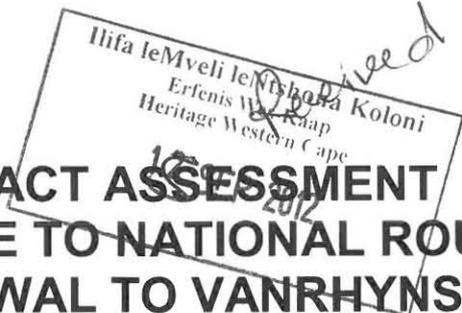


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Case # 2020



**HERITAGE IMPACT ASSESSMENT  
 PROPOSED UPGRADE TO NATIONAL ROUTE 7,  
 SECTION 4 FROM TRAWAL TO VANRHYNSDORP,  
 WESTERN CAPE**

(Assessment conducted under Section 38 (8) of the  
 National Heritage Resources Act as part of an EIA)

Prepared for

**SIVEST Environmental Division**

Unit 112 Wentworth Building, Somerset Links, De Beers Avenue, Somerset West, 7130

Tel: 021 852 2988  
 Fax: 021 852 2660  
 Email: jennyb@sivest.co.za

October 2012



Prepared by

**Dave Halkett**

ACO Associates cc  
 Physical: Unit C26, Prime Park, Mocke Rd, Diep River  
 Postal: 8 Jacobs Ladder St James, 7945

Email: david.halkett@aco-associates.com  
 Tel: 021 7064104  
 Cell: 0731418606  
 Fax to e-mail: 086 603 7195

## INTEGRATED EXECUTIVE SUMMARY

Following the comment on the NID for the proposed project compiled by ACO Associates cc (see Appendix 1 - still awaiting comment) we have been appointed by SiVest to undertake a Heritage Impact Assessment, as part of the EIA process, that addresses particularly archaeological, palaeontological and visual issues for the proposed upgrade to National Route 7 Section 4, from Clanwilliam to Trawal (Figures 1 and 2).

The proposed project would undertake remedial measures aimed at improving the overall condition and safety of the N7.

### **Archaeology:**

A small scatter of artefacts (003) may be affected by Climbing Lane 1. Some mitigation is therefore required if the lane is constructed at this point. Given the presence of the cemeteries not far away, realignment of climbing lanes 1 and 2 may be required, and may influence the mitigation. Road widening can proceed after the mitigation.

Of more concern are two farm cemeteries (004 and 005) that lie just outside the road reserve within the areas proposed for Climbing Lanes 1 and 2. The engineers will have to evaluate the positions of the cemeteries and determine if it is feasible to upgrade the road in these areas without impacting either.

Preference would be to leave them untouched, but if the road here are absolutely essential, and they cannot be accommodated without impacting either one or both cemeteries, exhumation may be considered as a last resort. Several permissions are required from both the authorities and families of the deceased who would have to be traced and consulted. If this option is considered, it is likely to be a lengthy process and should be undertaken well in advance of the construction program. We cannot guarantee that permissions will be granted by any, or all of the parties. An engineering solution is preferred. The owners of the graveyard may need to be consulted with respect to any construction that will occur in proximity of the cemeteries. A permit from the South African Heritage Resources Agency (SAHRA) may be required to undertake construction in such close proximity to graves and consultation in this regard must be entered into with SAHRA following inspection by the engineers to determine requirements.

If it is feasible to accommodate the lanes within the situation as is, then both cemeteries must be identified on construction plans and they must be fenced for the duration of the construction phase. No construction vehicles may enter the cordoned areas nor should there be any incursion of fill material into the sites. Consultation with the affected families of the deceased may be required if there is to be encroachment outside of the road reserve at these locations.

If the lanes are abandoned or modified to avoid these areas and the *status quo* is maintained, then all requirements *vis a vis* the cemeteries would fall away.

We also add a general caution with respect to unmarked graves which could occur in sandy areas, particularly in proximity to known settlements or archaeological sites along all of the climbing lanes. As there are few identified heritage indicators we do not expect this to be a major issue, however, if any are uncovered during construction, this must immediately be reported to Heritage Western Cape to determine what action is required.

The assessment of the upgrade has indicated very minor impact on archaeological sites or material. Two farm cemeteries may be affected by the proposals and engineers must examine the situation to

determine what, if any, the impacts will be. Provided the recommendations are followed in the sections where heritage issues have been identified, there is no objection to the proposed upgrade overall. No limitations on climbing lanes, or the lengthening of existing culverts were noted on other sections of the route.

### **Palaeontology**

The occurrence of fossils in the rock substrates is unlikely.

The upgrade traverses the western slopes of the Olifants River Valley. The area is hilly and the geology indicates hard rock deposits of predominantly Cape Super Group quartzites, traces of other hard rock formations and, mostly north of Klawer, more recent predominantly sandy Quaternary sediments. A band of limestone cuts across the N7 roughly half way between Klawer and Van Rhynsdorp.

Quaternary alluvial deposits may include sand and gravel sediments that could contain fossils and/or sub-fossils. Limestone may include solution cavities (pockets) that can preserve fossils. The existence of "heuweltjies" is noted; they may reveal fossils and/or sub-fossils if cut through during construction. Small pockets of bone can occur, for instance, where bone accumulators like hyaenas, Jackals or porcupines used cavities or holes in harder substrates or burrows dug by aardvarks. These, and the limestone outcrop should be carefully assessed during construction.

"Heuweltjies are present in the vicinity of BP2 and other sandy areas along the route, but BP3 appears to have already been heavily disturbed. Any excavation along the upgrade that cuts through a "heuweltjie" should be carefully monitored.

Provided that the recommendations of this assessment are complied with, there is no palaeontological reason why the proposed development should not proceed.

### **Visual:**

This section of the N7 is seen to have some visual significance because of the scenic qualities of the adjacent Olifants River, mountainous terrain, intact vegetation / spring flowers, wine cellars and general rural and wilderness characteristics of the area. The N7 is also seen as an important tourist route for visitors to the West Coast, Namaqualand and Namibia.

The proposed road works will take place predominantly within the existing road alignment, which will result in only minimal increased visibility from the surrounding area, and minimal effect on the viewshed of the roadway.

The proposed road works would result in some increase to road cuts and fills along the route, as well as possible interference with historical graveyards, which could have both visual and heritage impact implications. The lengthened box culverts and vehicular underpasses, which are below the road, will have negligible visual impact, except during construction, when substantial earthworks are involved. Some indication of the nature of the earthworks can be obtained from the current work on the N7 between Citrusdal and Clanwilliam.

The proposed **expansion of the Borrow Pit 2** on the N7 at KM 43.8, could have significant visual implications, being adjacent to the N7.

Based on the field survey, photographic simulations and assessment criteria used in this report, the visual impact assessment results were as follows:

- The road widening and climbing lanes would range from low to high potential visual impact before mitigation. This could be reduced to low to medium significance if the mitigations in Section 6 are implemented.
- The proposed expansion of the existing Borrow Pit 2 adjacent to the N7 would have high potential visual impact, and Borrow Pit 3 medium-low potential visual impact before mitigation.

The use of the borrow pits would however be short term (construction phase), and the significance could be reduced if the mitigations in Section 6 are implemented. It is strongly recommended that alternative borrow pits be investigated away from visually sensitive areas.

- The construction phase of the proposed road works would have a high potential visual impact before mitigation. This would however also be short term. The significance could be marginally reduced to medium-high if the mitigations in Section 6 are implemented.

The following recommendations are proposed, arising from the visual impact assessment:

- The mitigations outlined in Section 6 should be integrated into the design, construction and operational phases of the proposed project. In particular, climbing lanes at C1 and C2 should be modified to avoid the historical graveyards.
- A rehabilitation ecologist should be commissioned to assist with the planning and implementation of revegetation of areas disturbed by the road works, particularly the road cuts and fills along the route, as well as drainage courses and wetlands that may be affected.
- A landscape architect should be commissioned to assist with the design and implementation of all picnic / view sites along the route, including picnic furniture, fencing, signage etc.
- An environmental control officer (ECO) should be employed on the road contract to ensure that disturbance to the surrounding landscape is minimised and that the environmental management plan (EMP) is implemented.

### **Comments from IAAP's:**

The comments from IAAP's will only be available after tabling of the draft Basic Assessment report. There is no local heritage body for this area to comment.

### **Integrated heritage conclusions:**

No severe limitations were identified in terms of Stone Age Archaeology or Palaeontology. Two farm cemeteries lie close to the road along the routes of climbing lanes 1 and 2. Engineers must determine if the road widening at these points can be accommodated without impacting the cemeteries. Some re-planning of these lanes may be necessary. Some impacts have been identified by the visual impact assessment most of which are manageable through appropriate mitigation. The expansion of (existing) borrow pit 2 has been identified as a potential visual impact.

Provided that the recommendations in the Archaeological, Paleontological and Visual specialist reports are followed, the upgrade will not impact significantly on heritage.

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## 1. INTRODUCTION

A Basic Assessment (BA) Process is being conducted for the Proposed Upgrade to National Route 7 Section 4 from Trawal to Van Rhynsdorp (Figures 1 and 2, Tables 1 and 2).

The proposed project would undertake remedial measures aimed at improving the overall condition and safety of the N7, Section 4 from Trawal to Vanrhynsdorp within the Matzikama Municipality. The following activities are proposed: (see Figure 2 for detailed mapping):

- Construction of 3.7m wide climbing and passing lanes at proposed locations totalling some 13.68km;
- Widening of the existing road structure to 3.7m lane widths with 1m surfaced shoulder and a 1.5m surfaced shoulder at proposed climbing lane locations;
- Lengthening of pipes and box culverts where required;
- Localised repair and pre-treatment of the existing surface, subsurface drainage improvements and construction of an appropriate surface seal over the full 33.5km length;
- Widening of the road over Olifants Bridge by approximately 2.2m (from 8.38m to 12.85m) and paving of the Wiedou Bridge;
- Potential for permanent land acquisition to accommodate construction of climbing lanes;
- Fill material for climbing lanes to be sourced from the road reserve during construction of widening and cuttings;
- Sourcing of base course materials and surfacing materials required will most likely be from commercial sources;
- Higher quality materials for lower layers of the road may need to be sourced from borrow pits.

The proposed upgrade is aligned with the objectives set out in the National 2014 Vision (National Spatial Development Perspective, 2003) which aims to: “..achieve a better national health profile and reduction of preventable causes of death including road accidents.” The road upgrade, especially the widening of the N7 and the addition of climbing lanes on blind corners and steep inclines, will contribute significantly to the safety of road usage and minimize accident occurrences. This is of great importance considering that the N7 highway is a major throughway for import/export traffic to/from Namibia.

Further, the West Coast District IDP (2007), Section 2.4 on Regional Development Challenges, identifies road upgrades as a priority in the Matzikama Region. The Cederberg IDP (2007-2011) states that infrastructure upgrades will have preference over infrastructure development. The proposed road upgrade will improve current infrastructure with limited additional development (climbing lanes). The Cederberg SDF (2010) specifically references the improvement of the agricultural sector. It is herewith assumed that the improved road infrastructure of the N7 will contribute positively to the development of the agricultural sector in terms of exporting goods in a manner that is safe and efficient for all resource users involved.

The proposed upgrade is considered necessary to improve general safety for road users through the re-surfacing and widening of the proposed road section and bridges/culverts contained therein as well as to improve safety and speed reduction by constructing climbing lanes at proposed locations.

Following the comment from HWC on the NID for the proposed project compiled by ACO Associates cc (see Appendix 1), we have been appointed by SiVest to undertake a Heritage Impact Assessment, as part of the Basic Assessment process, that addresses particularly Archaeological, Palaeontological and Visual impacts, and assesses the comments of IAAP's in connection with the proposed work. Specialist reports as requested by HWC are appended in full.

