



BOTANICAL SCAN

THE PROPOSED NEW NAMAQUA N7 TRUCK STOP

Portion 62 of Farm Biesjesfontein No. 218, Springbok, Northern Cape

A Botanical scan of the area that might be impacted as a result of the proposed development.



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SUMMARY - MAIN CONCLUSIONS

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VEGETATION EXPECTED	<u>Namaqualand Blomveld (Least Threatened)</u>
CONSERVATION STATUS	<u>Least Threatened</u> , (NSBA, 2006). More than 94% of this vegetation still remains in its natural state, but at present only 1.5% is formally protected.
VEGETATION ENCOUNTERED	The site is located on historical agriculture (ploughed) land and supported a disturbed version of Namaqualand Blomveld. The vegetation cover was sparse with very low species diversity dominated by <i>Galenia africana</i> (a plant which in itself is normally a disturbance indicator). It is expected that the veld will still support a number of spring annuals (especially of the Asteraceae and Aizoaceae families), but they were not visible at the time of the study.
RED-LISTED PLANT SPECIES	No red-listed species observed.
PROTECTED SPECIES	No trees protected in terms of the National Forest Act, Act 84 of 1998 was encountered. One plant protected in terms of the Northern Cape Nature Conservation Act, Act 9 of 2009 was encountered namely the hardy disturbance indicator: <ul style="list-style-type: none"> • <i>Galenia africana</i>
MAIN CONCLUSION	The impact assessment took into account that the vegetation type is not considered vulnerable or endangered and no red-listed plants were observed, although one protected plant was observed. No special habitats were likely to be impacted and the development will not impact on any ESA or CBA. According to the impact assessment it is considered highly unlikely that the development would have contributed significantly to any of the following: <ul style="list-style-type: none"> • Significant loss of vegetation type and associated habitat. • Loss of ecological processes (e.g. migration patterns, pollinators, river function etc.) due to construction and operational activities. • Loss of local biodiversity and threatened plant species. • Loss of ecosystem connectivity Apart from the protected species that will be impacted no other botanical features of significance were observed. WITH THE AVAILABLE INFORMATION IT IS RECOMMENDED THAT PROJECT BE APPROVED SINCE IT IS UNLIKELY TO RESULT IN IRREVERSIBLE ENVIRONMENTAL IMPACT.
NO-GO OPTION	Since the development is relative small and within an already disturbed area the no-go option will not contribute significantly to national or provincial conservation targets.

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INTRODUCTION

The applicant proposes the establishment of a new Truck stop & re-fuelling station next to the N7 and just south of Springbok on a small portion of the Farm Biesjesfontein No. 218/62. The proposed truck stop and associated infrastructure will cover an area of approximately of approximately 2.25ha in size (an area of approximately 150m x 150m). The preferred site will be located about 300m away from a small seasonal stream to its north and also about 300m away from the granite outcrop (koppie) to its south.

The proposed truck stop is located on land that was used for agriculture (ploughed) and as a result supported a disturbed version of Namaqualand Blomveld. The vegetation cover was sparse with very low species diversity dominated by *Galenia africana* (a plant which in itself is normally a disturbance indicator). It is expected that a number of spring annuals might still be present, but at the time of the site visit only hardy and mostly plants indicative of disturbance was encountered (e.g. *Galenia africana*). The proposed site is not located within a critical biodiversity area or an ecological support area.

The proposed development constitutes a listed activity under the National Environmental Management Act, (Act 107 of 1998) (NEMA) and the EIA regulations (as amended). PB Consult was appointed to evaluate the proposed site and its immediate surroundings in terms of the potential impact of such a development on significant botanical features encountered.

TERMS OF REFERENCE

The terms of reference for this appointment were to:

- Evaluate the proposed site in order to determine whether any significant botanical features will be impacted as a result of the proposed development.
- Make recommendations on impact minimisation should it be required
- Consider short- to long-term implications of impacts on biodiversity and highlight irreversible impacts or irreplaceable loss of species.

A desktop study coupled with a site visit on the 5th of April 2017 was performed in order to evaluate the potential impacts of the development.

