

Plants, Animals, and Terrestrial Biodiversity Assessment

prepared in accordance with the
protocols for the specialist assessment and minimum report content
requirements for environmental impacts on plant species, animal species and
terrestrial biodiversity.

Raumix Queenstown Quarry on the Farm Lesseyton No 81 near Komani in the
Eastern Cape Province:
Section 102 Mining Right Amendment



BioCensus (Pty) Ltd



BioCensus (Pty) Ltd

Address:

Postnet Suite #116

Private Bag X025

Lynnwood Ridge

0040

41 Soetdoring Avenue

Lynnwood Manor

Pretoria

Cell: 083 284 5111

Email:

david@davidhoareconsulting.co.za

Plant Species, Animal Species, and Terrestrial Biodiversity Assessment Report for the proposed Section 102 Mining Right Amendment for the Raumix Queenstown Quarry near Komani in the Eastern Cape

14 August 2026

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Specialist details and declaration

This report has been prepared in accordance with the protocol for the specialist assessment and minimum report content requirements, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320, for environmental impacts on terrestrial plant and animal species (October 2020), and terrestrial and aquatic biodiversity (March 2020). It has been prepared independently of influence or prejudice by any parties.

Details of the specialist:

Specialist	Qualification and accreditation
Dr David Hoare (Pr.Sci.Nat.)	<ul style="list-style-type: none">• PhD Botany• SACNASP Reg. no. 400221/05 (Ecology, Botany)

Declaration of independence

David Hoare of BioCensus (Pty) Ltd is an independent consultant and hereby declares that he does not have any financial or other vested interest in the undertaking of the proposed activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998). In addition, remuneration for services provided by BioCensus (Pty) Ltd is not subjected to or based on approval of the proposed project by the relevant authorities responsible for authorising this proposed project.

Disclosure

BioCensus (Pty) Ltd undertakes to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the

National Environmental Management Act, 1998 (Act 107 of 1998) and will provide the competent authority with access to all information at its disposal regarding the application, whether such information is favourable to the applicant or not.

Based on information provided to BioCensus (Pty) Ltd by the client and in addition to information obtained during the course of this study, BioCensus (Pty) Ltd presents the results and conclusion within the associated document to the best of the author's professional judgement and in accordance with best practice.

A handwritten signature in black ink, appearing to read 'D Hoare', is positioned above a horizontal line.

14 August 2026

Dr David Hoare

Date

Executive summary

A terrestrial biodiversity assessment was undertaken for the proposed expansion of the existing mine near Queenstown (Komani), Eastern Cape. The assessment considered the Terrestrial Plant Species, Terrestrial Animal Species and Terrestrial Biodiversity Themes, with particular attention given to the mapped Critical Biodiversity Area 2 (CBA2) areas within and surrounding the proposed expansion.

The site was initially flagged by the DFFE Screening Tool as having MEDIUM sensitivity for the Terrestrial Plant Species Theme and Terrestrial Animal Species Theme, and VERY HIGH sensitivity for the Terrestrial Biodiversity Theme. Site inspection and desktop assessment indicate that the likelihood of the plant and animal Species of Conservation Concern identified by the Screening Tool occurring within the proposed development footprint is low. The sensitivity of both species themes is therefore assessed as LOW, and significant impacts on terrestrial plant or animal SCC are not anticipated.

The terrestrial biodiversity assessment identified variation in the condition and ecological value of the vegetation within the site. The existing mine is surrounded by natural vegetation, although portions of the plains, particularly between the mine and the national road, have been substantially degraded by historical and ongoing disturbance, including severe overgrazing and the influence of existing mining activities. In contrast, the ridge and associated rocky outcrops retain relatively intact natural vegetation and contain more specialised microhabitats and plant species. These areas represent the most important ecological features within the site, although they are widespread and represented throughout the range of the regional vegetation type, Tarkastad Montane Shrubland.

The regional conservation planning layer identifies the site as being within CBA2 areas, resulting in the VERY HIGH sensitivity assigned by the Screening Tool being confirmed. However, the field assessment demonstrates that the ecological value and functionality of the CBA2 areas are heterogeneous at the property scale. The intact ridge and rocky outcrops make a sgreater contribution to biodiversity conservation than the severely degraded plains. The CBA2 designation therefore remains an important indication of

landscape-scale conservation priority but should not be interpreted as indicating that all portions of the mapped area have equivalent ecological condition or functionality.

The proposed mine expansion will affect a relatively small area of the CBA2 network. The principal affected habitat is the degraded plains vegetation, which is already in poor ecological condition and has substantially reduced ecological functionality. The loss of this habitat is permanent but represents a negligible proportion of the broader CBA2 network and is not expected to materially affect landscape-scale connectivity, ecological processes or the overall functioning of the CBA network. The impact on this component of the CBA2 is therefore assessed as LOW significance.

Provided that appropriate measures are implemented to control soil disturbance, runoff and alien invasive species, the proposed expansion is not expected to materially compromise the ecological functionality of the CBA2 network.

The assessment therefore concludes that the proposed expansion can be accommodated without significant impacts on terrestrial biodiversity, subject to implementation of the recommended mitigation measures. The LOW significance rating for the affected CBA2 habitat should not be interpreted as indicating that CBA2 areas have low conservation value; rather, it reflects the limited ecological consequence of losing a small area of already degraded CBA2 habitat within the context of the wider landscape.

As an additional conservation consideration, it is recommended that the applicant engage with the relevant provincial conservation authority regarding the apparent mismatch between the condition of portions of the existing CBA2 and the better-condition natural grassland occurring to the north and north-east. Through the appropriate conservation-planning process, consideration could be given to strengthening the CBA network towards the Lesseyton River, where better-condition habitat may provide a more effective contribution to the same landscape-scale conservation objectives.

Terms of reference

This report is prepared in compliance with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity, terrestrial plant species and terrestrial animal species.

This assessment follows the requirements of The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320 dated 20 March 2020 for Terrestrial and Aquatic Biodiversity, and in GN. No. 1150 dated 30 October 2020 for Terrestrial Plant Species and Terrestrial Animal Species. As per these Regulations, the approach for assessing sensitivity with respect to Terrestrial Plant Species and Terrestrial Animal Species is in accordance with guidelines described in the latest version of the "Species Environmental Assessment Guidelines," available at <https://bgis.sanbi.org/>.

The assessment and minimum reporting requirements of these protocols are associated with a level of environmental sensitivity identified by the Department of Forestry, Fisheries and the Environment (DFFE) national web-based environmental screening tool (<https://screening.environment.gov.za/screeningtool>).

Introduction

Site location

The site is immediately to the west of Komani (Queenstown) in the Eastern Cape (Figure 1). It is located alongside the N6 national road from Bloemfontein / Aliwal North a few kilometres before Komani. There is an existing operational quarry on site that occupies approximately 36 ha.

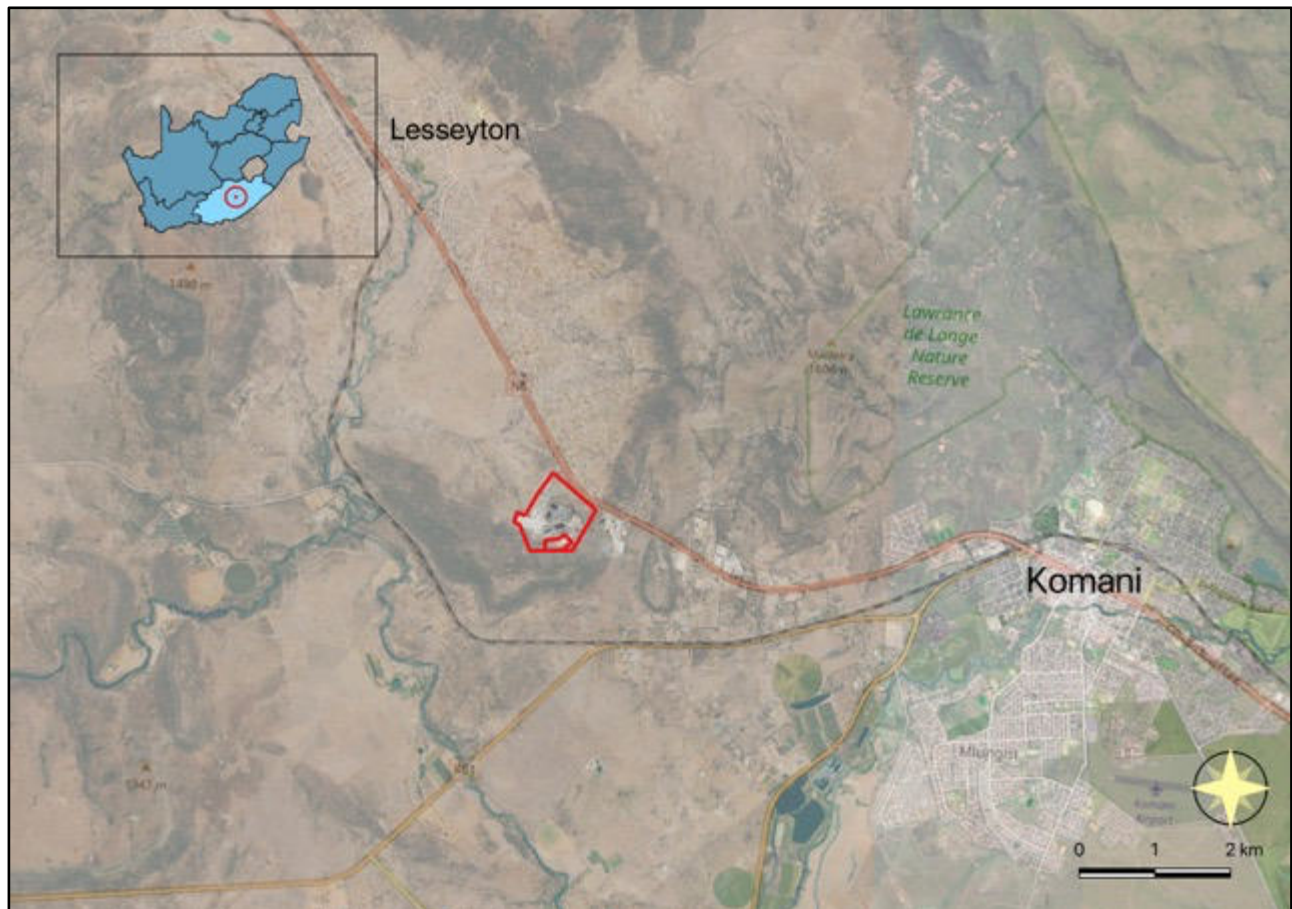


Figure 1: Location of the site (inside red circle).

