

BIODIVERSITY ASSESSMENT

PROPOSED DOLOMITIC LIMESTONE MINE ON PORTION 4 OF FARM WELVERDIEND NO 511, NEAR VANRHYNSDORP

August 2018



View towards the proposed mining site (mid distance) from the N7, with Gifberg in the background.



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DECLARATION OF INTEREST BY SPECIALIST

I Mark Gerald Berry, as the appointed specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
 - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
 - am not independent, but another specialist that meets the general requirements set out in Regulation 13 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.



Signature of the specialist:

Mark Berry Environmental Consultants cc

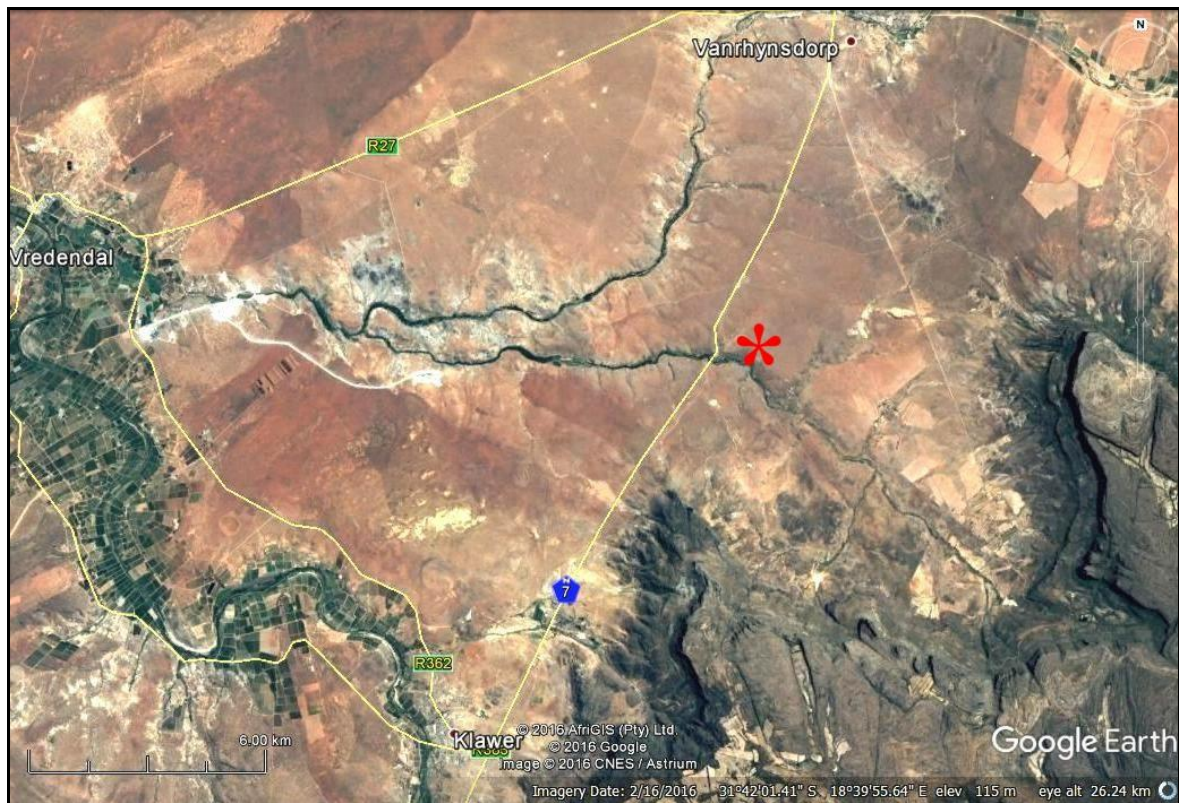
Name of company:

21 May 2021

Date:

1 INTRODUCTION

This report investigates the biodiversity impacts of the proposed extension (45 ha) of an approved limestone mine on Portion 4 of Farm Welverdiend 511, near Vanrhynsdorp (see Map 1). The proposed mining site is located on a relatively flat plain at the foot of the Matsikamma Mountains. The general area is covered with a mixture of low shrubland and grassland. An existing access road (partially tarred) provides access to the mining site. According to the 2006 Vegetation Map of South Africa, the site is located in Knersvlakte Dolomite Vygieveld and Vanrhynsdorp Gannabosveld. Also found in the general area to the south of the Wiedou River is Klaver Sandy Shrubland and Namaqualand Riviere along the Wiedou River itself.



Map 1 Satellite photo showing the location of the proposed mining site (red asterisk) between Klaver and Vanrhynsdorp.

Cape Lime (Pty) Ltd, a subsidiary of Afrimat Ltd, currently mine and process limestone and dolomite on the Farm Vaderlandsche Rietkuil, 7 km east of the proposed project. The current activities entail, apart from mining of limestone and dolomite, crushing and screening of all mined material, as well as calcination of limestone in a fluid bed lime kiln. The markets currently served are water treatment, glass industry, aggregates, mineral fillers and chemical industries.

