

BOTANICAL STATEMENT FOR PROPOSED REFURBISHMENT OF BASIN 6 AND BASIN 9, ATLANTIS

[Works Project No: BW-WP045 Atlantis Aquifer]

INTRODUCTION

The City of Cape Town is planning to refurbish two stormwater basins in Atlantis. The project involves increasing the size of the basins and has potential implications from a botanical perspective since indigenous vegetation would be impacted. The project is included in a S30A Directive (Contract No. 194C/2020/2021: Term Tender for the Provision of Multidisciplinary Professional Services for the Water and Sanitation Department of the City of Cape Town), which effectively removes the requirements for an Environmental Impact Assessment (EIA) or Basic Assessment. A site sensitivity assessment is, however, required in order to (a) describe the extent of vegetation and species loss, and (b) provide mitigation measures that may reduce the severity of impacts imposed by the project. This report focuses on the botanical attributes of the site and is not intended to provide a high level of detail from a project design perspective.

FINDINGS

The study area was visited on 25 January 2023 and surveyed on foot. Sample waypoint positions and tracks were obtained using a Garmin GPS map64. The site was visited outside the peak spring flowering period for geophytes, which presents a limitation. The vegetation condition was thus used to determine the likelihood of geophytes being present.

BOTANICAL ATTRIBUTES

Vegetation type and Ecosystem Threat Status

The Vegetation Map of South Africa, Lesotho and Swaziland (VEGMAP) (SANBI 2018)¹ assigns Basin 9 as Atlantis Sand Fynbos (ASF) and Basin 6 as ASF and Cape Flats Dune Strandveld (CFDS). However, ground-truthing confirmed that both sites fall within the Atlantis Sand Fynbos

¹ South African National Biodiversity Institute. 2018 Vegetation Map of South Africa, Lesotho and Swaziland [vector geospatial dataset] 2018. Available from the Biodiversity GIS website, downloaded on 18 January 2020.

ecosystem. Atlantis Sand Fynbos is listed as ENDANGERED due to limited distribution and biotic disruption from invasive species and overgrazing (Government Gazette, 2022)².

Conservation Plans

The City of Cape Town Biodiversity Network (BioNet) (City of Cape Town, shapefile June 2017 version) assigns both sites as 'Other Natural Area' (Figure 1). This is a low tier category (Table 1) but should be subject to low impact activities where vegetation is in good condition (Table 2).

Table 1. Tiered CBA categories comprising the City of Cape Town Biodiversity Network (Holmes & Pugnalin, 2016).³

Critical Biodiversity Area Category	Critical Biodiversity Area Name
Protected: In Perpetuity	Protected Area that is Proclaimed in Perpetuity
Protected: Not In Perpetuity	Protected Area that is Proclaimed for a Limited Period
Conservation Area	Protected Area that is not Yet Proclaimed
CBA 1a	Irreplaceable Core Flora site
CBA 1b	Irreplaceable Good & Fair Condition site
CBA 1c	Minset* Good & Fair Condition site
CBA 1d	Irreplaceable Consolidation site
CBA1e	Connectivity Site
CBA 2	Restorable Irreplaceable site
CESA	Unselected Natural Area of Conservation Significance
OESA	Irreversibly Modified Site of Conservation Significance
Other Natural Area	Unselected Natural Area: Good/Fair/Restorable condition
Irreversibly Modified	Unselected Irreversibly Modified Site

² Government Gazette No. 47526 (2747), 18 November 2022. The Revised National List of Ecosystems that are Threatened and in need of protection. Department Of Forestry, Fisheries and the Environment.

³ Holmes, P. and Pugnalin, A. 2017. Cape Town's Biodiversity Network. Environmental Resource Management Department (ERMD), City of Cape Town. Shape file (<http://bgis.sanbi.org/Projects/Detail/43>).

Table 2. City of Cape Town Biodiversity Network category descriptions and permissible activities assigned in the category relevant to the study area (Holmes & Pugnalin, 2016).

