartzite rock) to be very pure, strict control over potential hydrocarbon contamination will be imposed through a fuel and lubricant management system relating to vehicle maintenance, refuelling, refuelling procedures, the use of drip trays and drip sheets under parked vehicles, and incorporation of the fuel and lubricant management programme into the Environmental Induction Training Programme.

   No fuel is to be stored on site, with daily refuelling to take place by means of a mobile fuel bowser.

2) Provision of chemical toilets given the temporary nature of the site.

6.2.2.9 **Air quality (Dust)**

Given that implementation of the following measures to control dust has become minimum standard practise, the consideration of dust impact must assume that at least the following basic measures will be implemented.

1) Dust generated off unsurfaced roadways (General): Wetting of unsurfaced roadways by water cart spray when required and limit speeds on the affected roads.

2) Drilling generated dust (*should blasting be required):* Drills to be provided with dust extraction equipment (This is now standard).

3) Dust generated during blasting(*if required*) (No specific measure identified as it is expected that the blast dust will be low in the absence of weathered overburden and that give the surrounding land use, no users will be significantly impacted.

4) Crushing and screening (*if required*) will be undertaken within the confines of the excavation. With such crushing position minimum 230m from the public road and 480m from the nearest residences, crushing and screening dust can be limited to levels which will not impact on the passing traffic.

5) Should excessive dust however occur under light north-westerly or southerly wind conditions (which if noted are impacting on either road traffic or the surrounding land use) the site manager should terminate crushing/screening activities in order to not place any risk on passing traffic due to such dust.

It must be remembered that dust impact must also be controlled / limited in terms of employee health (Mine health and safety), which of necessity requires the contractor to limit dust generation at the source, thereby also reducing broader environmental dust impact.

6.2.2.10 **Noise**

Para 6.1.2.10 describes the existing elements which serve to eliminate most noise impacts through the proposed operation on surrounding land users and uses.

Staff/ Operators will be made aware of noise considerations through induction training.

As the activities will be limited to daytime only, while the high-pitch reverse signals of the front-end loader will be audible from the residences under wind-still conditions this will not be considered an impact during normal working hours.

Against monitoring conducted at numerous quarries in terms of the standard set in SABS 0103 ,at the 480m distance to the farmstead it is not expected that the general borrow pit noise will exceed the recommended daytime noise level of 45dB.

Expected community response

In terms of community response to noise, SANS recommendations are to be used as follows:

Excess dB above ambient	Estimated Community / Group Response	
	Category	Description
0	None	No observed reaction
5	Little	Sporadic complaints
10	Medium	Wide spread complaints
15	Strong	Threats of community / group action
20	Very Strong	Vigorous community / group action

In addition, the general noise industry rule of "ambient +7 dB" shall serve as a good indicator above which levels are generally "not acceptable" (this applies to variations which may occur on occasion and not the average levels).

In the case of blasting being required: The most significant impact (startling effect) beyond the mining area is that of blast noise. Given the distances involved (the closest of which is the landowner's residence some 480m) even this effect will be limited, but be that as it may, the following will be implemented:

1) Never blast under temperature inversion (early cold windless mornings).
2) Avoid blasting under low cloud conditions.
3) Always try to blast at the same time of day so that it becomes expected
4) Warn, by way of telephone / SMS, all neighbouring land owners.
5) Temporary closure of the adjacent public gravel road for a period of 20 minutes at time of blasting during initial blasts while the risk is fully established by monitoring the initial blast noise, dust and flyrock.

6.2.2.11 **Blast vibration and fly rock (in the event of blasting being required)**

a) Blast vibration

Despite expected acceptable levels of ground vibration at the closest distance of 480m to a structure, in the event of blasting being required, blast design must seek to ensure that blast ground vibration levels (measured as PPV; Peak Particle Velocity) at such structures preferably does not exceed 7.5mm per second as an achievable limit based on experience elsewhere in similar rock conditions even at closer distances in the order of 350m, but to ensure that the recommended limit of 12.5mm/second is not exceeded.