Aerial imagery (Figure 2) shows the boundary of the S102 application area.



Figure 2: Aerial image of the application area.

Identified Theme Sensitivities

A sensitivity screening report from the DFFE online screening tool was requested in the application category:

Mining|Mining Right

The screening tool report for the area, dated 13/08/2026, indicates the following ecological sensitivities:

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Plant Species Theme			X	
Animal Species Theme			X	
Terrestrial Biodiversity Theme	X			

Plant species theme

Areas of different sensitivity are shown in **Figure 3**. Species of Conservation Concern (SCC) that are flagged for the site are as follows:

Sensitivity	Feature
Low	Subject to confirmation
Medium	Sensitive species 93
Medium	Indigofera ovina

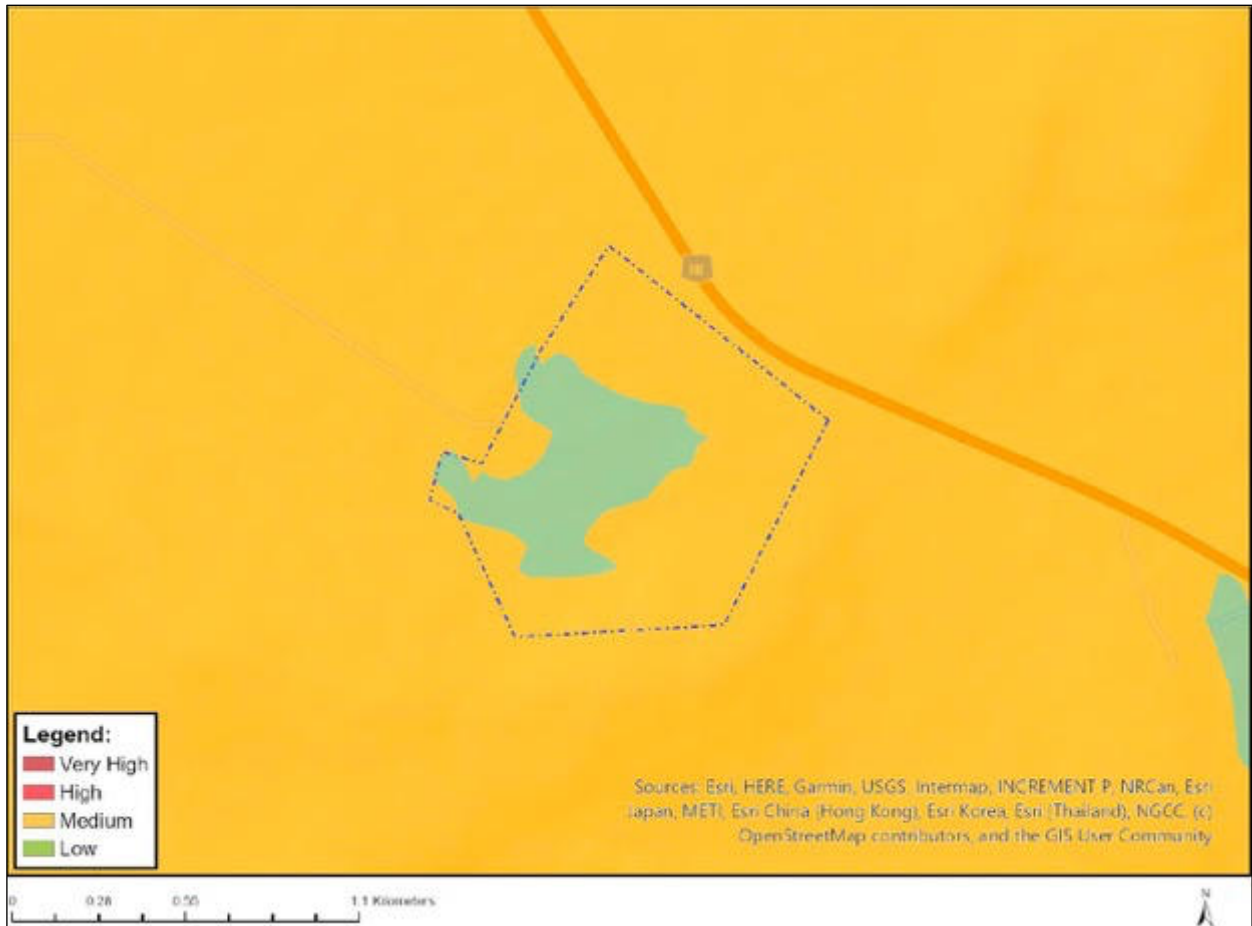


Figure 3: Plant species theme sensitivity for the site and surrounding areas.

Animal species theme

Areas of sensitivity are shown in Figure 4 and SCC that are flagged for the site are indicated as follows:

Sensitivity	Feature
Low	Subject to confirmation
Medium	<i>Mammalia-Ourebia ourebi ourebi</i>

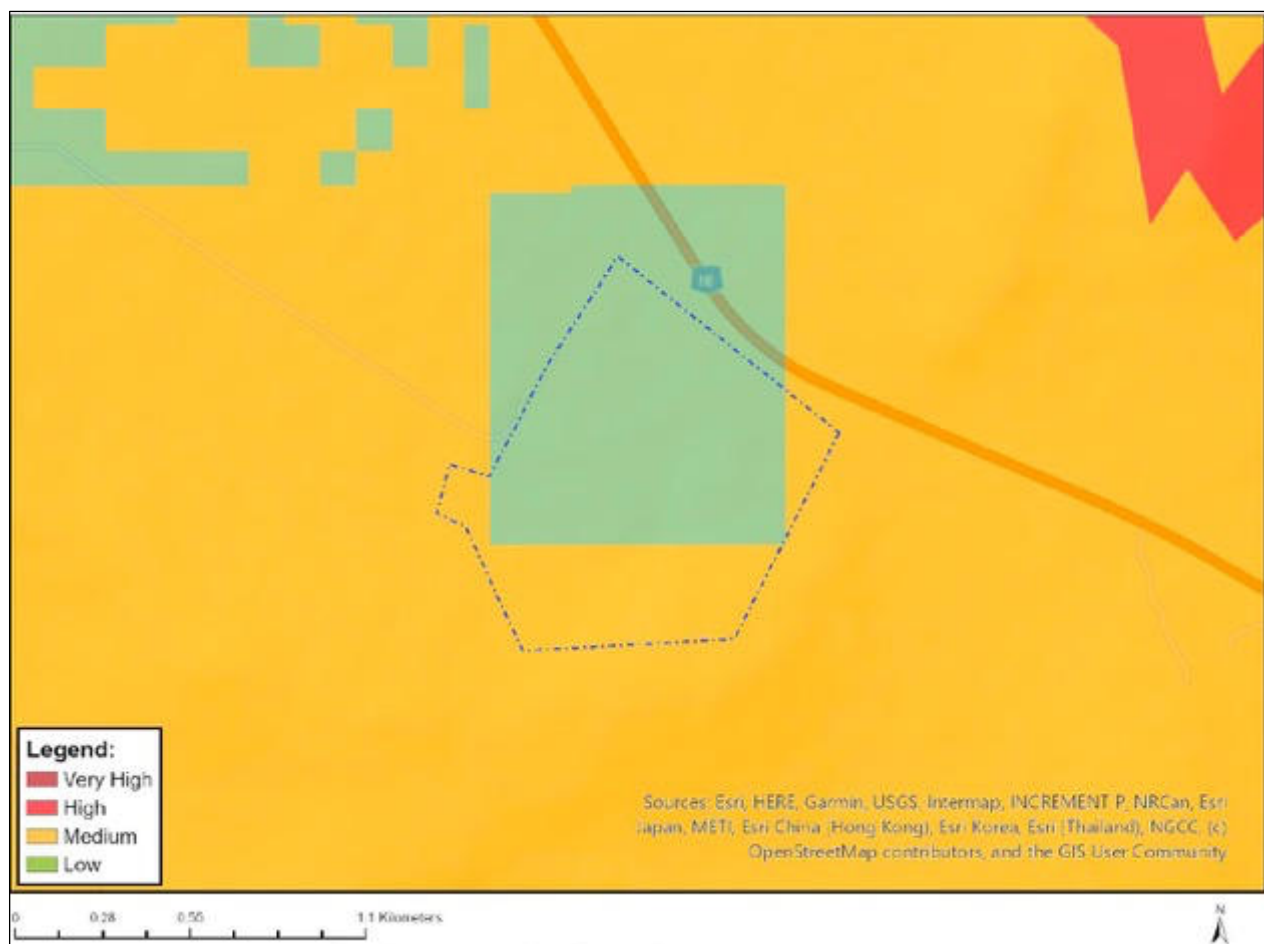


Figure 4: Animal species theme sensitivity for the site and surrounding areas.

