NICK HELME BOTANICAL SURVEYS
PO Box 22652 Scarborough 7975
Ph: 021 780 1420 cell: 082 82 38350 email: botaneek@iafrica.com
Pri.Sci.Nat # 400045/08

TERRESTRIAL BIODIVERSITY ASSESSMENT OF PROPOSED NEW MACASSAR WASTE WATER TREATMENT WORKS AND ELECTRICAL CONNECTION, WESTERN CAPE.

Compiled for: Zutari, Cape Town

Client: City of Cape Town

29 Feb 2024

DECLARATION OF INDEPENDENCE

In terms of Chapter 5 of the National Environmental Management Act of 1998 specialists involved in Impact Assessment processes must declare their independence and include an abbreviated Curriculum Vitae.

I, N.A. Helme, do hereby declare that I am financially and otherwise independent of the client and their consultants, and that all opinions expressed in this document are substantially my own.

NA Helme

ABRIDGED CV:

Contact details as per letterhead.
Surname : HELME
First names : NICHOLAS ALEXANDER
Date of birth : 29 January 1969
University of Cape Town, South Africa. BSc (Honours) – Botany (Ecology & Systematics), 1990.

Since 1997 I have been based in Cape Town, and have been working as a specialist botanical consultant, specialising in the diverse flora of the south-western Cape. Since the end of 2001 I have been the Sole Proprietor of Nick Helme Botanical Surveys, and have undertaken over 1700 site assessments in this period.

A selection of relevant previous botanical work is as follows:

- Botanical assessment of Zeekoevlei weir upgrades (Infinity Environmental 2022)
- Botanical assessment of proposed development on Ptn 29 of Farm 410 Caledon (PHS Consulting 2022)
- Botanical assessment of proposed development on Ptn 10 of Broken Hill 88, Heidelberg (Isikhova 2021)
- Botanical assessment of Ptns 3 & 6 of Farm 563 Kleinmond (Lornay Environmental 2021)
- Botanical assessment of Ptn 9 of Farm 429 Gabrielskloof, Caledon (Infinity Environmental 2021)

- Baseline ecological assessment of Karwyderskraal 584, Caledon (Terramanzi 2021)
- Botanical impact assessment of proposed development of Ptn 29 of Farm 410, Caledon (PHS Consulting 2021)
- Botanical assessment of proposed new cultivation on Welbedacht farm, Tra Tra Mountains (Footprint Environmental 2020)
- Biodiversity Compliance Statement - Philippi erf 1/1460 (Infinity Environmental 2020)
- Botanical assessment of Kleinmond WWTW expansion (Aurecon 2020)
- Botanical assessment of Mooreesburg WWTW expansion (Aurecon 2020)
- Botanical assessment of Struisbaai cemetery sites (Infinity Environmental 2020)
- Botanical assessment of MoPama development site, Swellendam (Landscape Dynamics 2020)
- Botanical assessment of Ptn of Rem of Erf 1 Caledon (Theewaterskloof Municipality 2019)
- Botanical assessment of proposed new cultivation on Portion of Wittewater 148, Piketberg (Cornerstone Environmental 2019)
- Botanical assessment of Droogerivier farm Leipoldtville (Footprint Environmental 2018)
- Botanical assessment of Sebulon farm, Redelinghuys (Natura Libra Environmental Services 2018)
- Botanical assessment of proposed new cultivation on Ptn 2 of farm Groenevalley 155, Piketberg (Cederberg Environmental Assessment Practise 2017)
- Botanical assessment of proposed new cultivation on farm Rosendal, Koue Bokkeveld (Cederberg Environmental Assessment Practise 2016)
- Botanical assessment of proposed cultivation on farm Kransvlei, Clanwilliam (Cederberg Environmental Assessment Practise 2016)
- Botanical assessment of proposed cultivation on farm Erfdeel, Bo-Swaarmoed, Ceres (Cederberg Environmental Assessment Practise 2016)
- Botanical constraints in a northern corridor across Ptns 2 and 3 of Farm Frankendale 152, Vissershok (Urban Dynamics 2014).

CONDITIONS RELATING TO THIS REPORT:

The methodology, findings, results, conclusions and recommendations in this report are based on the author's best scientific and professional knowledge, and on referenced material and available knowledge. Nick Helme Botanical Surveys and its staff reserve the right to modify aspects of the report, including the recommendations and conclusions, if and when additional relevant information becomes available.

This report may not be altered or added to without the prior written consent of the author, and this also applies to electronic copies of this report, which are supplied for purposes of inclusion in other reports, including in the report of EAPs. Any recommendations, statements or conclusions drawn from or based on this report must cite this report, and should not be taken out of context, and may not change, alter or distort the intended meaning of the original in any way. If these extracts or summaries form part of a main report relating to this study or investigation this report must be included in its entirety as an appendix or separate section to the main report.

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1. INTRODUCTION

This terrestrial biodiversity (ecology) assessment was requested to inform the environmental planning and authorisation process being followed for the potential expansion of the Macassar Wastewater Treatment Works, in the Western Cape. A single development layout was presented for assessment, mostly northwest of the existing treatment works (Figures 1 & 2). After the initial assessment had been completed an underground electrical connection was added to the requirement for assessment (see Figure 1b).

