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Pri.Sci.Nat # 400045/08

ADDENDUM REPORT: ECOLOGICAL ASSESSMENT OF PROPOSED NEW ACCESS ROAD TO MULDERSVLEI RESERVOIR, AND ASSOCIATED PIPELINE RELOCATION, CITY OF CAPE TOWN.

Compiled for: Zutari

Client: City of Cape Town - Bulk Water

25 January 2023

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

The author believes that the information presented in this report complies with the PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON TERRESTRIAL PLANT SPECIES (Government Gazette No. 43855 of 30 October 2020).

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ABRIDGED CV:
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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 1800 site assessments in this period.

Peninsula and Cape Flats botanical surveys include: Portion of Driefontein 39, Atlantis (P Roux Planning 2022); proposed infrastructure on Rem of Ptn 2 of Farm 921 Malmesbury (ABO Wind Renewables 2022); Erf 254 Atlantis (The

Environmental Practise 2021); Erf 255 Atlantis (The Environmental Practise 2021); CoCT Desalination Project for Witzands and Paarden Eiland (CSIR 2020); Vergenoegd IA (Khula 2019); Haazendal IA (Kapp Environmental 2019); Hout Bay erf 666 IA (Cameron Consulting 2019); Imhoff Farm, Kommetjie IA (Khula Environmental 2019); Langverwacht, Kuilsririver update (JNES 2019); Princessvlei IA (TEP 2019); Koeberg Servitude maintenance inputs (Koeberg 2017), Koeberg NPS water tanks (Doug Jeffery Enviro 2016); De Grendel SDF inputs (Footprint 2015); Eersterivier erven baseline (dbas 2015); Eskom Ankerlig – Sterrekus powerline walkdown (Eskom 2015); Welbeloond survey (Headland 2015); Wolwerivier baseline (TEP 2014); De Mitchells Plain & Brentwood Park scans (TEP 2014); CoCT BioSolids Beneficiation IA, Vissershok (RMS; 2013); De Grendel 24G study (De Grendel; 2013); Koeberg Visitors Centre constraints study (Stauch Vorster; 2013); Protea Ridge IA, Kommetjie (Doug Jeffery; 2013); Delft Sand Mine (EnviorSci Africa; 2012); Atlantic Beach study (Kantey & Templer; 2012); Ocean View Erf 5144 updated baseline (GNEC; 2011); Ocean View infill housing BA (I. Terblanche & Associates; 2010), Oakhurst farm, Hout Bay (SEC 2010); Protea Ridge Corridor study (Doug Jeffery; 2009); Oudekraal botanical constraints study (Doug Jeffery 2009); Mitchells Plain hospital site (Doug Jeffery; 2006, 2008); Eerste River Erf 5540 (CCA 2008); Eerste River Erf 5541 (EnviroDinamik 2008); Kommetjie Riverside IA (Doug Jeffery 2008); Strandfontein Road widening (CoCT 2008); Pelikan Park IA (CoCT 2008); Blue Downs Erf 1897 (Environmental Partnership 2008); Driftsands NR Sensitivity Study (CapeNature 2006); Assessment of Driftsands South (Environmental Partnership 2006); Woodgreen housing Mitchell's Plain (CCA; 2006); Assessment of new Eskom Briers Substation and new 66kV overhead powerline (Eskom 2006); Muizenberg erf 108161 (CndeV; 2005); Muizenberg erf 159848 (Headland; 2005); Muizenberg erf 159850 (Headland; 2005); Rocklands, Simonstown (CCA; 2005); Erf 35069 and Ptn. Erf 3418, Kuils River (SEC; 2005); Erf 550 & 552, Phillippi (Amathemba Environmental; 2005).

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.

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1. INTRODUCTION

This specialist ecological Addendum report was requested to inform the environmental authorisation process being followed for the proposed access road to the new Muldersvlei bulk water reservoir, as well as a pipeline relocation, in the Joostenberg area of Cape Town, in the Western Cape. Three access road options were assessed in the botanical report of Helme (2010), including Option A, which was very similar to the new alternative here assessed. Helme (2010) identified an area of elevated botanical sensitivity within the current road study area, just south of the point where it joins the proposed pipeline relocation (see Figure 1).