The extent of the current limestone deposit being mined is such that it cannot support the supply of limestone to additional processing facilities without drastically reducing the life of the resource. Expansion in terms of additional capacity on the current site is also limited due to numerous constraints. Cape Lime is confronted on a regular basis with enquiries with regard to supply of high quality white lime products to potential new projects in South Africa, for which Cape Lime does not have the current production capacity.

Cape Lime has been awarded a mining right for the proposed mining activity by the Department of Mineral Resources (DMR) in terms of Section 22 of the Mineral & Petroleum Resources Development Act of 2002. Subsequently, environmental authorisation has been obtained in terms of the NEMA (Act 107 of 1998) related to mining activities on ± 5.2 ha. It was followed by a General Authorization in terms of Section 39 of the National Water Act of 1998, as well as authorization by the Matzikama Municipality in terms of the LUPO (No 15 of 1985). The application for the approval of the current EIA is triggered by the enlarged mining area, still well within the approved Mining Right area of 321 ha, and the establishment of lime kilns.

2 PROJECT DESCRIPTION

The proposed project entails the clearing of 45 ha of virgin (undeveloped) land for the purposes of mining limestone deposits, the erection of a crushing plant, four Fluid Bed Lime Calciners and associated supporting services. The total footprint of mining development on the Remainder of Farm Welverdiend 511, Vanrhynsdorp, will be ± 34 ha and the process plant and logistical facilities will have a maximum footprint of 11 ha (see Map 2 below).

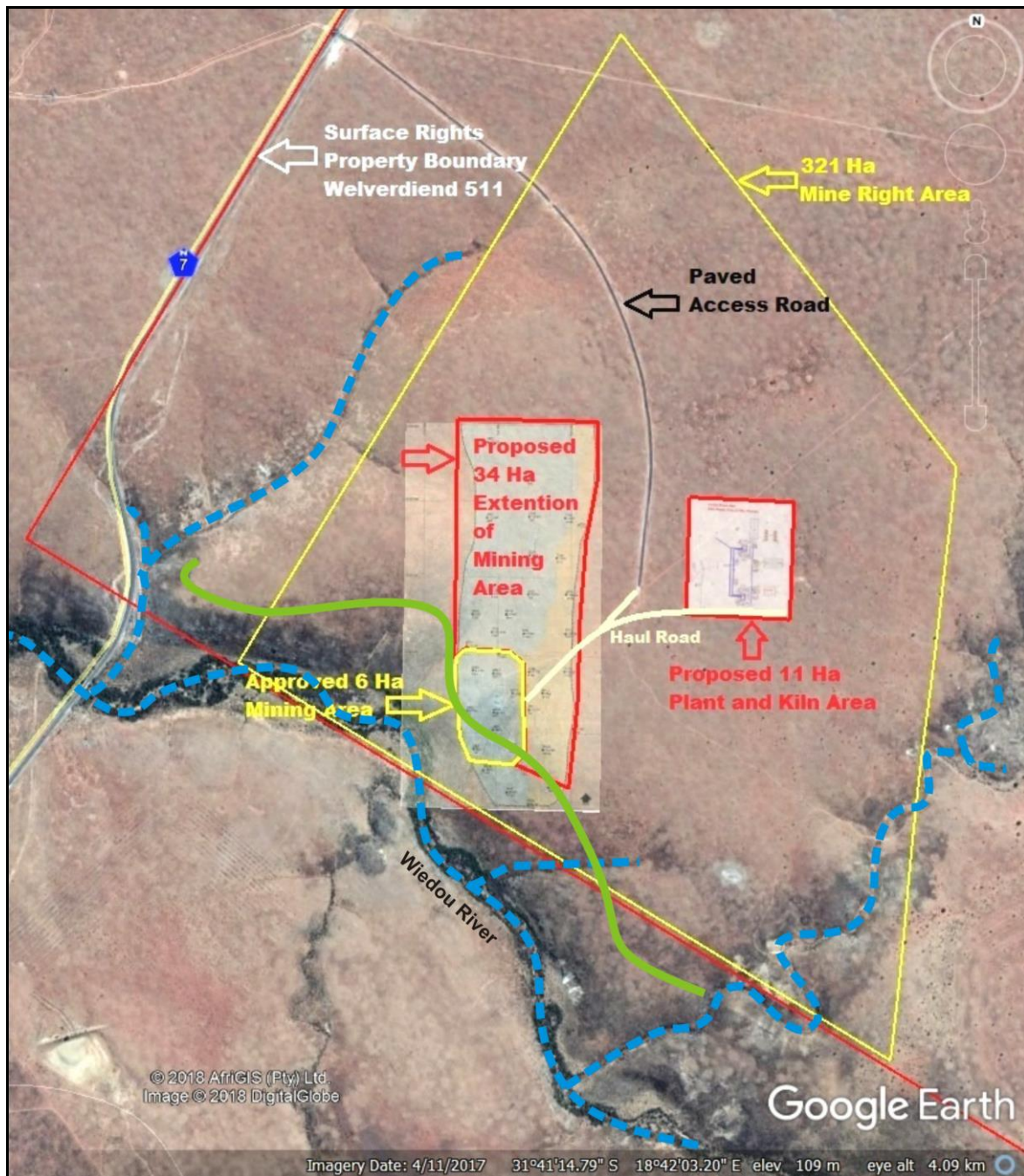
It is envisaged that the following supporting service infrastructure will be provided on site:

- Workshops for mechanical and electrical maintenance;
- Laboratory for quality control test work; and
- Administrative offices, including a weigh bridge.