Figure 1: Satellite image showing the location of the study area. Satellite image dated January 2023.

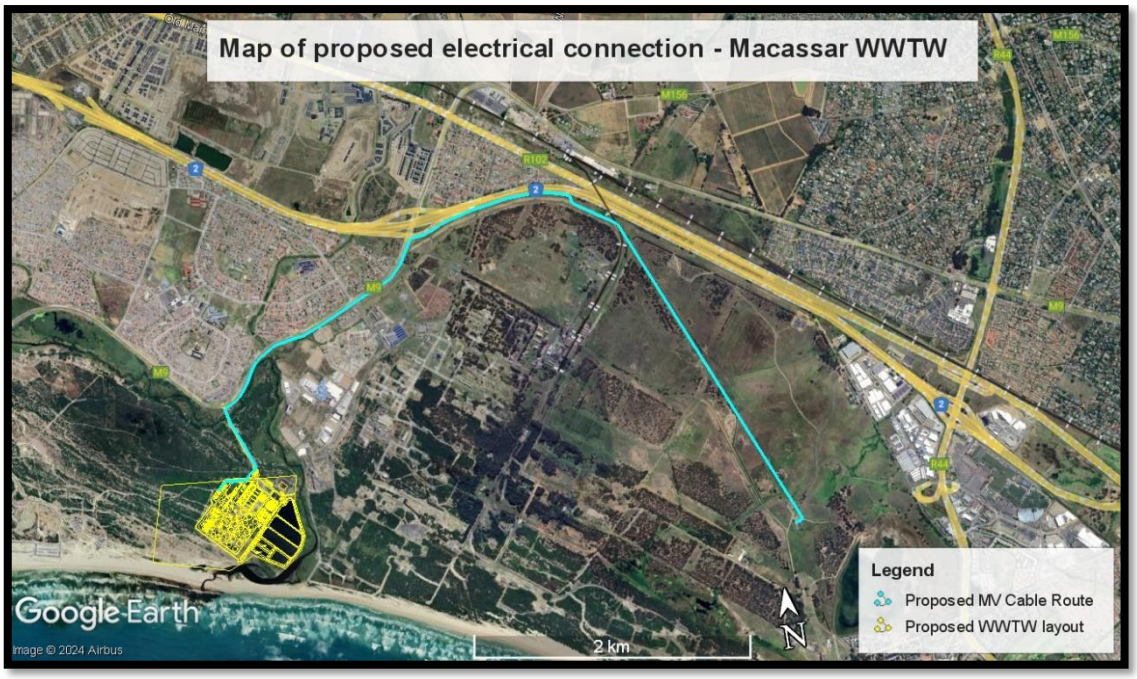

Figure 1b: Satellite image showing the location of the proposed cable route. Satellite image dated January 2023.

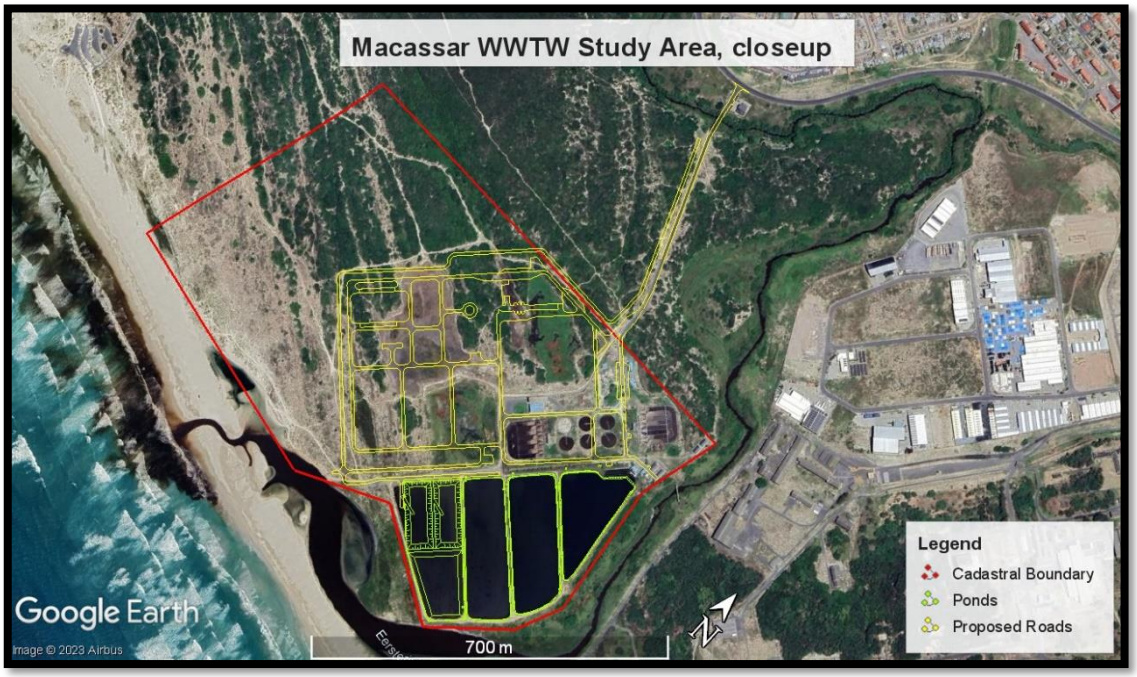

Figure 2: Zoomed in view of existing and proposed layout, as assessed.