Critical Biodiversity Area (CBA) Category	CBA Name	Subtype	Description	Significance of Habitat	Objective	Action	Compatible Activities
Other Natural Vegetation	Unselected Natural Vegetation: High/Medium/Restorable	Not selected	Natural vegetation in Endangered, Vulnerable and Least Concern in good or restorable condition.	Local significance. Will result in impaired ability to meet targets, given that higher categories will not always be achievable.	Sustainable management within general rural land-use principles.	Negotiable. Low priority, no urgency. Invasive alien control.	Until Bio Network is secured elsewhere, these areas may become NB if required as biodiversity offset sites. Higher impact activities could be considered on degraded portions. Vegetation in good condition should be subject to low impact activities only.

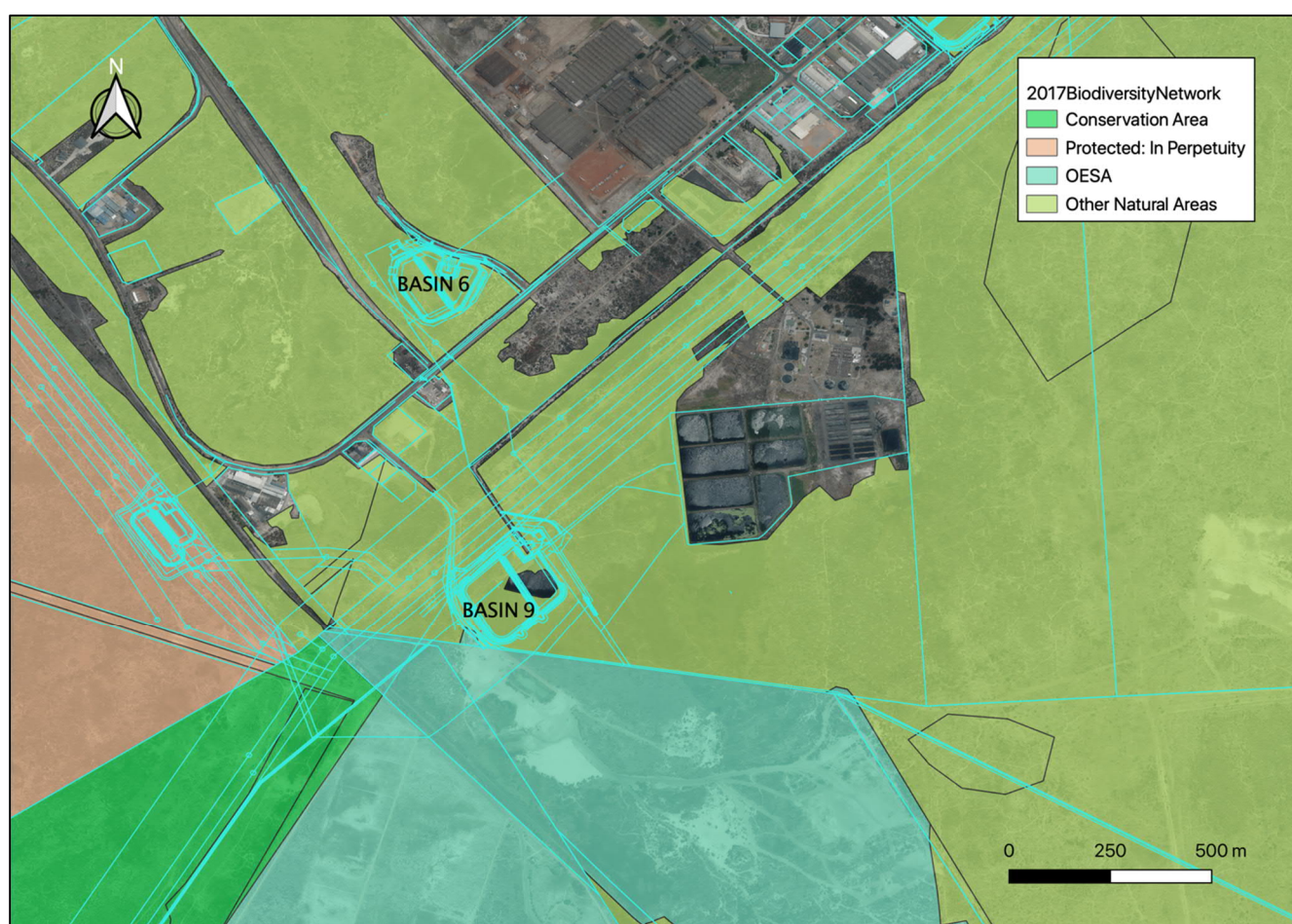


Figure 1. The two sites in relation to The City of Cape Town Biodiversity Network (City of Cape Town 2017) overlaid on a City of Cape Town 2022 aerial image.

Basin 6

The vegetation surrounding Basin 6 is in a highly degraded to transformed condition on the western, southern and eastern sides whereas the northern side supports a linear strip of semi-

intact vegetation (Figure 2A). The semi-intact habitat is of high sensitivity due to (1) the endangered status of the vegetation type, (2) the presence of species of conservation concern (SCC) and (3) ecological connectivity to an adjacent and connected vegetation patch extending northwards (Figure 2B). It extends northwards to an Eskom servitude and beyond (Figure 3). The degraded and transformed habitats have low restoration potential and are of low sensitivity. The artificially wet areas on the southern side of the Basin are dominated by *Typha capensis* and very high density of Port Jackson willow.

Key features:

1. SCC include *Leucospermum parile* (VULNERABLE), *Microdon capitatus* (ENDANGERED) and *Ruschia tecta* (ENDANGERED) located within the semi-intact vegetation.
2. Several (3 to 5) individuals of seegwarrie *Euclea racemosa* within the highly degraded vegetation at waypoint 009 ((33°36'44.13"S; 18°28'24.15"E) (Figure 4).
3. Evidence of geophytes was observed but species can only be accurately identified during the spring period (August to October).

Species (D = dominant; * = exotic):

Semi-intact vegetation: **Acacia saligna*, *Anthospermum aethiopicum*, *Aspalathus divaricata* subsp. *divaricata*, *Cliffortia polygonifolia*, *Conicosia pugioniformis*, *Cissampelos capensis*, *Ehrharta villosa*, *Eriocephalus racemosus*, *Erica mammosa*, *Euclea racemosa*, *Hellmuthia membranacea*, *Limon cf. purpuratum*, *Leucospermum parile* (VULNERABLE), *Mesembryanthemum canaliculatum*, *Microdon capitatus* (ENDANGERED), *Osteospermum moniliferum*, *Phyllica cephalantha*, *Prismatocarpus fruticosus*, *Ruschia tecta* (ENDANGERED), *Salvia africana*, *Searsia laevigata*, *Thamnochortus punctatus*, *Thamnochortus spicigerus* and *Thesium* sp.; Highly degraded and transformed vegetation: **Acacia saligna*, *Carpobrotus edulis*, *Citrullus amarus*, *Ehrharta villosa*, **Pennisetum clandestinum*, **Ricinus communis*