All blasts shall be recorded by means of calibrated "vibro-recorder" equipment placed adjacent to the receiving structure. The results of all readings printed by the vibro-recorder shall be retained by the holder of the permit and if vibration levels are higher than expected ie above 7.5mm per second, the blast designer shall be instructed to amend any further blasting to achieve lower levels.

In addition, through consultation with the owners of such structures, prior to any blasting occurring the Holder of the permit shall have the structure

photographed to record any structural failure already present, its plaster and its windows in order to avoid any dispute regarding possible claimed blasting damage.

b) Fly rock

As Fly rock is acknowledged as being a potential impact within a radius of up to 500m, but definite high risk to the passing traffic on the public road, it will require the temporary closure of the public gravel road by flagmen for the 20 minutes period prior to and during blasting for all blasts, during mining operation. The blaster together with the appointed mine manager shall also inspect the distribution of fly rock and remove any fly rock from the tilled field. Excessive distribution of fly rock should be taken into account by the blaster to inform any further blast design.

7 REGULATION 52 (2) (d): Financial provision.

The applicant is required to-

7.1 Plans for quantum calculation purposes.

(Show the location and aerial extent of the aforesaid main mining actions, activities, or processes, for each of the construction operational and closure phases of the operation).

Refer figure 4: Detailed Mine layout plan in para 5.2.2 and Figure 5: Decommissioning Rehabilitation Plan.

7.2 Alignment of rehabilitation with the closure objectives

(Describe and ensure that the rehabilitation plan is compatible with the closure objectives determined in accordance with the baseline study as prescribed).

The proposed closure objective is to return the entire site to its current grazing/wilderness function through restoration of natural vegetation over the disturbed area.

Once mining ceases, all disturbed perimeter surfaces, slopes, and borrow pit floor will be rehabilitated through:

- shaping as shown diagrammatically in para 6.2.2.2,
- retention of the upper stormwater cut-off channel
- removal of logistical facilities and chemical toilet
- removal of the fences not requested by the landowner for retention
- ensuring internal drainage to the northwest corner of the site with controlled release from a detention pond.
- Retopsoiling of all disturbed areas
- Seeding for re-establishment of vegetation

7.3 Quantum calculations.

(Provide a calculation of the quantum of the financial provision required to manage and rehabilitate the environment, in accordance with the guideline prescribed in terms of regulation54 (1) in respect of each of the phases referred to).

As per the Financial and Technical Ability Report Table 2 (overleaf), an amount of R50 000 is specified for decommissioning rehabilitation.

ACTIVITY Mark with X which activities are applicable		POTENTIAL IMPACT	MITIGATION MEASURE	STATE QUARTERLY COST OF THE MITIGATION MEASURES IN THE AVAILABLE SPACE BELOW, IN RANDS	STATE THE ESTIMATED REHABILITATION COST RELATED TO THE ACTIVITY IN THE AVAILABLE SPACE BELOW, IN RANDS
Excavating		Surface disturbance	Rehabilitation		R50 000
		Dust	Dust Control Measure	None required	
		Noise	Noise Control Measure	None required	
		Contaminated drainage	Storm water system	None required	
Blasting		Fly rock	Access control measures	None required	
Stockpiles		Surface disturbance	Rehabilitation		N/A load from pit
		Dust	Dust Control Measure	Not Applicable	
		Contaminated drainage	Storm water system	Not Applicable	
Discard dumps or dams		Surface disturbance	Rehabilitation		Not Applicable
		Dust	Dust Control Measure	Not Applicable	
		Contaminated drainage	Storm water system	Not Applicable	
Loading, hauling and transport		Noise	Noise Control Measure	Not Applicable	
		Dust	Dust Control Measure	R8 000	
Water supply dams and boreholes		Surface disturbance	Rehabilitation		Not Applicable
Accommodation, offices, ablution, stores, workshops, etc		Surface disturbance	Rehabilitation		Situated at main project site
Processing plant		Noise	Noise Control Measure	Not Applicable	
		Dust	Dust Control Measure	Not Applicable	
		Contaminated Water	Storm water system	Not Applicable	
		Surface disturbance	Rehabilitation		
			TOTAL	R8 000	R50 000

Decommissioning Rehabilitation cost @ R50 000

7.4 Undertaking to provide financial provision

(Indicate that the required amount will be provided should the right be granted).