2. TERMS OF REFERENCE

The terms of reference for this study were as follows:

- Undertake a site visit to assess the terrestrial vegetation and fauna (not birds) in the study area
- Identify and describe the vegetation and terrestrial fauna in the study area and place it in a regional context, including its status in terms of the City of Cape Town Biodiversity Network (CBA/ESA/ONA, etc)
- Identify and locate any (likely) plant and terrestrial faunal Species of Conservation Concern in the study area, based on observation, literature and iNaturalist website review
- Provide an overview and map of the botanical and faunal conservation significance (sensitivity) of the site
- Identify and assess (according to standard IA methodology) the potential impacts of the project, using the current development layout provided
- Indicate the acceptability of the project proposal from an ecological perspective
- Identify and describe the potential cumulative impacts of the proposed development in relation to proposed and existing developments in the surrounding area
- Recommend mitigation measures to avoid and/or minimise impacts and/or optimise benefits associated with the proposed project.

3. LIMITATIONS, ASSUMPTIONS AND METHODOLOGY

The site was visited on 12 October 2023, but as the cable route was only added for assessment in February 2024 no site visit was undertaken for this. The site visit was undertaken late in the optimal winter – spring flowering season in this mainly winter rainfall area, and most (but not all) of the few likely geophytes and the many annuals were thus at the end of their flowering (and few were evident and identifiable), whilst all perennial plants were identifiable. There were thus some minor seasonal constraints on the accuracy of the botanical findings, but more than enough evidence was present for the confidence in the botanical findings to be high. Vegetation patterns were very clear, with degree of disturbance being the key driver of habitat quality. The author has undertaken extensive work within the region, which facilitates the making of local and regional comparisons and inferences of habitat quality and conservation value.

The study area was walked, and all plants on site were noted. Photographs of some of the key species were made using a Fuji mirrorless slr camera and a

Xiaomi cellphone, and have been uploaded to the biodiversity website iNaturalist.org. Satellite imagery dated January 2023 (and earlier) was used to inform this assessment, and for mapping. It is assumed that any development would result in the permanent loss of all natural or partly natural vegetation and terrestrial faunal habitat in that area. Faunal observations were incidental during the site visit, and no formal trapping or surveying of any sort was undertaken, and thus most of the faunal species present are likely to have been missed. Faunal observations on iNaturalist.org were used to inform the faunal survey. One species of frog was calling during the site visit (*Breviceps rosei* ssp*. rosei*), and could be easily identified by call.

The botanical sensitivity of a site is a product of plant species diversity, plant community composition, rarity of habitat, degree of habitat degradation, rarity of species, ecological viability and connectivity, restorability of habitat, vulnerability to impacts, and reversibility of threats.

The meaning of the No Go alternative in this case is assumed to mean no new development, minor but effective ongoing alien invasive vegetation management in the study area, and other potential future development.

It is assumed that all natural vegetation and faunal habitat within approved development areas will be lost over time, if not directly during the construction phase.

4. REGIONAL CONTEXT OF THE VEGETATION

The study area is part of the Southwest Fynbos bioregion (Mucina & Rutherford 2006), and is part of the Fynbos biome, located within what is now known as the Core Region of the Greater Cape Floristic Region (GCFR; Manning & Goldblatt 2012). The GCFR is one of only six Floristic Regions in the world, and is the only one largely confined to a single country (the Succulent Karoo component extends into southern Namibia). It is also by far the smallest floristic region, occupying only 0.2% of the world's land surface, and supporting about 11500 plant species, over half of all the plant species in South Africa (on 12% of the land area). At least 70% of all the species in the Cape region do not occur elsewhere, and many have very small home ranges (these are known as narrow endemics). Many of the lowland habitats are under pressure from agriculture, urbanisation and alien plants, and thus many of the range restricted species are also under severe threat of extinction, as habitat is reduced to extremely small fragments. Data from the nationwide plant Red Listing project indicate that 67% of the threatened

plant species in the country occur only in the southwestern Cape, and these total over 1800 species (Raimondo *et al* 2009). It should thus be clear that the southwestern Cape is a major national and global conservation priority, and is quite unlike anywhere else in the country in terms of the number of threatened plant species.

The Southwest Fynbos bioregion is characterised by relatively high winter rainfall, strong rainfall gradients, poor, sandy soils, high topographic diversity, and large urban areas and high levels of alien invasive vegetation. Due to this combination of factors the loss of natural vegetation in this bioregion has been severe (>60% of original extent lost within the region), and the bioregion has a very high number of threatened plant species (Raimondo *et al* 2009).

The City of Cape Town Biodiversity Network (see Figure 3) shows that CBA1b (Critical Biodiversity Area 1b, good condition) vegetation is mapped for about 60% of the target area. The degraded areas are mapped as No Natural Vegetation and OESA (Other Ecological Support Area). This map has good congruence with the groundtruthed sensitivity map shown in Figure 4, and the mapping is thus supported.