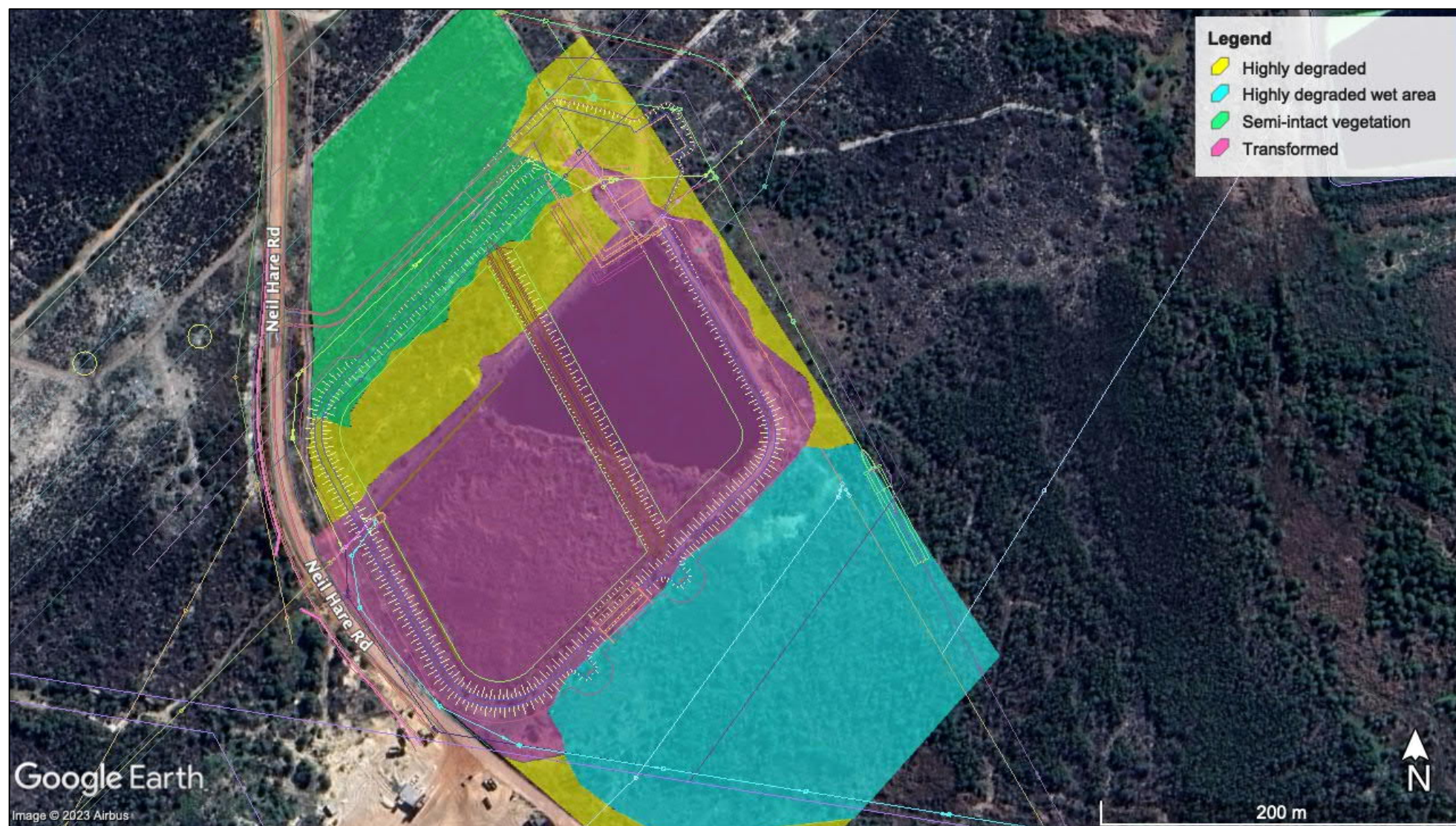


Figure 2A. HABITAT MAP: Basin 6 with footprint and habitat overlay represented on a Google Earth™ aerial image.



Figure 2B. SENSITIVITY MAP: Basin 6 with footprint and sensitivity overlay represented on a Google Earth™ aerial image.



Figure 3. View of the transition from highly degraded to semi-intact remnant vegetation showing invasive Port Jackson willow on the edges. The Eskom servitude is visible in the background. The good quality vegetation continues northwards beyond the servitude.