Terrestrial Biodiversity theme

Areas of sensitivity are shown in **Figure 5** and sensitive features are indicated as follows:

Sensitivity	Feature
Low	Low sensitivity
Very High	CBA2



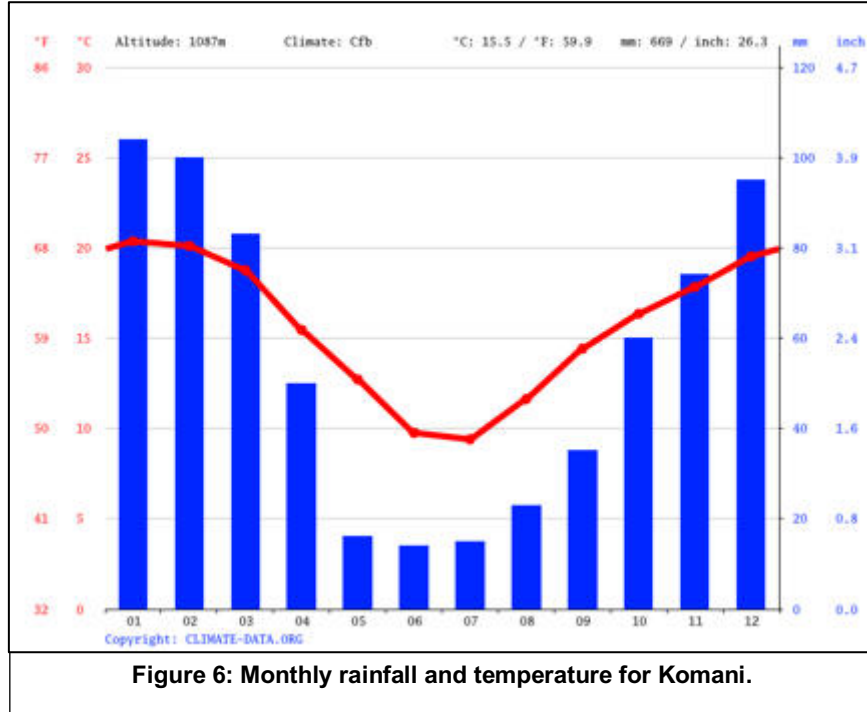
Figure 5: Terrestrial Biodiversity theme sensitivity for the site and surrounding areas.

Assessment methodology

The detailed methodology followed as well as the sources of data and information used as part of this assessment are described below.

Survey timing

The study commenced as a desktop-study followed by site-specific field study on 28 March 2022. The site is within the Grassland Biome with a summer peak rainfall season and a strong dip in mid-winter (**Figure 6**). Rainfall seasonality drives most ecological processes, and the timing of the survey in late summer is therefore optimal in terms of assessing the flora and vegetation of the site. It was therefore possible to determine the overall condition of the vegetation with a high degree of confidence.



Field survey approach

The field survey was undertaken on 28 March 2022. Field surveys of the site included meander searches of general areas, and active searching in habitats that were suitable for specific groups or species. Where sensitive species were encountered, co-ordinates for all individuals that occur on site were obtained as far as possible. A hand-held Garmin GPSMap 64S was used to record a track along which observations were made. Digital photographs were taken of features and habitats on site, as well as of all plant and animal species seen. Images of plants and animals recorded were uploaded to the iNaturalist website (<https://www.inaturalist.org>) and are accessible by viewing the observations for the site (use the Explore menu, zoom and pan until the study area is within the browser window, click the button "Redo search in map", and all observations for that area will be shown and listed).

Aerial imagery from Google Earth was used to identify and assess habitats on site. This included historical imagery that may show information not visible in any single dated image. Patterns identified from satellite imagery were verified on the ground. Digital photographs were taken at locations where features of interest were observed. During the field survey, particular attention was paid to ensuring that all habitat variability was ground-truthed.

Impact assessment methodology

The analysis of impact uses a detailed assessment methodology based on several factors considering of the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). These factors assess the sensitivity and significance of impacts on biodiversity resources, integrating criteria for biodiversity value and impact magnitude. The details of the impact assessment methodology are described and explained in Appendix 1.

Sources of information

Vegetation and threatened ecosystems

- South African National Biodiversity Institute (2006-2024). The Vegetation Map of South Africa, Lesotho and Swaziland, Mucina, L., Rutherford, M.C. and Powrie, L.W. (Editors), Online, <https://bgis.sanbi.org/Projects/Detail/2258>, Version 2024.
- The conservation statuses of the vegetation types were obtained from the Revised National List of Ecosystems that are Threatened and in need of protection (GN1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004).

Conservation plans

- Information from the National Protected Areas Expansion Strategy (NPAES) was consulted for possible inclusion of the site into a protected area in future (available on <http://bgis.sanbi.org>).
- The 2019 Eastern Cape Biodiversity Conservation Plan maps were used to determine inclusion of any parts of the site into any Critical Biodiversity Areas or Ecological Support Areas (ECBCP, 2019. Available from the Biodiversity GIS website (biodiversityadvisor.sanbi.org)).
- South Africa Protected Areas Database (SAPAD_OR_2024_Q3) retrieved from the DFFE website (https://egis.environment.gov.za/data_egis/data_download/current).

Aerial imagery

Satellite imagery for historical land use and vegetation cover was obtained from Google Earth Pro.

Archive of historical aerial photography dating back to the 1930's accessed from the Department of Agriculture, Land Reform and Rural Development's (DALRRD) National Geo-spatial Information (NGI) website (<http://www.cdngiportal.co.za/cdngiportal/>).

Plant species

Plant species description, conservation status, distribution and habitat information was obtained from the following sources:

- South African National Biodiversity Institute (SANBI) available on the Biodiversity Advisor website (<https://biodiversityadvisor.sanbi.org/>) and the NewPosa portal.
- SANBI's Red List (<http://redlist.sanbi.org>),
- World Flora Online (<https://www.worldfloraonline.org/>)
- Published literature.

Regulations published for the National Forests Act (Act 84 of 1998) (NFA) as amended, provide a list of protected tree species for South Africa.

Animal species

Animal species historically recorded in the study area were obtained from literature sources (see References and Bibliography). This was supplemented with information from the Animal Demography Unit website (adu.uct.ac.za) which has been migrated to iNaturalist (<https://www.inaturalist.org/home>), and Birdlife South Africa.

Threat status, distribution, and habitat information for threatened species was obtained from the IUCN Red List (<https://www.iucnredlist.org/>), SANBI Threatened Species Programme, as well as published literature.

Lists of potential species in and around the site were generated from iNaturalist (<https://www.inaturalist.org/home>).

Limitations

The following assumptions, limitations, uncertainties are listed regarding the assessment of the site:

- The assessment is based on a field survey conducted on 28 March 2022. The current study is based on a detailed site visit as well as a desktop study of the

available information. The time spent on site was adequate for understanding general patterns across affected areas. The seasons in which the fieldwork (peak summer flowering period) was conducted was ideal for assessing the composition and condition of the vegetation.

- Rare and threatened plant and animal species are, by their nature, usually very difficult to locate and can be easily missed. This is partially overcome by undertaking desktop research of possible species of concern. The screening tool output contains modelled distributions of all species that could occur on site, based on current knowledge of all SANBI databases.

Results

Desktop description of vegetation

There are two regional vegetation types in the study area, namely Queenstown Thornveld Gs16 and Tarkastad Montane Shrubland Gs17 (distribution relative to the site shown in **Figure 7**). The national vegetation map is, however, not mapped at a fine scale and it is probable that local topography could support other habitat types, such as thicket or low forest. For example, the dashed pink line shows the base of the hills, which would be a more accurate boundary for Tarkastad Montane Shrubland. The vegetation type that occurs on site and nearby areas, according to the national map, is briefly described below (as taken from Rebelo et al. 2006, Mucina et al. 2006).