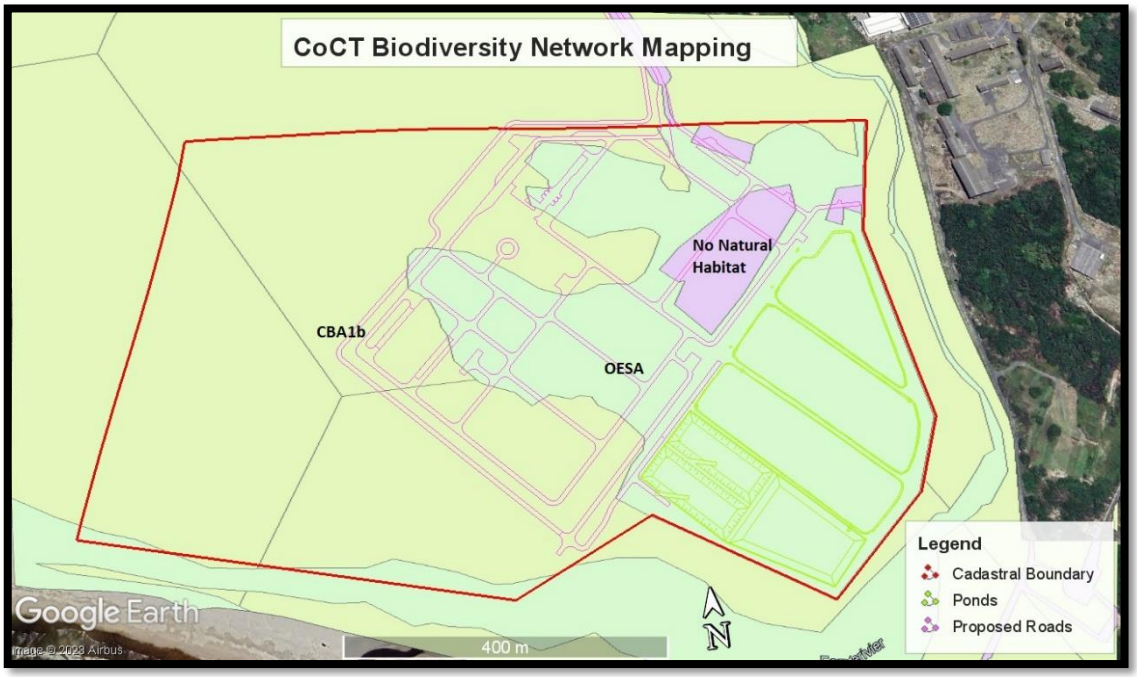

Figure 3: Extract of the City of Cape Town Biodiversity Network (Holmes et al 2018) for the main project area, showing that all natural areas are mapped as CBA1b, with the disturbed areas being OESA (Other Ecological Support Area) and No Natural Habitat.

5. THE VEGETATION AND ITS SENSITIVITY

According to the SA Vegetation Map the original natural vegetation in virtually all the study area is **Cape Flats Dune Strandveld** (Mucina & Rutherford 2018). Based on my ground-truthing I agree with this, and no copy of the vegetation map is provided as it adds little value.

Cape Flats Dune Strandveld is now gazetted as **Endangered** on a national basis (Government of South Africa 2022), with less than 60% of its total original extent remaining intact, less than 5% conserved, and a national conservation target of 24% (Rouget *et al* 2004). The unit supports a moderate number of threatened and endemic plant species, and occurs on deep, nutrient poor, alkaline marine sands in the area between Macassar, Cape Point and Blouberg. The vegetation type does not need fire for optimal ecological functioning (Helme *et al* 2016). Ongoing loss to this habitat type is a major problem and concern, notably in the Cape Flats, where even "formal" conservation areas are being lost to land invasions, sand mining and numerous other pressures (such as in Driftsands NR and Macassar NR).

Plate 1: View east from near the northern edge of the study area, with High sensitivity vegetated dunes on the left, and kikuyu grass dominated sludge pond on the right (low sensitivity), with existing WWTW beyond.

Plate 2: View south across the sludge pond (low sensitivity), with intact Cape Flats Dune Strandveld on the dune ridge (High sensitivity).

There is a very clear divide between disturbed and non-disturbed habitat on this site. No woody invasives occur in the study area, but many non-woody invasives are present in the disturbed areas, including *Cenchrus clandestina* (kikuyu grass), *Lolium* (ryegrass), *Bromus diandrus* (ripgut brome), *Echium plantagineum* (Patetrosns curse), *Glebionus coronaria, Plantago lanceolata* (ribwort plaintain), *Ricinus communis* (castor oil), *Erodium* spp., *Raphanus rapistrum* (wildemostert), and *Silybum marianum* (milk thistle).

No natural wetland habitat is present within the proposed footprints.