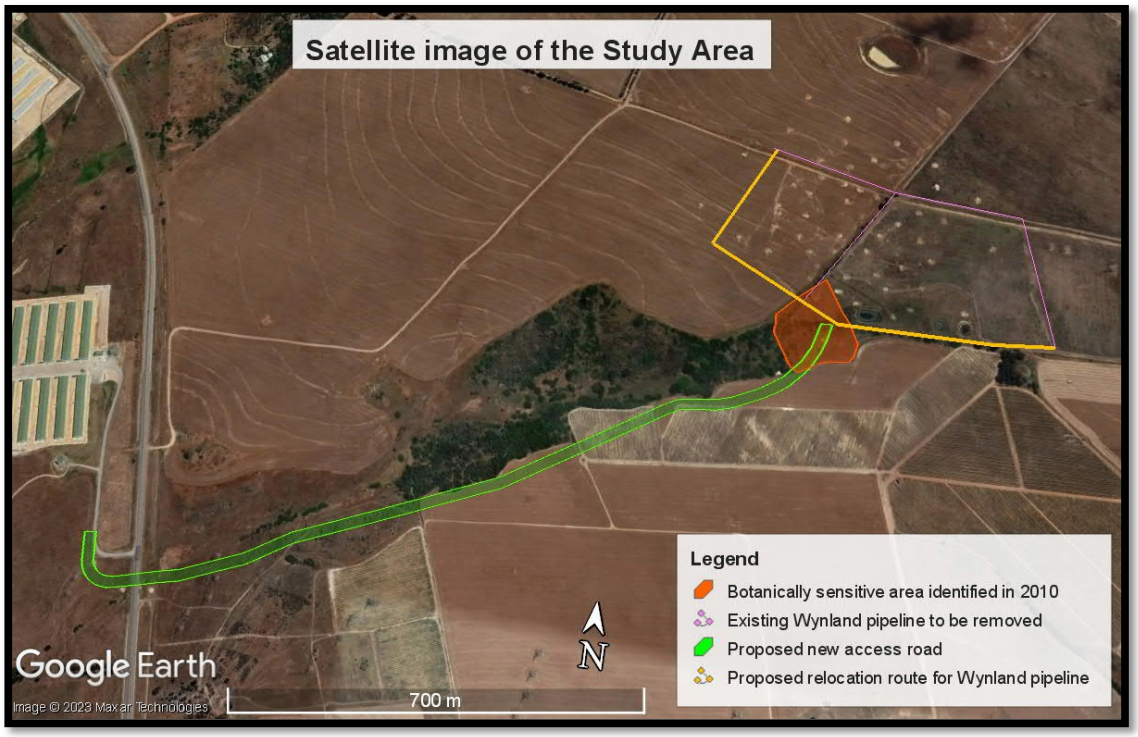

Figure 1: Satellite image showing the study area, and previously identified botanically sensitive area (from Helme 2010).

2. TERMS OF REFERENCE

The terms of reference for this study were as follows:

- Undertake a site visit to assess the vegetation and fauna in the study area (the new road routing and the pipeline relocation area; see Figure 1)
- Identify and describe the vegetation and fauna in the study area and place it in a regional context, including its status in terms of the CoCT Biodiversity Network (CBA/ESA/ONA, etc), and making reference to the recent conservation area application (Damarakloof)

- Identify and locate any (likely) plant and animal Species of Conservation Concern in the study area, based on observation, literature and iNaturalist website review
- Provide an overview of the botanical and faunal conservation significance (sensitivity) of the new road routing and pipeline relocation area
- Identify and assess (according to standard IA methodology) the potential impacts of the project including impacts associated with the construction and operational phases, and compare this to the approved road routing
- Indicate the acceptability of the project proposal from a botanical and faunal 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 17 January 2023. This is outside the optimal winter – spring flowering season in this winter rainfall area, and consequently there were significant seasonal constraints on the potential accuracy of the botanical finding. However, a habitat based approach was thus used to assess the botanical sensitivity, using plant community structure and composition as key determinants, with a further focus on perennial plant Species of Conservation Concern, supplemented by at least sixty spring observations of the flora of the area posted on the biodiversity website inaturalist.org. 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. Confidence in the accuracy of the findings is deemed to be high.

The entire study area was walked, with most time spent in the most sensitive areas. All indigenous plants observed were noted in a notebook, and incidental observations were made in terms of the fauna present. No faunal trapping was undertaken. Site photographs were taken with a Fuji mirrorless SLR camera, and a 30mm macro lens. Satellite imagery dated November 2022 (and earlier time series) was used to inform this assessment, and for mapping. References are as noted in the body of the report. The iNaturalist website was scanned for any observations on site, of which there are about 120, mostly from winter and spring 2021 and 2022, and my additional images have also been uploaded to this site.

This study was undertaken in accordance with the Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species and terrestrial biodiversity (Government Gazette 43855 & 43110) as and where possible, but it should be noted that the original assessment reports were done under ECA regulations. The associated Screening Tool has animal species as high sensitivity and plant species as medium sensitivity for most of the study area. It is assumed that all the vegetation and habitat within the proposed road corridor will be lost during the construction phase. The width of the likely disturbance corridor for the pipe installations and relocation was not provided, but is assumed to be about 5-6m, as not only will a trench be required, but digger access and temporary soil stockpiling will be required alongside.

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.