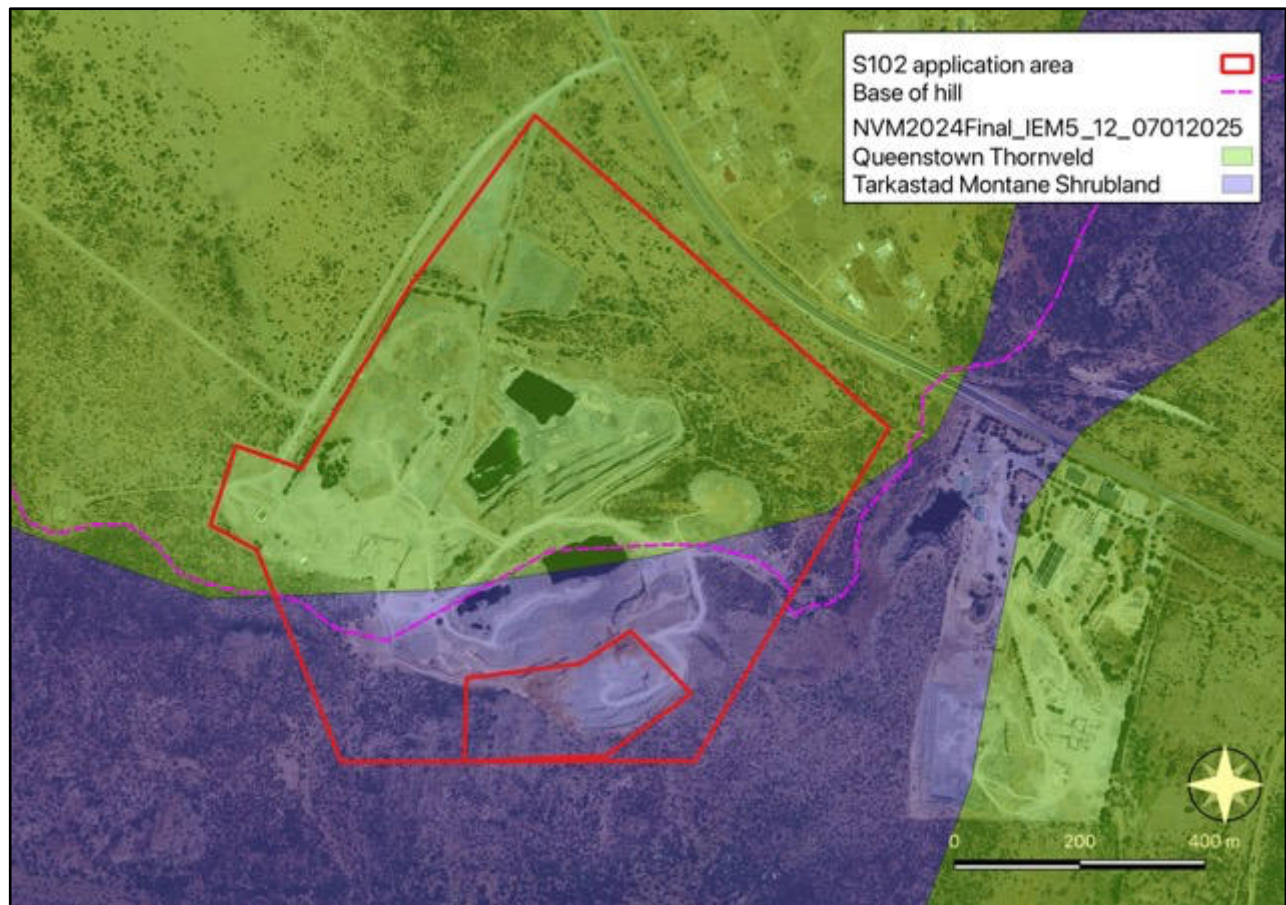


Figure 7: Regional vegetation types of the site and surrounding areas.

Queenstown Thornveld

Distribution

Eastern Cape Province: From the vicinity of Queenstown in the east to the vicinity of Tarkastad in the west, and Sterkstroom in the north. Altitude 980–1 500 m.

Vegetation & Landscape Features

Flat bottomlands of intramountain basins with adjacent slopes supporting a complex of *Acacia natalitia* thornveld and grassland dominated by *Aristida congesta*, *Cymbopogon pospischilii*, *Eragrostis curvula* and *Tragus koelerioides*, with scattered shrubs and low *Acacia* in places (Hoare 1997, Hoare & Bredenkamp 1999).

Geology & Soils

Sedimentary rocks of the Tarkastad Subgroup (Beaufort Group, Karoo Supergroup) overlain with clay-loam soils typical of Da and Fc land types.

Climate

Rainfall peaks in late summer. MAP mainly 380 mm in the west, increasing to 640 mm in the east. The coefficient of variation in MAP from 28–34% across the unit. Incidence of frost is 22–58 days, higher in the northwest than the southeast.

Important Taxa

Small Tree: *Acacia natalitia* (d).

Tall Shrub: *Euryops floribundus* (d).

Low Shrubs: *Asparagus laricinus*, *Atriplex semibaccata* var. *appendiculata*, *Felicia filifolia* subsp. *filifolia*, *F. muricata*, *Helichrysum asperum* var. *albidulum*, *H. dregeanum*, *Melolobium microphyllum*, *Pentzia globosa*, *Sutera pinnatifida*, *Tephrosia capensis* var. *acutifolia*.

Succulent Shrub: *Hertia pallens*.

Graminoids: *Aristida canescens* (d), *A. congesta* (d), *A. diffusa* (d), *Cymbopogon pospischilii* (d), *Cynodon incompletus* (d), *Digitaria argyrograpta* (d), *D. eriantha* (d), *Eragrostis chloromelas* (d), *E. curvula* (d), *E. lehmanniana* (d), *E. obtusa* (d), *E. trichophora* (d), *Heteropogon contortus* (d), *Microchloa caffra* (d), *Panicum stapfianum* (d), *Themeda triandra* (d), *Tragus koelerioides* (d), *Brachiaria serrata*, *Cynodon dactylon*, *Cyperus usitatus*, *Elionurus muticus*, *Eustachys paspaloides*, *Microchloa kunthii*, *Sporobolus fimbriatus*, *Tragus racemosus*.

Herbs: *Arctotis microcephala*, *Blepharis integrifolia* var. *clarkei*, *Commelina africana*, *Cyanotis speciosa*, *Gazania krebsiana* subsp. *krebsiana*, *Helichrysum pedunculatum*, *H. rugulosum*, *Hermannia depressa*, *Indigofera alternans*, *Salvia stenophylla*, *Senecio asperulus*, *Tribulus terrestris*.

Herbaceous Climber: *Rhynchosia totta*.

Geophytic Herbs: *Oxalis corniculata*, *O. depressa*.

Tarkastad Montane Shrubland

Distribution

Eastern Cape and marginally into Northern Cape Province: Noupoort, Middelburg and a point west of Cradock define the western extent of this unit and Cathcart, Queenstown and Sterkstroom the eastern extent. The unit falls within the area between the Great Escarpment in the north, marked by the Bamboesberg and Stormberg Mountains, and the minor escarpment, marked by the Winterberg and Amathole Mountains in the south. Altitude 1 020–1 780 m.

Vegetation & Landscape Features

Ridges, hills and isolated mountain slopes, characterised by high surface rock cover, this often consisting of large, round boulders. The vegetation is low, semi-open, mixed shrubland with 'white' grasses and dwarf shrubs forming a prominent component of the vegetation.

Geology & Soils

Sedimentary rocks of the Tarkastad Subgroup (Beaufort Group, Karoo Supergroup), widely affected by intrusions of Jurassic dolerites forming numerous dykes and sills. Soils typical of land types Ib, Fb and Fc.

Climate

Rainfall in late summer to autumn (peak in February–March). MAP 280–720 mm (overall MAP 470 mm), increasing from west to east. Coefficient of variation of MAP from 22–35% across the unit (31% overall APCV), decreasing with distance eastwards. Incidence of frost 7–68 days (average: 39 days), increasing with proximity to the Escarpment.

Important Taxa

Succulent Tree: *Aloe ferox* (d).

Small Tree: *Acacia karroo* complex.

Tall Shrubs: *Diospyros austro-africana* (d), *Cadaba aphylla*, *Ehretia rigida*, *Rhus burchellii*, *Tarchonanthus minor*.

Woody Climbers: *Asparagus racemosus*, *A. retrofractus*.

Low Shrubs: *Euryops annae* (d), *Aptosimum elongatum*, *Asparagus striatus*, *Blepharis mitrata*, *B. villosa*, *Chrysocoma ciliata*, *Diospyros pallens*, *Eriocephalus ericoides*, *Felicia filifolia* subsp. *filifolia*, *F. muricata*, *Gymnosporia heterophylla*, *Helichrysum dregeanum*, *H. zeyheri*, *Hermannia filifolia*, *Indigofera sessilifolia*, *Lantana rugosa*, *Limeum aethiopicum*, *Melolobium microphyllum*, *Nenax microphylla*, *Pegolettia retrofracta*, *Pentzia globosa*, *Phymaspermum parvifolium*, *Rosenia humilis*, *Sutera pinnatifida*, *Wahlenbergia albens*.

Succulent Shrubs: *Lycium schizocalyx*, *Pachypodium succulentum*, *Sarcocaulon camdeboense*.

Semiparasitic Shrub: *Thesium hystrix*.

Graminoids: *Aristida adscensionis* (d), *A. congesta* (d), *A. diffusa* (d), *Cynodon incompletus* (d), *Enneapogon scoparius* (d), *Eragrostis chloromelas* (d), *E. lehmanniana* (d), *E. obtusa* (d), *Heteropogon contortus* (d), *Tragus berteronianus* (d), *T. koelerioides* (d), *Chloris virgata*, *Cymbopogon pospischilii*, *Digitaria eriantha*, *Eragrostis curvula*, *Eustachys paspaloides*, *Fingerhuthia africana*, *Sporobolus fimbriatus*, *Themeda triandra*, *Tragus racemosus*.

Herbs: *Commelina africana*, *Gazania krebsiana* subsp. *krebsiana*, *Hibiscus pusillus*, *Indigofera alternans*, *Lepidium africanum* subsp. *africanum*, *Tribulus terrestris*.

Geophytic Herbs: *Asplenium cordatum*, *Boophone disticha*, *Cheilanthes deltoidea*, *C. hirta*, *Oxalis depressa*.

Succulent Herb: *Crassula muscosa*.

Biogeographically Important Taxa (^{SE}Sub-Escarpment Grassland endemic, ^EEastern distribution limit) Small Tree: *Encephalartos friderici-guilielmi*^{SE}.

Low Shrubs: *Eriocephalus africanus*^E, *Senecio acutifolius*^E.

Conservation status of broad vegetation types

The threat status of the vegetation type in which the site is mapped is in accordance with the Revised National List of Ecosystems (Government Notice No 2747 of 18 November 2022) published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004), which lists national vegetation types that are afforded protection on the basis of rates of transformation.

Vegetation Type	Conservation status
	Revised National Ecosystem List (NEM:BA) (2022)
Queenstown Thornveld	Least Concern
Tarkastad Montane Shrubland	Least Concern

Ecosystem status in accordance with Section 52(2) of National Environmental Management: Biodiversity Act (Act No. 10 of 2004):

- i. **Critically endangered** ecosystems are ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention, and are subject to an extremely high risk of irreversible transformation;
- ii. **Endangered** ecosystems are ecosystems that have undergone degradation of ecological structure, function or composition as a result of human intervention, and are subject to a significant risk of irreversible transformation (although to a lower extent than critically endangered ecosystems;
- iii. **Vulnerable** ecosystems are ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention; their risk of irreversible transformation is less than for critically endangered or endangered ecosystems; and
- iv. **Protected** ecosystems are ecosystems of high conservation value or of high national or provincial importance, although they are not under immediate risk of irreversible transformation, such as critically endangered, endangered or vulnerable ecosystems; and.
- v. **Degraded**/sacrificial zones that could be used in support of sustainable development without impacting adversely on the environment.