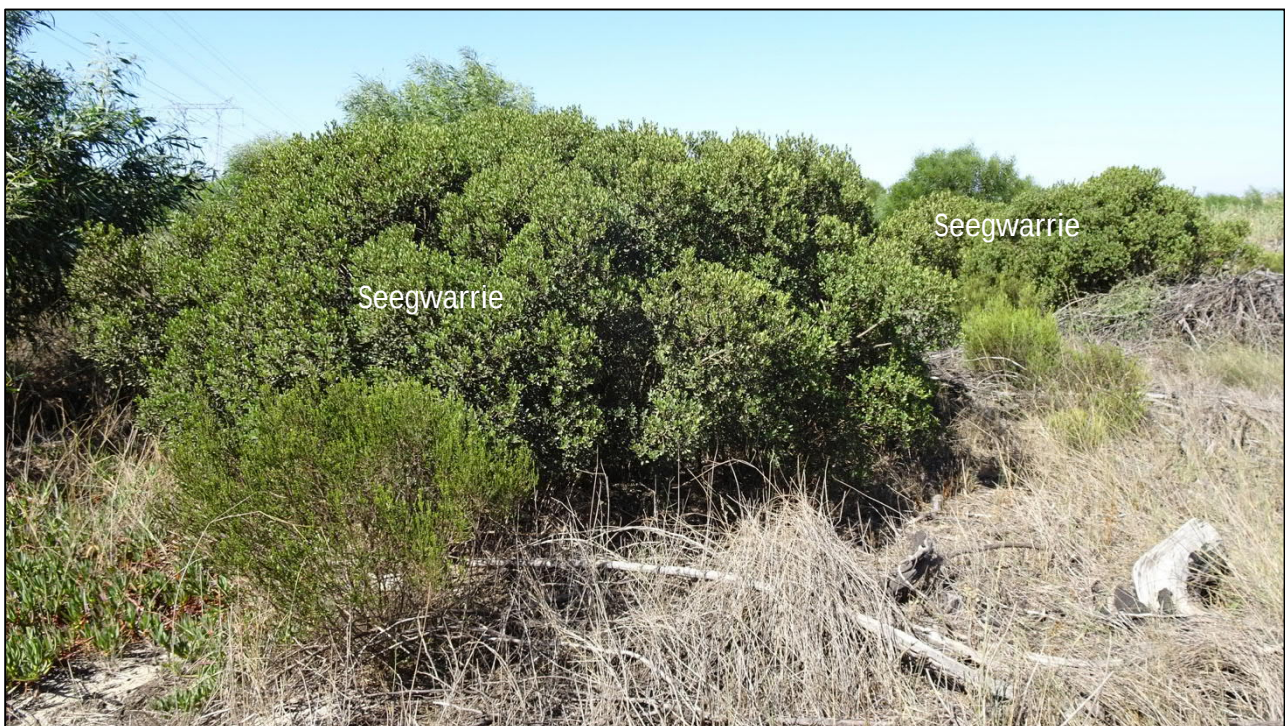


Figure 4. Large seegwarrie *Euclea racemosa* within highly degraded habitat at waypoint 009 (33°36'44.13"S; 18°28'24.15"E).

Basin 9

The vegetation within the footprint of Basin 9 supports transformed and highly degraded vegetation on the western and northern sides, and degraded to semi-intact vegetation on the southern side (Figures 5). The semi-intact vegetation is of high sensitivity due to (1) the endangered status of the vegetation type, (2) the possible presence of species of conservation concern (SCC), and (3) ecological connectivity to an adjacent and connected vegetation patch to the south up to Neil Hare Road (Figure 5B). The eastern side is formed by the road and contains mounds of dumped soil mixed with rubble. The highly degraded areas have low species diversity with low to medium restoration potential. Invasive Port Jackson willow *Acacia saligna* has been previously cleared from the highly degraded areas but has emerged at high densities immediately east of the existing basin following dredging/maintenance activities (Figure 6 and 7).

The southern side of the site was not surveyed since the layout was changed subsequent to the site visit. This area was, however, noted as having remnant vegetation of at least degraded or possibly semi-intact condition. Furthermore, SCC are likely to be present, specifically *Leucospermum parile*.

Key features:

1. The low dune with degraded to semi-intact on the southern side of the site. It is likely that *Leucospermum parile* occurs on the dune.
2. A single plant of *Leucospermum parile* (VULNERABLE), occurs within the highly degraded habitat at waypoint 001 (33°36'20.07"S; 18°28'18.44"E).