4. REGIONAL CONTEXT OF THE VEGETATION

The study area is part of the West Coast Renosterveld 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 West Coast Renosterveld bioregion is characterised by moderate to relatively high winter rainfall, rich clay soils, rather low topographic diversity, and very high levels of cultivation. Due to this combination of factors the loss of natural vegetation in this bioregion has been extremely severe (>90% of original extent lost within the region), and the bioregion has an exceptionally high number of threatened plant species (Raimondo *et al* 2009). The lowland regions of the Cape metropole (stretching from Atlantis in the north, southeast to near Somerset West), generally known as the Cape Flats, are under enormous pressure, and the area has been described as a "conservation mega-disaster" (Rebelo *et al* 2011), in terms of the number of severely threatened plants (some already extinct) and habitats within the area. The study area lies on the eastern fringes of what is normally considered the "Cape Flats".

Surprisingly, the City of Cape Town's Biodiversity Network (Holmes *et al* 2016, 2018 update) indicates that no habitat remnants are present within the study area, with no CBAS (Critical Biodiversity Areas), Red Flags or areas of concern. No copy of this map is shown as it adds little value.

5. THE VEGETATION IN THE STUDY AREA

According to the SA Vegetation Map the original natural vegetation in the study area is a mix of Swartland Granite Renosterveld and Swartland Shale Renosterveld (Mucina & Rutherford 2016; see Figure 2) and this author agrees with that.

Swartland Shale Renosterveld is gazetted as a Critically Endangered habitat on a national basis (DEA 2011) and the latest study, as yet ungazetted, has supported this (Skowno *et al* 2019). Less than 9% of its total original extent remains intact, less than 1% is conserved, and the national conservation target is 26% (Mucina & Rutherford 2006). Primary threats to the habitat include cultivation, urban expansion and alien invasive vegetation. The unit is known to support a very large number of plant Species of Conservation Concern (Raimondo *et al* 2009). This unit occurs on loamy clay soils, and the topography is often relatively flat. This vegetation type needs fire for optimal ecological functioning (Helme *et al* 2016).

Swartland Granite Renosterveld is gazetted as a Critically Endangered habitat on a national basis (DEA 2011) and the latest study, as yet ungazetted, has downlisted this to Endangered (Skowno *et al* 2019). Less than 20% of its

total original extent remains intact, less than 1% is conserved, and the national conservation target is 26% (Mucina & Rutherford 2006). Primary threats to the habitat include cultivation, urban expansion and alien invasive vegetation. The unit is also known to support a very large number of plant Species of Conservation Concern (Raimondo *et al* 2009), and occurs on loamy clay soils, and the topography is often slightly hillier than Shale Renosterveld. This vegetation type also needs fire for optimal ecological functioning (Helme *et al* 2016).