Biodiversity Conservation Plans

The Eastern Cape Biodiversity Conservation Plan (ECBCP) classifies the habitats of the province according to conservation value in decreasing value, as follows:

1. 2. Protected Areas (PA) = map category 6;
2. 4. Critical Biodiversity Areas 1 (CBA1) = map category 5;
3. 6. Critical Biodiversity Areas 2 (CBA2) = map category 4;
4. 8. Ecological Support Area 1 (ESA1) = map category 3;
5. 10. Ecological Support Area 2 (ESA2) = map category 2.

The ECBCP map for the site (ECBCP 2019) shows that significant parts of the site (all untransformed area) are within a CBA2 area (**Figure 8**). The CBA2 area continues beyond the boundaries of the site. According to the ECBCP Technical Report, CBA2 areas are the best design options for meeting targets for vegetation types, species points and expert-defined areas, as well as selected cliffs buffered by 100 m, other forest patches, and Bearded and Cape Vulture home ranges. This indicates that the remaining vegetation on site is important for the conservation of biodiversity in the Province as well as for maintaining ecological patterns in the landscape.

This desktop description verifies that the site is included in conservation zones and that an on-site assessment is required to verify the sensitivity of the site with respect to this attribute.

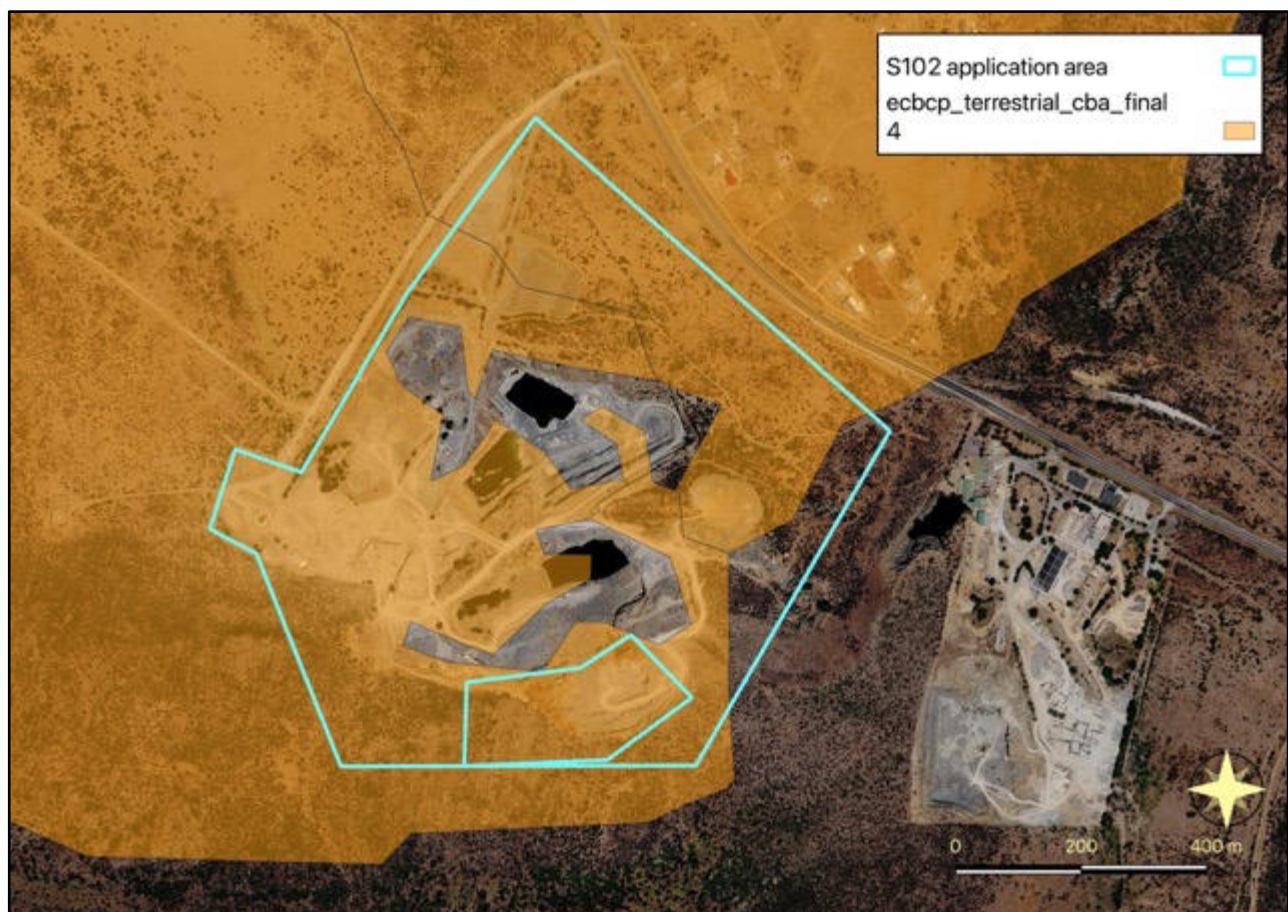


Figure 8: Western Cape Biodiversity Spatial Plan for the site.

Historical disturbance

There is no evidence of previous cultivation on site or nearby, but there is a history of mining dating back to before 1988, with small expansions since then. The effect of the mining on the surrounding landscape is through secondary impacts, such as dust, mechanical damage, rocks rolling downslope and similar impacts, which have affected habitats on the margins of the mine. These mining secondary impacts are aggravated by persistent grazing pressure from communal livestock grazing and trampling emanating from neighbouring settlements. These livestock impacts are most severe next door to settlements, which are just across the national road from the mine, and dissipate more with distance. The effect is persistent reduction in vegetation cover leading to erosion of soils, and eventual irreversible change in species composition that has been shown in some circumstances to lead to alternative stable states in vegetation composition.

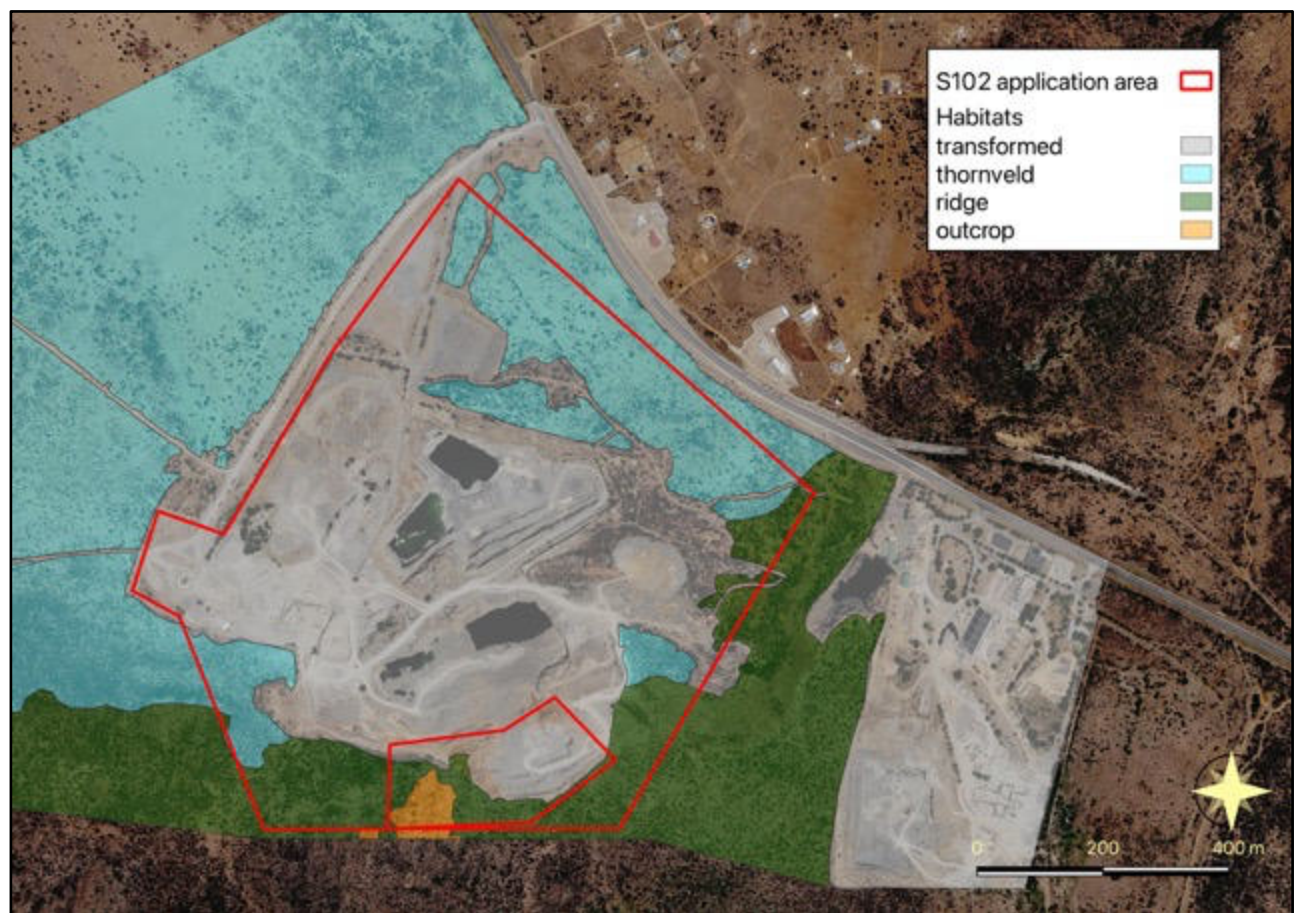


Figure 9: Map of habitats on site and in surrounding areas.