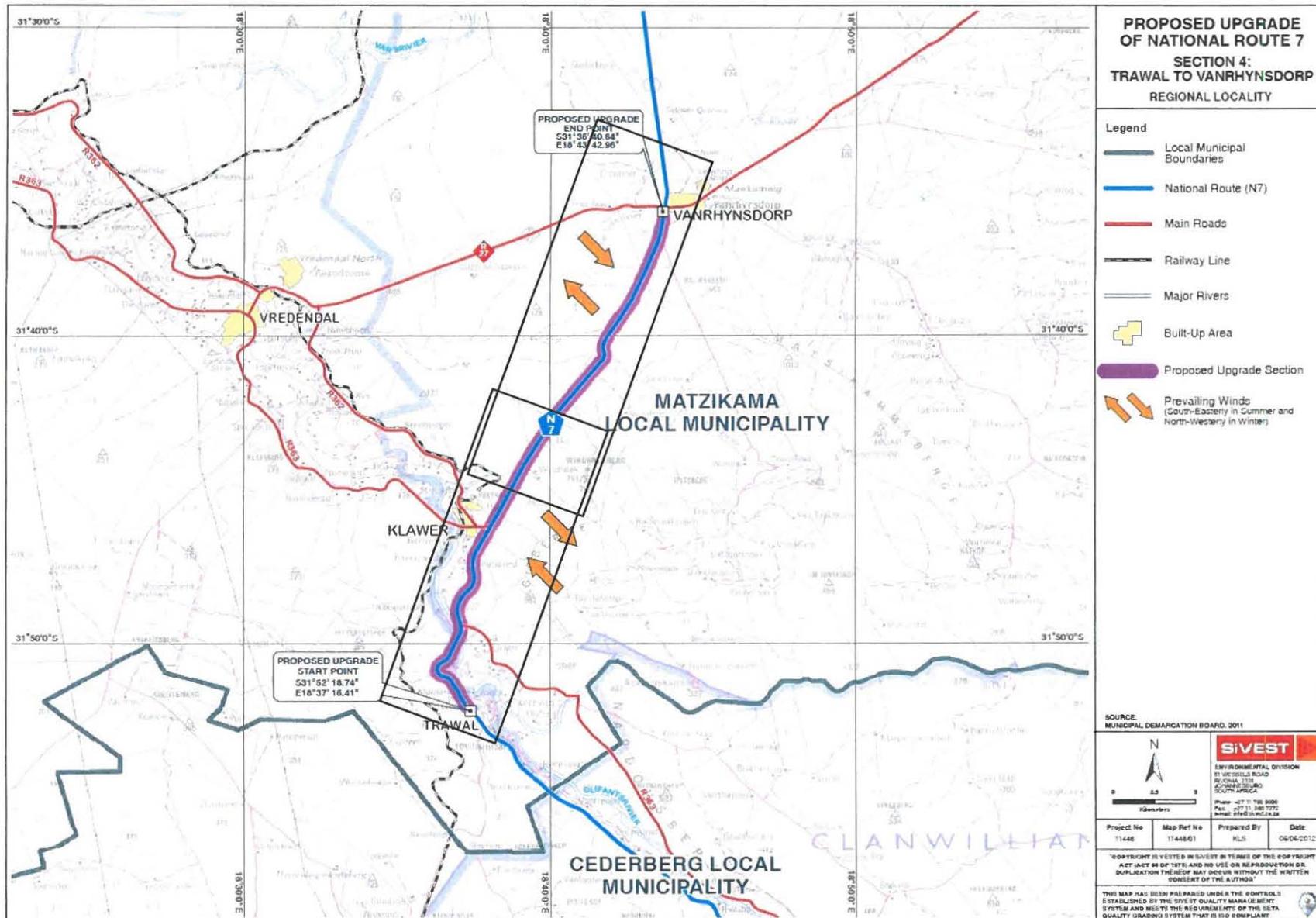


Figure 1: Route layout maps (supplied by client). Rectangles show the locations of the climbing lane diagrams in Figure 2 (author's addition)

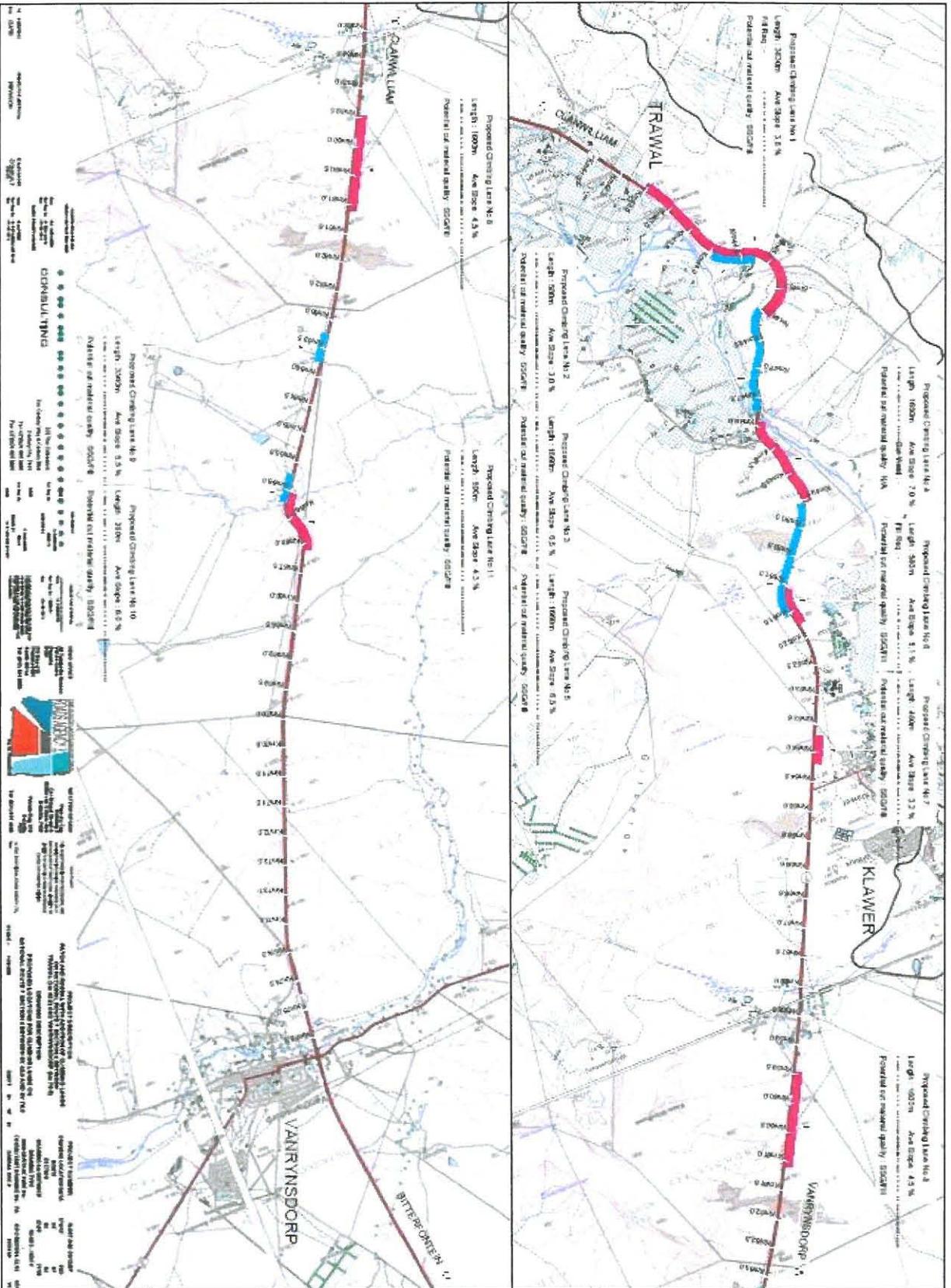


Figure 2: Proposed upgrade with passing lanes shown by red and blue stripes

## 1.1 Proposed upgrade work

### 1.1.1 Bridges, culverts, borrow pits

Description	Km ref.	Proposed works
Olifants River Bridge	47.8	Widening top for pedestrian walkways only
Wiedou Bridge	66.2	Resurfacing only
Culverts general	47.45 and 48.25	Widening
Borrow pits	BP2: at 43.8 next to N7. BP3 is on a divisional road off the N7	Expansion of existing pits

**Table 1:** Bridge and culvert upgrade locations

### 1.1.2 Climbing lanes

Climbing Lanes	west		east		Length km
	km	km	km	km	
1	42.5	46.0			3.63
2			44.0	45.5	0.58
3			46.0	48.25	1.66
4	48.0	49.5			1.66
5			49.5	51.5	1.66
6	51.0	51.75			0.58
7	53.7	54.25			0.48
8	59.5	61.1			1.6
9			63.25	63.75	0.36
10			65.75	66.25	0.36
11	66.0	67.0			0.89

**Table 2:** Climbing lane upgrade locations

## 2. SUMMARY OF FINDINGS

The full specialist reports are presented in Appendix 2 - 4 and can be read as required. Some minor impact on a single Late Stone Age site and potentially significant impacts on two farm cemeteries. there is little chance of finding palaeontological material overall although cavities in the band limestone rocks on the Knersvlakte may contain fossils. Visual impacts are relatively minor overall and manageable by mitigation, with the exception of BP2 since it location very close to the N7. Likely to be visual impact before mitigation.

## 3. INTEGRATED HERITAGE CONCLUSIONS AND RECOMMENDATIONS

### 1.2 Archaeology

The assessment of the upgrade has indicated very minor impact on archaeological sites or material. Two farm cemeteries may be affected by the proposals and engineers must examine the situation to determine what, if any, the impacts will be. Provided the recommendations are followed in the sections where heritage issues have been identified, there is no objection to the proposed upgrade overall. No limitations on climbing lanes, or the lengthening of existing culverts were noted on other sections of the route.

### 1.3 Palaeontology

The likelihood that palaeontological remains will be encountered during construction of the proposed upgrade of the N7 between Trawal and Van Rhynsdorp is small but, if encountered, such material is important and must be recorded by an appropriately-qualified person.

Provided that the recommendations in this report are followed, current information indicates that the proposed upgrade will not impact significantly on palaeontological remains. Appropriately conducted the development may in fact provide opportunities to access rare fossil material and to better understand the local Quaternary sequence.

### 1.4 Visual

This section of the N7 is seen to have some visual significance because of the scenic qualities of the adjacent Olifants River, mountainous terrain, intact vegetation / spring flowers, wine cellars and general rural and wilderness characteristics of the area. The N7 is also seen as an important tourist route for visitors to the West Coast, Namaqualand and Namibia.

The proposed road works will take place predominantly within the existing road alignment, which will result in only minimal increased visibility from the surrounding area, and minimal effect on the viewshed of the roadway.

The proposed road works would result in some increase to road cuts and fills along the route, as well as possible interference with historical graveyards, which could have both visual and heritage impact implications. The lengthened box culverts and vehicular underpasses, which are below the road, will have negligible visual impact, except during construction, when substantial earthworks are involved. Some indication of the nature of the earthworks can be obtained from the current work on the N7 between Citrusdal and Clanwilliam.

The proposed **expansion of the Borrow Pit 2** on the N7 at KM 43.8, could have significant visual implications, being adjacent to the N7.

Based on the field survey, photographic simulations and assessment criteria used in this report, the visual impact assessment results were as follows:

- The road widening and climbing lanes would range from low to high potential visual impact before mitigation. This could be reduced to low to medium significance if the mitigations in Section 6 are implemented.
- The proposed expansion of the existing Borrow Pit 2 adjacent to the N7 would have high potential visual impact, and Borrow Pit 3 medium-low potential visual impact before mitigation. The use of the borrow pits would however be short term (construction phase), and the significance could be reduced if the mitigations in Section 6 are implemented. It is strongly recommended that alternative borrow pits be investigated away from visually sensitive areas.
- The construction phase of the proposed road works would have a high potential visual impact before mitigation. This would however also be short term. The significance could be marginally reduced to medium-high if the mitigations in Section 6 are implemented.

The following recommendations are proposed, arising from the visual impact assessment:

- The mitigations outlined in Section 6 should be integrated into the design, construction and operational phases of the proposed project. In particular, climbing lanes at C1 and C2 should be modified to avoid the historical graveyards.
- A rehabilitation ecologist should be commissioned to assist with the planning and implementation of revegetation of areas disturbed by the road works, particularly the road cuts and fills along the route, as well as drainage courses and wetlands that may be affected.

- A landscape architect should be commissioned to assist with the design and implementation of all picnic / view sites along the route, including picnic furniture, fencing, signage etc.
- An environmental control officer (ECO) should be employed on the road contract to ensure that disturbance to the surrounding landscape is minimised and that the environmental management plan (EMP) is implemented.

### **1.5 Comments from IAAP's**

The comments from IAAP's will only be available after tabling of the draft Basic Assessment report. There is no local heritage body for this area to comment.

APPENDIX 1: NID COMMENT



**APPENDIX 2: ARCHAEOLOGICAL IMPACT ASSESSMENT**

# ARCHAEOLOGICAL IMPACT ASSESSMENT: PROPOSED UPGRADE TO NATIONAL ROUTE 7, SECTION 4 FROM TRAWAL TO VANRHYNSDORP, WESTERN CAPE

(Assessment conducted under Section 38 (8) of the  
National Heritage Resources Act as part of an EIA.)

Prepared for

## **SIVEST Environmental Division**

Unit 112 Wentworth Building, Somerset Links, De Beers Avenue, Somerset West,  
7130

Tel: 021 852 2988

Fax: 021 852 2660

Email: [jennyb@sivest.co.za](mailto:jennyb@sivest.co.za)

October 2012



Prepared by

**Dave Halkett**

ACO Associates cc

Physical: Unit C26, Prime Park, Mocke Rd, Diep River  
Postal: 8 Jacobs Ladder St James, 7945

Email: [david.halkett@aco-associates.com](mailto:david.halkett@aco-associates.com)

Tel: 021 7064104

Cell: 0731418606

Fax to e-mail: 086 603 7195

## DECLARATION

by the independent person who compiled a specialist report or undertook a specialist process

I ...David John Halkett....., as the appointed independent specialist hereby declare that I:

- act/ed as the independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not; and
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.

Note: The terms of reference must be attached.