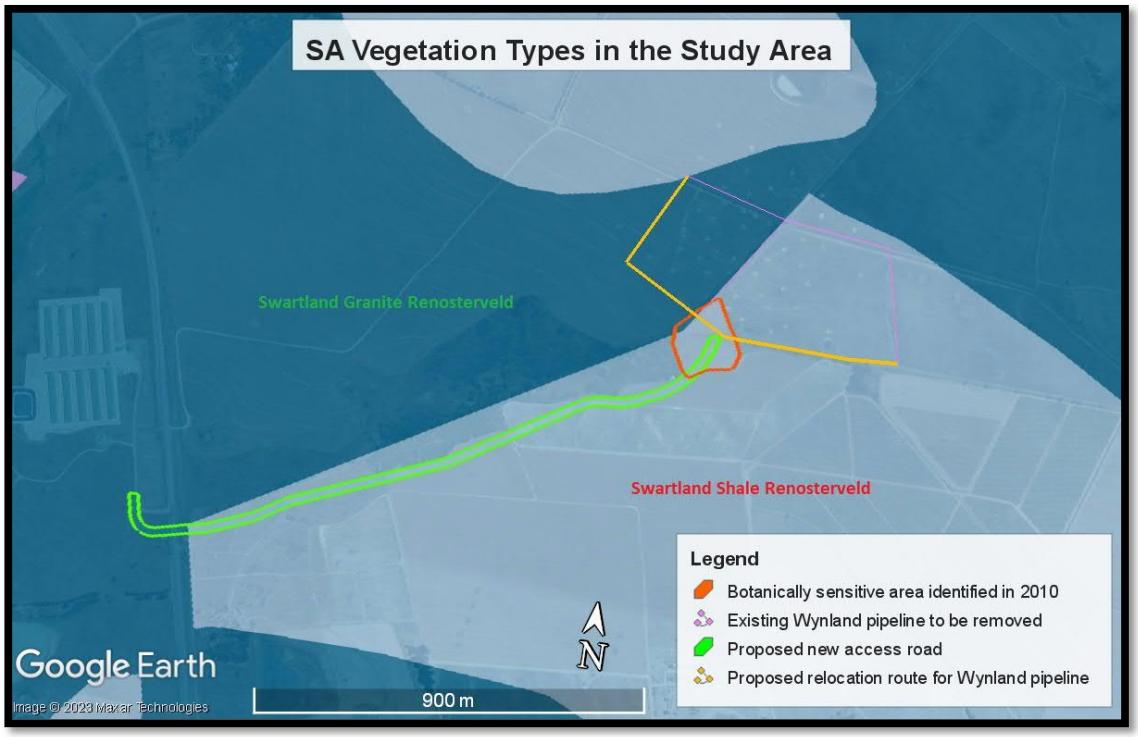

Figure 2: Extract of the SA Vegetation Map of the study area.

Plate 1: View of the botanically sensitivity area indicated in Figure 1, looking southwest from northern end of proposed new road route. The proposed road would pass through the large alien black wattle (*Acacia mearnsii*) at right. And would essentially remove all vegetation to the right of the orange line, including a most of the High sensitivity area shown in blue (habitat of the Endangered shrub *Athanasia capitata*). The proposed relocation of the pipeline would pass through and disturb the area between the dam wall (at left) and the orange line.

Plate 2: View looking southwest from the northern end of the proposed new road route. The road route would go through the large alien invasive *Acacia mearnsii* at left (same tree as shown in Plate 1) and then more or less follow the left hand (southern) edge of the drainage line.

Plate 3: *Athanasia capitata* is an Endangered shrubby daisy species restricted to seasonally wet loamy soils in the southern Swartland, and a significant population of about 40 plants lies within the proposed road route where it crosses the drainage line.

Plate 4: Wild olive shrubs in previously disturbed areas in the southern part of the road corridor looking south towards the R304. This area is of Medium ecological sensitivity.

There is currently natural vegetation in only about 20% of the study area, with most areas either currently cultivated or being fallow lands that were previously cultivated at some time. In some areas these fallow areas have been undergoing natural rehabilitation over many decades, but it is still clear that they were previously cultivated, as plant diversity here is <15% of what it is in the adjacent uncultivated areas.

The Very High sensitivity area (see Figure 3) supports the highest plant diversity in the study area, Medium sensitivity areas support about 30-50% of the diversity in the Very High sensitivity areas, and the Low sensitivity areas are essentially cultivated or otherwise heavily degraded.

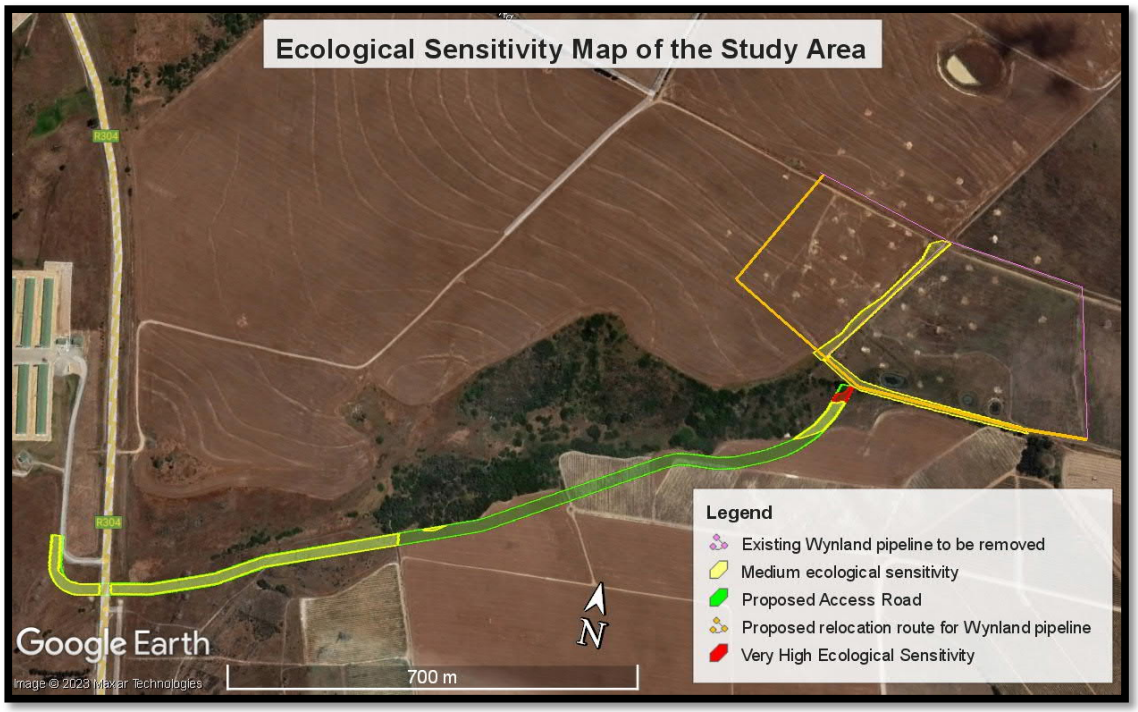

Figure 3: Ecological Sensitivity map of the study area. Areas within the study area that are not indicated as Medium or Very High sensitivity are of Low sensitivity. Note that extensive Very High sensitivity areas close to but outside the actual survey area have not been mapped.