Species (D = dominant; * = exotic, ^ = extralimital):

Highly degraded vegetation: *Acacia saligna* (D), *Albucca* sp., **Conyza bonariensis*, **Cynodon dactylon*, *Cysticapsos vesicaria*, **Echium plantagineum*, *Ehrharta villosa* (D), *Metalsia densa*, **Opuntia ficus-indica*, *Passerna corymbosa*, **Pennisetum clandestinum*, *Phyllis cephalantha*, **Raphanus raphanistrum*, *^Senecio pterophorus* (D), *Thamnochortus spicigerus* and *Willdenowia incurvata* (D).

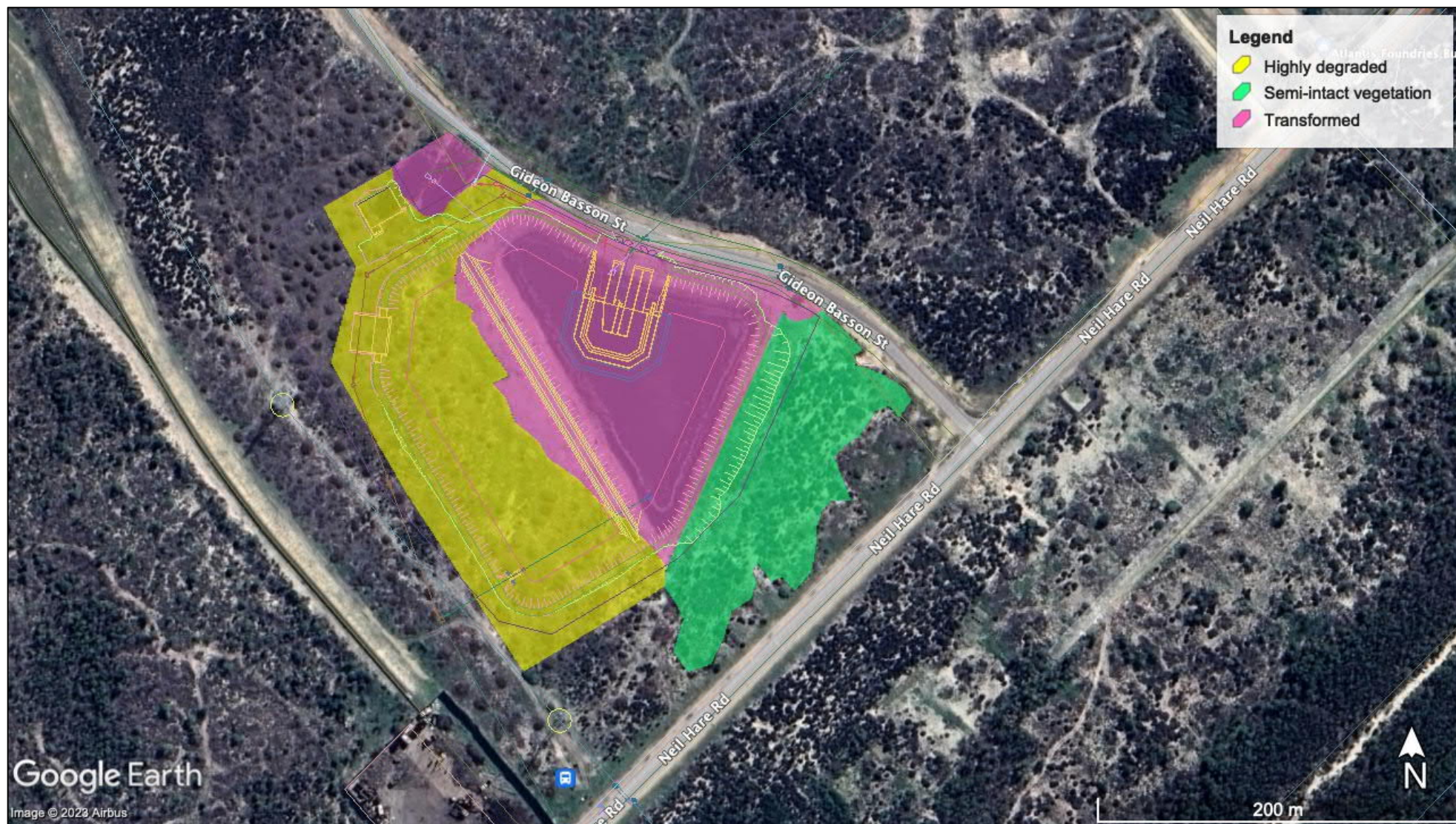


Figure 5A. HABITAT MAP: Basin 9 with footprint and habitat overlay represented on a Google Earth™ aerial image.