The required amount of R50 000 or alternate amount adjudicated by DMR will be provided by the applicant by way of Bank Guarantee. The applicant commits to the provision of such guarantee through the lodging and signing of this document.

8 REGULATION 52 (2) (e): Planned monitoring and performance assessment of the environmental management plan.

8.1 List of identified impacts requiring monitoring programmes.

The only aspects of the operation that will require monitoring are as follows:

1. **Topsoil management**
2. **Fuel/Lubricant management**
3. **Dust and Noise**
4. **Blasting, ground vibration and especially fly rock**
5. **Stormwater management (Cut-off trench inspections)**
6. **Vegetation management (no-go area)**

8.2 Functional requirements for monitoring programmes.

Fortunately this monitoring programme is a fairly straightforward with monitoring to be managed by the Mine manager. As such no specific functional requirements are deemed necessary but it will serve to note the following elements to be implemented and as such for their implementation to be monitored by the mine manager.

1. **Topsoil management:**

   Mining Permit area:

   - Remove all topsoil to designated stockpiles for re-use in excavation bench rehabilitation and rehabilitation of the excavation rim and upper safety bench
   - Pre-ripping of disturbance footprints prior to topsoil replacement.
   - Replacement of topsoil by dozing from perimeter topsoil berms.
   - Re-ripping/blending of the replaced growing medium materials.
   - Smoothing the surface by scarification, and reseeding with localised pioneer species in consultation with specialist botanist.

2. **Fuel/Lubricant management** As per paragraph 5.2:

   The appointed mine manager will ensure implementation of the fuel and lubricant management programme elements as per paragraph 5.2 on a daily basis. Additionally, the operators of the equipment must be instructed to report daily on any fuel/lubricant incidents and the mine manager will be responsible for such daily verbal reporting. The mine manager shall record all "environmental incidents" in writing (Place of occurrence, date and time together with description of occurrence, remediation treatment applied and residual status etc).

3. **Dust and Noise**

   Ambient conditions will be monitored visually and audibly daily and the Mine Manager will adapt operations so as to limit all noise and dust generation when conditions are unfavourable, and instruct on additional water cart wetting of manoeuvring areas and roads as required to control dust.

   Should a combination of high dust and westerly/southerly wind conditions pose any risk to traffic safety at any time, or to the nearest farmsteads, the on-site activities shall immediately be terminated and attenuation measures applied prior to recommencement of activities at a reduced risk.

4. **Blasting**

   Blasting will be conducted by a blasting contractor who shall be responsible for the ground vibration monitoring of each blast while the blaster and mine manager/production manager will inspect the distribution of fly rock as basis for risk assessment relating to continued road closures during blasting. Any subsequent blast required shall take cognisance of such monitoring in the blast design.

5. **Stormwater cut-off channels and ponds**

   On a monthly basis and additionally during and after heavy rains the Mine Manger/Production Manager shall inspect the stormwater cut-off channel/detention pond to ensure that it is maintained and functioning.

6. **Vegetation**

   On a monthly basis the mine manager/production manager shall conduct a site inspection to:

- Check that no unnecessary disturbance of natural vegetation takes place by either unauthorised tipping or movement of mobile plant outside of demarcated areas and roadway.
- Alien vegetation management in accordance with botanist specification.
- That No-Go area demarcation is in place

8.3 Roles and responsibilities for the execution of monitoring programmes.

The applicant will arrange for the conducting of monitoring during topsoil removal, mining and during substrate ripping and re-topsoiling and an Environmental Performance Assessment (EPA) will be conducted midway during rehabilitation, which EPA will be supplemented by a final rehabilitation inspection serving the purpose of closure motivation.