LOCATION & LAYOUT

The proposed development will be located on portion 62 of the Farm Biesjesfontein No. 218, Springbok. The property is located approximately 8km south of the town of Springbok, right next to the N7. The development footprint (including associated infrastructure) will be approximately 150 x 150m or 2.2.5ha (Refer to Figure 1). Co-ordinates for the centre of the site is given as: S29° 43' 42.3" E17° 51' 55.1"

Figure 1: Location map indicating the approximate location of the property in relation to nearby towns

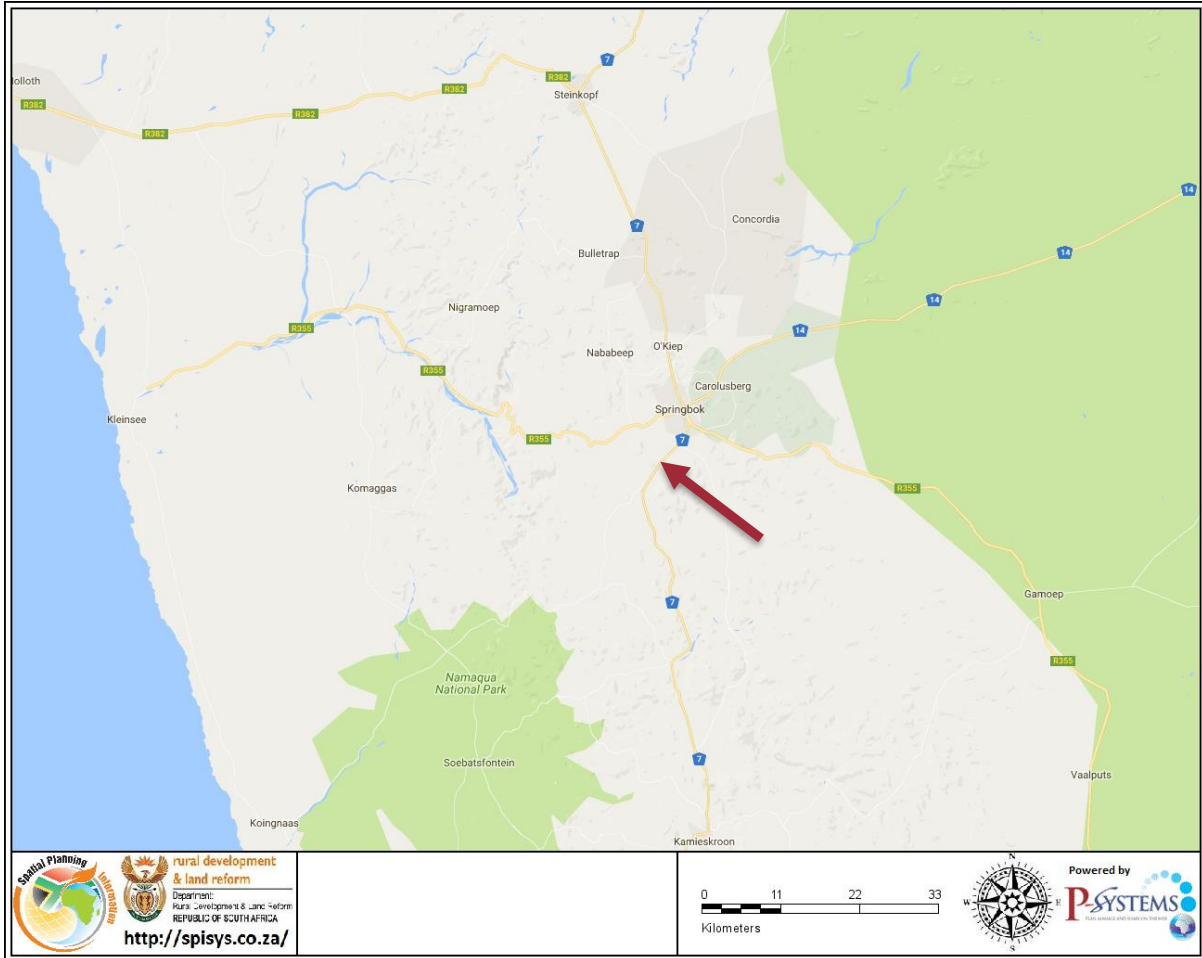


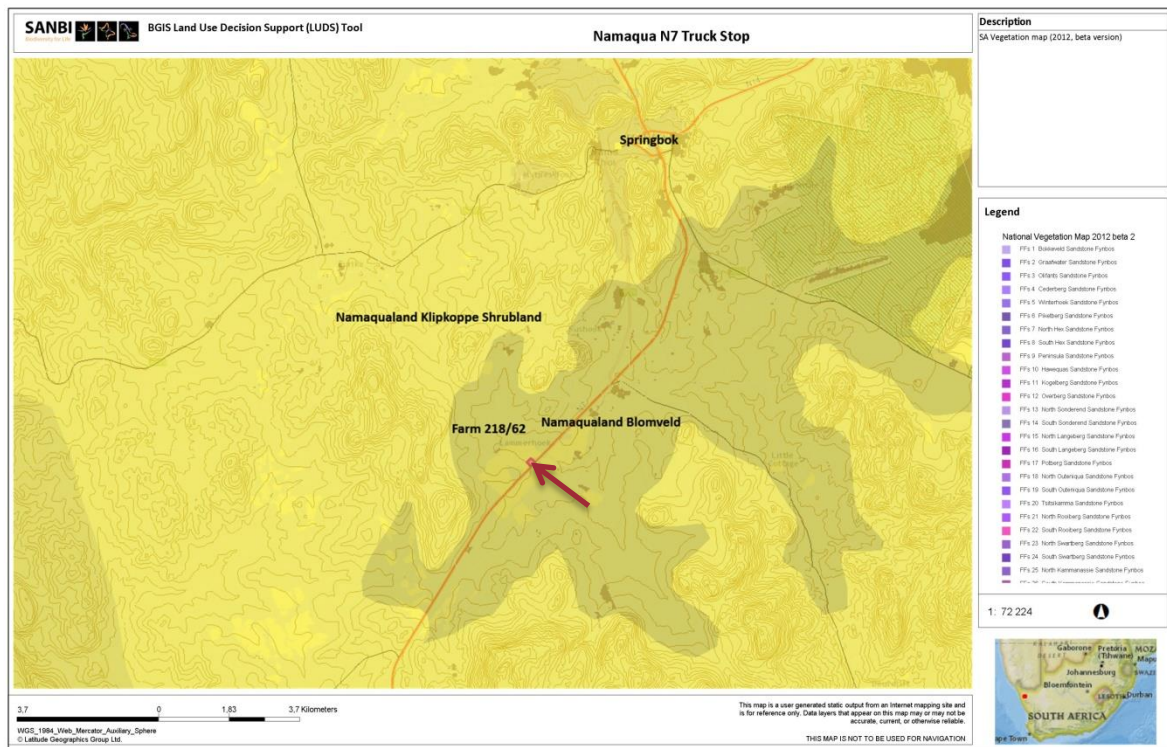
Figure 2: The proposed development footprint (green) within the larger property (Yellow)



NATURAL VEGETATION EXPECTED

According to the 2012 (beta 2) version of the Vegetation map of SA (Mucina & Rutherford, 2006) property would falls within a vegetation type known as Namaqualand Blomveld (Refer to Figure 3), a vegetation type classified as “Least Threatened”, according to the *National list of ecosystems that are threatened and in need of protection* (GN 1002, 9 December 2011).

Figure 3: Vegetation map of South Africa (2012 beta 2 version), indicating the development footprint (red)