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Signature of the specialist:

---

ACO Associates cc  
Name of company:

---

28<sup>th</sup> June 2012  
Date:

## EXECUTIVE SUMMARY

Archaeological sites and two farm cemeteries have been identified along sections of the route. The engineers must determine if climbing lanes 1 and 2 can be accommodated without impacting the cemeteries which lie very close to the edge of the road reserve. Some consultation with the affected families of the deceased may be required if there will be encroachment outside the road reserve at these locations. An engineering solution, rather than exhumation and reburial is advised if the widened lanes are a priority. If the lanes can indeed be accommodated, the cemeteries must still be identified on construction plans and fenced for the duration of the construction phase. Caution must be exercised to prevent incursion of road fill or construction vehicles onto the cemeteries. One Late Stone Age (LSA) archaeological site requires minor mitigation by way of sampling of an artefact scatter. In the event of any unmarked human burials being found along the route in the construction areas, Heritage Western Cape (HWC) must be contacted to determine the appropriate action.

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## 4. INTRODUCTION

A Basic Assessment (BA) Process is being conducted for the Proposed Upgrade to National Route 7 Section 4 from Trawal to Vanrhynsdorp (Figure 1). ACO Associates has been commissioned to undertake an Archaeological Impact Assessment and to compile an integrated Heritage Impact Assessment.

The proposed project would undertake remedial measures aimed at improving the overall condition and safety of the N7, Section 4 from Trawal to Vanrhynsdorp within the Matzikama Municipality. The following activities are proposed: (see Figure 2 for detailed mapping):

- Construction of 3.7m wide climbing and passing lanes at proposed locations totalling some 13.68km;
- Widening of the existing road structure to 3.7m lane widths with 1m surfaced shoulder and a 1.5m surfaced shoulder at proposed climbing lane locations;
- Lengthening of pipes and box culverts where required;
- Localised repair and pre-treatment of the existing surface, subsurface drainage improvements and construction of an appropriate surface seal over the full 33.5km length;
- Widening of the road over Olifants Bridge by approximately 2.2m (from 8.38m to 12.85m) and paving of the Wiedou Bridge;
- Potential for permanent land acquisition to accommodate construction of climbing lanes;
- Fill material for climbing lanes to be sourced from the road reserve during construction of widening and cuttings;
- Sourcing of base course materials and surfacing materials required will most likely be from commercial sources;
- Higher quality materials for lower layers of the road may need to be sourced from borrow pits.

The proposed upgrade is aligned with the objectives set out in the National 2014 Vision (National Spatial Development Perspective, 2003) which aims to: "...achieve a better national health profile and reduction of preventable causes of death including road accidents." The road upgrade, especially the widening of the N7 and the addition of climbing lanes on blind corners and steep inclines, will contribute significantly to the safety of road usage and minimize accident occurrences. This is of great importance considering that the N7 highway is a major throughway for import/export traffic to/from Namibia.

Further, the West Coast District IDP (2007), Section 2.4 on Regional Development Challenges, identifies road upgrades as a priority in the Matzikama Region. The Cederberg IDP (2007-2011) states that infrastructure upgrades will have preference over infrastructure development. The proposed road upgrade will improve current infrastructure with limited additional development (climbing lanes). The Cederberg SDF (2010) specifically references the improvement of the agricultural sector. It is herewith assumed that the improved road infrastructure of the N7 will contribute positively to the development of the agricultural sector in terms of exporting goods in a manner that is safe and efficient for all resource users involved.

The proposed upgrade is considered necessary to improve general safety for road users through the re-surfacing and widening of the proposed road section and bridges/culverts contained therein as well as to improve safety and speed reduction by constructing climbing lanes at proposed locations.

Following the comment from HWC on the NID for the proposed project compiled by ACO Associates cc (see Appendix 1) we have been appointed by SiVest to undertake a Heritage Impact Assessment, as part of the Basic Assessment process, that addresses particularly Archaeological and Palaeontological material, and visual issues. Palaeontological and Visual studies are dealt with in separate reports.

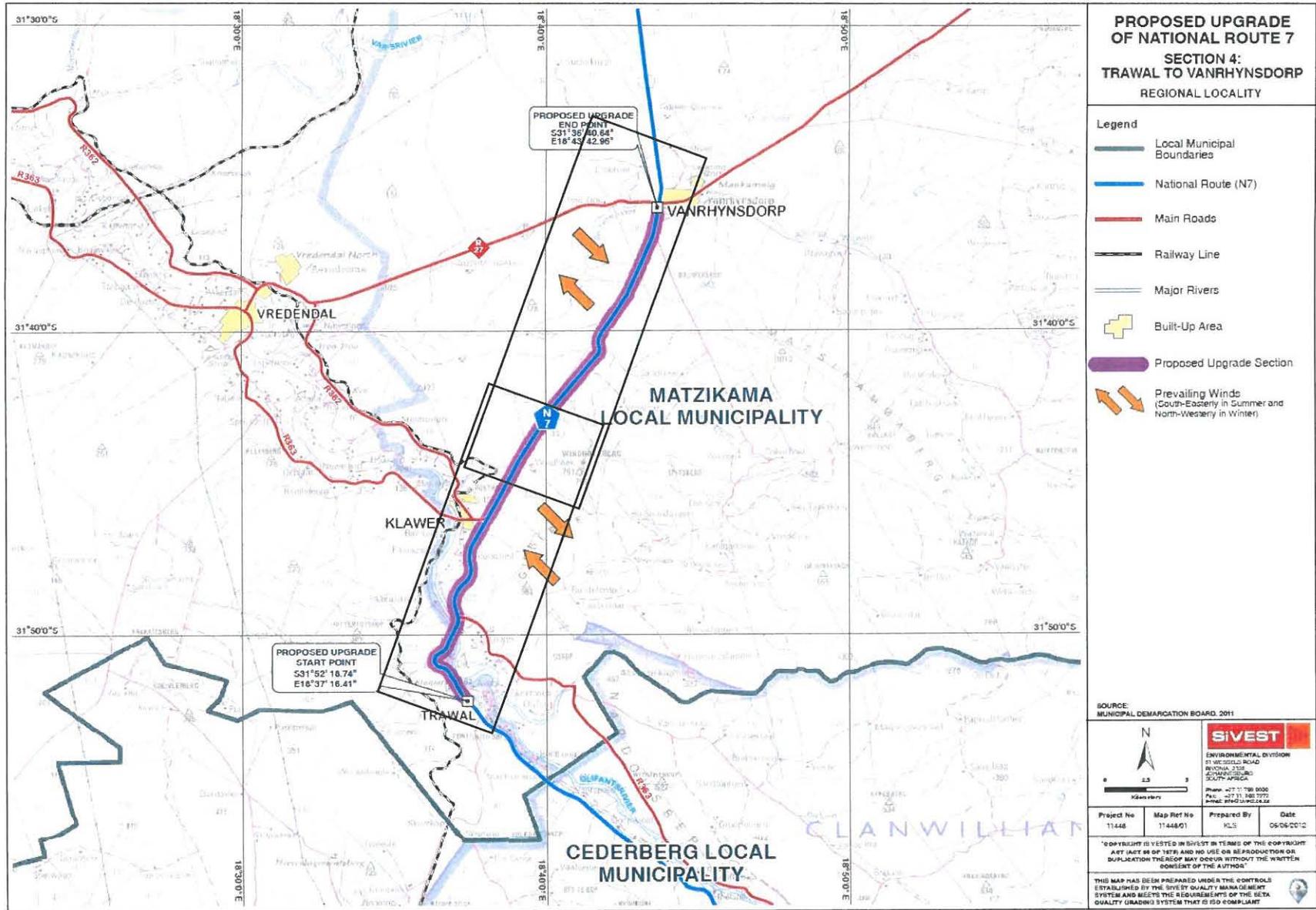


Figure 1: Route layout maps (supplied by client). Rectangles show the locations of the climbing lane diagrams in Figure 2 (author's addition)

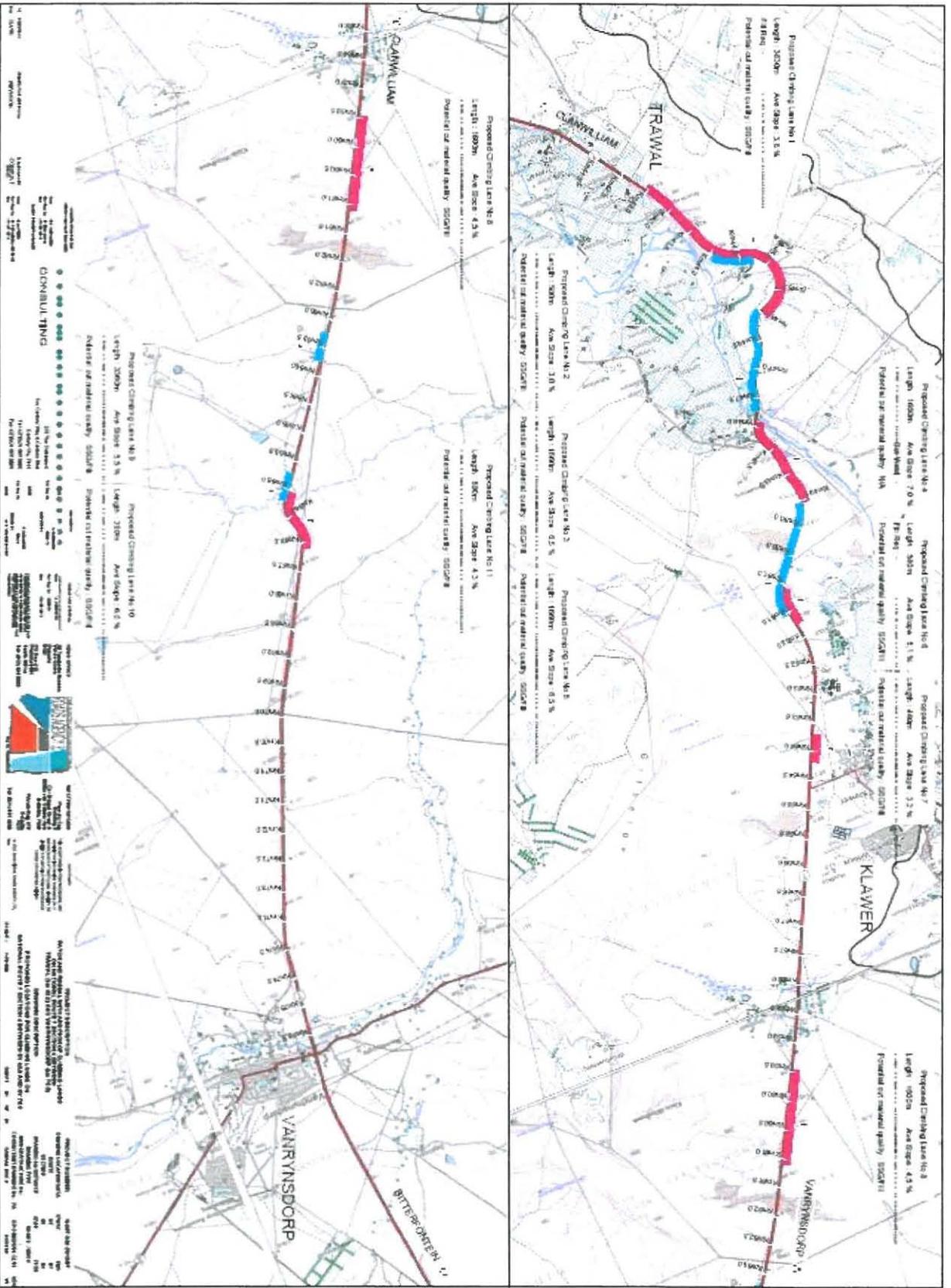


Figure 2: Proposed upgrade with passing lanes shown by red and blue stripes

## 5. METHODOLOGY

This study has been commissioned as the HIA component of a Basic Assessment process. It assesses the identified range of impacts on heritage, focussing on archaeological, palaeontological and visual impacts with comments from IAAP's in compliance with the comment on the NID received from HWC (see Appendix 1 - still awaiting HWC comment).

Maps of the proposed Climbing Lane sections, culverts, bridges and borrow pits were provided by SIVEST (Figure 2). Lane sections were digitised and converted for uploading to handheld GPS receivers (set to the WGS84 datum) to facilitate the identification of the search area during field work. Drive and walk search paths were recorded with the GPS and photographs were captured to characterise the local receiving environment and heritage resources. Most works will occur within the existing road reserve although in some instances where existing conditions are difficult, additional land might have to be acquired to facilitate climbing/passing lanes.

The fieldwork was conducted on the 29th September 2012, by Mr D Halkett and Ms R Mosdell.

### 1.6 Limitations

No limitations were experienced while conducting the study

## 6. FINDINGS

### 1.7 Archaeological and heritage sites

Minimal archaeological material or concerns were identified during the survey, but two farm cemeteries may require some replanning of two of the climbing lanes. The findings are presented in Table 1, where the heritage sites are listed and described.

Two cemeteries lie just outside the road reserve and some assessment will have to be made as to whether the road works will impact on them. The reason for two cemeteries in these locations is presumed to relate to the building of this section of N7 in the 1950's. The older graves lie to the south, while more recent graves are in the northern one.

Although the route lies largely outside of the areas where rock paintings are known to occur alongside the N7, in the few instances where rock was observed alongside the road, it was assessed in terms of a broader view of potential impacts. Two localised, ephemeral silcrete artefact scatters were observed and are of interest as they probably signal the presence of silcrete sources nearby. A small Late Stone Age artefact scatter in partially disturbed context was identified at a rock outcrop previously damaged during preparation of a road cutting.