5.1 High Sensitivity Cape Flats Dune Strandveld

The portions of the study area that have not been heavily disturbed by sludge pond development support a high diversity of typical Cape Flats Dune Strandveld plant species, including: *Thamnochortus spicigerus, Pelargonium capitatum, Searsia lucida, S. laevigata, C. crenata, Colpoon compressum, Metalasia muricata, Osteospermum moniliferum, Oxalis pes-caprae, Carpobrotus edulis, Cynanchum obtusifolium, C. africanum, Ehrharta villosa, E. calycina, Ruschia macowanii, Cineraria geifolia, Solanum guineense, Tetragonia fruticosa, Zantedeschia aethiopica, Helichrysum crispum, H. revolutum, Zaluzianskya villosa, Oncosiphon suffruticosum, Euclea racemosa, Crassula glomerata, Euphorbia burmanii, E. mauritanica, Nemesia affinis, Capnophyllum africanum, Trachyandra hispida, Chasmanthe aethiopica, Geranium incanum, Cissampelos capensis, Viscum capense, Salvia aurea, Adenogramma glomerata, Arctotheca calendula, Adenocline violifolia, Ficinia indica, F. marginata, Otholobium*

bracteolatum, Cyanella hyacinthoides, Sideroxylon inerme, Asparagus lignosus, Manulea tomentosa, Pterocelaastrus tricuspidatus and *Pelargonium gibbosum*.

5.1 Plant Species of Conservation Concern (SoCC)

Two plant Species of Conservation Concern (SoCC) were recorded during the survey, and no other Redlisted plant species are likely to occur in viable numbers in the study area.

Capnophyllum africanum is Redlisted as Near Threatened (Raimondo *et al* 2009), and is found on alkaline sands from here north to Vredenburg. The population on site is fairly large (and thus possibly regionally significant), but it is also likely to be present in large numbers in the adjacent parts of the Macassar conservation area.

Asparagus lignosus is also Redlisted as Near Threatened. The species is even more widespread, being found from Vanrhynsdorp to Mossel Bay, and the site population (although quite large) is thus not regarded as regionally significant.

Sideroxylon inerme (milkwood) is well known as a Protected Species (as in fact are many of the indigenous species present on site, but they are just less well known to the public), but it is common and widespread and is not Redlisted. At least three plants occur in or close to the proposed footprint.

6. FAUNA

One species of frog (*Breviceps rosei* ssp. *rosei*) was heard calling from the vegetated dunes on site, and populations on site are probably viable and moderately significant. This species lives and breeds independently of water, and is Redlisted as Least Concern, even though it has a relatively narrow coastal range from Langebaan to Cape Point.

Bradypodion pumilum (Cape Dwarf Chameleon) has been recorded from similar nearby habitat (iNaturalist.org) and is likely to be present on site. This species is Redlisted as Vulnerable (Bates *et al* 2014). No other Redlisted reptiles are likely to be present. The Southern Adder (*Bitis armata*; Vulnerable) has been flagged by the Screening Tool for the region, but does not occur here.

Mammals present or using the site (tracks and scat found) include porcupine (*Hystrix africaeaustralis*), vlei rat (*Otomys unisulcatus*), Cape Dune Molerat (*Bathyergus suillus*), Cape Gerbil (*Gerbilliscus afer*), Cape Grey Mongoose (*Herpestes pulverulentus*) and Water Mongooose (*Atilax paludinosus*), and other likely species include Large Grey Mongoose (*Herpestes ichneumon*), Cape Grysbok (*Raphicerus melanotis*), Striped Fieldmouse (*Rhabdomys pumilio*) and Cape Genet (*Genetta tigrina*). Some of these may be resident on site.

No threatened butterflies are likely to utilise the site, although this cannot be ruled out without a survey (Mecenero *et al* 2013). *Kedestes* butterflies (Dune Rangers) include a number of rare species, and may be present, but very little of their favoured caterpillar food grass (*Imperata cylindrica*) was seen on site (as the dune slacks in which this usually grows have already been destroyed for the existing sludge ponds), so it is not likely to be optimal habitat.

Indigenous dune snails (*Trigonephrus*) were also observed on site (possibly *T. ambiguosus*). Birds were abundant and diverse, but are not the subject of this report.

7. PROPOSED MV ELECTRICAL CABLE ROUTE

Two 11 kV MV cables (laid 300mm apart) about 6941m long will be laid underground and will require a trench about 1m deep and 1m wide, with a buffer of 500mm either side of the proposed route.

Starting from the WWTW the route initially goes through High sensitivity Dune Strandveld in an area of dune ridges, and then crosses Tie road and the Eerste River and runs along the southern edge of the M9, in another High sensitivity section of about 500m long (two sections), making the total High sensitivity section about 1300km long (see Figure 4b). The rest of the route, all the way to the Paardevlei substation, is then in disturbed ground along road or in old cultivated lands, and is deemed to be of Low ecological sensitivity, although it does cross areas that are seasonally wet and occasionally flooded.

8. ECOLOGICAL SENSITIVITY

About 21.5ha of the study area has been mapped as High ecological sensitivity (see Figure 4), about 10ha is mapped as Medium sensitivity, and the rest is mapped as Low sensitivity.

All High sensitivity areas support largely natural vegetation of an Endangered type (Cape Flats Dune Strandveld), with at least two plant Species of Conservation Concern (SoCC) present in these areas. These areas are essentially all mapped as CBA1b in the City's BioNet (Figure 3).

The Medium sensitivity areas are areas that support more recently colonised dunes, with structurally much simpler vegetation (not trees or large shrubs), and lower species diversity (fauna and flora). Most of these areas are also mapped as CBA1b, but do not support any plant SoCC.

Low sensitivity areas have been heavily disturbed, support little or no natural vegetation, and no plant SoCC.

