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APPENDIX 1 MAPS

1. INTRODUCTION

This botanical assessment forms part of the Environmental Impact Assessment for the proposed Cape Town Ring Road, or the N21, which will run from the northern suburbs of Cape Town, via the Cape Flats, to the southern suburbs near Lakeside. The fieldwork for this study was conducted in late August 2000, and timed to coincide with the spring flowering season so that as many of the seasonal species as possible would be evident.

2. THE BRIEF

The brief for this study was as follows:

- Provide a description of the vegetation in a corridor along the proposed route, including the Table View alternative of Phase 2.
- Provide an assessment of the conservation importance of the vegetation along the route, in local and regional (CMA) terms.
- Provide an indication of the presence or likelihood of occurrence of Red Data Book, Protected, or locally endemic species.
- Provide recommendations based on your findings towards *eg.* the rescue of plants or re-alignment of the route.

3. STUDY AREA

The study area (ie. the proposed route of the N21) will be described in detail elsewhere within the Environmental Impact Assessment. The survey area was generally a corridor some 100m wide following the proposed route, although in parts of Phase 2 this was 400m wide due to the alignment not yet having been finalised. Soils range from deep, alkaline, coastal sands to shallow acid sands over a ferricrete cap, to wet clays derived from shales. Some areas are highly

disturbed and contain little or no natural vegetation, while others are virtually pristine systems with a high species diversity.

The project is divided into three phases and this report will describe each in turn.

4. THE VEGETATION

4.1. PHASE 1 AND PHASE 2 EAST OF KUIPERSKRAAL RD.

Stellenberg Interchange — Le Bron Rd. (Km 38.45 — Km 40.0)

Old agricultural lands and disturbed riverine area of no botanical significance. Dominated by kikuyu grass (*Pennisetum clandestinum*), *Typha capensis*, *Sesbania punicea*, and *Acacia saligna* in wetlands.

Low conservation value.

Red Data Book (RDB) species highly unlikely.

Le Bron Rd — De Villiers Rd. Interchange (Km 40.0 — Km 41.8)

Golf driving range and wheatlands. No natural vegetation.

Low conservation value.

Red Data Book species highly unlikely.

De Villiers Rd Interchange — Madelief Rd. (Km 41.8— Km 43.45)

Disturbed ground and old farmlands. No natural vegetation.

Low conservation value.

No Red Data Book species likely.

Madeliefe Rd. — Wellington Rd. Interchange (Km 43.45 — Km 44.5km)

From Km 43.45 — Km 44.2 there is no natural vegetation of significance.

Low conservation value.

No Red Data Book species likely.

From Km 44.2 — Km 44.5 there is an increasing amount of natural renosterveld vegetation on the seasonally wet clays typical of this area. The vegetation is moderately disturbed, and has been invaded by alien grasses to a substantial degree, but the remaining renosterveld is of Moderate conservation value on a regional scale, and Moderate - High on a local scale. The only RDB species recorded in this area were a few plants of *Athanasia capitata* (Indeterminate status), which is restricted to wet clays in the region. This is a small likelihood of other RDB or locally endemic species still occurring in this partially disturbed area.

Wellington Rd. Interchange

Map 1 (Appendix 1) shows the botanically sensitive areas.

There is substantial natural vegetation remaining in this area, with the wet clays supporting a seriously threatened form of renosterveld that harbours a high number of local endemics and RDB plants. This is probably the single most important botanical site on the entire N21 route, and is of High conservation value on a local and regional scale.

The critical areas include the majority of the interchange area south of Wellington Rd. and the majority of the open areas to the north of Wellington Rd., including the corridor right up to the northern edge of Durmonte suburb at the Phesantekraal farm boundary.

The area supports at least eight RDB species including *Ischyrolepis duthieae* (Vulnerable), *Lampranthus fihicaulis* (Vulnerable), *Lampranthus* sp. (status uncertain due to taxonomic changes in progress; probably Vulnerable),

Athanasia capitata (Indeterminate), *Chondropetalum rectum* (Vulnerable), *Arctotheca forbesiana* (to be listed as Vulnerable), *Gladiolus watsonius* (to be listed as Vulnerable), and *Psoralea alata* (to be listed as Vulnerable). The majority of these species are dependant on the high water table being maintained, and even if populations are not destroyed by the footprint of the road the impact on the soil water status could be severe. There are very few sites nearby that would be suitable for “rescued” specimens.