Implementation of the on-site daily monitoring by observation and internal verbal reporting will be conducted by the equipment operators and mine manager.

8.4 Committed time frames for monitoring and reporting.

The following applies:

1) Daily monitoring by observation of:
    a. Fuel and lubricant management
    b. Dust and noise levels
    c. Restriction of equipment movement to demarcated areas
2) Continuous visual monitoring of dust levels
3) Ground vibration monitoring by contractor and fly rock monitoring by contractor and mine management during each blast
4) Three stages of topsoil monitoring by Mine Management ie:
    a) During topsoil removal
    b) Retention in berms during mining
    c) During rehabilitation sub-soiling and re-topsoiling
5) Monthly monitoring by management inspection of:
    a) Stormwater and siltation channel and pond
    b) Alien vegetation
    c) Progress in Phased rehabilitation per block
6) As Environmental Performance Assessments are prescribed to be conducted every two years, and given that the lifespan of a Mining Permit as sought is two years, only a single formal Environmental Performance Assessment Report will be submitted to the DMR during final rehabilitation.

However, should a 1-year extension period be sought, or it be deemed necessary throughout the project by the DMR, such Report may be conducted annually to fall within site activity time frames.

9 REGULATION 52 (2) (f): Closure and environmental objectives.

9.1 Rehabilitation plan

(Show the areas and aerial extent of the main mining activities, including the anticipated mining area at the time of closure).

Refer Figure 5: Decommissioning rehabilitation Plan.

9.2 Closure objectives and their extent of alignment to the pre-mining environment.

The closure objective is to return the entire site to its grazing/wilderness use.

9.3 Confirmation of consultation

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

Yes.

The public participation process was exhaustive and part of that process was the preparation of a so-called "Background Information Document" (BID). Such document is included in full in Appendix A. The BID document was hand delivered to the landowner and adjacent landowners, with all such persons additionally contacted telephonically and this Application discussed. The landowner's written consent for the project is attached hereto in Appendix C and he will be entering into a Surface Rental Agreement with Great Karoo Prospecting prior to the commencement of any activities on-site.

In order to reach the general public, a notice of the Application was placed in the local newspaper, The Kouga Express, along with a hard copy of the BID document made available at the Humansdorp Public library for perusal, with the BID being emailed to identified I&AP's as well as persons who requested registration as I&AP's. (responses to date are attached hereto in Appendix D).

10 REGULATION 52 (2) (g): Record of the public participation and the results thereof.

10.1 Identification of interested and affected parties.

(Provide the information referred to in the guideline)

As referred in the report on Consultation:

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

While no community is specifically identified, this borrow pit will serve the supply of mateials to the Tsitsikamma Community Wind Farm Project which is an undertaking involving the Tsitsikamma Development Trust – Mfengu Community,

and consequently the community will be deriving full benefit from the successful construction of the wind farm, and successful and cost effective supply of materials in the construction programme by the Applicant.

The Borrow Pit is located in a rural farming area with the closest town being the Mfengu Village at some 7km to the west.

The Department Rural Development and Land Reform has been notified in respect of possible land claims and their response is awaited.

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

No, the land is privately owned.

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

The Department Rural Development and Land Reform has been notified in respect of possible land claims. Their response is however still awaited and will be included as an Appendix to this report once received.

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

The Department Rural Development and Land Reform has been notified in respect of possible land claims. Their response is however still awaited and will be included as an Appendix to this report once received.

10.1.5 Name the Traditional Authority identified

None applicable

10.1.6 List the landowners identified by the applicant.

Farm Diep Riviers Mond 358 portion 8 remaining extent is owned by the Elna Tennant Trust, in terms of Title deed T32616/2010.

10.1.7 List the lawful occupiers of the land concerned.

The landowner currently utilizes this portion of the farm for grazing.