The layout will be planned to allow the phasing in of the four kilns to the process line as and when required and justified. It will also include related logistical facilities, workshops and an office complex. The application for the approval of the EIA is triggered by the enlarged mining area, still well within the approved Mining Right area of 321 ha, and the erection of Lime Kilns.

Mining will be done by removal of overburden to expose the underlying limestone. Overburden thickness varies from virtually none on the southern end of the deposit to ± 10 m on the northern side. This allows strip mining to be done by drilling and blasting ± 30 m wide and 50 m long strips on the shallow end of the deposit. This will facilitate backfilling of the southern end

of the excavation to commence relatively early (± 3 years after the start of operations), thereby minimising the need for overburden stockpiles. This will assist in minimising the visual impact of the operation and expedite rehabilitation of backfilled slopes. Excavation of blasted limestone will be done by an excavator and trucks will haul the limestone to the crushing plant.



Map 2 Google Earth photo showing the position of the proposed mining extension area and plant/kiln site (outlined in red). The approved mining area and mining rights area are outlined in yellow. The green line indicates the boundary between the good quality vgyieveld on the steeper slope above the Wiedou River and the grassy area to the north. The blue lines indicate watercourses.

Crushing will consist of a three-stage crushing operation to reduce the limestone to <6 mm particle size. Co-products in the crushing and screening process will be <1 mm material, which will be supplied to customers in the glass and industrial minerals industry. The <6 mm material will be stockpiled for use as feed to the lime kilns. The latter will be fed by a limestone feed conveyor. The coal to be used as fuel in the kilns will also be fed from a coal stockpile, via a coal conveyor. Lime produced will be stored in silos before being dispatched to various clients.

3 TERMS OF REFERENCE

The terms of reference for this study are as follows:

- To determine if vegetation of high conservation value will be affected by the project. Reference will be made to its conservation value and potential impact on ecological linkages, CBA's, etc.
- To determine if any rare and threatened (Species of Conservation Concern) plant species will be affected.
- To assess the impacts on flora and vegetation.
- To propose mitigation measures to be included in method statements to ensure that the impact on biodiversity is minimised.

4 METHODOLOGY

A biodiversity survey of the site was undertaken on 14-15 November 2016, and a follow-up survey on 6 August 2018. The site surveyed is as presented on Map 2. This does not mean that every square meter of the site was surveyed, but rather a good representative portion of it, including all possible habitat types with a focus on the footprint areas, as well as certain areas outside the site. A qualitative assessment of the type and condition of the affected vegetation, disturbance and presence of alien species and Species of Conservation Concern (SCC) was carried out.

Plant species not identified in the field, were collected or photographed and identified at the Compton (Kirstenbosch) Herbarium. John Manning (Compton Herb), Dee Snijman and Cornelia Klak (Bulus Herb) kindly assisted with the identification of a few of the bulbs and vygies. Mucina & Rutherford's (2006) vegetation map and the latest floristic taxonomic literature and reference books were used for the purpose of this specialist study. Any plants classified as rare or endangered in the Red List of South African Plants online database are highlighted. The assessment follows Brownlie's (2005), CapeNature and other relevant guidelines for biodiversity assessments.

The following information was recorded during the site visit:

1. The condition of the vegetation. Is the vegetation either disturbed or degraded? A disturbed or degraded area could range from old/existing agricultural fields (fallow land), or areas previously disturbed by construction activities, to an area that has been severely eroded or degraded as a result of bad land management.
2. The species diversity. This refers to the numbers of different indigenous plant and animal species occurring on site.
3. Species of Conservation Concern occurring on site. This would include rare, vulnerable, endangered or critically endangered plants and animals (where possible).
4. Fatal flaws. These would include finding large numbers of threatened plants or local endemics that would be negatively impacted upon if project was allowed to continue.
5. Identification of the vegetation type(s) on the site. This would include trying to establish the known range of a vegetation type and whether or not this vegetation type is vulnerable (VU), endangered (EN) or critically endangered (CR).

Earlier biodiversity studies for mining applications on the site were undertaken by Ian Oliver (2010) and Simon Todd (2014).

5 LIMITATIONS TO THE STUDY

Since fieldwork was carried out during the beginning and after the spring season, flowering plants that only flower at other times of the year (e.g. autumn to early winter), such as certain amaryllids, may have been missed. The findings are supplemented with the findings of other botanical studies undertaken in the area for previous mining applications. The overall confidence in the completeness and accuracy of the botanical findings is therefore considered to be moderate to good.