It is possible that a more detailed survey could yield other RDB or regionally endemic species. The very high regional conservation importance of this site will necessitate major mitigation measures if the road goes ahead.

Wellington Rd. Interchange — Phesantekraal farm dam

This section consists of wheatfields of low conservation value, with the exception of a small patch of Renosterveld and Thicket at the northeastern edge of the dam. This small patch should be avoided by the road, as it is the only island of natural vegetation in the area. Plant species diversity is fairly high, and there is a high density of birds and small animals. No RDB or locally endemic plants were recorded in the patch, although there is a small probability that some may be present. The *conservation* value of this little patch is High in local terms, and Moderate in regional terms.

Phesantekraal farm dam — Kuiperskraal Rd. (Km 47.0 approx. — Km 54.2)

Farmlands with no natural vegetation.

Low conservation value.

Very low likelihood of RDB or endemic species.

4.2. PHASE 2: TABLE VIEW ALTERNATIVE

Map 2 (Appendix 1) shows the botanically sensitive areas.

Kuiperskraai Rd. — Van Schoorsdrift Rd. (no chainages were provided for this section)

Farmlands of no botanical significance. The crossing of the Diep River should be designed to minimise damage to the riverine system, and to maintain down river flow. There is no significant natural vegetation in this portion of the Diep River due to the highly eutrophic conditions in this dairy and wheat farming area.

Low conservation value.

Very low likelihood of RDB or endemic species.

Van Schoorsdrift Rd. — N7

This area is heavily overgrown with aliens such as Port Jackson (*Acacia saligna*) and gums (*Eucalyptus* sp.), but still supports a patchy remnant Renosterveld vegetation with a fair diversity and at least two recorded RDB species (*Lampranthus spiniformis* — Vulnerable, and *Babiana villosula* — to be listed as Rare). The alien cover is particularly dense in the western part around the Microlite Club, where *Acacia saligna* covers over 75% of the area. The soils in this western portion tend to be deep acid sands, whilst the eastern side is mainly on sandy clays derived from shales. This area thus marks the transition from renosterveld in the east, to the Sandplain Fynbos in the west.

The main Renosterveld area in the east has been given a Moderate conservation value, due to the presence of the two RDB species and the relatively intact natural vegetation, which although not particularly special, is still conservation worthy, particularly if the aliens are removed. The chance of there being further RDB species in this area is low — moderate. The

surrounding areas are given a Low conservation value due to the high level of alien invasion and the low likelihood of rehabilitation.

N7 — minor quarry north of Brickworks

This area would originally have been a mix of Sandplain Fynbos and Laterite Fynbos, both now extremely rare habitats in the CMA. However, this section has been highly disturbed by fires, aliens, and quarrying, and therefore now supports little natural vegetation, and no RDB species were recorded here.

The area has a Low conservation value, and there is a very small likelihood of rare species still persisting.

Minor quarry north of Brickworks — Railway line

This area consists of aeolian sands over ferricrete clays, and has been extensively disturbed by informal tracks that serve as an offroad vehicle testing area. There are also a number of smaller quarries, and a high level of woody alien invasion (75% on average). At least two RDB species were recorded in the remaining natural vegetation (mixed Sandplain Fynbos and Laterite Fynbos), these being *Erica ferrea* (Vulnerable), and *Leucadendron levisanus* (Endangered). Both these species are randomly scattered throughout the adjacent areas and it would be difficult to designate a route alignment to minimise impact on these species. Some of this area has been burned within the past year.

The area has a High conservation value based purely on the rarity of the botanical component, but in reality this has been rendered exceedingly difficult to conserve given the ongoing disturbances to the site, the densifying alien invasion, and the threat of fires. The chances of there being further RDB or locally endemic species in this area are fairly high.

Railway line — R27 (West Coast Rd.)

Most of this area is highly degraded by repeated fires, and dense alien invasions (over 75% cover). The original vegetation would have been Sandplain Fynbos on the acid sands near the railway line, moving into Strandveld and Dune Thicket mosaic on the more alkaline sands nearer the coast. The western third of this strip (between the new bulk water pipeline and the R27) has already been bulldozed, in a corridor almost 50m wide. The eastern part of the area has been burned this year, but the vegetation can be assumed to have been very similar to nearby patches that were not burned. Typical species in the Sandplain Fynbos include *Phylica cephalantha* and *Thamnochortus punctatus*. The Dune Thicket dominants include *Rhus glauca*, *R. laevigata*, *Ehrharta villosa*, *Chrysanthemoides monilifera* and *Ruschia macowanii*. No RDB species were recorded in the route corridor, although there is potential for *Euphorbia marlothiana* (now *E. caput-medusae*) nearby.