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

The proposed Mining Permit area of 1.49Ha combined with the 2-year lifespan of the operation results in a limited direct employment impact arising from the mining operation, which will be served largely by existing Great Karoo Prospecting employees. However, this Mining Permit will serve to provide the very necessary construction materials to the Tsitsikamma Community Wind Farm Project and as such will contribute positively to the employment of the local workforce involved in the Civil Engineering Construction programme of the Project and in post completion the wind farm will provide the community of Mfengu with a source of income.

10.1.9 Name the Local Municipality identified by the applicant

Kouga Local Municipality. Their comment on this documentation is not requested, as a separate full Application for Land Use Departure is being submitted to the Local Authority.

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

- Department Environment and Nature Conservation (Eastern Cape)
- Department of Water Affairs and Forestry
- Department of Agriculture

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

Landowners

The landowner's (Trust's) representative, Mr J.P. Steynberg, was fully consulted by the Applicant in a meeting held between himself and Mr Kevin Konkol of Great Karoo Prospecting on 23/5/2013, and as per the signed table of confirmation (Appendix C) has received a full copy of the Background Information Document (BID) outlining the envisioned activities on site.

Refer Appendix C which contains copies of:

- Table of Landowners who were personally met with on-site which includes Mr Steynberg of the Elna Tennant Trust
- Emailed notification and cover letter as sent to the immediate adjacent landowners of:
    - Farms 358 portion 20 and 675 remainder, the Basson Family Trust,
    - Farm 678 portion 1, the Steynberg Boerdery Trust, and
    - Farm 818 (consolidated), the Kliprug Familie Trust.

  In the cases of both the Kliprug Familie Trust and the Steynberg Boerdery Trust, Mr J.P. Steynberg, as for the Application property, is the designated representative.

- Signed letters of consent from Mr Steynberg on behalf of the Elna Tennant Trust, the Kliprug Familie Trust and the Steynberg Boerdery Trust.

While the Basson Family Trust has been fully telephonically consulted by Mr Stephen van der Westhuizen of this office, and was provided with emailed documentation as attached in Appendix C, no formal written response has been received on their behalf to date. It is however noted that the telephonic discussion as well as the "read receipt" received in regard to the emailed documentation confirms that all information was received by the Trust.

General I&APs and general Public (notification by newspaper)

Refer Appendix D which includes:

- Copy of newspaper notice published in the Kouga Express on 23 May 2013 with copies of the BID document provided at the Humansdorp Public Library
- Copies of correspondence received in respect of the newspaper advert (One to date, the St Francis Kromme Trust, represented by Mrs M. Langlands)

Refer Appendix E which the includes notification and comment of other identified I&AP's

- Correspondence with the Department Rural Development and Land Reform. As mentioned, given the discrepancies in farm numbering being encountered between the title deeds, SG diagrams and Windeed and GIS databases, notification to the Department of Rural Development and Land Reform was specifically delayed until Conveyancer's Certificates were obtained to ensure correct Farm references were used. No response has yet been received from the Department, but such response will be appended to this EMP once received. Given that land reform has taken place to a large degree in this area to date, no land claims in respect of this property are expected.

10.2 The details of the engagement process.

10.2.1 Description of the information provided to the community, landowners, and interested and affected parties.

Refer Appendix A. The Background Information Document (BID) contained the following:

- General information regarding the application process with specific reference to where public participation takes place in the process.
- Brief project description
- Brief description of existing environment, anticipated impacts and impact attenuation (reduction) measures
- Way forward and request to comment/register as I&AP

This BID document was:

1. Hand delivered to the Landowner and adjacent landowner where possible, and emailed to further adjacent landowners following telephonic discussion with such parties – Refer Appendix C
2. Placed at the Public Library in Humansdorp following notification in the press
3. Provided by Email or to all other parties who requested a copy (none requested to date).
4. Placed on the Site Plan Consulting website

The result is that every single person who wished to know more about the operation or comment thereon had access to the Background Information Document.