**Table 1: Heritage sites**

Site	Lat (dec deg)	Long (dec deg)	Road feature	Description	Mitigation
001			climbing lane 8	Localised disturbed, silcrete scatter, large flakes, fresh-looking. Looks like debitage that may be associated with a silcrete outcrop. Suspect that the rocks protruding from the ground on the farm to the west of the road may in fact contain silcrete, or it is buried (Plates 1-2).	No further action is required. The material will not tell us more about the occurrence if collected. It does highlight the possibilities for silcrete rafts in the area.
002			climbing lane 11	A few flakes of silcrete on the bank above a road cutting. As with 001, material is fresh looking and is also perhaps debitage that may be associated with a silcrete outcrop in the area, though the rock in the road embankment are primarily dolomite.	No further action is required. The material will not tell us more about the occurrence if collected. It does highlight the possibilities for silcrete rafts in the area.
003a			climbing lane 1	A ledge of Table Mountain Sandstone boulders immediately adjacent to the	A surface collection and shallow scrape of the minimal sandy floor

				road. These had previously been cut through when the original N7 was prepared. A small scatter of Late Stone Age artefacts on silcrete, quartzite and quartz was found in semi-disturbed context just beyond the road reserve on a small "floor" in front of one of the boulders. Some quartz pieces were noted inside the road reserve amongst the rubble of the previous road cutting. No rock paintings were noted on the exposed boulders (Plates 3 - 5).	should be undertaken to collect and document the artefactual material. This can be easily achieved in a short time.
004a	S31.85981	E18.61164	climbing lane 1	Farm graveyard, very overgrown, containing in the order of 20-40 graves. Some of the recent graves close to the N7 are surrounded by the remains of fencing. Many are formal graves with stone or cement surrounds and headstones, while others are simpler with unmarked sandstone slabs used as headstones. Marine shell was noted on some graves. Several graves dated to the 1940's, 50's and 60's and the most recent from 1965. Van Zyl, Van Lill, Niewoudt are some surnames observed (Plates 6 - 10).	Although outside the existing road reserve, road fill to accommodate the widening of the lane, could encroach on the cemetery. The site must be surveyed onto plans and the engineers must determine if the road works can be accommodated without impacting the site. If it will be possible, the cemetery must nevertheless be cordoned off during construction with visible materials.
004b	S31.86022	E18.61157		cemetery corner point	
004c	S31.86020	E18.61141		cemetery corner point	
004d	S31.85978	E18.61145		cemetery corner point	
005a	S31.85908	E18.61058	climbing lane 2	Farm graveyard, on the opposite side of the N7 road from 004. The cemetery is less overgrown and partially surrounded by bluegum trees. A small stream has encroached on the one edge. 15 Formal graves cluster in the upper section towards the road, with headstones including Lochner, Niewoudt, Coetzee and Prins. The oldest grave dates to 1966 (Plates 11- 13).	Although outside the existing road reserve, road fill to accommodate the widening of the lane, could encroach on the cemetery. The site must be surveyed onto plans and the engineers must determine if the road works can be accommodated without impacting the site. If it will be possible, the cemetery must nevertheless be cordoned off during construction with visible materials.
005b	S31.85894	E18.61035		cemetery corner point	
005c	S31.85871	E18.61061		cemetery corner point	
005d	S31.85884	E18.61076		cemetery corner point	

## 1.8 Bridges, culverts and borrow pits

No archaeological issues were identified at any of the culverts, canals or underpasses that would prevent them being widened where necessary.

All **box culverts** are constructed from concrete and have no inherent heritage value. Culverts provide places for occasional water flow, irrigation scheme canals, and vehicular or pedestrian access under the N7 and tend to be provided through areas which have previously been infilled in the course of building the N7. As a result, areas of the road reserve adjacent to these are largely disturbed. In any event, no sensitive heritage was identified at any of the culvert points.

There is no built environment to speak of along the route that will be directly affected by the proposals. The **Olifants River bridge** is perhaps the exception, that could be said has some aesthetic qualities. Postdating 1954, it is an elegant arched structure with some aesthetic qualities (Plates 14 & 15). Only the top of the bridge is being moderately widened to accommodate pedestrian traffic. The proposed work poses no archaeological (or visual) problems. The **Wiedou River bridge** is a standard concrete structure with no particular aesthetic qualities (Plate 16). It will only be resurfaced and so there are no archaeological concerns.

Two existing **borrow pits** are to be used in addition to material derived from road cuttings (Plates 17 - 19). Borrow pits will be expanded moderately to accommodate the requirements during the N7 upgrade. Minimal isolated ESA archaeological material was identified at BP2.



**Figure 3:** Most heritage issues lie within this area. The borrow pits are shown by Turquoise polygons, while the cemeteries by small ochre coloured polygons just to the south on the wide curve. Climbing lanes indicated by blue or red.



**Figure 4:** A small archaeological site is shown by marker 003. The two farm cemeteries are indicated by the ochre coloured polygons based on GPS co-ordinates. The road reserve appears lighter in colour than the surroundings and is elevated on road fill at this point to even out the gradients. Driefontein farm is situated on the northern side of the road.

**Table 2:** Heritage issues identified at bridge and culvert upgrade locations

Description	Km ref.	Proposed works	Heritage issues
Olifants River Bridge	47.8	Widening top for pedestrian walkways only	Built post 1954. Arch. Has aesthetic qualities. One of few major bridges along the N7. No archaeological issues.
Wiedou Bridge	66.2	Resurfacing only	Basic concrete bridge of no particular significance. Typical of bridges along the N7.
Culverts general	47.45 and 48.25	Widening	No archaeological issues identified to prevent widening.
Borrow pits	BP2: at 43.8 next to N7. BP3 is on a divisional road off the N7	Expansion of existing pits	No archaeological issues identified to prevent expansion and re-use of either of the existing pits.

### 1.9 The climbing lanes:

Climbing lanes will be introduced to provide passing opportunities at known congestion points along the route. These will be achieved on both left and right hand sides as required. Areas within the existing road reserve will be utilised, but land will be acquired where they cannot be accommodated. In some cases, road cuttings will be expanded to accommodate widening but in many places widening will be achieved by introduction of road fill. A few archaeological sites have been identified along the route. For the most part easily manageable. The most significant heritage sites are two cemeteries, one on each side of the N7 at km 44.45 (south) and 44.6 (north). They lie just beyond the existing road reserve alongside two of the climbing lane sections (Cl 1 and 2). The engineers will have to determine if the road can be accommodated without impacting on either of the two cemeteries.

The findings with respect to climbing/passing lane features is summarised in Table 2. Photographs of typical receiving environments are shown in Plates 20 - 22)

**Table 3:** Heritage issues identified at climbing lane upgrade locations

Climbing Lanes	west		east		Length km	Receiving Environ	Heritage issues
	km	km	km	km			
1	42.5	46.0			3.63	steep embankment of fill to even out valley	Cemetery immediately to west of road reserve. Small rock overhang with stone artefact scatter. Engineers to examine if lanes can be accommodated given the proximity of the cemetery. Stone artefact scatter to be mitigated.
2			44.0	45.5	0.58		Cemetery immediately to east of road reserve. Engineers to examine if lanes can be accommodated given the proximity of the cemetery.
3			46.0	48.25	1.66		no archaeological issues
4	48.0	49.5			1.66		no archaeological issues
5			49.5	51.5	1.66		no archaeological issues
6	51.0	51.75			0.58		no archaeological issues
7	53.7	54.25			0.48		no archaeological issues
8	59.5	61.1			1.6	even sandy area with rocky areas	Silcrete artefact scatter inside and outside road reserve (possible silcrete outcrop in vicinity). No archaeological mitigation required.
9			63.25	63.75	0.36		no archaeological issues
10			65.75	66.25	0.36		no archaeological issues
11	66.0	67.0			0.89	road cutting exposing local dolomite rocks	Silcrete artefact scatter inside road reserve. Origin unknown. (possible silcrete outcrop in vicinity). No archaeological mitigation required.

## 7. ARCHAEOLOGICAL CONTEXT

Little archaeological work has been undertaken along the section of the route proposed for upgrade. Two reports by Kaplan, (1997, 2008) are not directly useful for comparative data as they refer to sites immediately along the Olifants River some distance from the road, rather than along the N7 itself. Halkett 2012 (a and b) indicated that there were few archaeological issues resulting from the road modifications on the section of the route from Clanwilliam to Trawal, Webley and Halkett (2010) found rock paintings and stone artefact scatters in rock shelters on Birdfield farm to the west of the Olifants River bridge but several kilometres from the road. Rock paintings are known from personal experience to be located in the rocky outcrops behind the weigh station to the east of Klaver, but these are also distant from the road will not be affected in any way by the proposed developments. Orton (2010, 2011) has demonstrated the presence of Late Stone Age and Middle Stone Age archaeological material around Van Rhynsdorp and while Orton et al have noted and excavated both LSA and MSA material from the Knersvlakte north of Vredendal. Rock paintings and LSA material is known to exist along the Wiedou River in the numerous shelters formed in the Dolomite and TMS strata.

## 8. CONCLUSIONS AND RECOMMENDATIONS

A small scatter of artefacts (003) may be affected by Climbing Lane 1. Some mitigation is therefore required if the lane is constructed at this point. Given the presence of the cemeteries not far away, realignment of climbing lanes 1 and 2 may be required, and may influence the mitigation. Road widening can proceed after the mitigation.

Of more concern are two farm cemeteries (004 and 005) that lie just outside the road reserve within the areas proposed for Climbing Lanes 1 and 2. The engineers will have to evaluate the positions of the cemeteries and determine if it is feasible to upgrade the road in these areas without impacting either.

Preference would be to leave them untouched, but if the road here are absolutely essential, and they cannot be accommodated without impacting either one or both cemeteries, exhumation may be considered as a last resort. Several permissions are required from both the authorities and families of the deceased who would have to be traced and consulted. If this option is considered, it is likely to be a lengthy process and should be undertaken well in advance of the construction program. We cannot guarantee that permissions will be granted by any, or all of the parties. An engineering solution is preferred. The owners of the graveyard may need to be consulted with respect to any construction that will occur in proximity of the cemeteries. A permit from the South African Heritage Resources Agency (SAHRA) may be required to undertake construction in such close proximity to graves and consultation in this regard must be entered into with SAHRA following inspection by the engineers to determine requirements.

If it is feasible to accommodate the lanes within the situation as is, then both cemeteries must be identified on construction plans and they must be fenced for the duration of the construction phase. No construction vehicles may enter the cordoned areas nor should there be any incursion of fill material into the sites. Consultation with the affected families of the deceased may be required if there is to be encroachment outside of the road reserve at these locations.

If the lanes are abandoned or modified to avoid these areas and the *status quo* is maintained, then all requirements *vis a vis* the cemeteries would fall away.

We also add a general caution with respect to unmarked graves which could occur in sandy areas, particularly in proximity to known settlements or archaeological sites along all of the climbing lanes. As there are few identified heritage indicators we do not expect this to be a major issue, however, if

any are uncovered during construction, this must immediately be reported to Heritage Western Cape to determine what action is required.

The assessment of the upgrade has indicated very minor impact on archaeological sites or material. Two farm cemeteries may be affected by the proposals and engineers must examine the situation to determine what, if any, the impacts will be. Provided the recommendations are followed in the sections where heritage issues have been identified, there is no objection to the proposed upgrade overall. No limitations on climbing lanes, or the lengthening of existing culverts were noted on other sections of the route.

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## 10. PHOTOGRAPHS



**Plate 1:** The location of the silcrete artefact scatter alongside the road at km 59.8. It is mixed with road gravel inside the road reserve but less so over the boundary fence. **Plate 2:** A selection of large flakes of rather fresh looking appearance. **Plate 3:** A band of TMS, seen in the distance at the bend of the road was previously cut during the building of the N7. The area in front was used by Late Stone Age people who left scattered artefacts there.



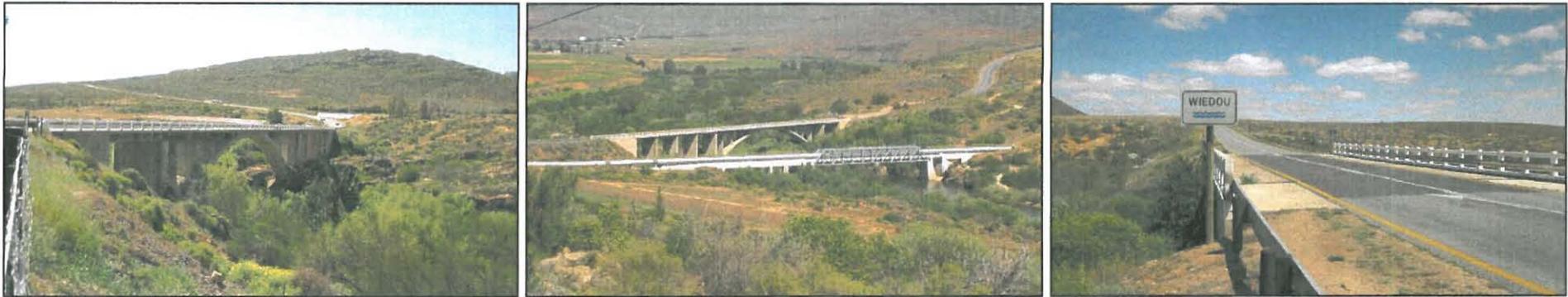
**Plate 4:** Debris from the previous road building can be seen to the side of the road. **Plate 5:** Small sandy “terraces” are too small for occupation but nevertheless contain scattered artefacts. Perhaps a more suitable shelter was removed during the initial road preparation? **Plate 6:** A row of cement gravestones protruding above the vegetation on an old silt terrace mark the one edge of an old farm cemetery (003). In the distance, a stand of bluegum trees identifies the location of another farm cemetery (005).