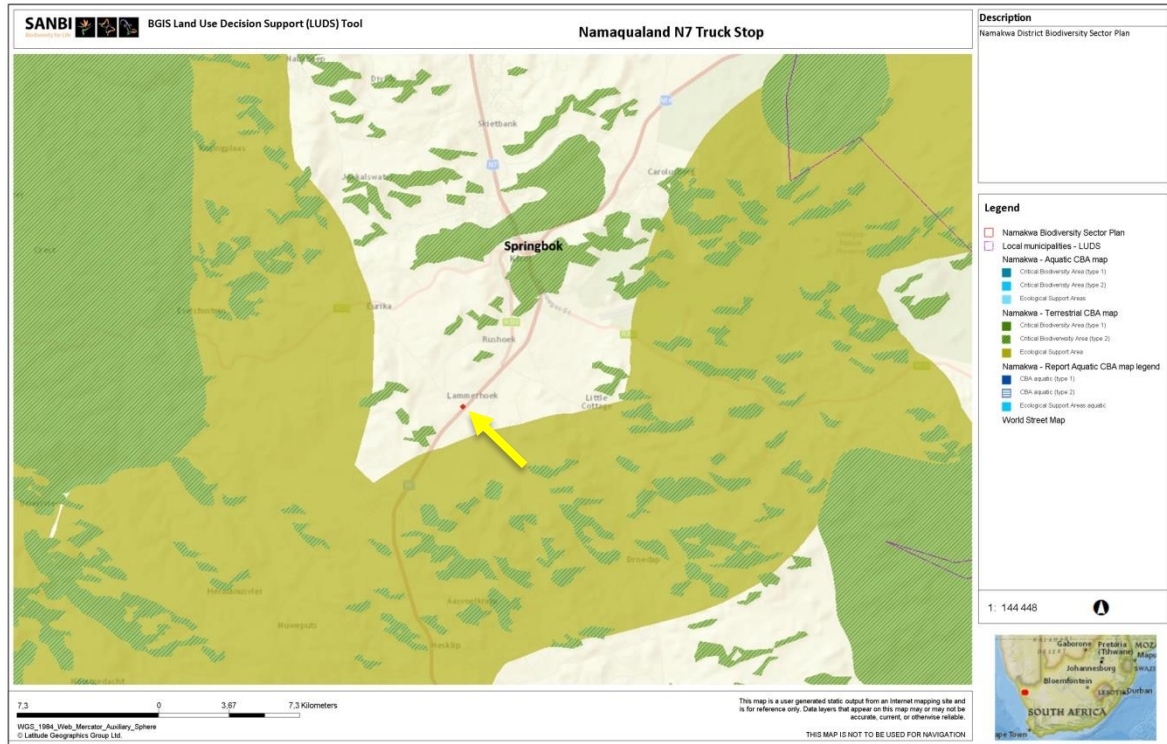
According to Mucina & Rutherford (2006), Namaqualand Blomveld is found mostly in the Northern Cape, but also in the Western Cape (to a much smaller extent). The vegetation is associated with the valleys and flat areas (piedmonts, vlaktes) between the granitic rocky hills of the Namaqualand Escarpment, from Bitterfontein to Steinkopf at altitudes varying between 460–1 080 m.

According to the 2004 National Spatial Biodiversity Assessment (Mucina & Rutherford, 2006) the Conservation target for this vegetation type is 28%. Even though the vegetation is classified as “Least Threatened”, only small areas (about 1.5%) of this vegetation type are currently statutorily conserved in the Goegab Nature Reserve and Namaqua National Park, with some additional protection through privately owned game farms. Only about 6% of the total area is been transformed (mostly by grain farming and planting of salt-bush), but overgrazing is found almost throughout this unit. The vegetation on abandoned (formerly ploughed) fields is the result of continued disturbance, first by ploughing and then the vegetation is kept from recovery by heavy grazing of the annuals and palatable perennial seedlings. In areas with loamy soils *Drosanthemum hispidum*, *Galenia sarcophylla* and *Hypertelis salsoloides* are sometimes dominant, while elsewhere the only perennial species sometimes is *Galenia africana*.

CRITICAL BIODIVERSITY AREAS MAPS

The Namakwa District Biodiversity Sector Plan (2008) gives both aquatic and terrestrial Critical Biodiversity Areas (CBAs) and ecological support areas for the Namakwa District Municipality (Refer to Figure 4).

Figure 4: The Namakwa District Biodiversity Sector Plan (2008), fine scale maps, indicating the location of the development (red)



According to Namakwa District Biodiversity Sector Plan (2008), the development does not fall within an ecological support area or a critical biodiversity area.

VEGETATION ENCOUNTERED

A site visit was performed on the 5th of April 2017, during which the author walked the proposed site and its immediate surrounding in order to get a feel for the condition of the remaining natural veld (Refer to Figure 5). The property is about approximately 295ha in size of which the proposed footprint will cover approximately 2.25ha. The development footprint and its immediate surroundings are located on a sandy plain with a slight slope (approximately 2.7% average slope) towards the north (sloping down towards the small seasonal stream to the north of the site). No water courses or wetlands were observed on the site, apart from the small unnamed seasonal stream approximately 300m north of the site.

From the desktop studies and the site visit it was immediately clear that the site and in fact, almost all of the sandy plains surrounding the site, can be described as abandoned (previously ploughed) agricultural fields. At the time of the site visit it was very dry and only hardy drought resistant plants were visible. Some of these plants showed signs of having succumbed to the drought, making positive identification somewhat difficult. Even so, it was clear to see that the vegetation reflects a poor representation of species that might have been

expected within natural veld. Species diversity was low, echoing the fact that most the property was subjected to agriculture in times past (Photo 1). The vegetation can be described as a sparse low open shrubland dominated by the hardy shrubs *Galenia africana* and *Hermannia disermifolia* (both of which can be indicative of disturbance). Near the water course the small tree *Vachellia karroo* (used to be *Acacia karroo*) can be observed, with the only other tree the occasional alien invasive *Prosopis* tree.