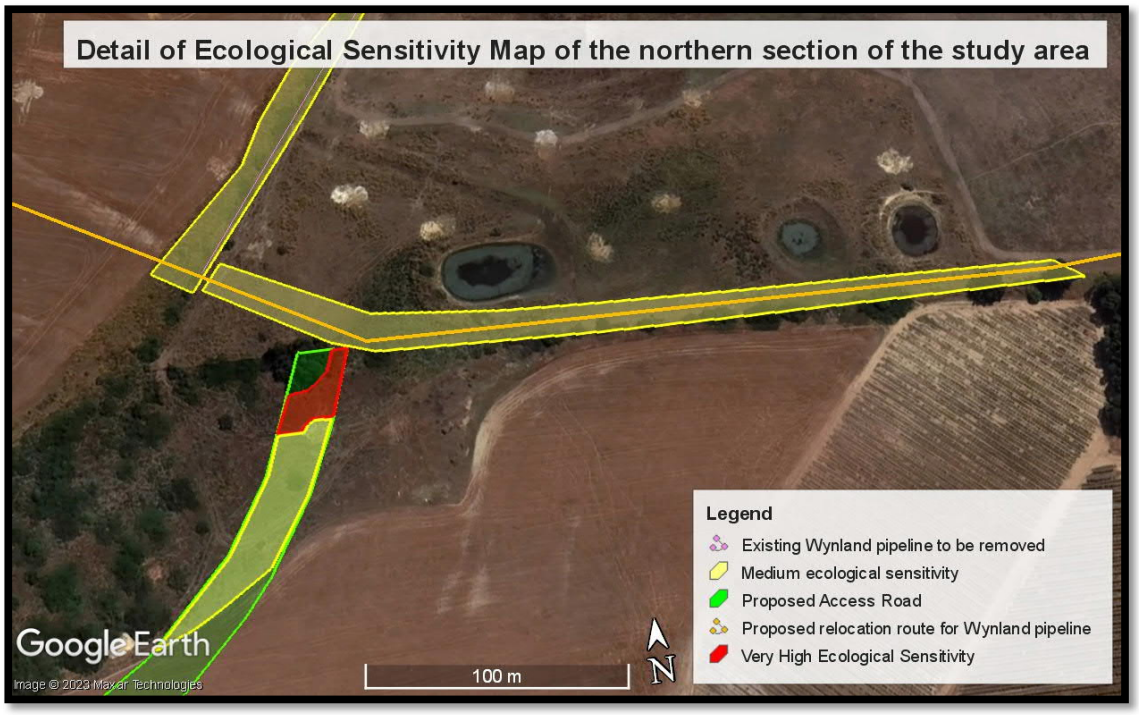

Figure 4: Zoomed in detail of the ecological sensitivity map of the northern part of the study area. Areas within the study area that are not indicated as Medium or Very High sensitivity are deemed to be Low sensitivity.

5.1 Low Sensitivity Areas

Low sensitivity areas are essentially cultivated (vines or cereals) or otherwise heavily degraded. A wide range of alien invasive species is present in these areas, including kikuyu grass (*Pennisetum clandestinum*), *Trifolium angustifolium, Plantago lanceolata* (ribwort plantain), *Xanthium spinosum* (cocklebur), *Helminthotheca echioides, Echium plantagineum* (Patterson's curse), *Lolium* sp. (ryegrass), *Avena* sp. (oats) and *Bromus pectinatus* (ripgut brome).

Current indigenous plant cover is generally low in these areas and varies widely from place to place (<10% to about 60% cover), made up of the following species: *Cynodon dactylon* (kweekgras; dominant), *Athanasia trifurcata* (klaaslouwsbos), *Arctotheca calendula* (Cape weed), *Ornithogalum thyrsoides* (chinkerinchee), *Senecio pterophorus* and *Senecio burchellii*.

No plant of Species of Conservation Concern (SoCC) were recorded within the Low sensitivity areas on site, and none are likely, given the history of soil disturbance.