**Plates 7 - 10:** Formal graves date from the 1940's - 1960's. The names Van Zyl and Nieuwoudt are numerous. Some of the graves are marked only by simple stone mounds and sandstone slabs. Marine shell is noted on some graves.



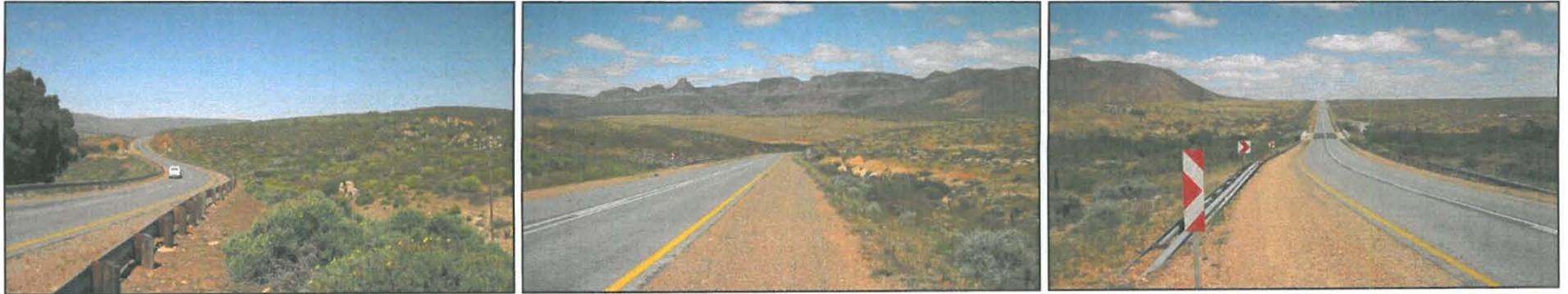
**Plates 11 - 13:** Another farm graveyard, surrounded by bluegum trees can be found immediately north of the N7 where 15 graves are present including graves of the Lochner, Nieuwoudt, Coetzee and Prins families.



**Plates 14 and 15:** Two views of the Olifants River bridge. **Plate 16:** The Wiedou River bridge



**Plate 17:** An existing borrow pit immediately adjacent to the N7 will be enlarged to supply material for the project. **Plate 18:** The N7 borrow pit can be seen in the distance as a dark line just above the treeline. **Plate 19:** An additional existing borrow pit on the divisional road to Clanwilliam may also be used to supply material for the project.



**Plate 20:** Typical receiving environment of the passing lanes between Trawal and the Olifants River. **Plate 21 & 22:** Typical receiving environment of the passing lanes beyond Klawer

APPENDIX 1  
NID Comment from HWC

**APPENDIX 3: PALAEOLOGICAL IMPACT ASSESSMENT**

# **Palaeontological Assessment N7 Upgrade Trawal to Van Rhynsdorp, (3118DC Klawer; 3118DA Van Rhynsdorp)**

**Prepared by**  
**Graham Avery**  
(Sole Proprietor)

Archaeozoology, Stone Age Archaeology and Quaternary Palaeontology

October, 2012

## Contents

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## 11. Executive Summary N7 Upgrade Trawal to Van Rhynsdorp

Graham Avery was commissioned by SiVEST on behalf of SANRAL to conduct a survey of the palaeontological potential along the proposed upgrade route.

Applicant: SiVEST/SANRAL  
Proposed activity: Upgrade of existing national road  
Location: N7 Trawal to Van Rhynsdorp, Western Cape Province

The occurrence of fossils in the rock substrates is unlikely. However, any excavation for foundations and/or infrastructure that penetrates into the sandier Quaternary sediments may encounter wetland deposits and/or fossils.

The upgrade traverses the western slopes of the Olifants River Valley. The area is hilly and the geology indicates hard rock deposits of predominantly Cape Super Group quartzites, traces of other hard rock formations and, mostly North of Klawer, more recent predominantly sandy Quaternary sediments. A band of limestone cuts across the N7 roughly half way between Klawer and Van Rhynsdorp.

The Cape Supergroup and other rocks do not normally preserve fossils. It is, however, possible that fossils could be encountered during any excavation (notably for the bridges) that cuts into Quaternary deposits. Quaternary alluvial deposits may include sand and gravel sediments that could contain fossils and/or sub-fossils. Limestone may include solution cavities (pockets) that can preserve fossils. The existence of "heuweltjies" is noted; they may reveal fossils and/or sub-fossils if cut through during construction. These, the limestone outcrop and any alluvial deposits (at river crossings in the main) should be carefully assessed.

Sparse fossils or sub-fossils of interest could be encountered during any excavation that cuts into undisturbed softer sediments; such younger sediments may contain ancient wetland deposits and/or more-recent fossils. Small pockets of bone can occur, for instance, where bone accumulators like hyaenas, Jackals or porcupines used cavities or holes in harder substrates or burrows dug by aardvarks. Examination of borrow pits may provide clues as to potential, but this is minimal.

"Heuweltjies are present in the vicinity of BP2 and other sandy areas along the route, but BP3 appears to have already been heavily disturbed. Any excavation along the upgrade that cuts through a "heuweltjie" should be carefully monitored.

Collaboration between the developer/contractor and a suitably-qualified palaeontologist will be required when sufficient detail is available for more-accurate assessment of the approved line and decision-making regarding the necessity (or not) of monitoring during construction. Geotechnical information and details of the depth to which any excavations will extend would assist in assessing whether monitoring will be necessary.

**Provided that the recommendations of this assessment are complied with, there is no palaeontological reason why the proposed development should not proceed.**

## 12. Location of proposed N7 Trawal-Van Rhynsdorp Upgrade

The proposed area falls on topographical maps 3118DC Klawer and 3318DA Van Rhynsdorp.

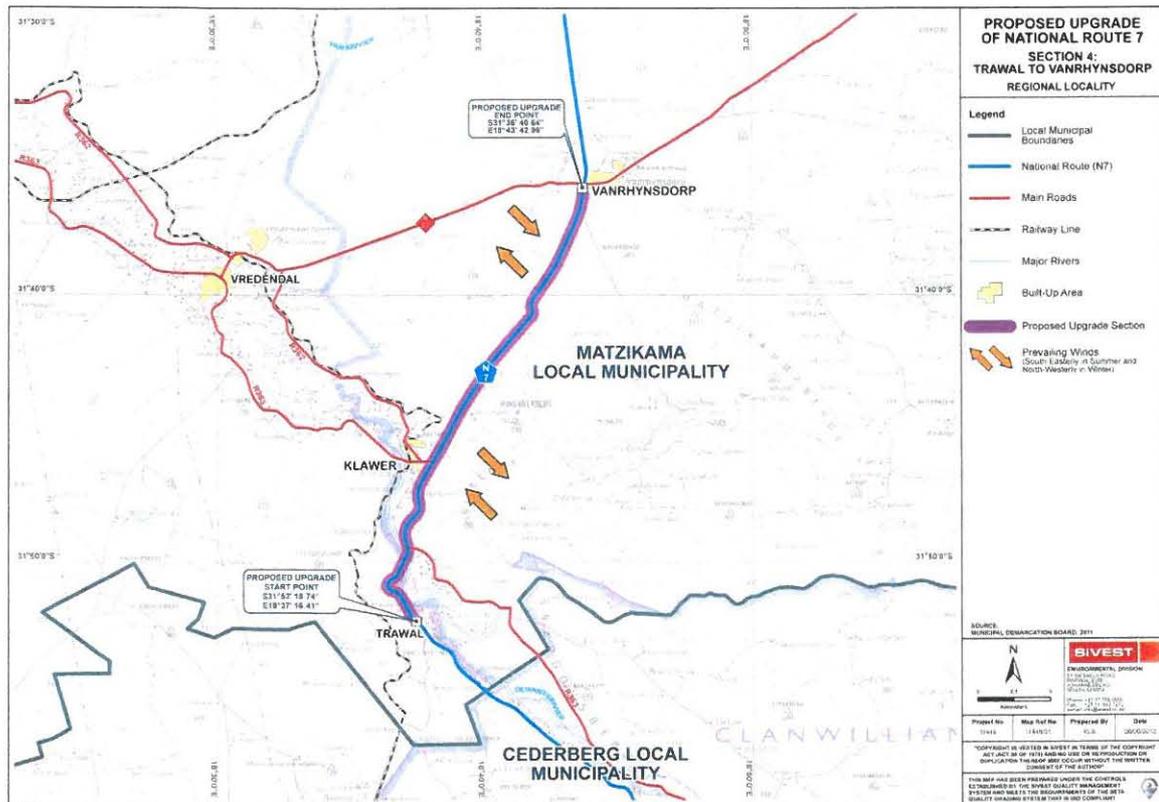


Figure 1. The location of the upgrade (1:250 000).

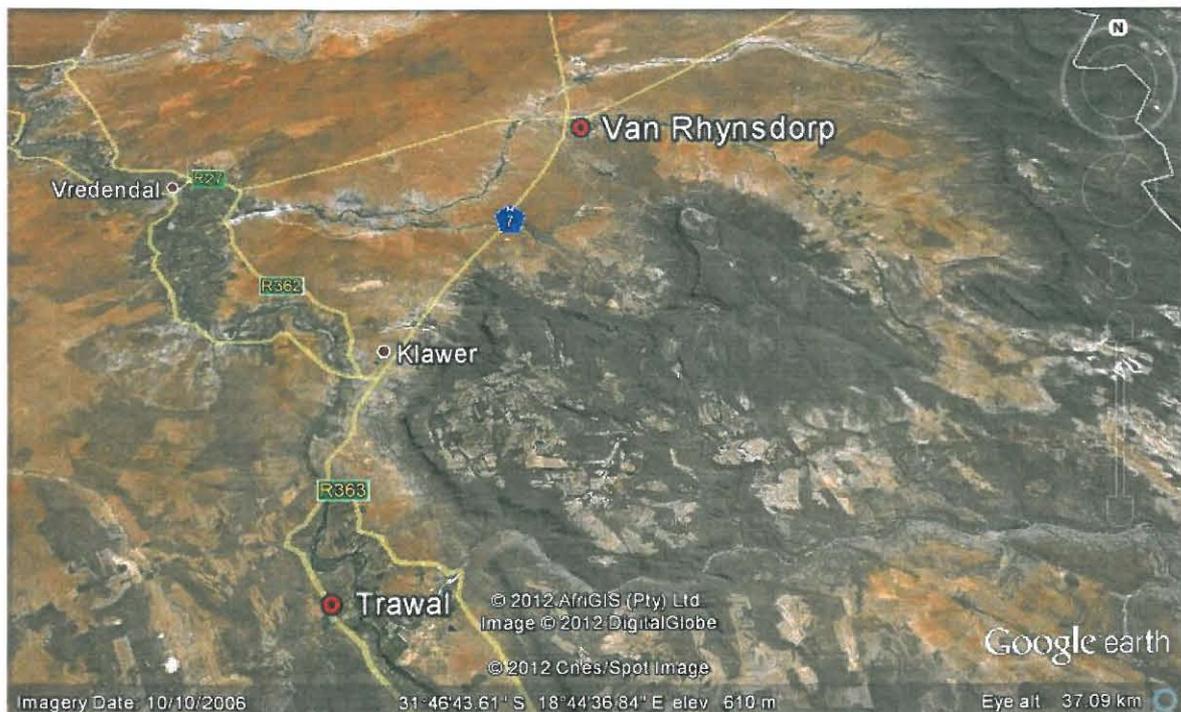


Figure 2. Google Earth view showing N7 between Trawal and Van Rhynsdorp.



Figure 2. Location of the two proposed borrow pits, **BP 2** (31°51'50.28" S 18°37'01.63" E) and **BP 3** (31°51'07.66" S 18°38'16.60" E)

Figure 3. Google Earth view showing location of proposed borrow pits (ACO Report). Heuweltjies are present in the vicinity of BP2 (and see Figure 5). The surface of BP3 has been disturbed.

### 13. Method

A desktop study was conducted, by Dr G. Avery Archaeozoologist. Details of the upgrade were provided (Figures 1 and 3). Geological maps and Google Earth images were consulted. Details of the underlying sediments are derived from 1:250 000 Geological Series 3118 Calvinia (Figure 4). Norman and Whitfield (2006) provide a simple summary of the surrounding geology.

#### Results of Survey

No surface palaeontological material was found in the literature.