Figure 5: Shows the property (in red) and the route walked and droved during the site visit

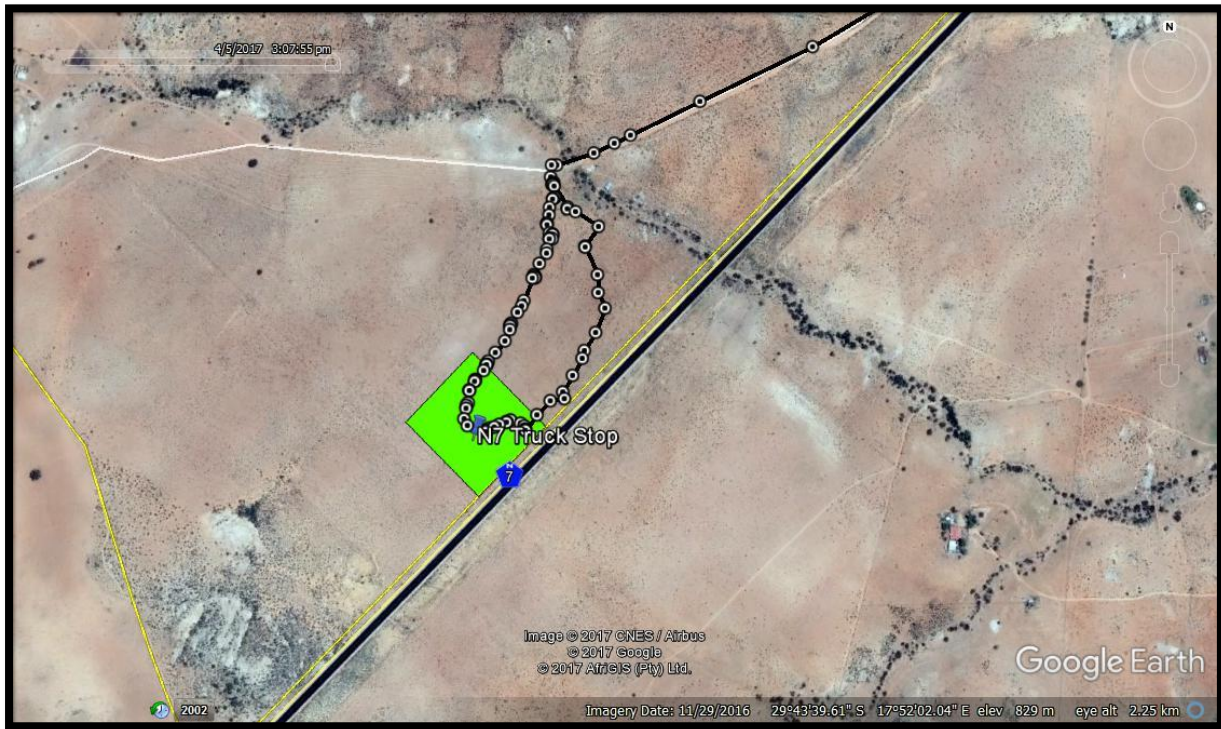


Photo 1: Typical vegetation encountered on site (looking from the site to the north)



Although the drought made positive identification of some species difficult the author managed to identify most of the species to at least genus level: The following plant species were observed: *Galenia africana*, *Hermannia*

disermifolia, *Hypertelis* species (most probably *H. salsoloides*), *Manochlamys albicans*, *Ornithogalum* cf. *hispidum* (only the dry florescence visible) and *Peliostomum virgatum*. Very few grasses were observed at the time of the study. It is expected that the veld will still support a number of spring annual flowering plants, especially of the Asteraceae and Aizoaceae families, but they were also not visible at the time of the study.

Photo 2: Vegetation encountered looking north from the proposed footprint



FLORA ENCOUNTERED

Please note that this study never intended to be full botanical assessment. However, a scan of significant species was done during the site visit, and even though the author does not claim that all species encountered were identified, all efforts were made to do just that. It is also expected that because of the timing of the site visit a number of spring annuals would have been missed some of whom might be protected in terms of the Northern Cape Nature Conservation Act (NCNCA), Act, 9 of 2009 (especially referring to species of the Aizoaceae family).