5.2 Medium Sensitivity Areas

The boundary between the Medium and Low sensitivity areas is not always well defined, and may extend over 10m or so. These are generally fallow areas that have been previously disturbed, but that have rehabilitated naturally over time. Indigenous plant cover ranges from about 30% to about 70%, although in two narrow areas within the road corridor it is 100%, where it includes small slivers of thicket, dominated by *Searsia laevigata* and *Olea europaea ssp cuspidata*. Indigenous species include *Cynodon dactylon*, *Nidorella ivifolia, Tenaxia stricta*, *Athanasia trifurcata*, *Arctotheca calendula, Ornithogalum thyrsoides*, *Senecio pterophorus, Senecio burchellii, Restio tetragonus, Eleocharis limosa, Pentameris pallida, Aspalathus hispida, Anthospermum spathulatum, Eriocephalus africanus, Helichrysum patulum, H. cymosum and Leysera gnaphalodes*.

No plant of Species of Conservation Concern (SoCC) were recorded within the Medium sensitivity areas on site, and none are likely, given the history of soil disturbance.

5.3 Very High sensitivity areas

An area of about 300m^2 in the northern tip of the proposed access road corridor is deemed to be of Very High botanical sensitivity, and is the only part of the study area of Very High sensitivity (see Figure 3). Note that extensive Very High sensitivity areas close to but outside the actual survey area have not been mapped. This is an undisturbed, seasonally wet area that supports the only population (estimated 30-50 plants) of the Endangered daisy *Athanasia capitata* (see Plate 3) within the study area. The species is present in various other patches within this same drainage line, and the total population within about 150m of the study area is likely to be about 150-200 plants (pers. obs.). This species, being a deep rooted shrub, is not likely to survive translocation attempts. There may be as many as 8 other plant SoCC in this area, but these are probably seasonally evident bulbs, that would not have been evident or identifiable during the January survey. Seasonally evident plant SoCC that have been recorded nearby in the same drainage line (see inaturalist.org) and that could be present within the Very High sensitivity area include *Gladiolus watsonioides* (Near Threatened), *Babiana odorata* (Endangered), *B. angustifolia* (Near Threatened), *Geissorhiza purpureolutea* (Near Threatened), *Eriospermum capense ssp. stoloniferum* (Vulnerable), *Oxalis strigosa* (Endangered), *Wachendorfia brachyandra* (Vulnerable), *Codonorhiza azurea* (Endangered) and *Pelargonium ternifolium* (Near Threatened).

6. FAUNA

The fauna within the study area is expected to be broadly representative of these habitats in the southern Swartland.

The Klipheuwel Dainty Frog (*Cacostermum aggestum*) is known from about 8km north of this site, and this rare and rather localised species (Malmesbury to Somerset West) may occur in this drainage line. The Cape Sand Frog *Vandijkophrynus angusticeps*) may occur within the drainage line, but no other frogs are likely. Mammals or signs thereof observed include Porcupine (*Hystrix africeaeustralis*), Cape Hare (*Lepus capensis*), Steenbok (*Raphicerus campestris*) and Large Grey Mongoose (*Herpestes ichneumon*). Reptiles noted include Parrotbeaked Padloper (*Homopus areolatus*) and Mole Snake (*Pseudaspis cana*). Birds observed include Speckled Mousebird (*Colius striatus*), Helmeted Guineafowl (*Numida meleagris),* Jackal Buzzard (*Buteo rufofuscus*), Karoo Prinia (*Prinia maculosa*), Yellow Bishop (*Euplectes capensis*) and Red Bishop (*Euplectes orix*).

No Faunal SoCC are expected to be resident in or dependant on habitat within the study area, but a few may pass through fairly regularly. Blue Crane (*Anthropoides paradiseus*; Vulnerable) is fairly regularly observed in the area, and may even overnight in some of the farm dams nearby when there is water. Great White Pelican (*Pelecanus onocratalus*; Near Threatened) frequent the nearby chicken farms for scraps, but are unlikely in the study area. African Marsh Harrier (*Circus ranivorus*; Endangered) could occasionally frequent the drainage line vegetation.

7. ASSESSMENT OF IMPACT

The primary construction phase impact would be disturbance and permanent loss of all remaining natural and partly vegetation in the development footprint, estimated to be about 3.1ha.

About 2.13ha of Medium sensitivity habitat will be lost or heavily disturbed at the construction phase, of which 1.26ha will be permanent loss, within the road corridor. Some 0.03ha of Very High sensitivity habitat will be permanently lost, with no temporary impact. The remainder of the disturbance or loss of habitat (about 1.0ha) will be in Low sensitivity areas.

The vegetation type that will be most impacted is Swartland Shale Renosterveld, which is currently gazetted as Critically Endangered (DEA 2011) and this is supported by the latest study, as yet ungazetted (Skowno *et al* (2019).

A viable population of at least one plant Species of Conservation Concern (SoCC; *Athanasia capitata*; Endangered)) is present within the Very High sensitivity area that will be lost, and there may be as many as 8 other only seasonally evident SoCC, most likely in the Very High sensitivity area. *Athanasia capitata* is a perennial shrub that is not likely to survive translocation.