Sandy soils of the area have been heavily modified by agricultural activity. The area is hilly and the geology (Figure 4) indicates hard rock deposits of predominantly Cape Super Group quartzites (bright light blue Op), traces of other very ancient hard rock formations and, mostly North of Klawer, more recent predominantly sandy Quaternary sediments (buff and yellow-stippled colours). A band of limestone (darker blue labelled LS) cuts across the N7 roughly half way between Klawer and Van Rhynsdorp.

The Cape Supergroup and other rocks do not normally preserve fossils. It is, however, possible that fossils could be encountered during any excavation (notably for the bridges) that cuts into Quaternary deposits. Quaternary alluvial deposits may include sand and gravel sediments that could contain fossils and/or sub-fossils. Limestone may include solution cavities (pockets) that can preserve fossils.

It is possible that sparse fossils or sub-fossils of interest could be encountered during any excavation that cuts into undisturbed softer sediments; such younger sediments may contain ancient wetland deposits and/or more-recent fossils. Small pockets of bone can occur, for instance, where bone accumulators like hyaenas, Jackals or porcupines used cavities or holes in harder substrates or burrows dug by aardvarks. Examination of borrow pits may provide clues as to potential, but this is minimal. However, these, and any alluvial deposits that are dug into, could be potential sources of fossils and should be carefully assessed when the upgrade has been approved.



Figure 4. Section of 1:250 000 Geological Series 3118 Calvinia (arrow indicates Trawal).

'Round', raised hummocks (known as "heuweltjies") occur on sandy substrates and are evident on the example shown in Figure 5 as scattered patches, often marked by vegetation different to their immediate surroundings. These features are considered to be remnants of fossil termite mounds (Francis et al. 2012). They are of potential interest. Fossils may be revealed if "heuweltjies" are cut through during excavations; under suitable conditions termite nests themselves can be preserved (Moore and Picker, 1991, Lovegrove and Siegfried, 1989). While active ardvarks dig into termitaria and their burrows may subsequently be occupied by bone-accumulating animals, such as hyenas and porcupines; the calcareous content of the mounds may help to preserve bones. "Heuweltjies are present in the vicinity of BP2, but BP3 appears to have already been heavily disturbed. Any excavation along the upgrade that cuts through a "heuweltjie" should be carefully monitored.

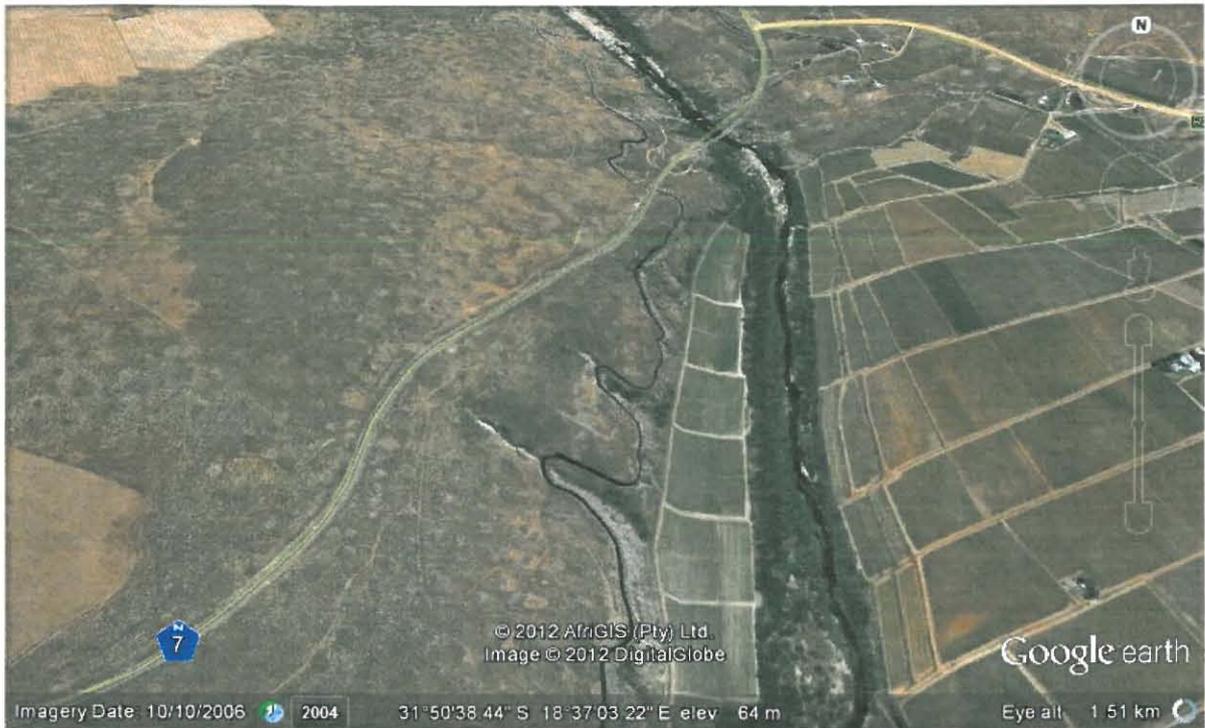


Figure 5. Google Earth image showing “heuweltjies” (centre-point 31°50’41.61”S; 18°36’52.80”E).

While the occurrence of fossils in underlying hard rock sediments in the area concerned is unlikely, any excavation that penetrates into the superficial Quaternary sediments or alluvium may have potential; collaboration between the contractor and a suitably-qualified palaeontologist will be required when sufficient detail is available for more-accurate assessment of the approved upgrade and decision making regarding the necessity (or not) of monitoring during construction of, e.g., bridges where excavation into alluvium may take place.

Geotechnical information and details of the depth to which any excavations will extend would assist in assessing whether and where monitoring will be necessary.

#### 14. Comments

Occurrence of palaeontological material along the proposed upgrade route is unlikely. Geotechnical information and details of the depth to which any excavations will extend would assist in assessing whether and where monitoring of alluvial deposits will be necessary.

While it is unlikely that fossils will be encountered, it should be borne in mind that small pockets of bone can occur in any deposit where bone accumulators like hyaenas, jackals or porcupines used holes/burrows dug by, for instance, aardvarks. Fossils can also be associated with alluvial deposits.

Good communication with the developer and contractors regarding the need for on-site monitoring during excavations will be required.

Permits from the appropriate Heritage agencies will be required should fossil remains be encountered. These should preferably be obtained ahead of any construction activity.

#### 15. Conclusion

The likelihood that palaeontological remains will be encountered during construction of the proposed upgrade of the N7 between Trawal and Van Rhyndorp is small but, if encountered, such material is important and must be recorded by an appropriately-qualified person.

Provided that the recommendations in this report are followed, current information indicates that the proposed upgrade will not impact significantly on palaeontological remains. Appropriately conducted the development may in fact provide opportunities to access rare fossil material and to better understand the local Quaternary sequence.

**From the palaeontological perspective the proposed upgrade can be allowed to proceed.**

## **16. Recommendations**

If possible, geotechnical information together with the proposed details of excavations for bridge foundations should be provided prior to the commencement of construction. This may enable a better estimation of the time(s) when/if monitoring might be necessary.

Excavations for foundations in areas where it is determined that fossils may be encountered should be monitored; the frequency of this is to be worked out a priori, once the upgrade is approved, by an appropriately-qualified palaeontologist and the developer/contractor to minimize time spent on site. The presence of "heuweltjies" that may be affected should be carefully assessed when the upgrade is approved.

Protocols for dealing with palaeontological/palynological monitoring/mitigation must be included in the Environmental Management Plan (EMP). Any such material is likely to be fragile and due care must be exercised.

Any material recovered will be lodged in the palaeontological collections of Iziko South African Museum. Funds must be available a priori to cover costs.

## **17. Heritage Permits Required**

The primary heritage legislation that needs to be considered is The South African Heritage Resources Act 25 of 1999 and regulations (details at [www.sahra.org.za](http://www.sahra.org.za)).

Clearance in terms of the National Heritage Act of 1999 and Amendments will be required before the development can proceed.

It is important that, to obviate possible delays should fossil material be encountered, permits from the Western Cape Provincial Heritage Agency be applied for ahead of construction. This would enable the monitor to readily recover material, should it be encountered during construction activities without delay.

Should human remains be encountered, they must be dealt with separately under SAHRA Regulations.

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Dr Graham Avery MRSSAf  
13 Prince Street  
Oranjezicht 8001  
Cell: 0834410028  
Email: [gavery@iziko.org.za](mailto:gavery@iziko.org.za)

Honorary Associate: Iziko Museums, Natural History Collections Department  
Honorary Research Associate: University of Cape Town, Archaeology Department

**APPENDIX 4: VISUAL IMPACT ASSESSMENT**

Proposed Upgrade of National Road N7, Section 4,  
Trawal to Vanrhynsdorp

**Visual Impact Assessment**

October 2012



Prepared by  
Bernard Oberholzer Landscape Architect / Environmental Planner  
Quinton Lawson, MLB Architects / Urban Designers

Prepared for  
SIVEST

On behalf of  
SANRAL

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Fig 5: Proposed Passing Lanes, Windhoek Farm to Vanrhynsdorp
Figures 6 to 12: Passing Lane Photomontages



Cemetery adjacent to the N7 on the Driefontein Farm.

## 1 Introduction

### 1.1 Project Background

The proposed project would undertake remedial measures aimed at improving the overall condition and safety of the N7, Section 4 from Trawal to Vanrhynsdorp within the Matzikama Municipality, (SIVEST, Background Information Document).

The project would include widening of the existing roadway and bridges, addition of climbing lanes in places, and lengthening of pipes and box culverts where required. The route is indicated on Figure 1.

### 1.2 Terms of Reference

The terms of reference for the Visual Impact Assessment (VIA) includes the following:

- Quantify and assess the existing scenic resources/visual characteristics in and around the N7 Route in relation to the surrounding areas.
- Evaluate and classify the landscape in terms of its sensitivity to the road upgrade.
- Determine view corridors and important viewpoints in order to assess the visual impact of the proposed project.
- Assess the significance of the likely visual impacts resulting from the proposed project from various important viewpoints, e.g. farmsteads, recreational areas and tourist facilities.
- Identify practicable mitigation measures to reduce negative visual impacts and indicate how these can be built into the project design.

### 1.3 Methodology

The following steps were used in the visual assessment process:

- A site visit and photographic survey of the N7 route and surroundings;
- Identification of characteristics of the natural and cultural landscape;
- Identification of visual and scenic resources along the route;
- Preparation of photographic montages of the proposed road upgrading;
- Use of quantitative and qualitative criteria to measure potential visual impacts and benefits.
- Formulation of mitigation measures to minimise negative visual impacts.

### 1.4 Definition of 'Visual'

The term 'visual' used in this report is taken in its broadest meaning to include visual, scenic, aesthetic and amenity values represented by the natural and the built environment, which can in totality be described as the area's 'sense of place', and which encompass spatial and psychological characteristics.

### 1.5 Limitations and Assumptions

No actual design drawings for the widening of the roadway or road furniture such as crash rails, signage and picnic furniture were available during the preparation of the VIA.

It was assumed that a half-construction method for the roadway would be used, and that no temporary (or permanent) by-pass roads would be created during construction.

### 1.6 Key Issues

The public participation process is still in progress and a full list of issues is therefore not available. A number of visual issues have been identified by the visual specialists below:

- Potential visual impacts from the widening of the roadway for climbing lanes resulting in additional road cuts and fills.
- Potential encroachment on archaeological and graveyard sites.
- Potential disturbance of the rural/wilderness landscape during construction, including construction camps, temporary haul roads, visual scarring, dust and noise.
- Potential visual impacts and landscape disturbance at quarries and borrow pits related to the construction works.

## 2 Description of the Affected Environment

The N7 Route environment is briefly described in Table 2 below, including the visual/scenic significance of the area. Visual features of the route are indicated on Figures 2 and 3.

Table 1: Landscape Description of the N7 Route

<i>Location</i>	The N7 Section 4 study area is situated between Trawal and Vanrhynsdorp, in the Matzikama Municipality of the Western Cape. The N7 is the main national road between Cape Town and Namibia to the north.
<i>Geology</i>	The Klawer section of the N7 road consists of shale, mudstone and sandstones of the Table Mountain Group of rocks. The northern section of the road to Vanrhynsdorp consists of sediments of the Vanrhynsdorp Group, including ochry iron formation, limestone and phyllite s subjected to folding and metamorphism, (Norman and Whitfield, 2006).
<i>Physical landscape</i>	The topography is dictated by the geology of the area described above, the more rugged mountainous topography being a reflection of the harder Table Mountain Group rocks, and the flatter plains being the older more weathered Vanrhynsdorp Group rocks. The Olifants River has formed a wide alluvial valley running parallel with the N7 for part of the route.
<i>Vegetation cover and land use</i>	The vegetation around Klawer consists of 'Klawer Sandy Shrubland' changing to 'Vanrhynsdorp Gannabosveld' the vegetation being a reflection of the geology, (Mucina and Rutherford, 2006). The Olifants River valley to the east has been heavily transformed by farming, including orchards and vineyards.
<i>Visual significance of the area</i>	The N7 route follows the Olifants River Valley for part of the route before turning inland to Vanrhynsdorp, an area characterised by irrigated farmland, tree shelterbelts and dry shrubland to the north. The route is used by local farmers, transport trucks plying between the Western Cape and Namibia, and by visitors to the West Coast, Namaqualand and Namibia.  The N7 therefore has significance as a tourism route providing access to these destinations. It forms part of the Spring flower tours, as well as being a wine route. Old graveyards dating back to 1915 were noted adjacent to the N7, near the Driefontein Farm 3km south of the Olifants river Bridge.
<i>Opportunities and constraints</i>	The main visual constraints are the scenic value of the rural landscape, particularly along the olifants River, and the cultural heritage sites. An opportunity exists to not only increase road safety and access to the area, but to improve the visitor experience by upgrading viewing and picnic sites for visitors.