6 LOCALITY & BRIEF SITE DESCRIPTION

The study site is located in the Knersvlakte, a topographically uniform area or plain that stretches from Klawer in the south to Kliprand in the north (see Map 1). The surrounding area comprises a relatively flat area that dips gently down towards the Wiedou River on the southern boundary of the Mining Right area (see Photo 1). The Gifberg forms a dramatic backdrop 7 km to the east. The underlying geology comprises Namibian Gariep Supergroup metasediments, in particular dolomite-rich sediments (Mucina & Rutherford 2006). Limestone is exposed on the steeper slopes above the Wiedou River (see Photo 2). The surrounding area is mostly untransformed and used for grazing (sheep farming). The Olifants River Valley, 15 km west of the site, supports wine farming as the main agricultural activity in the area.



Photo 1 Typical view across the northern portion of proposed mining site, looking southwards towards the Matsikamma Mountains. *Stipa capensis* is the dominant grass cover. *Salsola zeyheri* and *Atriplex lindleyi* subsp *inflata* are also common. Insert: Early spring view of northern portion.

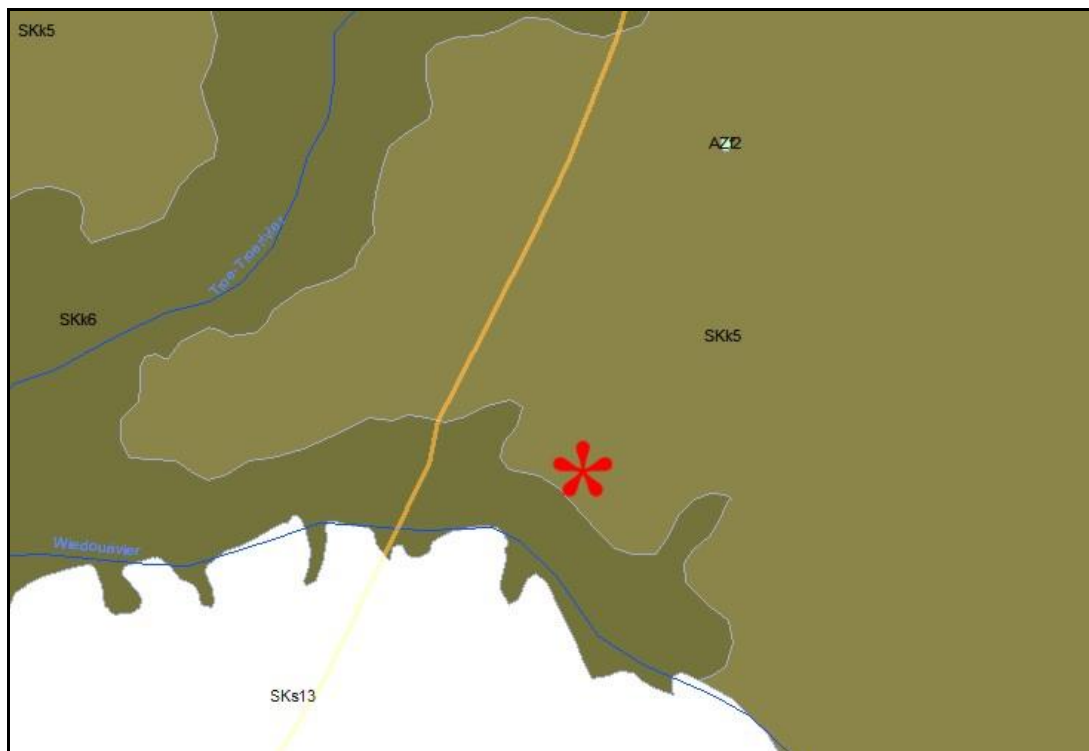
7 BIOGEOGRAPHICAL CONTEXT

Being located in the north-western corner of the Western Cape interior, the site lies inside the Succulent Karoo Biome evidenced by a prominence of succulent shrubs, such as vygies, *Aloe falcata*, *Tylecodon wallichii* and *Euphorbia mauritanica*. Grasses are dominant in the disturbed or overgrazed areas. The Vegetation Map of South Africa (Mucina & Rutherford 2006) classifies the main vegetation types found on site as Vanrhynsdorp Gannabosveld (SKk5) and Knersvlakte Dolomite Vygieveld (SKk6) (see Map 3). Klawer Sandy Shrubland (SKs13) and Namaqualand Riviere are located outside the proposed mining area to the south.

Vanrhynsdorp Gannabosveld is found in the southern Knersvlakte between Vredendal and Vanrhynsdorp at the foot of the Matsikamma and Gifberg Mountains, as well as northeast of Vanrhynsdorp (Mucina & Rutherford 2006). The landscape is mainly flat or slightly undulating, supporting succulent shrubland dominated by *Salsola*, vygies and *Galenia* species (Mucina & Rutherford 2006). In the south, the plains can acquire a grassland appearance through seasonal dominance of certain grass species, such as *Bromus pectinatus* and *Stipa capensis* (Mucina & Rutherford 2006).



Photo 2 Knersvlakte Dolomite Vygieveld with exposed limestone. Insert: *Aloe falcata*.