No Faunal SoCC are expected to be resident in or dependant on habitat within the study area, but a few may pass through fairly regularly. Blue Crane (*Anthropoides paradiseus*; Vulnerable) is the most likely, and is fairly regularly observed in the area, and may even overnight in some of the farm dams nearby when there is water.

Development within the proposed areas would not result in loss of any mapped CBAs or ESAs in terms of the CoCT BioNet, but some of the Medium sensitivity areas in the south are part of the recently declared Damarakloof Conservation Area, a partnership between the City and the landowner.

The extent of the ecological impact is deemed to be local and site specific, but as the vegetation type is restricted to the southern Swartland and Critically Endangered on a national basis any loss of this habitat also has a much wider impact, and further threatens this vegetation type.

The botanical significance of the loss of vegetation and habitat would be notably higher than the faunal impact (see Tables 1 & 2), and especially so in the small area (0.0.3ha) of Very High sensitivity vegetation that will be impacted by the road, which is the key driver of the assessed ecological impacts. This High negative impact for this area can only be reduced to an acceptable Medium negative by rerouting the road at this point, to avoid the Very High sensitivity habitat.

Positive impacts could come about at the operational phase, through implementation of the required mitigation, which includes ongoing ecological management of the 4.5ha of currently natural vegetation expropriated by the City in this area (north of proposed road), as well as about 1ha of currently cultivated

or fallow land that will be rehabilitated (also north of proposed road). These positive ecological impacts would go some way to balancing out the negative ecological impacts of the construction phase, so that the overall, mitigated impact of the proposed development is reduced to an acceptable Low negative level.

Development Component	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Degree of confidence	Significance before mitigation	Significance after mitigation *
New road access	Local, site	Permanent	High	Definite	High	High -ve	Medium -ve
Removal of existing pipelines	Local, site	Permanent	High	Definite	High	Low -ve	Low -ve
New pipeline	Local, site	Permanent	High	Definite	High	Medium -ve	Medium -ve

Table 1: Summary table for construction phase impact associated with the loss of vegetation in the three main project areas. *Construction phase mitigation is mainly Search and Rescue within the Medium and Very High sensitivity areas.

Development Component	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Degree of confidence	Significance before mitigation	Significance after mitigation*
New road access	Local, site	Permanent	High	Definite	High	Low to Medium -ve	Low -ve
Removal of existing pipelines	Local, site	Permanent	High	Definite	High	Low -ve	Low -ve
New pipeline	Local, site	Permanent	High	Definite	High	Low to Medium -ve	Low -ve

Table 2: Summary table for construction phase impact associated with the loss of faunal habitat and species in the three main project areas. *Construction phase mitigation is mainly ensuring that no animals are trapped in pipeline trenches nor are in construction areas prior to any heavy machinery use.

Operational phase botanical impacts are likely to be no more than Low negative before mitigation, and are primarily fairly minor additional invasive alien plant invasion caused by the associated soil disturbance.

The road will have a minor negative impact on the current levels of ecological linkage through to the surrounding areas, but as the road will still be ecologically permeable (faunal and botanical), and operational phase traffic (impact on fauna, via possible roadkill) should be fairly minimal these impacts are likely to be of Low negative significance at a regional scale.

Development Component	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Degree of confidence	Significance before mitigation	Significance after mitigation
New road access	Local, site	Permanent	Low	Likely	High	Low -ve	Low -ve
Removal of existing pipelines	Local, site	Temporary	Low	Low	Medium	Very Low -ve	Very Low -ve
New pipeline	Local, site	Long term	Low	Likely	High	Low -ve	Low -ve

Table 3: Summary table for operational phase impact associated with the loss of vegetation in the three main project areas. *Operational phase mitigation is mainly ongoing ecological management of the 4.5ha offset conservation area (see Figure 5), and rehabilitation of the 1ha of currently cultivated or fallow area north of the road that has been expropriated.

Development Component	Extent of impact	Duration of impact	Intensity	Probability of occurrence	Degree of confidence	Significance before mitigation	Significance after mitigation*
New road access	Local, site	Permanent	Low to Medium	Likely	High	Low -ve	Low -ve
Removal of existing pipelines	Local, site	Temporary	Very Low	Low	Medium	Very Low -ve	Very Low -ve

New pipeline	Local, site	Long term	Low	Likely	High	Low -ve	Low -ve

Table 4: Summary table for operational phase impact associated with the loss of faunal habitat and species in the three main project areas. *Operational phase mitigation is mainly ongoing ecological management of the 4.5ha offset conservation area (see Figure 5), and rehabilitation of the 1ha of currently cultivated or fallow area north of the road that has been expropriated.