Figure 5B. SENSITIVITY MAP: Basin 9 with footprint and sensitivity overlay represented on a Google Earth™ aerial image.



Figure 6. The eastern side of Basin 9 showing highly degraded habitat with previously cleared Port Jackson willow.



Figure 7. Transformed area on the eastern side of Basin 9 where regular pond maintained and dredging take place.

MITIGATION

Specific mitigation

The mitigation options provided below assume two scenarios. The first scenario allows for avoidance whereas the second scenario assumes that avoidance is not feasible.

Scenario 1 (unlikely)

It is emphasized that design changes are unlikely to be accommodated at this point in the project. The options below are unlikely to be feasible but are nonetheless presented should there be any changes in the design (from an engineering perspective) that would make allowance for these options.

Basin 6

- If it is a feasible option the design should be amended to avoid the high sensitivity area shown in Figure 2B. This would involve shifting the footprint to the south and/or east away from the high sensitivity vegetation. The high sensitivity area would then need to be demarcated so that no activities impact this area.

Basin 9

- If it is a feasible option the design should be amended to avoid the high sensitivity area shown in Figure 5B. Since the vegetation to the north, east and west is highly degraded and transformed the severity of the impacts in terms of loss of vegetation and species would be lower if the footprint can be shifted into these areas. The high sensitivity area would then need to be demarcated so that no activity impacts this area.

Scenario 2 (most likely)

If avoidance mitigation is not feasible then the cleared vegetation should include the following:

1. The boundary of the development footprint must be demarcated so that no impacts occur beyond the approved site;
2. Search and rescue of geophytes; and
3. Careful removal, stockpiling and translocation of topsoil (with indigenous vegetation from high sensitivity areas) to a suitable receptor site.

The topsoil and geophytes collected from the high sensitivity areas during the construction phase would need to be stockpiled and covered on site during the construction phase. This topsoil should be translocated to a suitable receptor site, with the main purpose being ecological

restoration. This can be used to restore a degraded area on site, or a selected off-site locality, in consultation with the City of Cape Town's Biodiversity Management Branch.

General mitigation

The following measures should be adhered to:

- An Environmental Control Officer (ECO) must be present during the construction phase to ensure that the mitigation measures are followed.
- No overburden should be placed outside the approved footprint.
- Invasive alien plants (IAPs) will need to be regularly cleared from the site since these are present in the seedbank and will inevitably emerge. Port Jackson willow is likely to be the most prolific species.
- Locally indigenous wetland species could be planted on the edge of the basins but there is no guarantee that these won't be outcompeted by invasive species such as Spanish reed *Arundo donax* and bulrush *Typha capensis*. Dense planting of low growing species such as *Cyperis textilis*, *Cyperus longus*, *Elegia tectorum*, *Ficinia nodosa*, *Juncus kraussii* and *Bolboschoenus maritimus* is recommended at the correct wetting regime.
- Since it is anticipated that the areas surrounding the basins will be regularly disturbed due to dredging of sediment, kikuyu grass and Port Jackson willow are likely to become invasive along the edges. A hard surface should be considered around the edge of the basins since this would allow for easy vehicle access and would prevent the proliferation of weeds.
- If any terrestrial areas are considered for rehabilitation (i.e. receptor site for translocation of topsoil as stated above) this should only be implemented if no future disturbances are anticipated.
- Long-lived species that are not fire-dependent should be considered for general rehabilitation. These could include species such as seegwarrie *Euclea racemosa*.
- Dewatering will be required during the excavation process. Any water that cannot be discharged directly into one of the pipeline should be discharged into areas around the south and east of Basin 6, and north west of Basin 9.

Paul Emms Pr. Sci. Nat.



Botanical Specialist