Map 3 Extract of the SA Vegetation Map (Mucina & Rutherford 2006), showing the position of the study site (red asterisk) within Vanrhynsdorp Gannabosveld (SKk5) and Knersvlakte Dolomite Vygieveld (SKk6). Also found in the area to the south of the site are Klawer Sandy Shrubland (SKs13) and Namaqualand Riviere (along the Wiedou River).

According to the Vegetation Map of South Africa, Knersvlakte Dolomite Vygieveld follows the main river courses (Troe-troe and Wiedou Rivers) between Vanrhynsdorp and Vredendal. It is described as a sparse, succulent shrubland dominated by erect shrubs lower than 0.3 m with succulent leaves. Klawer Sandy Shrubland is restricted to the area south of the Troe-troe and Wiedou Rivers, and east of the Olifants River. It extends past Klawer southwards. It is also found on a slightly undulating landscape and foothills covered with medium dense, tall shrubland. A narrow strip of Namaqualand Riviere vegetation is found along the Wiedou River where thickets of *Vachellia karroo* dominate on alluvial deposits.

8 VEGETATION, FLORA & FAUNA

The area proposed for the limestone mine comprises mainly a low grassland, dominated by *Stipa capensis*. *Salsola zeyheri* (vaalganna), *Atriplex lindleyi* subsp. *inflata*, *A. vestita*, *Psilocaulon junceum*, *Asparagus capensis*, *Justicia cuneata*, *Hoplophyllum spinosum*, *Trachyandra falcata* and *Brunsvigia bosmaniae* (Maartblom) are also common (see Photo 1). The latter is especially plentiful on the eastern side of the site. The dominance of *Stipa capensis* indicates to disturbance or severe overgrazing. The increase in cover of *Stipa capensis* also reduces grazing potential for sheep due to wool damage by seeds.

Succulent shrubs are dominant on the steeper limestone slopes directly above the Wiedou River where a low, open shrubland prevails (see Photo 2). *Euphorbia mauritanica* (dominant), *Tylecodon wallichii*, *Mesembryanthemum nitidum*, *M. guerichianum*, *Ruschia cf. bolusiae*, *R. leucosperma*, *R. comptonii*, *Drosanthemum cf. deciduum*, *Aloe falcata*, *Didelta carnosus*, *D. spinosa*, *Eriocephalus microphyllus*, *Pteronia succulenta*, *Elytropappus rhinocerotis*, *Berkheya fruticosa*, *Cotula microglossa*, *Gorteria diffusa*, *Asparagus retrofractus*, *Cyphia crenata*, *Roeperea morgsana*, *R. cordifolia*, *Lessertia frutescens*, *Hermannia* sp, *Galenia africana*, *Searsia undulata* and *Atriplex semibaccata* were recorded on the limestone slopes. A single occurrence of *Quaqua* sp (not in flower; 31° 41' 16.5"S, 18° 42' 27.4"E) was also recorded in the good quality vygieveld directly west of the proposed mining site. Unfortunately this plant could not be found during the follow-up survey to determine its species.

The Wiedou River (seasonal) to the south of the site supports *Vachellia karroo* thicket (see Photo 3). The latter has been invaded with *Prosopis glandulosa* and *Nerium oleander*. From a distance it is impossible to distinguish between the *V. karroo* and *P. glandulosa* due to their similar growth form and armed branches. It is understood that the riverine area will not be affected by mining activities. Erosion does not seem to be a problem in the area (due to low rainfall), although signs of minor sheet and gully erosion were noted on the southern side (left bank) of the Wiedou River.

Bulb species recorded include *Trachyandra falcata*, *T. revoluta*, *T. tortilis*, *Brunsvigia bosmaniae*, *Haemanthus coccineus*, *Ammocharis longifolia*, *Lachenalia unifolia*, *L. marginata*, *Drimia elata*, *Massonia depressa*, *Albuca canadensis*, *Gladiolus scullyi*, *Moraea lewisiae* subsp. *secunda*, *Lapeirousia pyramidalis*, *Eriospermum* sp, *Cyanella orchidiformis*, *Oxalis pes-caprae* and *O. purpurea*. Alien species recorded include *Limonium sinuatum* (alien weed), *Prosopis glandulosa* and *Nerium oleander*. *Prosopis glandulosa* is a declared alien invader under the Conservation of Agricultural Resources Act (Act 43 of 1983). It is considered the most important woody invader species in Namaqualand (Mucina & Rutherford 2006). *Galenia africana* can also become invasive along watercourses.



Photo 3 Wiedou River, with *Vachellia karroo* and *Prosopis glandulosa*. Insert: *Brunsvigia bosmaniae*

CapeNature mentioned in their comment letter (dated 27 Feb 2017) of the occurrence of a sizeable population of *Haemanthus lanceifolius* on the adjacent site. This species is listed as Vulnerable (see Red List of South African Plants online database). The survey on 6 August 2018 did not reveal any of this species on site, although *Haemanthus coccineus* is present in low numbers. Pictures taken of the leaves of several *Haemanthus* plants on and off the proposed mining site were that of *H. coccineus* as confirmed by Dee Snijman, an amaryllid

specialist. Other Species of Conservation Concern¹ (SCC) recorded in the area by Simon Todd in an earlier study (Todd 2014), include *Gethyllis gregoriana* (Rare), *Quaqua framesii* (VU), *Eriospermum calcareum* (EN) and *Oxalis blastorrhiza* (EN). Todd noted that very few of these species were observed, mostly single plants. He presumably recorded *H. lanceifolius* in the area directly west of the southern half of the site.