Historical graveyard adjacent to the N7 at KM 44.5 with graves dating back to 1915 and possibly older. Graveyard has become overgrown.

### 3 Description of Road Upgrade Proposals

The proposed project would involve remedial measures aimed at improving the overall condition and safety of the N7, Section 4 from Trawal to Vanrhynsdorp. The following activities are proposed, (see also Table 2 and Figures 4 and 5):

- Widening of the existing road structure to 3.7m lane widths with 1m surfaced shoulder and 600mm shoulder at proposed climbing lane locations;
- Lengthening of pipes, box culverts and vehicle underpasses where required;
- Localised repair and pre-treatment of the existing surface, subsurface drainage improvements and construction of an appropriate surface seal over the full 33.5km length;
- Widening of existing Olifants River Bridge;
- Potential land acquisition to accommodate construction of climbing lanes;
- Fill material for climbing lanes sourced from the road reserve during construction of widening and cuttings;
- Sourcing of base course materials and surfacing materials required from commercial sources;
- Higher quality materials for lower layers of the road may need to be sourced from borrow pits;
- Two borrow pits have been identified for construction material extraction. Exemption from a mining permit has been applied for.

Table 2 : Schedule of Road Upgrade Proposals

Proposed Roadworks	Location / distance	Comments
Road widening over entire length	Total 33.5km	Proposed widening and resurfacing of roadway. Increase in overall width of roadway from approx. 7.2m to 9.4m + side drains.
Climbing lanes in 11 places	Total 13.66km	Overall width of roadway at proposed climbing lanes is 12.3m + side drains.
Bridge widening	Km 47.8	Widening of road over the Olifants River Bridge by 2.2m, and widening of the bridge from 8.38m to 12.65m. Paving of the Wiedou Bridge.
Box culvert lengthening	Km 47.45 Km 48.25	2 box culverts. Would require roadway to be excavated and refilled.
Vehicle underpass	Km 47.57 Km 48.16	2 vehicle underpasses. Would require roadway to be excavated and refilled.
Cut / fill embankments		Height and volume of proposed cut / fill slopes varies.
Borrow pits at 2 locations	Km 43.8	Existing borrow pits to be utilised. Borrow pit coverage unknown. The N7 borrow pit is highly visible adjacent to the N7. The second borrow pit is near Eureka farmstead on a district road.
View / picnic sites		3 existing view / picnic sites to be resurfaced and furniture upgraded.
Construction camp/s		Size and location unknown.
Haul roads		Length and location unknown.

### 4 Planning and Legal Context

The proposed construction of the N7 Road Upgrade requires compliance with the Environmental Impact Assessment (EIA) Regulations of 2010, promulgated in terms of the **National Environmental Management Act, Act 107 of 1998**, as amended. This triggered the requirement for a Basic Assessment.

The **National Heritage Act (Act 25 of 1999)** involved the submission of a Notification of Intent to Develop (NID) to Heritage Western Cape (HWC). HWC in turn required an integrated heritage impact assessment (HIA), including 'a visual / spatial impact assessment study' for this particular project.

There are no specific legal requirements relating to visual, except that the study be undertaken by specialist consultants having the relevant qualifications and appropriate experience.



Example of road widening during construction of N7 between Citrusdal and Clanwilliam.



Telephone wires and signs clutter the skyline on existing N7 route.



Existing borrow pit 'C' on the N7 identified for proposed expansion.



Existing borrow pit 'D' on district road, identified for proposed expansion for road works.

## 5 Visual Assessment Criteria

Quantitative and qualitative criteria, listed below, are used to measure the value and sensitivity of visual / scenic resources, and these are used in turn to rate the potential visual impacts and benefits.

### 5.1 Viewpoints

Viewpoints were selected based on prominent viewing positions of the upgrading proposals along the N7 route. These tended to be within the road corridor, particularly where climbing lanes are proposed involving road widening and possibly road cuts, as well as bridge widening and borrow pits. The road users would tend to be the most affected. The viewpoints are listed in Table 3 below, and indicated in Figures 4 and 5.

### 5.2 Visibility

Visibility tends to be determined by distance between the proposed road works and the viewer. Given that the N7 is an existing road, and that the existing horizontal and vertical alignment will be retained, the road widening would mostly result in only a marginal increase in visibility. Table 3 gives an indication of the potential visibility of the of the proposed road works, based on the field survey and a study of the photographic simulations. (Figures 6 to 12).

### 5.3 Visual Exposure

Visual exposure is usually determined by the 'viewshed' or 'view catchment', being the geographic area within which the proposed road works would be visible. For the reasons mentioned above, the road corridor itself was seen to be the main visually affected area with a limited view catchment.

### 5.4 Landscape Integrity

The N7 route between Trawal and Vanrhynsdorp has a combined rural / wilderness quality with few visual intrusions or incompatible structures. The existing road has become embedded in the rural landscape, and except for some road cuts and construction works, the proposed road upgrading would not unduly affect the character of the area.

### 5.5 Visual Absorption Capacity

This is the ability of the landscape to conceal or screen the proposed road works, mainly by means of topography or vegetation cover. The generally low vegetation cover means that the visual absorption capacity is low, except where tree shelterbelts exist.

### 5.6 Visual Sensitivity

Visual sensitivity is determined by a number of factors, usually in combination, such as prominent topographic or scenic features. Along the N7 route these include the following:

- Mountain ridgelines, steep slopes and rock outcrops;
- Mountain kloofs with streams;
- Intact vegetation communities;
- Vistas of the Olifants River Valley;
- Cultural heritage sites, including farmsteads and graveyards;
- Rural landscapes including vineyards, citrus orchards and tree shelterbelts.

### 5.7 Cumulative Visual Impact

The proposed N7 road upgrading needs to be seen in context with the existing road. The current proposals will marginally add to the scale of the roadway. Based on the photomontages, the proposed road works would not add significantly to the visibility of the N7. Possible visual impacts could be potentially reduced by means of visual mitigation measures, such as re-vegetation.

The potential visual impacts are assessed in Tables 3 and 4 below.

Table 3: Potential Visual Impact (Trawal to Vanrhynsdorp)

View Point	Location	Length m	Cut / Fill m <sup>3</sup>	Potential Visual Impact
C1	Climbing lane LHS KM 42.40	3 630	8 000 / 0	<b>High.</b> Long climbing lane with large cut volume and height. Affects historical graveyard on western side of the N7 at KM 44.50. Generally scenic area near the Olifants River.
C2	Climbing lane RHS KM 44.70	580	1 800 / 3 500	<b>High.</b> Moderate length climbing lane with small cut and fill volumes of low height. Affects cemetery on eastern side of N7 at KM 44.60
C3	Climbing lane RHS KM 47.75	1 660	8 000 / 4 000	<b>Medium-high.</b> Long climbing lane with large cut and moderate fill volumes but low height. Scenic area near the Olifants River, including the bridge and picnic / viewing site.
C4	Climbing lane LHS KM 48.20	1 660	0 / 8 500	<b>Medium-high.</b> Long climbing lane with large fill volume but low height. Scenic area near the Olifants River with distant views of the river valley and mountains.
C5	Climbing lane RHS KM 51.00	1 880	3 000 / 0	<b>Medium.</b> Long climbing lane with moderate cut volume but low cut face. Scenic landscape area.
C6	Climbing lane LHS KM 51.10	580	0 / 4 000	<b>Medium-low.</b> Moderate length climbing lane with moderate fill volume and height. Scenic landscape area.
C7	Climbing lane LHS KM 53.70	480	0 / 2 000	<b>Low.</b> Short climbing lane with moderate fill volume and height. Scenic landscape area.
C8	Climbing lane LHS KM 59.20	1 600	0 / 2 800	<b>Medium-low.</b> Long climbing lane with moderate fill volume.
C9	Climbing lane RHS KM 63.60	360	0 / 3 500	<b>Low.</b> Short climbing lane with moderate fill volume, and low fill height.
C10	Climbing lane RHS KM 66.00	360	0 / 3 000	<b>Low.</b> Short climbing lane with moderate fill volume and low height.
C11	Climbing lane LHS KM 66.10	890	7 000 / 2 000	<b>Medium-high.</b> Moderate length climbing lane with large cut and moderate fill volumes and high cut face. Visible on the skyline in Wiedou River crossing area.
B	Bridge widening KM		2 000 / 14 200	<b>Low.</b> Widened bridge with pedestrian lanes. Scenic viewing area of the Olifants River.
bp1	Borrow pit 1 KM 43.8	?ha	-	<b>High.</b> Existing borrow pit to be enlarged. Visible from the N7 in scenic area near the Olifants River.
bp2	Borrow pit 2 Eureka	?ha	-	<b>Medium-low.</b> Existing borrow pit to be enlarged. Visible from the district road. Rural area next to the irrigation canal.

Table 3 reveals that potential visual effects of the road works will range from low to high intensity based on the length of the climbing lanes and amount of cuts / fills on the one hand, combined with the visual sensitivity of the landscape on the other. Road works, and especially cut or fill faces, tend to be more visible on the skyline.

The potential visual impacts are moderated by the fact that the road works will take place within the existing N7 road alignment, but could be exacerbated by the visual-scenic attributes of the natural and cultural landscape along the route. These potential impacts should also be seen in the context of the heritage assessment.

The climbing lanes at C1 and C2 are of particular concern because of the proximity of historical graveyards to the N7.

The potential visual impacts are further evaluated in terms of the spatial extent and duration of the impacts as indicated in Table 4 below.

Table 4 : Synthesis of Visual Impacts / Benefits

Criteria	Comments	Climbing Lanes	Bridge widening	Borrow pits	Construction Phase
Intensity of visual impact	See ratings in Table 3.	Low to high visual impact	Low visual impact	BP1 High BP2 Med-low visual impact	High visual impact
Spatial extent geographic area: local, district, regional	Marginal visual effect beyond 2km.	District	Local	Local	District
Duration Projected life-span of project.	Potentially longer than 15 years.	Long-term	Long term	Short term	Short term
Probability Possibility of the impact occurring.	Limited potential for visual screening.	Highly probable	Highly probable	Highly probable	Highly probable
Confidence Degree of predictability.	Based on available information and photomontages.	High	High	High	High
Overall significance	Synthesis of criteria	Varies: low to high significance	Low significance	BP1: High BP2: Med-low significance (short term)	Varies: medium to high significance (short term)
Status		Negative	negative	Negative	Negative



High fences at view sites should be below the level of the road to allow uninterrupted views.



Picnic and view sites should be upgraded to be in keeping with the tourist route.

## 6 Mitigation Measures

The N7 is a significant commuter and tourist route in the region, and mitigation measures should be incorporated to blend the proposed road works with the landscape. The measures outlined below are intended to minimise potential visual impacts that could arise from the proposed road works, and to enhance benefits.

### 6.1 Design Phase Mitigations

- Reduce the length of climbing lanes at C1 and C2 to avoid interference with the historical graveyards on both sides of the N7. (Climbing lane C1 could be divided into 2 sections, leaving out the section in the middle where the graveyard occurs).
- Minimise cut slopes on the mountain side and fill slopes on the valley side by slight adjustments to the horizontal road alignment, where possible.
- Where cut slopes are inevitable, ensure that a rough irregular face is achieved to create niches for re-vegetation.
- Use stone gabions instead of concrete retaining walls and barriers where possible. Use locally occurring stone for the gabions to blend with the surrounding landscape.
- Construct the stone gabions in a stepped formation to provide ledges for planting.
- Use stone gabions and reno type mattresses for headwalls and aprons instead of concrete at drainage outlets/ culverts.
- Use local stone for facing of exposed concrete structures.
- Use an exposed aggregate finish for solid concrete barriers and side drainage channels.
- Avoid the use of vertical barrier kerbs along the route or at picnic / view sites as these create an 'urban' effect not in keeping with the rural / wilderness character of the area.
- Replace existing picnic furniture with appropriately designed furniture in keeping with the scenic qualities of the route. Consider using natural stone in the design of furniture where possible, and gravel instead of premix surface material.
- Re-locate the high fences at picnic / view sites further down the slope, below the level of the road surface, to allow unobstructed views. Create appropriate visitor viewing facilities at the Olifants River Bridge.
- Commission landscape plans for the layout and design of all picnic and viewing sites, by a suitably qualified landscape architect.