Table 1: List of species encountered on the proposed footprint and its immediate surroundings

SPECIES NAME	FAMILY	Protected species	Legal requirement(s)
<i>Galenia africana</i>	AIZOACEAE	Protected in terms of schedule 2 of the NCNCA	Apply for a flora permit in terms of the NCNCA
<i>Hermannia disermifolia</i>	MALVACEAE		
<i>Hypertelis</i> species	MOLLUGINACEAE		
<i>Manochlamys albicans</i>	AMARANTHACEAE		
<i>Ornithogalum</i> cf. <i>hispidum</i>	COLCHICACEAE		
<i>Peliostomum virgatum</i>	SCROPHULARIACEAE		
<i>Prosopis</i> species	FABACEAE	Category 2 in terms of CARA; Category 3 in terms of NEMBA	Implement an alien invasive control program

South Africa has become the first country to fully assess the status of its entire flora. The Red List of South African Plants Online provides up to date information on the national conservation status of South Africa's indigenous

plants. **No red-listed species** was observed during the site visit. Also, **no plants protected in terms of the National Environmental Management: Biodiversity Act**, Act 10 of 2004 and its “Lists of critically endangered, endangered, vulnerable and protected species” (GN. R. 152 of 23 February 2007) were encountered on the site.

No plants protected in terms of the National Forest Act, Act 84 of 1998 (Protected tree species) was encountered.

One plant species protected in terms of the Northern Cape Nature Conservation Act, Act 9 of 2009 was encountered namely:

- *Galenia africana*, which is also a common disturbance indicator species. A flora permit application will have to be submitted for the removal of this plant.

IMPACT ASSESSMENT METHOD

The objective of this study was to evaluate the botanical diversity of the property area in order to identify significant environmental features which might have been impacted as a result of the development. The Ecosystem Guidelines for Environmental Assessment (De Villiers *et. al.*, 2005), were used to evaluate the botanical significance of the property with emphasis on:

- Significant ecosystems
 - Threatened or protected ecosystems
 - Special habitats
 - Corridors and or conservancy networks
- Significant species
 - Threatened or endangered species
 - Protected species

DETERMINING SIGNIFICANCE

Determining impact significance from predictions of the nature of the impact has been a source of debate and will remain a source of debate. The author used a combination of scaling and weighting methods to determine significance based on a simple formula. The formula used is based on the method proposed by Edwards (2011). However, the criteria used were adjusted to suite its use for botanical assessment. In this document significance rating was evaluated using the following criteria (Refer to Table 2).

$$\text{Significance} = \text{Conservation Value} \times (\text{Likelihood} + \text{Duration} + \text{Extent} + \text{Severity}) \text{ (Edwards 2011)}$$

Table 2: Categories and criteria used for the evaluation of the significance of a potential impact

ASPECT / CRITERIA	LOW (1)	MEDIUM/LOW (2)	MEDIUM (3)	MEDIUM/HIGH (4)	HIGH (5)
CONSERVATION VALUE	The attribute is transformed, degraded not	The attribute is in good condition but not sensitive (e.g.	The attribute is in good condition, considered	The attribute is considered endangered or,	The attribute is considered critically