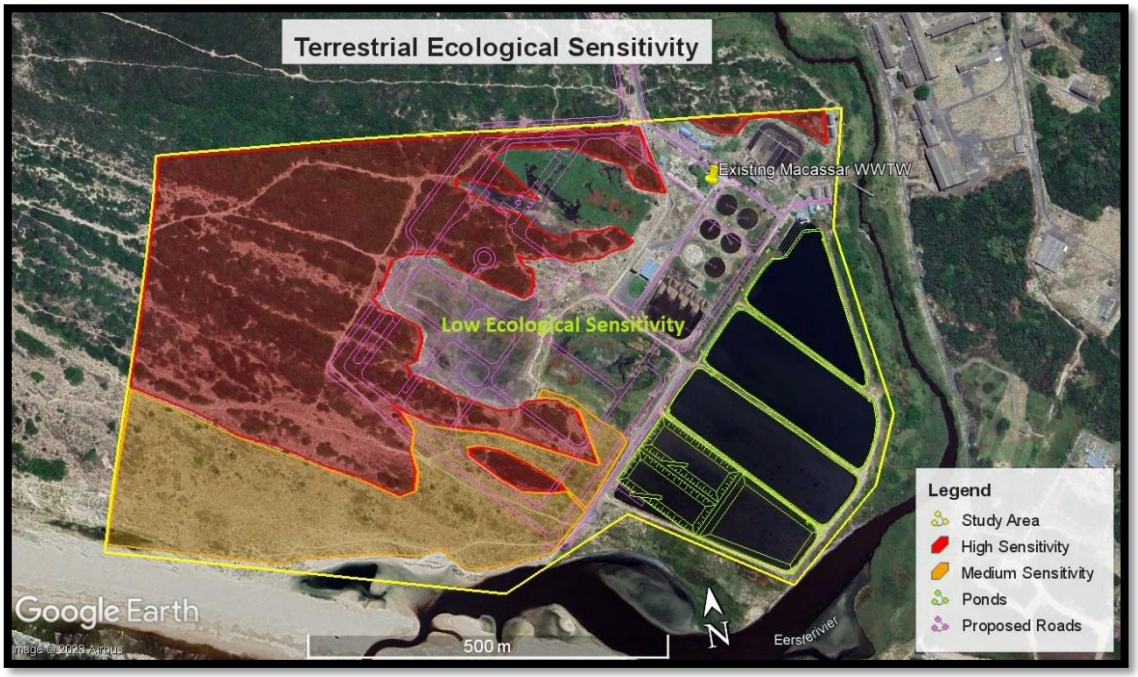

Figure 4: Ecological Sensitivity Map of the main project study area, overlaid on the proposed development layout (pink lines). All unshaded areas with the study area are deemed to be of Low sensitivity.

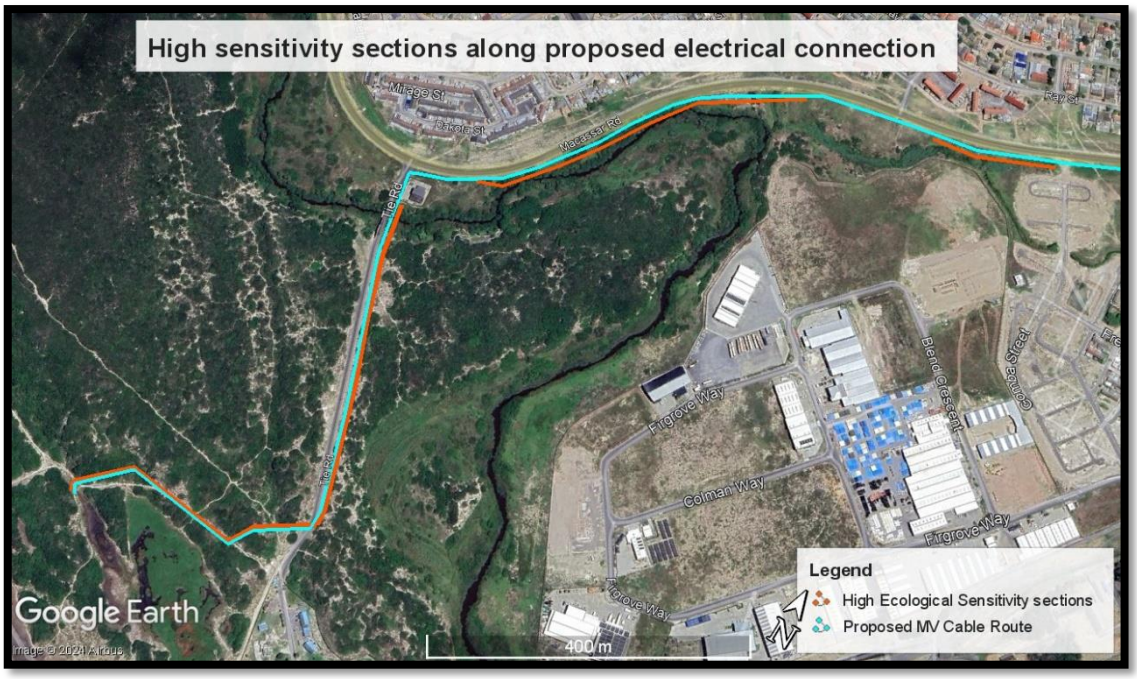

Figure 4b: Ecological Sensitivity Map of the electrical connection route. All unshaded areas along the route are deemed to be of Low sensitivity, and this map shows all the High sensitivity sections.