With regards to the presence of mammal fauna, only aardvark (see Photo 4), porcupine and mole or molerat activity was noted on site. Antelope species that may frequent the area include the common duiker, steenbok and grysbok. Rock hyrax and an angulate tortoise were recorded in the limestone area next to the N7. Termite (snout harvester termite mounds) and cocktail ant (*Crematogaster* sp) nests were also noted. The farm was utilised as a sheep farm until recently. The sheep was removed at the beginning of 2016.



Photo 4 An aardvark burrow. These burrows may also be occupied by aardwolf, bat-eared fox, Cape fox and black-backed jackal. Insert: termite mound.

¹ The Red List of South African Plants (Raimondo *et al.* 2009) has assessed all plant species in South Africa, and all indigenous species are now technically Red Data Book species, and thus it is preferable to use the term Species of Conservation Concern to refer to species that are listed as either Threatened or Rare.

9 CONSERVATION STATUS & BIODIVERSITY NETWORK

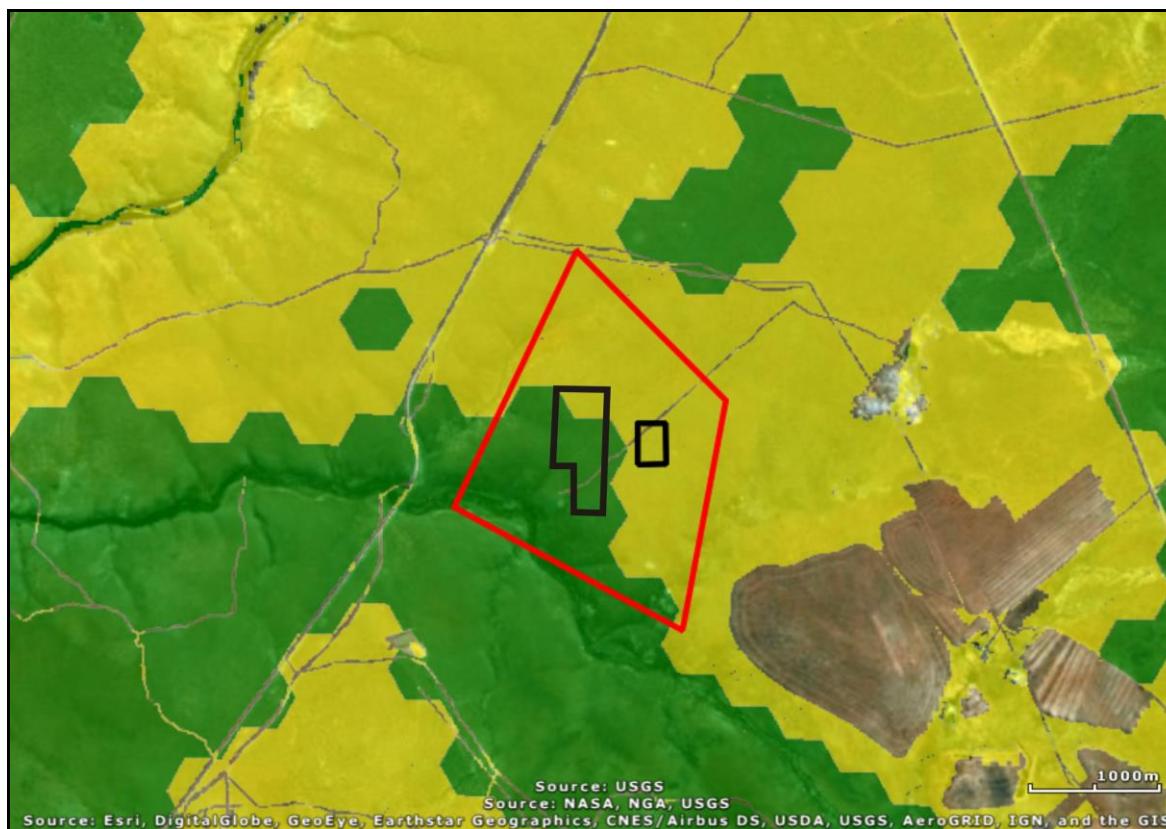
Knersvlakte Dolomite Vygieveld is the best represented vegetation unit, with less than 5% transformed (Mucina & Rutherford 2006). Vanrhynsdorp Gannabosveld is the most transformed unit, with 79.5% remaining according to Mucina & Rutherford (2006). None of the vegetation types appear on the national list of threatened ecosystems (DEA 2011). However, CapeNature commented (27 Feb 2017) that Vanrhynsdorp Gannabosveld is under threat from mining and agriculture and is poorly protected. They further commented that Knersvlakte Dolomite Vygieveld has a very limited range with no formal protection. In the larger area, both vegetation units are being threatened by overgrazing, cultivation (limited mainly to the Olifants River valley), mining activities and road construction. Mucina & Rutherford (2006) noted that “rehabilitation (of Vanrhynsdorp Gannabosveld) after open-cast mining is very limited due to lack of viable topsoil to cover the rehabilitated fields”.