Refers to the intrinsic value of an attribute or its relative importance towards the conservation of an ecosystem or species or even natural aesthetics. Conservation status is based on habitat function, its vulnerability to loss and fragmentation or its value in terms of the protection of habitat or species	sensitive (e.g. Least threatened), with unlikely possibility of species loss.	Least threatened), with unlikely possibility of species loss.	vulnerable (threatened), or falls within an ecological support area or a critical biodiversity area, but with unlikely possibility of species loss.	falls within an ecological support area or a critical biodiversity area, or provides core habitat for endemic or rare & endangered species.	endangered or is part of a proclaimed provincial or national protected area.
LIKELIHOOD Refers to the probability of the specific impact occurring as a result of the proposed activity	Under normal circumstances it is almost certain that the impact will not occur.	The possibility of the impact occurring is very low, but there is a small likelihood under normal circumstances.	The likelihood of the impact occurring, under normal circumstances is 50/50, it may or it may not occur.	It is very likely that the impact will occur under normal circumstances.	The proposed activity is of such a nature that it is certain that the impact will occur under normal circumstances.
DURATION Refers to the length in time during which the activity is expected to impact on the environment.	Impact is temporary and easily reversible through natural process or with mitigation. Rehabilitation time is expected to be short (1-2 years).	Impact is temporary and reversible through natural process or with mitigation. Rehabilitation time is expected to be relative short (2-5 years).	Impact is medium-term and reversible with mitigation, but will last for some time after construction and may require on-going mitigation. Rehabilitation time is expected to be longer (5-15 years).	Impact is long-term and reversible but only with long term mitigation. It will last for a long time after construction and is likely to require on-going mitigation. Rehabilitation time is expected to be longer (15-50 years).	The impact is expected to be permanent.
EXTENT Refers to the spatial area that is likely to be impacted or over which the impact will have influence, should it occur.	Under normal circumstances the impact will be contained within the construction footprint.	Under normal circumstances the impact might extent outside of the construction site (e.g. within a 2 km radius), but will not affect surrounding properties.	Under normal circumstances the impact might extent outside of the property boundaries and will affect surrounding land owners or –users, but still within the local area (e.g. within a 50 km radius).	Under normal circumstances the impact might extent to the surrounding region (e.g. within a 200 km radius), and will regional land owners or – users.	Under normal circumstances the effects of the impact might extent to a large geographical area (>200 km radius).
SEVERITY Refers to the direct physical or biophysical impact of the activity on the surrounding environment should it occur.	It is expected that the impact will have little or no affect (barely perceptible) on the integrity of the surrounding environment. Rehabilitation not needed or easily achieved.	It is expected that the impact will have a perceptible impact on the surrounding environment, but it will maintain its function, even if slightly modified (overall integrity not compromised). Rehabilitation easily achieved.	It is expected that the impact will have an impact on the surrounding environment, but it will maintain its function, even if moderately modified (overall integrity not compromised). Rehabilitation easily achieved.	It is expected that the impact will have a severe impact on the surrounding environment. Functioning may be severely impaired and may temporarily cease. Rehabilitation will be needed to restore system integrity.	It is expected that the impact will have a very severe to permanent impact on the surrounding environment. Functioning irreversibly impaired. Rehabilitation often impossible or unfeasible due to cost.

SIGNIFICANCE CATEGORIES

The formal NEMA EIA application process was developed to assess the significance of impacts on the surrounding environment (including socio-economic factors), associated with any specific development proposal in order to

allow the competent authority to make informed decisions. Specialist studies must advise the environmental assessment practitioner (EAP) on the significance of impacts in his field of specialty. In order to do this, the specialist must identify all potentially significant environmental impacts, predict the nature of the impact and evaluate the significance of that impact should it occur.

Potential significant impacts are evaluated, using the method described above, in order to determine its potential significance. The potential significance is then described in terms of the categories given in Table 3.

Table 3: Categories used to describe significance rating (adjusted from DEAT, 2002)

SIGNIFICANCE	DESCRIPTION
Insignificant or Positive (4-22)	There is no impact or the impact is insignificant in scale or magnitude as a result of low sensitivity to change or low intrinsic value of the site, or the impact may be positive.
Low (23-36)	An impact barely noticeable in scale or magnitude as a result of low sensitivity to change or low intrinsic value of the site, or will be of very short-term or is unlikely to occur. Impact is unlikely to have any real effect and no or little mitigation is required.
Medium Low (37-45)	Impact is of a low order and therefore likely to have little real effect. Mitigation is either easily achieved. Social, cultural and economic activities can continue unchanged, or impacts may have medium to short term effects on the social and/or natural environment within site boundaries.
Medium (46-55)	Impact is real, but not substantial. Mitigation is both feasible and fairly easily possible, but may require modification of the project design or layout. Social, cultural and economic activities of communities may be impacted, but can continue (albeit in a different form). These impacts will usually result in medium to long term effect on the social and/or natural environment, within site boundary.
Medium high (56-63)	Impact is real, substantial and undesirable, but mitigation is feasible. Modification of the project design or layout may be required. Social, cultural and economic activities may be impacted, but can continue (albeit in a different form). These impacts will usually result in medium to long-term effect on the social and/or natural environment, beyond site boundary within local area.
High (64-79)	An impact of high order. Mitigation is difficult, expensive, time-consuming or some combination of these. Social, cultural and economic activities of communities are disrupted and may come to a halt. These impacts will usually result in long-term change to the social and/or natural environment, beyond site boundaries, regional or widespread.
Unacceptable (80-100)	An impact of the highest order possible. There is no possible mitigation that could offset the impact. Social, cultural and economic activities of communities are disrupted to such an extent that these come to a halt. The impact will result in permanent change. Very often these impacts are un-mitigatable and usually result in very severe effects, beyond site boundaries, national or international.