The area has been given a Low conservation value in local and regional terms. No further RDB species are likely to occur here.

R27 — Otto du Plessis Drive

The vegetation in this area is a mosaic of Strandveld and Dune Thicket on deep calcareous sands which make up the system of parallel, N-S trending dunes. The alien density ranges from 25 - 50%. Immediately west of the R27 the dominant shrubs are *Thamnochortus spicigerus*, *Ehrharta villosa*, *Zygophyllum flexuosum*, *Chrysanthemoides monilifera*, *Ruschia indecora*, and *Rhus glauca*. Two RDB species were recorded within the proposed alignment of the road, these being *Satyrium carneum* (Indeterminate), and *Euphorbia marlothiana* (now a subspecies of *E. caput-medusae*, but still threatened and a Cape Flats endemic). It is unlikely that any other RDB or locally endemic species occur within the routing. There are signs of formal alien clearing in the area.

The area immediately east (up to 50m from the road) of Otto du Plessis Drive is a prime example of dense, closed Strandveld, with a high species diversity, and has a High conservation priority locally and regionally, as this is one of the best conserved examples of this habitat in the CMA. East of this is a disturbed area that was evidently disturbed during the quarrying just south of the alignment. This area has a Low conservation value. East of this, in the parallel dune system that stretches to the R27, one finds scattered examples of the two RDB species, and a system that has a Moderate — High conservation value in local and regional terms.

4.3 PHASE 2: PREFERRED ALTERNATIVE

Maps 3 & 4 (Appendix 1) show the botanically sensitive areas.

Kuiperskraal Rd — N7 Morningstar Interchange (No chainages given)

Farmland and highly disturbed Sandveld with minimal natural vegetation.

Low conservation value. No RDB or locally endemic species recorded or likely.

N7 Morningstar Interchange— Railway Line

The majority of this area is either fallow farmland, or highly disturbed Sandplain Fynbos with over 75% alien cover and minimal natural vegetation. There is however, one important exception that needs to be accommodated. This occurs on the eastern edge of the fenceline separating the Farm 101 *and* Morningstar 141, *ie.* located on the latter property, within 50m of the fenceline. In this area of about 1.5ha is a viable, healthy, and previously unrecorded population of *Leucadendron levisanus*, which is an Endangered RDB species now restricted (endemic) to the CMA. All viable populations are thus highly conservation worthy. About thirty plants occur in this area between two informal sand tracks, along with other Proteaceae such as *Leucadendron salignum*, *Serruria decipiens*, and *Serruria fasciflora*. *Babiana villosula* (to be listed as Rare) was also recorded here. As the plants occur only in a small patch about 150m long it is possible to re-route the alignment to entirely avoid the plants. There is a

small likelihood of there being other RDB or locally endemic species in the area, and the patch is thus of High conservation value locally and regionally.

Railway Line — West Coast Rd. (R27)

Farmland and highly disturbed natural vegetation of Low conservation value all the way down to the R27, with a small strip of Moderate conservation value veld on the north side of the road, just east of the R27. This a mosaic of Strandveld and Dune Thicket, dominated by species such as *Rhus laevigata* and *R. glauca*, with *Thamnochortus spicigerus*. No RDB or locally endemic species were recorded or are likely.

4.3. PHASE 3

Westlake Interchange — Main Rd. (Km 0— Km 1.17)

Low conservation value veld with no natural vegetation remaining.

No possibility of RDB or locally endemic species still naturally occurring.

Main Rd. — Railway (Km 1.17— Km 1.828)

This area is partly disturbed, and is partly built up. The disturbed areas are dominated by kikuyu grass, and due to the high water table in the area the dominant plants are those typical of such areas on the Peninsula, *eg. Senecio halimifolius* (tabakbos), *Phragmites australis* (reeds), *Juncus* sp. (vleibiesie). On the drier areas are thickets of *Rhus laevigata* (koerentebos). No RDB or locally endemic species were recorded and none are likely. The botanical conservation value of this area is Moderate in local terms, and Low- Moderate in regional terms. The area is popular with birds, with many nesting and feeding in the reeds. Important to note is that just south (<100m) of the proposed corridor is an area that supports a viable population of one of the Cape Flats' rarest species — *Passerina paludosa* ("Endangered" RDB status), and that this area should on no account be disturbed. This population falls within the Westlake wetland area and the local manager is aware of its presence.