Natural habitats on site

The natural habitats on site are determined by the presence of the ridge, which occurs along the southern boundary of the site and slopes down northwards. The main habitats on site largely follow the national vegetation types. The lowlands are covered with thornveld, and the ridge has a relatively dense thicket interspersed with rocky outcrops. The various natural and transformed habitats that occur on site, shown in Figure 8. A panoramic view over the site from near the centre point of the southern boundary is shown in Figure 9.

The lowland plains areas are dominated by grasslands with thorn trees at differing densities (see Figure 10). Typical species composition in these areas includes the following: the woody species, *Aloe ferox*, *Searsia pallens*, *Vachellia karroo* and *Ziziphus mucronate*, the grasses, *Aristida adscensionis*, *Cymbopogon pospischilii*, *Cynodon dactylon*, *Eragrostis obtusa*, *Microchloa caffra*, *Panicum coloratum*, *Tragus berteronianus*, and *Urochloa panicoides*, and the herbaceous species, *Berkheya heterophylla*, *Bidens bipinnata*, *Blepharis integrifolia*, *Commelina Africana*, *Crinum macowanii*, *Drimia capensis*, *Erigeron bonariensis*, *Falkia repens*, *Felicia muricata*, *Sida sp.*, *Glandularia aristigera*, *Hermannia depressa*, *Hibiscus pusillus*, *Kalanchoe rotundifolia*, *Monsonia angustifolia*,



Figure 10: Panoramic view over the site from the ridge towards the north.

Pseudognaphalium oligandrum, *Schkuhria pinnata*, *Solanum incanum*, *Solanum tomentosum*, *Stapelia gigantea*, *Tagetes minuta*, *Tribulus terrestris* and *Zinnia peruviana*.

The ridge has a higher diversity of woody species than the lowlands and is also a steeper landscape (see Figure 11). The species composition consists of the following: the woody species, *Aloe ferox*, *Celtis africana*, *Cussonia paniculata*, *Cussonia spicata*, *Diospyros scabrida*, *Ehretia rigida*, *Euclea crispa*, *Grewia occidentalis*, *Gymnosporia buxifolia*, *Lantana rugosa*, *Osyris lanceolata*, *Rhoicissus tridentata*, *Scolopia zeyheri*, *Searsia dentata*, *Searsia pallens*, *Viscum rotundifolium*, and *Ziziphus mucronata*, the herbaceous species, *Boophone disticha*, *Cheilanthes eckloniana*, *Cheilanthes viridis*, *Cotyledon orbiculata*, *Crystallopollen angustifolium*, *Datura stramonium*, *Dicliptera cernua*, *Euphorbia pulvinata*, *Berkheya* sp., *Euryops* sp., *Hypoxis* sp., *Lotononis* sp., *Helichrysum nudifolium*, *Ipomoea crassipes*, *Pellaea calomelanos*, *Rhynchosia totta*, and *Stachys aethiopica*, and the grasses, *Eustachys paspaloides*, *Fimbristylis ovata*, *Melinis nerviglumis*, and *Themeda*



Figure 11: Plains vegetation.

triandra. It also includes the spiny shrub, *Asparagus spinescens*, listed as Rare, and flagged as a species of concern for the site. In addition, a species of cycad occurs within this habitat.

There are some rocky outcrops on site, consisting of massive, rounded boulders near the summit of the ridge (see Figure 12). These form crevices and rock-sheets, as well as areas where there is water seepage from the base of large rocks. These conditions create microhabitats that contain a number of species that occur nowhere else on site, including the following: *Albuca bracteata*, *Anacampseros arachnoides*, *Arctotis arctotoides*, *Asparagus spinescens*, *Cineraria deltoidea*, *Clausena anisata*, *Cliffortia linearifolia*, *Crassula dependens*, *Crassula lanuginosa*, *Crassula perfoliata*, *Cussonia paniculata*, *Cyphostemma cirrhosum*, *Diospyros scabrida*, *Euphorbia nutans*, *Euphorbia pulvinata*,



Figure 12: Typical ridge vegetation.

Ledebouria sp., *Pelargonium* sp., *Polygala* sp., *Maytenus undata*, *Ophioglossum polyphyllum*, *Sansevieria hyacinthoides* and *Zantedeschia albomaculata*.



Figure 13: Rock outcrops on site.

Plant Species of Conservation Concern

Indigofera ovina

Vulnerable B1ab(iii)

This species is endemic to the Eastern Cape, where it occurs between Queenstown, Cathcart and Hogsback, where it occurs on the summits of rocky hills. It has been recorded from Fincham's Nek just south of Queenstown, as well as several times in the Amathola Mountains. The specific localities all have strong similarities to the current site. It therefore has a moderate chance of occurring on the site, where it is likely to occur within the ridge vegetation.

Asparagus spinescens

Rare

This is an Eastern Cape endemic distributed from Uitenhage to Queenstown, where it is found in thicket and grassland on mountain slopes and in valleys. It has only been observed a few times across its range but may have been overlooked due to being similar to other species of the genus *Asparagus*, of which there are 45 species in the Eastern Cape alone (Bredenkamp 2019). It was recorded twice on site, on the ridge and in the rocky outcrops (Figure 13). It is likely to be more widespread on site within the ridge habitat than what was observed.

Asclepias compressidens

Rare

This is an Eastern Cape endemic distributed from Cradock to Queenstown and down towards Alexandria near the coast. It is found in grasslands in sparsely wooded thornveld. The closest historical record is approximately 10km from the site. It has a moderate to low chance of occurring on the site.

Sensitive species 1248

Vulnerable A2ad

Distributed from Eastern Cape to Limpopo Province. Widespread elsewhere in southern and eastern Africa. Found at low and medium altitudes, usually along mountain ranges and in thickly vegetated river valleys, often under bush clumps and in boulder screes, sometimes found scrambling at the margins of karroid, succulent bush in the Eastern Cape. Occurs in bushy kloofs at the coast and inland in KwaZulu-Natal. In Gauteng, Mpumalanga and North West Province it is often found in open woodland or on steep rocky hills usually in well-shaded situations. It tolerates wet and dry conditions, growing predominantly in summer rainfall areas with an annual rainfall of 200-800 mm. Previously recorded a number of times between Adelaide and Cofimvaba. It has a MODERATE chance of occurring on the site.



Figure 14: The Rare species, *Asparagus spinescens*, found on site on ridge and rocky outcrop.

A Terrestrial Plant Species Compliance Statement is submitted in accordance with the requirements specified for LOW sensitivity (GN 1150: PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL PLANT SPECIES).

Animal Species of Conservation Concern

According to the screening tool, one animal SCC is flagged for the site, the Oribi (*Ourebia ourebi ourebi*), listed as Endangered in South Africa and Least Concern globally.

The Oribi is a small antelope associated primarily with open grasslands, floodplains and other relatively open habitats. It reaches its highest densities in moist grasslands and prefers grassland in good condition containing a mosaic of shorter grass for feeding and taller grass for shelter. The species has experienced substantial habitat loss and fragmentation, and its preferred grassland habitat is declining in both extent and quality. The remaining natural habitat within the study area is degraded and near urban areas, a national road, rural settlements (with domestic dogs) and other disturbances that are negatively associated with preferred animal occupation. The species is therefore not considered a realistic potential SCC for the site.

No suitable habitat exists for animal SCC to occur on site, therefore the site sensitivity for the Animal Species Theme is LOW.

Outcome of the assessment

Site ecological importance

The Species Environmental Assessment Guidelines require that a Site Ecological Importance is calculated for each habitat on site, and provides methodology for making this calculation.

As per the Species Environmental Assessment Guidelines, Site Ecological Importance (SEI) is determined from the combination of Biodiversity Importance (BI), which incorporates Conservation Importance (CI) and Functional Integrity (FI), and the resilience of the receptor to disturbance, in accordance with the Species Environmental Assessment Guidelines.

Table 1: Site ecological importance for habitats found on site.

Habitat	Conservation importance	Functional integrity	Receptor resilience	Site Ecological Importance (BI)
Plains	Low No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species.	Medium Mostly minor current negative ecological impacts with some major impacts (mining) and a few signs of minor past disturbance. Moderate	Low Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species	Medium (BI = Low)

		rehabilitation potential.	composition and functionality of the receptor functionality	
Ridge	Medium Confirmed or highly likely occurrence of populations of NT species, threatened species (CR, EN, VU) listed under Criterion A only. Presence of range-restricted species.	Medium Mostly minor current negative ecological impacts with some major impacts (mining) and a few signs of minor past disturbance. Moderate rehabilitation potential.	Very low Habitat that is unable to recover from major impacts	High (BI = Medium)
Rock outcrops	Medium Presence of range-restricted species.	Medium Mostly minor current negative ecological impacts with some major impacts (mining) and a few signs of minor past disturbance. Moderate rehabilitation potential.	Very low Habitat that is unable to recover from major impacts	High (BI = Medium)

Transformed	Very low	Very low	Very high	Very low
	No natural habitat remaining.	Several major current negative ecological impacts.	Habitat that can recover rapidly	(BI = Very low)

The calculation of SEI includes an explicit recognition of the ability of each ecosystem to tolerate and recover from disturbance. Guidelines for development activities within different importance levels are given in the table below.