8. MITIGATION REQUIREMENTS AND CONCLUSIONS

- All assessed impacts are within acceptable levels, apart from the High negative impact associated with loss of about 0.03ha of Very High sensitivity habitat in the northern section of the proposed road route. This impact is driven by the definite loss of a viable population (at least 20 plants out of a subpopulation of about 40) of an Endangered plant species - *Athanasia capitata*. It is possible that this small area also supports a number of other only seasonally evident plant SoCC, as 8 such species have been recorded nearby.
- The mitigation hierarchy would suggest that as a first step an attempt is made to avoid the key impact, but unfortunately in this case this is not easily possible due to prior landowner negotiations and preferred route alternatives arising from the work in 2010.
- Relocation of the Endangered plant species recorded in the Very High sensitivity is not the first choice, as the adult plants are very unlikely to survive, but an attempt should be made to take seed (in April/May) and cuttings (April/May), and an effort must be to translocate all the live plants (April/May) of *Athanasia capitata* from within the approved development footprint to nearby similar but secure habitat. As the Medium and Very High sensitivity habitat may support various other plant SoCC the CoCT Environmental Management Branch staff should undertake Search and Rescue in the approved development footprints on at least two occasions in the appropriate seasons (July – late September) prior to any earthmoving on site.
- The applicant (CoCT Bulk Water) must provide all necessary funding for all the required mitigation (including ongoing site management), and must transfer management responsibility and al necessary funding for the 5.5ha

conservation area to the CoCT Environmental Management Branch, within three months of any project approval.

- The 1ha of currently cultivated or fallow area north of the road that has been expropriated must be rehabilitated to local indigenous Renosterveld vegetation as soon as possible, and should form part of the main drainage line conservation area.
- During construction an ECO must ensure that no animals are trapped in the construction and pipeline trenches, and remove any that are. These should be checked every morning before work starts. Trenches should be infilled as soon as possible.
- No specific additional mitigation is required, as cumulative botanical and faunal impacts are at an acceptable level (Medium negative) if this mitigation and management can be implemented.

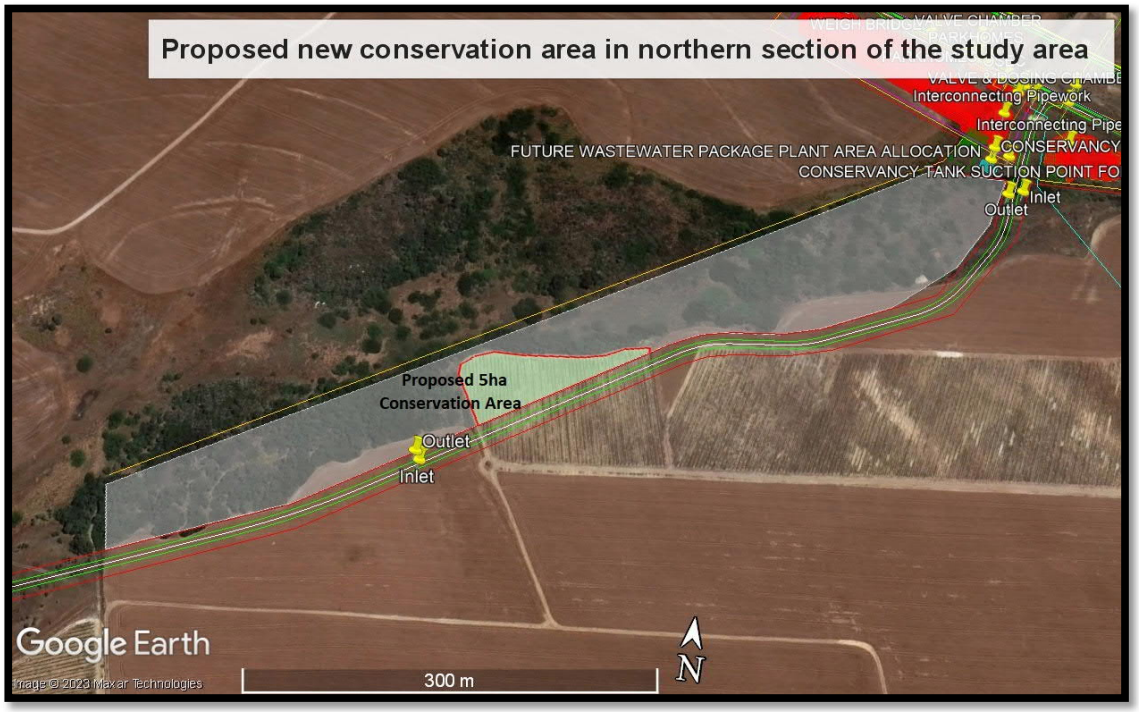

Figure 5: Map showing the proposed 5ha conservation area (grey and green shading) north of the proposed road that should be transferred to the CoCT Environmental Management Department (has already been expropriated by CoCT Bulk Water).

9. REFERENCES

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