IMPACT ASSESSMENT

The impact assessment took into account that the vegetation type is not considered vulnerable or endangered and no red-listed plants were observed, although one protected plants were observed (and more might be expected). No special habitats were likely to be impacted and the proposed development is not within an ecological support area or critical biodiversity area.

Table 4: Summary of impact assessment associated with the proposed development in terms of botanical impact

Aspect	Short description	CV	Lik	Dur	Ext	Sev	Sign.	Short discussion
Sensitive Geology & soils	The development will have a permanent impact on approximately 2.25 ha of soils within the Namaqualand Blomveld vegetation type (Least Threatened). However, no other sensitive geological habitats were observed (e.g. termite mounds or true quartz patches).							
	Significance	1	1	4	1	1	7	No significant features observed
Landuse and cover	The development will have a permanent impact on 2.25 ha on a farm with a total area of approximately 300 ha. The only viable alternative land-use is livestock grazing or agriculture (which is dependent on rains).							
	Significance	1	1	4	1	1	7	No alternative land use was observed (e.g. livestock grazing).
Vegetation type	The development footprint is relatively small and the vegetation classified as Least Threatened.							
	Significance	1	1	4	1	1	7	Impact considered very small and localized.
Conservation priority areas and connectivity	The property does not fall within an ecological support area or a critical biodiversity area.							
	Significance	1	1	4	1	1	7	Impact considered very small and localized.
Watercourses and wetlands	No ephemeral or water courses on or near the proposed development. The nearest water course is approximately 300m away, but since it is downslope, the development will have to implement adequate pollution prevention methods.							
	Significance	0	0	0	0	0	0	No direct impact inspected (operational control important).
Flora	No red-listed species was encountered and only one protected species was observed, but it is possible that a number of spring annual plants may occur, some of whom may also be protected in terms of the NCNCA.							
	Significance	1	2	4	1	1	8	Development without the necessary flora permits.
Cumulative impacts	Cumulative impacts refer to the sum of all impacts associated with the proposed development. In this case it was measured in terms of its potential impact on the vegetation type, red-listed species and protected species.							
	Significance	1	2	4	1	1	8	Development without mitigation.

According to the impact assessment it is unlikely that the development would have any significant impact on botanical features.

Taken the above into consideration it is highly unlikely that the proposed development will contributed significantly to any of the following:

- Significant loss of vegetation type and associated habitat.
- Loss of ecological processes (e.g. migration patterns, pollinators, river function etc.) due to construction and operational activities.
- Loss of local biodiversity and threatened plant species.
- Loss of ecosystem connectivity

RECOMMENDATIONS

Having evaluated the proposed site and its immediate surroundings, it is unlikely that the proposed development will lead to any significant impact on the biodiversity as a result of its placement. However, since it is a re-fuelling station and overnight stop for trucks, it is essential that good operational mechanisms are in place to prevent pollution as a result of accidental spillages.

The following impact minimisation recommendations should also be considered as part of the construction phase:

- All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must be developed by a suitably experienced Environmental Assessment Practitioner.
- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the EMP and any other conditions pertaining to specialist studies and requirements of the any competent authority.
- An application must be made to DENC for a flora permit in terms of the NCNCA with regards to impacts on species protected in terms of the act.
- Before any work is done the site and access routes must be clearly demarcated (with the aim at minimal width/smallest footprint). The demarcation must include the total footprint necessary to execute the work, but must aim at minimum disturbance.
- Access must be limited to routes approved by the ECO.
- Lay-down areas or construction sites must be located within already disturbed areas or areas of low ecological value and must be pre-approved by the ECO.
- Indiscriminate clearing of areas must be avoided.
- All alien plants must be removed from within the construction footprint and immediate surroundings.
- All areas impacted as a result of construction must be rehabilitated on completion of the project.
 - This includes the removal of all excavated material, spoil and rocks, all construction related material and all waste material.
 - It also included replacing the topsoil back on top of the excavation as well as shaping the area to represent the original shape of the environment.
- An integrated waste management approach must be implemented during construction.
 - Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites.
 - All rubble and rubbish should be collected and removed from the site to a suitable registered waste disposal site.

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