9. IMPACT ASSESSMENT

9.1 Construction Phase (Direct) Ecological Impacts

It can safely be assumed that the primary construction phase ecological impact of the proposed development would be permanent loss of all of the existing natural and partly natural vegetation and faunal habitat in the development footprints (gazetted as an Endangered vegetation type).

About 6.8ha of High sensitivity habitat will be lost to the proposed development, along with about 2.1ha of Medium sensitivity habitat, and the rest (about 13.5ha) will be of Low sensitivity.

Assuming that the electrical installation disturbs a 2m wide section (trench and fill) then about 2600m^2 of High sensitivity area will be disturbed. However, if a mechanical digger is used then this disturbance width will be closer to 5m, and the extent of the disturbed High sensitivity area will be about 6000m^2.

Two plant Species of Conservation Concern (SoCC) were recorded within the actual proposed main project area footprints (in the High sensitivity areas) and these subpopulations will hence be lost, and there is a moderate chance of at least one other SoCC being present.

At least one threatened animal species is likely to be present in the main project footprint area - the Cape Dwarf Chameleon (*Bradypodion pumilum*), which is listed as Vulnerable.

Direct loss of animals will also occur, notably in the High sensitivity areas. Animals most impacted will be those that are slow or reluctant to move, including at least one species of water independent frog (*Breviceps rosei*), dune snails (*Trigonephrus*) and the burrowing animals (including invertebrates). The proposed trenching for the power route could also excavate some of these animals, and may result in them (and other) falling into the trench as well.

The overall ecological significance of this direct vegetation and faunal habitat loss for the proposed layout (including cable trenching) is **High negative before mitigation.** Mitigation in this case needs to invoke the mitigation hierarchy - *viz.* avoidance first, then minimising of impact, and then mitigation. Avoidance is the first step, and means no loss of habitat within High sensitivity areas. If this is done the direct impacts could be reduced to an acceptable Low negative impact. However, given the probable physical requirements of the project for a certain minimum area this avoidance of impact is deemed unlikely. The likelihood of being able to minimise the impact (i.e. reduce the footprint in the High sensitivity areas) is also unlikely, as that would require substantial redesign and shrinking of the new facility.

This leaves a biodiversity offset as the only real way to try and reduce the unavoidable High negative residual impact to an acceptable level.

The **No Go alternative** would clearly have a much lower direct (construction phase) ecological impact than the proposed development - presumably best rated as **Neutral**, and would thus be **strongly preferred**.

The extent of the impacts are deemed to be local and regional, but also national, in that the vegetation type and threatened species are also assessed at a national level.

Development Alternative	Extent of impact	Duration of impact	Intensity	Probability of impact	Irreplaceable loss of biodiversity	Significance before mitigation	Significance after mitigation
Proposed Layout	National	Permanent	High	Definite	High	High -ve	High -ve
Proposed cable trench	National	Temporary to long term	Medium	Definite	Low to Medium	Low to Medium -ve	Low -ve
No Go	Local	Unknown and variable	Neutral to low negative	Not likely	Low	Neutral	Neutral

Table A: Summary table for construction phase ecological impacts associated with the proposed development layout. The primary construction phase impacts would be permanent loss of 6.8ha of High and 2.1ha of Medium sensitivity natural vegetation (gazetted as an Endangered vegetation type) and loss of associated faunal species and habitat in the development footprint.

9.2 Operational Phase Ecological Impacts

Operational phase impacts will take effect as soon as any of the natural vegetation and faunal habitat on the site is lost or disturbed, and will persist in perpetuity, or as long as those areas are not rehabilitated. Operational phase impacts include loss of current levels ecological connectivity across the site, associated habitat fragmentation and loss of areas mapped as CBA1b in the City's BioNet. This will affect both fauna and flora. Loss of areas mapped as CBA1b is highly undesirable from a conservation perspective, as it piles a lot of extra pressure on all remaining natural areas to "absorb the burden of adequate habitat provision to ensure ecological viability". Very little can mitigate loss of CBAs in a system that is already Endangered.

The site is a key (essentially the only) ecological linkage along the False Bay coast, between the Macassar NR to the west, and the Paardevlei dunes to the east, which the current Paardevlei development has been careful to conserve (pers. obs.; Helme 2019). Development of the study area will significantly reduce the width of this ecological corridor, and will clearly have a negative impact on the ecological functioning of this corridor.

Overall the operational phase ecological impacts of the proposed development here are likely to be **High negative** before mitigation. This could only be reduced to **Medium negative** by a significant layout reduction.

The **No Go alternative** would clearly have a much lower indirect (operational phase) ecological impact than the proposed development, and would thus be **strongly preferred**.

The cable trench will be filled in shortly after construction, so there will not be a major operational phase impact, other than minor habitat fragmentation results, and possible alien plant invasion in the disturbed areas.