Railway — Steenberg Canal

Map 5 (Appendix 1) shows the botanically sensitive areas.

There is a fenced off area here that is about 100m wide (road reserve), and there is still substantial natural vegetation present, in the form of Dune Thicket, dominated by *Rhus laevigata*, *Euclea racemosa*, and *Gymnosporia buxifolia* (= *Maytenus heterophylla*). This part falls within the boundaries of the Zandvlei Nature Reserve, and they have cleared the area of aliens. Species diversity is relatively low, but the area is also popular with birds. The botanical conservation value of this area is Moderate on a local scale, and Low —Moderate on a regional scale. No RDB or locally endemic species were recorded here and none are likely. Worth noting here is that the northern portion of the road reserve (a strip about 30m wide) is significantly more degraded (Low priority) than the southern portion, and is clearly the preferred routing.

Between the fenced off area and the canal is bulldozed ground of no botanical value.

Steenberg Canal — Prince George's Drive (Km 3.2)

Disturbed ground of no botanical value. No RDB or locally endemic species occur here.

Prince George's Drive — Canalised River (Km 3.2 — Km 5.60)

Disturbed ground of no botanical value until the southern end of Rondevlei Reserve is reached, where the northern side of the road reserve then becomes of Moderate local and regional conservation significance. This portion of the reserve has recently been cleared of a dense stand of aliens (*Acacia cyclops* and *A. saligna*) and the returning vegetation is a type of Dune Asteraceous Fynbos with *Metalasia muricata* and *Ehrharta villosa*. No RDB or locally

endemic species were recorded in this area, and given the disturbance in the area none are likely.

Canalised River — Strandfontein Rd. (Km 5.60 — Km 8.90)

The area immediately south of Zeekoevlei, as far east as the proposed Toll Plaza, is a heavily disturbed region and is dominated by a limited number of wetland plants such as *Typha capensis* (bulrush) and *Senecio halimifolius* (tabakbos). Kikuyu grass covers much of the dune area, a function of the eutrophic nature of the water. No RDB or locally endemic species were recorded, and none are likely. The area is a Low conservation priority on a local and regional scale.

Between the Toll Plaza and Strandfontein Rd. the pattern becomes more complicated, as there is a mosaic of disturbed and pristine habitats within a relatively small area. The reader is referred to map 6 (Appendix 1) for detail on this area. The first 300m on the west side of Strandfontein Rd. were burned this year, but essentially the vegetation here is a mosaic of Dune Asteraceous Fynbos (DAF) and Dune Thicket, with an alien cover of less than 25% (*Acacia cyclops*). There has been a bit of illegal rubble dumping in some of the dune slacks within 200m of the road, and the area south of the southernmost Pelican Park houses is disturbed and overrun with kikuyu, making it a Low conservation priority. Further west, near the proposed Toll Plaza, is a narrow strip of kikuyu meadow which separates two patches of good quality natural veld. *Euphorbia marlothiana* (Vulnerable subspecies of *E. caput-medusae*) was recorded in this area (with the main populations south of the alignment), and it is likely that *Satyrium carneum* also occurs in some of the dunes. These are the only two RDB or locally endemic species likely in the area, but due to the overall quality of the vegetation, and its increasing scarcity in the CMA, these good quality patches are of High conservation value.

Strandfontein Rd. — Westgate Interchange (Km 8.90—Km 13.45)

Map 7 (Appendix 1) shows the botanically sensitive areas.

On the north side of the proposed routing, east of Strandfontein Rd., the vegetation is disturbed and of Low conservation value. A little further west the indigenous DAF/Dune Thicket mosaic is Moderate conservation value in local and regional terms, although no RDB species were recorded here. South of the proposed alignment and immediately east of Strandfontein Rd. is a vegetated dune area that is part of a local Nature Reserve, and this area supports the typical DAF/Dune Thicket mosaic, with an alien cover of about 25% (*Acacia cyclops*). There is the potential for *Satyrium carneurn* to occur here, but neither this nor any other RDB or locally endemic species was actually recorded. This Reserve area runs up to the western edge of Strandfontein suburb, and is of Moderate — High conservation priority locally and regionally. North of the suburb is a relatively undisturbed area of vegetated dunes, covered with the typical mix of DAF and Dune Thicket, and about 25% cover of *Acacia cyclops*. There is a fair chance that some of the usual RDB species could occur here, but none were recorded during the survey. The conservation value of this area is Moderate in local and regional terms.