10.2.2 List of which parties identified in 6.1 above that were in fact consulted, and which were not consulted.

I&APs consulted were as follows:

Landowner:

- Elna Tennant Trust, represented by Mr J. Steynberg

Immediately Adjacent Landowners:

- Basson Family Trust
- Steynberg Boerdery Trust
- Kliprug Familie Trust

Other Identified I&AP's who were directly notified:

- Department Rural Development and Land Reform in respect of Land Claims

10.2.3 List of views raised by consulted parties regarding the existing cultural, socio-economic or biophysical environment.

The landowners response is attached In Appendix C. While he has made comment on the possible effects of mining as per para 10.2.4 below, he has no comment on this matter (in para 10.2.3).

10.2.4 List of views raised by consulted parties on how their existing cultural, socio-economic or biophysical environment potentially will be impacted on by the proposed prospecting or mining operation.

The landowner in the addendum to his letter of comment had the following comment in regard to his consent to mining:

a) That the mining does not impact negatively on future projects in the area
b) That the mining has no negative impact on any other application being lodged by the Trustee Mr Steynberg or any related party to Mr Steynberg.
c) That the rate or price of rental/surface right agreement is yet to be negotiated
d) That the possibility of a joint venture on a similar application already lodged by Mr Steynberg on behalf of Steynberg Boerdery Trust be considered by the Applicant.

The Applicant is in ongoing consultation with the landowner and a full surface rental agreement relating to all aspects raised will be put in place prior to any on-site activity.

Refer Appendix E for correspondence with the St Francis Kromme Trust. While their registration as an I&AP was in response to the later Application for Borrow Pit 6 which followed the Application for Borrow Pit 1 to 5, the concerns do relate to all borrow Pit applications which are underway and are thus included herein.

As per their letter of comment dd 3 July 2013, their concerns relate primarily to the potential impacts on avifauna of the area, specifically terrestrial species of conservation concern.

While they call for an avian specialist study to be undertaken, this is seen as unneccesary, given:

- The specialist assessment already undertaken for the area which informed the granted Environmental Authorization of the Tsitsikamma Community wind farm.
- That the primary impact of concern, being that of blasting noise, is of an exceptionally temporary nature, occurring at maximum only once every 3 weeks over a plus/minus 7 month period on the hard rock sites (Borrow Pits 2 and 6) and only possibly on ad hoc occasions on the soft rock sites (**Borrow Pits 4** and 5), and amounts only to an immediately startling effect with no long term residual effects on surrounding wildlife.
- 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 monthly blasting. This comment is based on 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.
    - Small buck footprints are found daily in the silt deposits in the proximity of the plant of the Outeniqua Quarry in George (refer Photo 13)
    - 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 Peak Quarry in Eerste River, despite immediately adjacent blasting and the direct line of site crusher noise and hauling activities
    - As per the photo 14, blue crane pairs were observed in the post-rehabilitation monitoring the first year following closure of a large “soft rock” calcrete borrow pit near Still Bay.
    - Visits to temporarily abandoned quarries and old quarries with hard rock faces on numerous sites reveals nesting by raptors, including owls.

While, as per the telephonic discussion between Mrs Langlands and Mr Stephen van der Westhuizen of Site Plan Consulting, we do concede that in the case of the hard rock excavations the habitat will be lost over the Mining Permit Area, this loss constitutes a change in habitat type rather than the sterilization of the area, as the rehabilitation to be put in place will allow reintegration of the area into a wilderness

function. As evidenced in the Avian assessment conducted by Avisense Consulting; quarry faces provide nesting sites for key raptor species, and the envisioned flooding of the quarry floor with a shallow gradient reed-bed in line with british quarry guidelines will provide habitat suitable for water fowl colonization of the site (as per "Amenity Reclamation of Mineral Workings: Main Report" published by Her Majesty's Stationary Office).

Photo 14: Buck spoor in silt bank 60 from existing operating crusher at Outeniqua Quarry, George

Photo 15: Blue cranes nesting on a rehabilitating "soft rock" Borrow Pit site at Still Bay, Western Cape, 1-year after initial decommissioning rehabilitation of the site.

10.2.5 Other concerns raised by the aforesaid parties.

As per para 10.2.4 above.