The study area falls within the Matzikama Biodiversity Network. Map 4 below shows that the proposed mining site on the northern side of a mapped critical biodiversity area (CBA), with the kilns site located inside an ecological support area (ESA). Please note that these maps are produced at a small scale and become less accurate when zooming in. The CBA comprises a wide east-west linking ecological corridor associated with the Wiedou River. CBA's are defined as areas in a natural condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure (Pool-Stanvliet *et al.* 2017). ESA's, on the other hand, are not essential for meeting biodiversity targets, but play an important role in supporting the functioning of protected areas or CBA's, and are often vital for delivering ecosystem services. These sites are selected for meeting national targets for species, habitats and ecological processes (Pool-Stanvliet *et al.* 2017). Many of these areas support known occurrences of threatened plant species, and/or may be essential elements of designated ecological corridors. They should be considered as essential regional priorities for conservation, and must be considered in all land-use planning initiatives (Pool-Stanvliet *et al.* 2017). Loss of designated CBA's is therefore not recommended.

10 IMPACT OF THE PROPOSED MINING OPERATION

The proposed mining site is located inside a largely untransformed, but severely degraded or overgrazed shrubland, mapped as Knersvlakte Dolomite Vygieveld and Vanrhynsdorp Gannabosveld. The largest portion of the mining site falls within the latter, while a small portion protrudes into Knersvlakte Dolomite Vygieveld. None of the vegetation types are currently considered as threatened. Being well represented and not threatened, the impact on vegetation type *per se* will be of low significance, with mitigation (Table 1 below summarises the impact). The impact is expected to be long term to permanent, depending on rehabilitation

success after the completion of mining activities. In the long term, the mining site will require a sustained management effort to control the aliens and allow indigenous species to re-establish during the rehabilitation phase.



Map 4 Biodiversity network map (produced by CapeNature) with the mining rights area outlined in red and the proposed mining extension areas outlined in black. Green = critical biodiversity area (CBA); yellow = ecological support area (ESA).

Table 1 Impact on vegetation type.

Mitigation	Extent	Duration	Intensity	Probability of occurrence	Significance	Status	Confidence
Without mitigation	Limited to site & surroundings	Long term - permanent	Med	Probable	Med	-	Med-high
With mitigation	Limited to site & surroundings	Long term - permanent	Med	Probable	Low	-	Med-high

The southernmost portion of the proposed mining site (see Map 2), being located inside Knersvlakte Dolomite Vygieveld and encroaching slightly onto the Wiedou River, poses the greatest impact as this area is more species rich and potentially more sensitive to erosion (steeper). Please note that the southernmost part of the mining site has already been approved for mining. Impact on ecological linkage is also likely to have some significance, due

to the mining site's encroachment of the Wiedou River (see Table 2). However, the proposed mining area extends northwards and eastwards away from the approved mining area and river. The shrubland around the southern portion of the mining site will assumably remain intact. There will be no direct impact on any known SCC, although SCC were previously recorded directly adjacent to the site by other authors.

Table 2 Impact on biological linkage and CBA's.

Mitigation	Extent	Duration	Intensity	Probability of occurrence	Significance	Status	Confidence
Without mitigation	Limited to site & surroundings	Long term - permanent	Med	Probable	Med-high	-	Med-high
With mitigation	Limited to site & surroundings	Long term - permanent	Med	Probable	Low-med	-	Med-high

As an indirect impact, soil disturbance caused by opencast mining activities will provide ideal conditions for the establishment of alien invasive vegetation. However, it is unlikely that any woody aliens, such as *Prosopis glandulosa*, will become a serious problem. *Prosopis glandulosa* and *Nerium oleander* are largely confined to the Wiedouw River streambed. Weedy pioneer species, such as *Atriplex* species, *Stipa capensis* and *Bromus pectinatus*, will probably be the first to establish and prevail. These will be difficult to control, but the impact is not considered significant, given the already degraded condition of the veld.

Table 3 Impact on fauna.

Mitigation	Extent	Duration	Intensity	Probability of occurrence	Significance	Status	Confidence
Without mitigation	Limited to site & surroundings	Long term - permanent	Med	Probable	Low-med	-	Med-high
With mitigation	Limited to site & surroundings	Long term - permanent	Med	Probable	Low	-	Med-high

Impact on fauna will be of low to medium significance, without mitigation. Since the Wiedouw River will not be directly affected by mining activities, mammals visiting the river will not be interfered with. Residing mammals on the proposed mining site, such as aardvark and porcupines, will be directly affected. It must be noted that sheep farming has probably displaced most of the indigenous mammal fauna. One can expect that all large fauna will move away with the commencement of mining activities. Insect fauna, such as termite and

cocktail ant nests, will be eliminated. It is uncertain (unlikely) whether rehabilitation of the mining site will create a suitable habitat for indigenous fauna post mining.