Between Strandfontein suburb and the Westgate Interchange much of the vegetation has been burned, and would also have supported a dense (>50%) cover of *Acacia cyclops*. There is also a large sandy area here that appears to have been an agricultural area, with a sand mine in the northern part. The entire area is of Low conservation value and is unlikely to support any valuable species.

Westgate Interchange — Wespoort Rd. extension

The south side of the proposed Wespoort Rd. extension supports a relatively intact DAF/ Dune Thicket mosaic with a moderate probability of rare species. The dune slacks tend to have a denser cover of rooikrans (>50%) than the

dune crests. The triangle made with Vanguard Drive supports a similar vegetation of Moderate conservation value.

The northern side of the proposed Wespoort Rd. alignment is heavily disturbed, with little natural vegetation, and is of Low conservation value, and little likelihood of rare species being found there.

Westgate Interchange— R300 (Km 13.45— Km 17.50)

Map 8 (Appendix 1) shows the botanically sensitive areas.

The area around and immediately to the north of the proposed interchange supports a reasonable DAF community that is of Moderate conservation value. There is a very small likelihood of there being rare species here, but there is a good community of birds and reptiles still present. The remainder of the northbound route up to the R300 is through severely disturbed duneveld and agricultural lands of Low conservation value. There is no chance of any rare species occurring here. The only other vegetation of conservation value occurs along the southern edge of the existing R300 in a narrow belt about 30m wide, and features a small population of the RDB species *Muraltia mitior* (Insufficiently Known), along with species such as *Chondropetalum nudum*, and *Chrysanthemoides monilifera*. It is unlikely that other RDB species occur here, and the patch is of Moderate conservation value locally and regionally.

5. RECOMMENDATIONS

- There are two sites of outstanding conservation value that are under threat given the current alignments: The Wellington Rd Interchange area in Phase 1; and the patch of *Leucadendron levisanus* about 1km west of the N7 along the preferred route for Phase 2. The obvious recommendation in the latter case is to realign the preferred route by moving it 100m further north which will then completely bypass the rare plants. The Wellington Rd. Interchange area is more difficult as much of the site is highly sensitive (with no less than eight RDB species) and should preferably not be developed at all. Options for this area need to be debated by the authorities, engineers, planners, local I&APs, and the consultant botanist. Potential solutions involve all of the following - reducing the road footprint; careful layout on site to avoid the most sensitive portions; and extensive search and rescue programs for all the rare species.
- For Phase 3 between the Wastewater Treatment Ponds and west of Strandfontein Rd. it would be desirable to keep the road as far north as possible, as this would minimise the impact on the larger undisturbed areas to the south.
- The Westgate Interchange should be moved about 150m south to coincide with the sandy, disturbed area, thus reducing the footprint on the Moderate conservation value DAF in this area.
- Care should be taken to conserve the small patch of Moderate value veld just south of the R300 near its junction with Vanguard Drive.
- In Phase 2 the road should be realigned between Phesantekraal farm and Spes Bona Rd. to avoid the small patch of Thicket and Renosterveld on the north side of the farm dam at Phesantekraal.
- Overall, from a botanical point of view, a slightly realigned (100m north) Preferred Alignment (to Melkbosstrand) is definitely of lower impact than the Table View alternative, which presents little opportunity to reduce the fairly substantial botanical impacts at various points along its length.

- The N7 — Table View alternative Interchange (Van Schoorsdrift Rd. area) should preferably be moved 150m north to avoid the small patch of Renosterveld that supports two RDB species.
- Little can be done to mitigate the botanical impacts between the R27 and Otto du Plessis Drive, as similar habitat exists on both sides. However, search and rescue for all the rare species (probably two species), and any easily transplantable indigenous species within the alignment, should be done prior to any construction.
- Any rare (RDB) or locally endemic species within the overall road route must be transplanted to a suitable temporary nursery or site prior to commencement of construction.
- All landscaping and revegetation of the road edge should be done using indigenous species rescued prior to construction along the route, and if necessary maintained in a greenhouse during the construction period. Transplanting should preferably be done in the rainy season.
- All alien species within the road reserve should be removed by the contractor. No alien species should be planted along the roadside.

APPENDIX

SENSITIVITY MAPS