10.2.6 Confirmation that minutes and records of the consultations are appended.

Full copies of signed notification acceptance table, correspondence and responses received are attached in the Appendices to this EMP

10.2.7 Information regarding objections received.

No objections have been received.

10.3 The manner in which the issues raised were addressed.

Refer para. 10.2.4 above.

11 SECTION 39 (3) (c) of the Act: Environmental awareness plan.

11.1 Employee communication process

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

An Environmental Awareness Training Programme is contained in Appendix F setting out how the applicant will communicate the environmental sensitivities and requirements to all staff

11.2 Description of solutions to risks

(Describe the manner in which the risk must be dealt with in order to avoid pollution or degradation of the environment)

The only risks which are evident are:

1. *Hydrocarbon spills:*
   Ensure that all prescriptions contained in para 5.2 are adhered to.
2. *Risk of unnecessary disturbance to areas outside of the demarcated mining area*
   The entire Mining Permit area will be fenced with stock-proof fence prior to primary on-site activities. Additionally the no-go areas will be demarcated/signposted denoting no entry.
3. *Improper Topsoil/Growing Medium Management*
   All available topsoil will be removed and stored temporarily in perimeter topsoil berms.
4. *Alien vegetation infestation*
   No significant alien infestation occurs on the site, but it is noted that Alien vegetation management will continue beyond decommissioning rehabilitation phase and will form part of minimum 2 year aftercare programme whereafter the management of alien vegetation on-site as for the remainder of the farm will revert to the landowner.

11.3 Environmental awareness training/Emergency situation management.

(Describe the general environmental awareness training and training on dealing with emergency situations and remediation measures for such emergencies).

Only two high evidential risk probabilities/possibilities are identified namely:

- Fuel/oil spills; or
- Veld fires.

To this end the following procedures must be brought to the attention of all staff and suitable material/equipment provided to deal with them.

a) Fuel/oil spills

The reporting procedure in terms of which any person on site who sees an oil/fuel spill occurring must:

1. Ensure the safety of any person nearby by evacuating any such persons from the danger area.
2. Having assessed the volume of the spills and if safe, then:

- Report the spill to the office personnel who shall notify the Manager
- Use either shovels or mechanical equipment (loader, etc.) to either dig a low trench or construct a wall to contain the spill.

3. The Manager shall consult the literature as to the methods of clearing up the spill and treating the affected soil.

b) <u>Fire</u>

No open fires are allowed on site.

Should any fire derived from the mine or elsewhere be noted in the veld, the mine manager must immediately be notified and all available persons recruited on site to beat the fire or use the water cart if available to assist. The contact names and telephone numbers (office and after hours) of the following persons must be displayed at the mobile offices/stores/equipment container.

EMERGENCY NUMBERS

	Name	**Telephone**
Mine Manager		
Surrounding Owners		
Land owner		
Municipal Fire Chief		

12 SECTION 39 (4) (a) (iii) of the Act: Capacity to rehabilitate and manage negative impacts on the environment.

12.1 The annual amount required to manage and rehabilitate the environment.

(Provide a detailed explanation as to how the amount was derived)

As per the table in paragraph 7.3 of this EMP which is a copy of table 2 in the Financial and Technical Ability section of the Application, an amount of R8 000 per active quarter is provided for environmental management and operational rehabilitation.

The above-mentioned table in para. 7.3 also contains the cost derivation for closure rehabilitation i.e.; the R50 000 Quantum which is over and above the quarterly allocation to operational rehabilitation.

12.2 Confirmation that the stated amount correctly reflected in the ~~Prospecting~~ Work Programme as required.

Yes, it is confirmed

13 REGULATION 52 (2) (h): Undertaking to execute the environmental management plan.

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises EIA and EMP compiled in accordance with the guideline on the Departments official website and the directive in terms of sections 29 and 39 (5) in that regard, and the applicant undertakes to execute the Environmental management plan as proposed.	
Full Names and Surname	Enzo Menegaldo Representing **Great Karoo Prospecting (Pty) Ltd**
Identity Number	**5912085211184**

-END-