11 CONCLUSION & MITIGATION MEASURES

The proposed mining site is located inside a largely untransformed, but severely degraded or overgrazed shrubland, classified as Vanrhynsdorp Gannabosveld and Knersvlakte Dolomite Vygieveld. The largest portion of the mining site lies inside the former. None of the vegetation types are currently listed as threatened. However, CapeNature commented that Vanrhynsdorp Gannabosveld is under threat from mining and agriculture, while Knersvlakte Dolomite Vygieveld has a very limited range with no formal protection.

The southernmost portion of the proposed mining site, being located inside Knersvlakte Dolomite Vygieveld and encroaching onto the Wiedou River, poses the greatest impact as this area is more species rich and potentially more sensitive to erosion. Impact on ecological linkage is also likely to have some significance, due to the mining site's encroachment of the Wiedou River. However, the proposed mining area extends northwards and eastwards away from the approved mining area and river. There will be no direct impact on any known SCC, although SCC were previously recorded directly adjacent to the site by other authors. Alien infestation and the impact on indigenous fauna will be of a lesser concern.

The impact is expected to be long term to permanent, depending on rehabilitation success after the completion of mining activities. It is recommended that the mining application be approved if the following mitigation options are adhered to:

- A buffer area of 250 m should be maintained between the mining area and the river itself.
- The mining area must be properly demarcated prior to the start of any mining activities, and no disturbance may occur outside this area. Fencing or coloured steel droppers could be used for this purpose. They must not be moved during mining.
- It is recommended that a search and rescue of succulents and bulbs be undertaken ahead of mining activities. These plants must be properly bagged and transplanted in the vygieveld adjacent to the mining site, a safe distance away from the mining area. Search and rescue and relocation of the bulbs should be undertaken early in spring at the beginning of the flowering season. An experienced contractor should be appointed to undertake search and rescue.
- Topsoil salvage and replacement would be critical for rehabilitation. Where possible, topsoil, containing indigenous plant seeds, should be pushed aside and protected from compacting/trampling. Topsoil stockpiles must not exceed 0.5 m in height.

- Mining should be phased, starting at the lowest point (closest point to the Wiedou River). Backfilling and rehabilitation of a mined-out area should be undertaken immediately after mining has been completed in that area. The primary means of rehabilitation should involve the replacement of topsoil and hydro-seeding with an indigenous grass seed mixture at the start of the rainfall season (June). A suitably experienced landscaping contractor should be appointed to undertake rehabilitation.
- In order to control or prevent erosion, it is recommended that runoff cut-off trenches and detention ponds be established on the down-slope side of mine.
- All erosion damage, such as erosion channels and runnels, must be backfilled and rehabilitated.
- Regular follow-up clearing of aliens may also be required in order to achieve rehabilitation successfully.

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PERSONAL COMMUNICATION

Mr Gerhard Terblanche, managing director of Cape Lime (Pty) Ltd.

BRIEF CV OF SPECIALIST

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PROFESSIONAL STATEMENT

Environmental assessment professional and biodiversity specialist with over 20 years of experience mainly in the Western Cape Province, but also in the Northern Cape and Eastern Cape. Experience in Environmental Impact Assessments (EIA's), biodiversity assessments, Environmental Management Programmes (EMPr's), Environmental Control Officer (ECO) duties and environmental due diligence investigations.

WORK EXPERIENCE

- 1989-1990** Nature Conservation Officer in the South African Air Force, based at Langebaan Road Air Force Base
- 1997-2005** Employed as principal environmental specialist at Planning Partners, a multi-disciplinary consultancy specialising in town and regional planning, environmental planning and landscape architecture. Duties included the conducting of EIA's, compiling EMPr's, ECO duties, biodiversity surveys and status quo environmental assessments for spatial development frameworks.
- 2000-2006** Examiner for the Board of Control for Landscape Architects (BOCLA), responsible for the setting up and marking of the Environmental Planning Section of exam paper.
- 2005-current** Started Mark Berry Environmental Consultants in June 2005. Responsibilities include office management, seeking tenders, conducting EIA's, compiling EMPr's, construction site environmental audits, biodiversity surveys, etc. A relationship is maintained with previous employer, and, among other, undertook land-use surveys and reporting for the Eskom's site safety reports for three proposed nuclear power plants in the Western and Eastern Cape Provinces.

QUALIFICATIONS

- BSc (1988) University of Stellenbosch
- BSc-Hons in Botany (1991) University of Stellenbosch
- MSc in Botany (1993) Nelson Mandela Metropolitan University
- PhD in Botany (2000) Nelson Mandela Metropolitan University.

PROFESSIONAL MEMBERSHIP

Professional member (reg. no. 400073/98) of the South African Council for Natural Scientific Professions (SACNASP).

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