Development Alternative	Extent of impact	Duration of impact	Intensity	Probability of impact	Irreplaceable loss of biodiversity	Significance before mitigation	Significance after mitigation
Proposed layout	Mainly local	Permanent	Med to High	Definite	Med	High -ve	High -ve
Proposed cable trench	Local	Temporary to long term	Low	Fairly likely	Low	Low -ve	Low -ve
No Go	Local	Unknown and variable	Neutral to low negative	Likely	Low	Neutral to Low negative	Neutral to Low negative

Table B: Summary table for operational phase ecological impacts associated with the proposed layout. The operational phase impacts would be loss of current ecological connectivity across the site and associated habitat fragmentation, as well as edge effects like alien plant invasion and disruption of ant-based seed dispersal in the surrounding natural areas.

9.3 The No Go Alternative

The No Go alternative (continuation of the *status quo)* on this site would have clearly lower construction and operational phase ecological impact (Neutral) than the possible development, and would thus be the **strongly preferred alternative** from an ecological perspective.

9.4 Cumulative Impacts

The cumulative ecological impacts are in many ways equivalent to the regional ecological impacts, in that the already Endangered vegetation type to be impacted by the proposed development has been, and will continue to be, impacted by numerous developments and other factors (the cumulative impacts) within the region. The primary cumulative impacts in the region are loss of natural vegetation and faunal habitat and threatened plant species to ongoing

agriculture, urban development and alien plant invasion (Mucina & Rutherford 2012; Helme *et al* 2016).

The overall cumulative ecological impact of development of this site at the local scale is High, but at the regional scale is likely to be Medium negative. Most of this is driven by the CBA1b status of the natural vegetation, and its critical position of the site as the last viable ecological link along the False Bay coastline, linking the Macassar NR to the Paardevlei dunes.

9.5 Positive Impacts

No significant positive ecological impacts of the proposed development are likely during either the construction or the operational phase.

10. REQUIRED MITIGATION

Layout change would be the strongly recommended primary mitigation, but is not proposed here as it is assumed that this facility expansion is critical for urban planning in the region, and that no alternative sites of lower sensitivity are available. Should this assumption be shown to be wrong then key primary mitigation would centre around avoiding all High sensitivity areas (as per Figure 4) in the final development layout.

The following mitigation for the only proposed development layout (as per Figure 2) and for the cable trench is deemed feasible, reasonable and mandatory:

- Any boundary fencing used must be permeable to small animals at ground level, with regular gaps of 200mm wide and 150mm high.
- The authorised overall development boundary should be surveyed and pegged out and fenced on site prior to any site development.
- No areas of natural or partly natural vegetation should be disturbed outside the pegged/fenced out and authorised site. No vehicular activity or dumping of material may take place outside the authorised site.
- Search and rescue of Cape Dwarf Chameleons (*Bradypodion pumilum*) and all other translocatable fauna should take place on site prior to any site disturbance, as well as during site establishment (site clearing). This should be undertaken by authorised and experienced faunal experts.
- Search and Rescue of all usable plant material should be undertaken on site prior to any site disturbance, as well as during site establishment (site clearing). Neither of the two plant SoCC recorded can be easily

translocated, although this should be attempted. This should be undertaken by authorised and experienced horticultural experts, and in this regard the Stellenbosch Botanical Garden is recommended.

- Stabilisation of any cut sand dunes and slopes outside the approved development site should be undertaken using only the rescued plant material from site, and should be undertaken by the appointed plant Search and Rescue contractor.
- Any trenches or excavations created during construction should be examined for trapped animals twice a day, and these should be removed and released in suitable natural habitat.
- The relevant permits will have to be sourced for removal of Protected Species such as milkwoods (*Sideroxylon inerme*).
- The High sensitivity section of the cable trench (see Figure 4b) must be hand excavated, whereas all other areas can be machine excavated. This is to minimise the disturbance footprint at the construction stage.
- The cable trench must be infilled as soon as possible after the cables are laid. In the High sensitivity areas this must be done by hand.
- The applicant must ensure that there is adequate budget for all required mitigation.

11. CONCLUSIONS AND RECOMMENDATIONS

- The remaining natural vegetation on site is Cape Flats Dune Strandveld, which is gazetted as Endangered on a national basis.
- At least two plant Species of Conservation Concern (SoCC), and probably at least one Redlisted animal are present in the proposed main development area. Neither of the two plant SoCC can be easily translocated, although this should be attempted.
- About half the proposed development area supports vegetation and faunal habitat that is mapped as High or Medium sensitivity, and is also mapped as CBA1b in the City's Biodiversity Network. These areas should ideally not be lost to development.
- The loss of the High and Medium sensitivity areas on site would be associated with a High negative ecological impact, and the preferred

alternative from an ecological perspective is thus currently the No Go alternative.

- All mitigation outlined in Section 10 must be implemented if development of this site is authorised.
- Ideally a biodiversity offset would be required, to help minimise the unavoidable High negative ecological impacts of the proposed development, even though High negative impacts are supposed to present a No Go (Red Flag) scenario in terms of offsets (Dept. of Forestry, Fisheries & Environment 2022). Should an offset be required by the authorities then extensive negotiation would be required with all relevant parties, as finding a suitable offset (conserving the same habitat, but of a much larger extent) within the City of Cape Town would not be easy. Essentially no feasible offset areas are known to this specialist, except perhaps in the northern fringes of the City, north of Blouberg (near Atlantis).

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