Site ecological importance	Interpretation in relation to proposed development activities
Very high	Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/ not possible (i.e. last remaining populations of species, last remaining good condition patches of ecosystems/ unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted; limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities
Very low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

Habitat sensitivity

To determine ecological sensitivity in the study area, site-specific, local and regional factors were considered. A summary of sensitivities that occur on site and that may be vulnerable to damage from the proposed project are as follows:

1. CBA2 areas: All remaining natural habitat on site falls within this zone.

This is a Terrestrial Biodiversity Theme sensitivity.

According to the "PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL BIODIVERSITY", there are two sensitivity classes for Terrestrial Biodiversity Theme: VERY HIGH or LOW. The VERY HIGH category includes any area of natural vegetation that falls within one of the following categories:



Figure 15: Site sensitivity for Terrestrial Biodiversity Theme, according to the Protocol.

1. **terrestrial Critical Biodiversity Areas (CBAs).**
2. terrestrial Ecological Support Areas (ESAs).
3. protected areas as defined by the National Environmental Management: Protected Areas Act, 2004.
4. priority areas for protected area expansion.
5. Strategic Water Source Areas (SWSAs).
6. Freshwater Ecosystem Priority Areas (FEPA) subcatchments.
7. indigenous forests.

Any area that is in a natural state and that falls within one of these categories is therefore automatically assigned a sensitivity class of VERY HIGH and requires a Terrestrial Biodiversity Specialist Assessment. Areas that do not fall into one of these categories are automatically assigned a sensitivity class of LOW. The current site is mapped within the VERY HIGH category, aside from the transformed areas, which are LOW.

The definition of natural vegetation, according to the National Environmental Management Act, 1998 (Act No. 107 of 1998) is "*vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding 10 years.*" According to this description, the vegetation on site (including secondary vegetation) is legally in a natural state.

The plains areas between the mine and the national road are in poor condition due to long-term secondary impacts from the mine as well as severe overgrazing from rural livestock that originate in nearby settlements. These impacts are largely irreversible and the pressures that have caused these will continue to operate into the foreseeable future. The effect is reduction in vegetation cover leading to erosion of soils and change in species composition and vegetation structure. The CBA2 areas in this part of the site retain their mapped CBA2 status, but their current contribution to biodiversity pattern and ecological processes is considered substantially lower than that of the intact ridge and associated rocky habitats.

Impact assessment

The proposal is to extend the existing quarry upslope as well as towards the national road, as per the assessed boundary. Possible impacts are on natural habitat, which also constitutes CBA2 area. The amount of natural habitat potentially affected is negligible relative to the extent of the size of the CBA2 area. The habitat on the plains area on site designated as CBA2 is in poor condition and affected by historical and current agents of degradation that will persist into the future, irrespective of mine expansion. The upslope parts on the ridge are in relatively good condition and ecologically functional.

CBA2 component	Current condition	Ecological value	Role in CBA network
Ridge	Good/intact	High	Important biodiversity habitat and connectivity, but well-represented elsewhere
Rocky outcrops	Good/intact	High	Specialist microhabitats; SCC habitat but well-represented elsewhere
Plains	Poor/degraded	Low–moderate	Reduced contribution; potentially retains landscape/restoration value
Existing mine	Transformed	Very low	No meaningful current habitat value

The impacts assessed here are therefore as follows:

1. LOCALISED LOSS OF CBA2 AREAS ON PLAINS.
2. LOCALISED LOSS OF CBA2 AREAS ON RIDGE.

Localised loss of CBA2 areas on the plains

Resource irreplaceability: All the proposed affected natural vegetation on site is within a CBA2 area. It is assumed that the CBAs are required partly for meeting biodiversity

targets and for maintaining ecosystem processes in the landscape. It has been observed that the natural vegetation on the plains area between the existing mine and the national road is in poor condition and probably irreversibly degraded. It is therefore in a compromised condition. The conservation objectives represented by the CBA2 designation are not dependent on the persistence of this degraded patch, as comparable or better-condition habitat occurs elsewhere in the surrounding landscape. There are several alternative locations for meeting the same conservation objectives. The vegetation type is not listed and not of conservation concern.

Threshold: Although the proposed mine expansion area is within mapped CBA2 areas, the proposed disturbance is small and is largely confined to an existing disturbed area. The impact therefore represents a small area of permanent disturbance relative to the extent of the mapped biodiversity network. Importantly, the proposed activity is not expected to result in fragmentation of the CBA network, sever ecological connectivity, or materially affect the ecological processes for which the areas were identified. The significance of the impact therefore relates primarily to localised vegetation loss rather than loss of the broader functionality of the CBA network.

Resource condition: The vegetation on site (within the proposed development footprint on the plains) is in poor condition.

Reversibility of impact: Loss of habitat associated with mine expansion is irreversible.

Extent of impact: The impact will occur within the boundary of the proposed footprint of development. It is possible that there will be limited spillover effects into surrounding areas.

Duration of impact: Loss of any habitat in the footprint of the development is assessed as being permanent.

Intensity of impact: At a local scale, the impact on CBAs is very low.

Probability of occurrence: Based on the proposed development plan, the probability of the impact on CBAs occurring definite - but there will be a slight impact on processes.

Confidence: There is a high understanding of the identity and on-site value of the vegetation, as well as the nature and extent of the proposed activity. No measures are therefore required to improve the confidence in the assessed impact.

Mitigation: Avoidance: If the mine expansion is approved then there is no feasible way to avoid the CBA2 areas. Remediation: control aliens and rehabilitate impacted areas. Other: the CBA2 network can be expanded into nearby areas to the north-west and achieve the same objectives.

	Biodiversity value				Impact magnitude			Probability	Significance
Impact on CBAs	I	T	C	R	E	D	M		
Before mitigation	3	1	2	5	2	5	2	Definite	LOW
After mitigation	3	1	2	5	2	5	2	Definite	LOW

The LOW significance rating should not be interpreted as indicating that CBA2 areas have low conservation importance. Rather, it reflects the limited ecological consequence of losing a small area of already degraded CBA2 habitat in a landscape where the principal conservation functions of the CBA network remain represented elsewhere.

Localised loss of CBA2 areas on the ridge

Resource irreplaceability: All the proposed affected natural vegetation on site is within a CBA2 area. It is assumed that the CBAs are required partly for meeting biodiversity targets and for maintaining ecosystem processes in the landscape. It has been observed that the natural vegetation on the ridge area is in good condition.

Threshold: Although the proposed mine expansion area is within mapped CBA2 areas, the proposed disturbance is small and is largely confined to an existing disturbed area. The impact therefore represents a small area of permanent disturbance relative to the extent of the mapped biodiversity network. Importantly, the proposed activity is not expected to result in fragmentation of the CBA network, sever ecological connectivity, or materially affect the ecological processes for which the areas were identified. The

significance of the impact therefore relates primarily to localised vegetation loss rather than loss of the broader functionality of the CBA network.

Resource condition: The vegetation on site (within the proposed development footprint on the ridge) is in good condition and intact.

Reversibility of impact: Loss of habitat associated with mine expansion is irreversible.

Extent of impact: The impact will occur within the boundary of the proposed footprint of development. It is possible that there will be limited spillover effects into surrounding areas.

Duration of impact: Loss of any habitat in the footprint of the development is assessed as being permanent.

Intensity of impact: At a local scale, the impact on CBAs is very low.

Probability of occurrence: Based on the proposed development plan, the probability of the impact on CBAs occurring definite - but there will be a slight impact on processes.

Confidence: There is a high understanding of the identity and on-site value of the vegetation, as well as the nature and extent of the proposed activity. No measures are therefore required to improve the confidence in the assessed impact.

Mitigation: Avoidance: If the mine expansion is approved then there is no feasible way to avoid the CBA2 areas. Remediation: control aliens and rehabilitate impacted areas. Other: the CBA2 network can be expanded into nearby areas to the north-west and achieve the same objectives.

Impact on CBAs	Biodiversity value				Impact magnitude			Probability	Significance
	I	T	C	R	E	D	M		
Before mitigation	3	1	4	5	2	5	3	Definite	LOW
After mitigation	3	1	4	5	2	5	3	Definite	LOW

Summary

PLANT SPECIES THEME:

1. The site was flagged as having MEDIUM sensitivity with respect to the Terrestrial Plant Species Theme.
2. The site inspection and desktop research determined the sensitivity to be LOW due to the low likelihood of any flagged species occurring within the proposed footprint areas.
3. The proposed development is unlikely to have any impacts on any Terrestrial Plant SCC.

ANIMAL SPECIES THEME:

1. The site was flagged as having MEDIUM sensitivity with respect to the Terrestrial Animal Species Theme.
2. The site inspection and desktop research determined the sensitivity to be LOW owing to the low likelihood of any flagged species occurring within the proposed footprint areas.
3. The project is therefore unlikely to have any impacts on any Terrestrial Animal SCC.

TERRESTRIAL BIODIVERSITY THEME:

1. The site consists of an existing mine surrounded by natural vegetation in different condition states - the areas between the existing mine and the national road are impacted and in poor condition.
2. All remaining natural areas and parts of the existing mine are within mapped CBA2 areas.
3. Due to the presence of the CBA2 areas, the site was flagged as having VERY HIGH sensitivity with respect to the Terrestrial Biodiversity Theme.

4. The site inspection and desktop research show that the site contains vegetation on the ridge that is in relatively good condition, while vegetation on the plains within the proposed development boundary is in poor condition. These areas are legally defined as "natural". The presence of CBA2 areas is therefore confirmed and the VERY HIGH sensitivity assigned to the Terrestrial Biodiversity Theme is retained.
5. The impact assessment indicates that the proposed expansion will have a LOW-significance impact on the affected CBA2 areas. However, the ecological value and functionality of the CBA2 areas are heterogeneous: the intact ridge and associated rocky outcrops have greater ecological value than the degraded plains, summarised as follows:
 - a. Impact 1: Localised loss of degraded CBA2 plains habitat: The proposed expansion will result in permanent loss of a small area of CBA2 habitat. However, the affected CBA2 vegetation is already in very poor ecological condition because of historical and ongoing disturbance and has substantially reduced ecological functionality. The affected area represents a negligible proportion of the broader CBA2 network, and its loss is not expected to fragment the network or materially affect landscape-scale ecological connectivity or processes. The impact is therefore assessed as LOW significance.
 - b. Impact 2: Potential loss of intact CBA2 ridge habitat: The intact ridge represents a more important component of the CBA2 network than the degraded plains, owing to its relatively high ecological integrity, intact vegetation structure and specialised rocky habitats. However, the habitat is widely represented throughout the range of the regional vegetation type, Tarkastad Montane Shrubland, and its loss is not expected to fragment the network or materially affect landscape-scale ecological connectivity or processes. The impact is therefore assessed as LOW significance.

Conclusions

The following conclusions can be made regarding the proposed development:

1. The ridge remains relatively intact and has higher ecological value than the plains. The rocky outcrops contain more specialised microhabitats and species, but are continuous with an extensive system of similar ridges in the general Komani area.
2. The plains have been heavily degraded by historical and ongoing disturbance. Some of the degradation is associated with the existing mine and some with severe overgrazing and surrounding land use.
3. The CBA2 designation identifies a legitimate landscape-scale conservation priority, but its ecological value is heterogeneous at the property scale. The intact ridge and rocky outcrops are more important components of the CBA2 network, while the heavily degraded plains have substantially reduced ecological functionality. The proposed expansion affects only a small area of this already degraded component and does not materially compromise landscape connectivity or the broader conservation objectives represented by the CBA2 network.
4. The proposed expansion can be accommodated without materially compromising the ecological functionality of the CBA2 network, provided that mining and ancillary activities is confined to the approved footprint.
5. The LOW significance rating of the proposed impact should not be interpreted as indicating that CBA2 areas have low conservation value; rather, it reflects the limited ecological consequence of losing a small area of already degraded CBA2 habitat in the context of the wider landscape.

Recommendations

- The final mine boundary should be clearly demarcated before construction, and mining, access, stockpiling, laydown areas, blasting-related activities and other ancillary activities should be excluded from impacting on surrounding areas. Mining best practices must be implemented to minimise soil disturbance, runoff and vegetation clearing in areas adjacent to the ridge.

Additional conservation recommendation

- It is recommended that the applicant engage with the relevant provincial conservation authority regarding the apparent mismatch between the current condition of the CBA2 areas around the mine and the better-condition natural grassland occurring to the north and north-east. Consideration could be given, through the appropriate conservation-planning process, to strengthening the CBA network in the direction of the Lesseyton River, where better-condition habitat may provide a more effective contribution towards the same landscape-scale conservation objectives.

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Appendix 1

Impact assessment factors used:

- Resource Irreplaceability (I): Measures the uniqueness and rarity of the biodiversity resource. This ranges from widespread/common resources (Low) to critically rare resources with persistence thresholds exceeded (High).
- Threshold (T): The scale of impact relative to the total distribution of the resource, representing how much the impact contributes towards ecological thresholds. Scores range from negligible to impact on a significant proportion.
- Resource Condition (C): The integrity and quality of the biodiversity resource, from severely degraded to fully functional in a natural state.
- Reversibility of Impact (R): How reversible the impact is, from reversible without rehabilitation to irreversible despite mitigation.
- Extent of Impact (E): The geographic scale of the impact, from site-specific to regional or global.
- Duration of Impact (D): Time over which the impact persists, ranging from immediate (0-1 year) to permanent (indefinite).
- Intensity of Impact (M): Degree of alteration, from no impact on processes to permanent cessation.
- Probability of Occurrence (P): Likelihood of impact occurring without mitigation, from improbable to definite.
- Confidence (not always scored explicitly): Level of certainty in the data and assessment.
- Significance of Impact (S): A combined score reflecting the biodiversity value, magnitude, and probability of the impact, classified as very low, low, moderate, high, or very high.
- The significance calculation is a function combining biodiversity importance and impact magnitude, with detailed scoring for each factor allowing an objective and transparent rating of impacts.

The impact assessment methodology assists in evaluating the overall effect of a proposed activity on the environment. The impact assessment must take account of the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). The rating system is applied to the potential impact on the receptor. The impact assessment methodology provided below explicitly takes into account the value and condition of the biodiversity resources affected. In assessing the significance of each issue the following criteria (including an allocated point system) are used:

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
BIODIVERSITY VALUE / SENSITIVITY CRITERIA					
Irreplaceability (I) The biodiversity value of the affected resource	Resource is widespread and common and /or regenerates itself (LC)	Resource is uncommon, endemic to a restricted area, moderately rare, or is already noticeably affected but still relatively widespread (e.g., NT, ESA)	Resource is naturally rare, restricted to limited localities, ephemeral, or is approaching a threshold of persistence (VU, CBA2)	Resource is highly localised / loss has already exceeded persistence thresholds (EN, CBA1)	Resource is critically rare / loss has already well exceeded persistence thresholds (CR, Protected)
Threshold (T) The scale of the impact relative to the overall distribution of a resource, therefore the degree to which the impact contributes towards exceeding an ecological threshold	Impact affects a negligible proportion of the overall biodiversity resource	Impact affects a proportion of the biodiversity resource that is within 6 orders of magnitude of the total extent / number of the resource (0.001-0.1%)	Impact affects a proportion of the biodiversity resource that is within 4 orders of magnitude of the total extent / number of the resource (0.1-1%)	Impact affects a proportion of the biodiversity resource that is within 2 orders of magnitude of the total extent / number of the resource (1-10%)	Impact affects a proportion of the biodiversity resource that is within 1 order of magnitude or more of the total extent / number of the resource ($\geq 10\%$)
Condition (C) The integrity of the resource in terms of its intactness and functionality, the coherence of its ecological structure and function	Resource in very poor condition, displaying advanced degradation		Moderately affected resource, functional but displaying obvious signs of minor degradation		Fully functional and in a state expected in a completely natural state, unaffected by human influence.

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation	Mostly reversible: requires minor mitigation	Partly reversible: Recoverable with more intense mitigation	Barely reversible: unlikely to be reversed, even with intense mitigation	Irreversible: Not possible despite action
IMPACT MAGNITUDE CRITERIA					
Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Within site boundary only	Site & surroundings: Extends for a limited distance beyond site boundaries	Landscape: Outside activity area	Regional: Affects patterns at a regional or provincial scale	Global: Across borders or boundaries
Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact, 0-1 years	Short term: 1-5 years	Medium term: 5-10 years	Long term: Project life, 10-25 years	Permanent: Indefinite
Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease or continue in a highly modified way	Very High: Permanent cessation of processes
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$S = [(E + D + M)/3 \times (R + I + T + C)/4]/5$ $Significance = (Extent + Duration + Magnitude)/3 \times (Reversibility + Irreplaceability + Threshold + Condition)/4$				
IMPACT SIGNIFICANCE RATING					
Total Score	0 - 1	1 - 2	2 - 3	3 - 4	4 - 5
Environmental Significance Rating (Negative (-))	Very low	Low	Moderate	High	Very High
Environmental Significance Rating (Positive (+))	Very low	Low	Moderate	High	Very High

Appendix 2

Abildgaardia ovata
Albuca bracteata
Aloe ferox
Anacampseros rufescens
Arctotis arctotoides
Aristida adscensionis
Asparagus mucronatus
Asparagus spinescens (Rare)
Berkheya discolor
Bidens bipinnata
Blepharis integrifolia
Boophone disticha
Celtis africana
Cheilanthes eckloniana
Cheilanthes viridis
Cineraria lobata
Clausena anisata
Cliffortia linearifolia
Commelina africana
Cotyledon orbiculata
Crassula dependens
Crassula lanuginosa
Crassula perfoliata
Crinum macowanii
Cussonia paniculata
Cussonia spicata
Cymbopogon pospischilii
Cynodon dactylon
Cyphostemma cirrhosum
Datura ferox
Dicliptera cernua
Diospyros scabrida
Drimia capensis
Ehretia rigida
Eragrostis obtusa
Erigeron bonariensis
Euclea crispa
Euphorbia nutans
Euphorbia pulvinata
Euryops floribundus
Eustachys paspaloides
Falkia repens
Felicia muricata
Glandularia aristigera
Grewia occidentalis
Gymnosporia buxifolia
Hermannia depressa
Hibiscus pusillus
Hilliardiella capensis
Hypoxis argentea

Indigofera disticha
Ipomoea crassipes
Kalanchoe rotundifolia
Lantana rugosa
Ledebouria ensifolia
Lotononis pungens
Maytenus undata
Melinis nerviglumis
Microchloa afra
Monsonia angustifolia
Nidorella podocephala
Ophioglossum polyphyllum
Opuntia ficus-indica
Osyris lanceolata
Panicum coloratum
Pelargonium zonale
Pellaea calomelanos
Polygala amatymbica
Priva adhaerens
Pseudognaphalium oligandrum
Rhoicissus tridentata
Rhynchosia totta
Sansevieria hyacinthoides
Schkuhria pinnata
Scolopia zeyheri
Searsia dentata
Searsia pallens
Sida dregei
Solanum elaeagnifolium
Solanum lichtensteinii
Solanum tomentosum
Stapelia grandiflora
Tagetes minuta
Themeda triandra
Tragus berteronianus
Tribulus terrestris
Urochloa panicoides
Vachellia karroo
Viscum rotundifolium
Zantedeschia albomaculata
Zinnia peruviana
Ziziphus mucronata