### 6.2 Construction Phase Mitigations

- Limit the width of the construction area along the route as far as is practical, to minimise disturbance of the surrounding landscape.
- Cordon off the construction area to avoid unnecessary damage to the surrounds, and apply strict penalties for unauthorised disturbance or damage to the surrounds.
- Permit only small areas to be cleared at a time for road construction, and rehabilitate disturbed areas as soon as possible to minimise visual impacts.
- Investigate alternative borrow pits in the general area that are less visually obtrusive from the N7 route.
- Screen Borrow Pit 1 from the N7 with berms and/or planting, and rehabilitate / revegetate all borrow pits as soon as possible.
- Restrict the creation of additional haul roads in the surrounding landscape and rehabilitate these as soon as possible.
- Locate construction camps, crusher plants and stockpiles out of view of the N7 and neighbouring farmsteads where possible.

- Re-locate existing overhead utility lines underground as part of the road works where possible to reduce visual clutter in the landscape.
- Require an environmental management plan (EMP) to form part of the construction process.

### 6.3 Operational Phase Mitigations

- Restrict non-essential and commercial signage to reduce visual clutter and intrusion along the N7 route. (The current small Cape-Namibia Route signs are not legible and unnecessarily add to the clutter of poles along the route).
- Ensure that resources are made available to maintain picnic and view sites, and to regularly remove refuse.
- Ensure that resources are made available to remove invasive alien vegetation, clear side drains, control erosion, and to re-vegetate the road verges on an on-going basis.

The significance of the visual impacts before and after mitigation are assessed in Table 6 below.

Table 5 : Significance of Visual Impacts before and after Mitigation

	Comments	Significance before mitigation	Significance after mitigation
Significance: Climbing Lanes	Significance is based on Table 4 ratings. Significance after mitigation assumes the mitigations in Section 6 are implemented.	Varies: low to high significance	Varies: low to medium-high significance
Significance: Bridge widening	Significance is based on Table 4 ratings. Few opportunities for mitigation.	Low significance	Low significance
Significance: Borrow pits	Significance is based on Table 4 ratings. Significance after mitigation assumes the mitigations in Section 6 are implemented.	BP1: high BP2: medium-low significance	BP1: med-high BP2: low significance
Significance: Construction Phase	Significance is based on Table 4 ratings. Significance after mitigation assumes the mitigations in Section 6 are implemented.	Varies: medium to high significance (short term)	Varies: medium-low to medium-high significance (short term)



Existing signs are often in competition and add to visual clutter in the scenic landscape

## 7 Conclusion and Recommendations

The proposed road works for the N7 National Road from Trawal to Vanrhynsdorp, Section 4, involve the widening of the roadway to include shoulders, the addition of some 11 climbing lanes to facilitate overtaking, the widening of the Olifants River Bridge, the lengthening of pipes and culverts under the road, and the expansion of 2 existing borrow pits, one of which is close to the N7.

This section of the N7 is seen to have some visual significance because of the scenic qualities of the adjacent Olifants River, mountainous terrain, intact vegetation / spring flowers, wine cellars and general rural and wilderness characteristics of the area. The N7 is also seen as an important tourist route for visitors to the West Coast, Namaqualand and Namibia.

The proposed road works will take place predominantly within the existing road alignment, which will result in only minimal increased visibility from the surrounding area, and minimal effect on the viewshed of the roadway.

The proposed road works would result in some increase to road cuts and fills along the route, as well as possible interference with historical graveyards, which could have both visual and heritage impact implications. The lengthened box culverts and vehicular underpasses, which are below the road, will have negligible visual impact, except during construction, when substantial earthworks are involved. Some indication of the nature of the earthworks can be obtained from the current work on the N7 between Citrusdal and Clanwilliam.

The proposed expansion of the Borrow Pit 1 on the N7 at KM 43.8, could have significant visual implications, being adjacent to the N7.

Based on the field survey, photographic simulations and assessment criteria used in this report, the visual impact assessment results were as follows:

- The road widening and climbing lanes would range from low to high potential visual impact before mitigation. This could be reduced to low to medium significance if the mitigations in Section 6 are implemented.
- The proposed expansion of the existing Borrow Pit 1 adjacent to the N7 would have high potential visual impact, and Borrow Pit 2 medium-low potential visual impact before mitigation. The use of the borrow pits would however be short term (construction phase), and the significance could be reduced if the mitigations in Section 6 are implemented. It is strongly recommended that alternative borrow pits be investigated away from visually sensitive areas.
- The construction phase of the proposed road works would have a high potential visual impact before mitigation. This would however also be short term. The significance could be marginally reduced to medium-high if the mitigations in Section 6 are implemented.

The following recommendations are proposed, arising from the visual impact assessment:

- The mitigations outlined in Section 6 should be integrated into the design, construction and operational phases of the proposed project. In particular, climbing lanes at C1 and C2 should be modified to avoid the historical graveyards.
- A rehabilitation ecologist should be commissioned to assist with the planning and implementation of revegetation of areas disturbed by the road works, particularly the road cuts and fills along the route, as well as drainage courses and wetlands that may be affected.
- A landscape architect should be commissioned to assist with the design and implementation of all picnic / view sites along the route, including picnic furniture, fencing, signage etc.
- An environmental control officer (ECO) should be employed on the road contract to ensure that disturbance to the surrounding landscape is minimised and that the environmental management plan (EMP) is implemented.

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- Passing Lane Prioritisation List for Route N7, Section 4, between Trawal and Vanrhynsdorp.
- SiVEST, undated. Background Information Document: Basic Assessment for the Upgrade of National Road N7 Section 4 from Trawal to Vanrhynsdorp including widening of Road and Addition of Climbing Lanes.

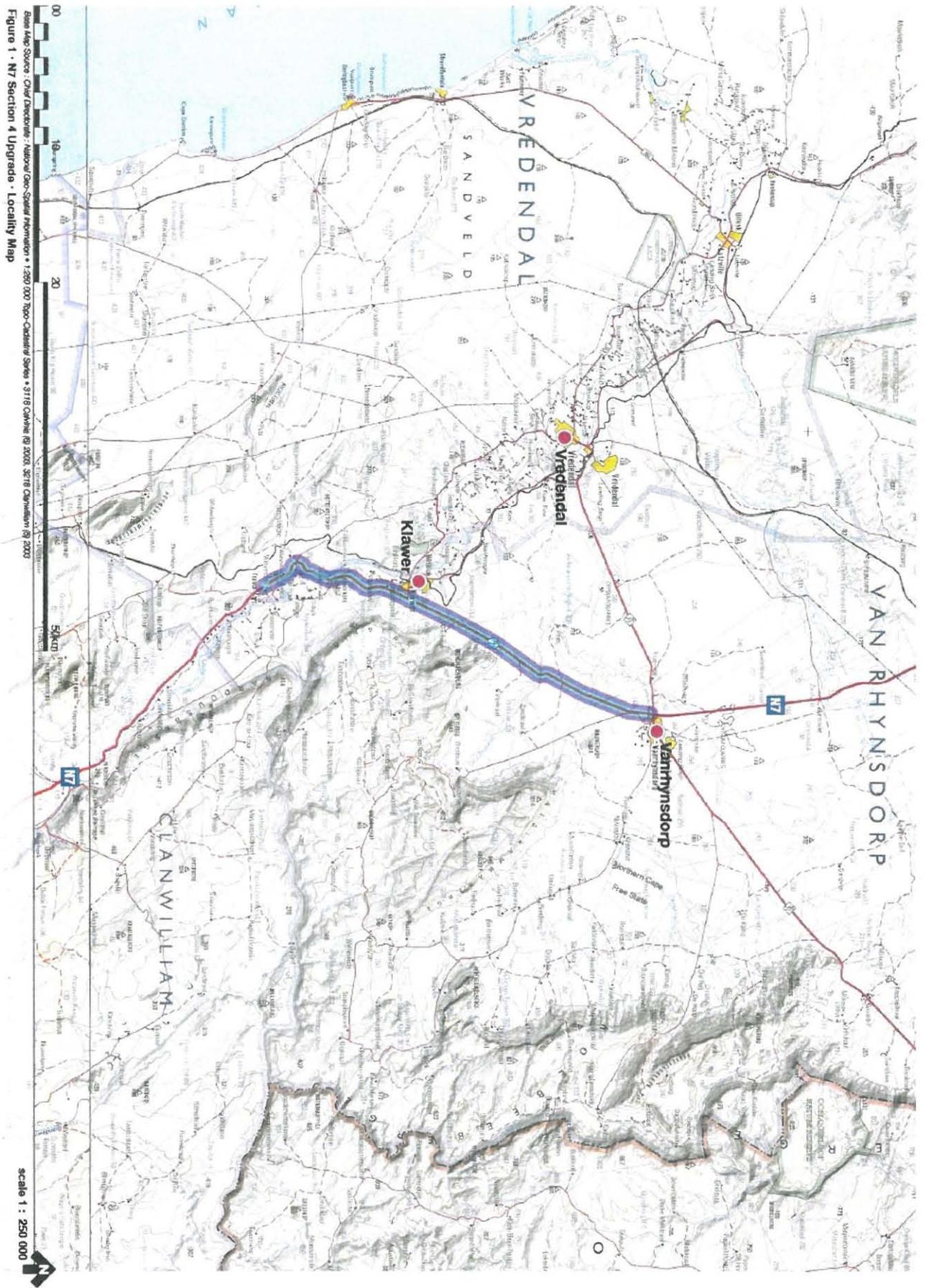
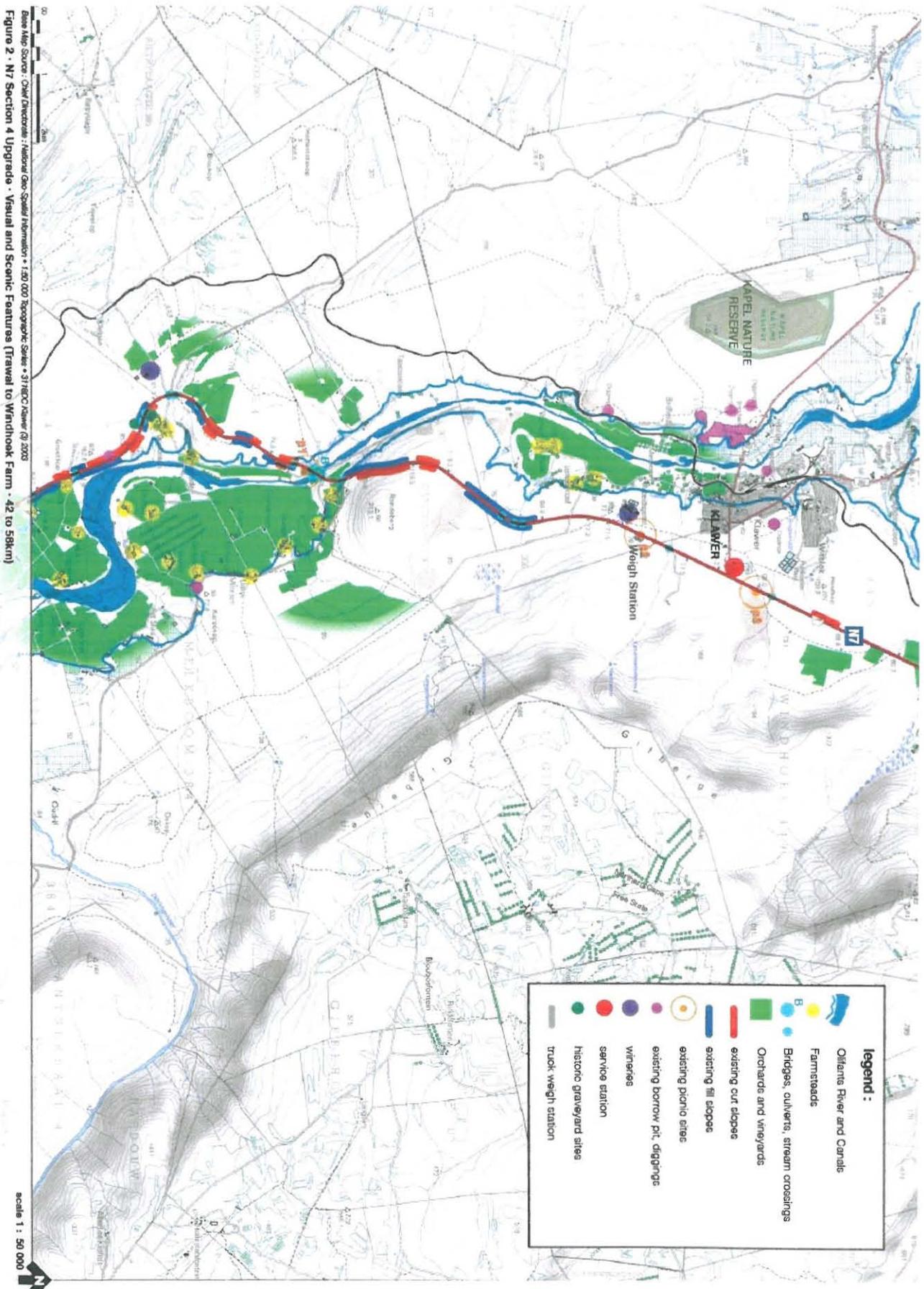


Figure 1 - N7 Section 4 Upgrade - Locality Map

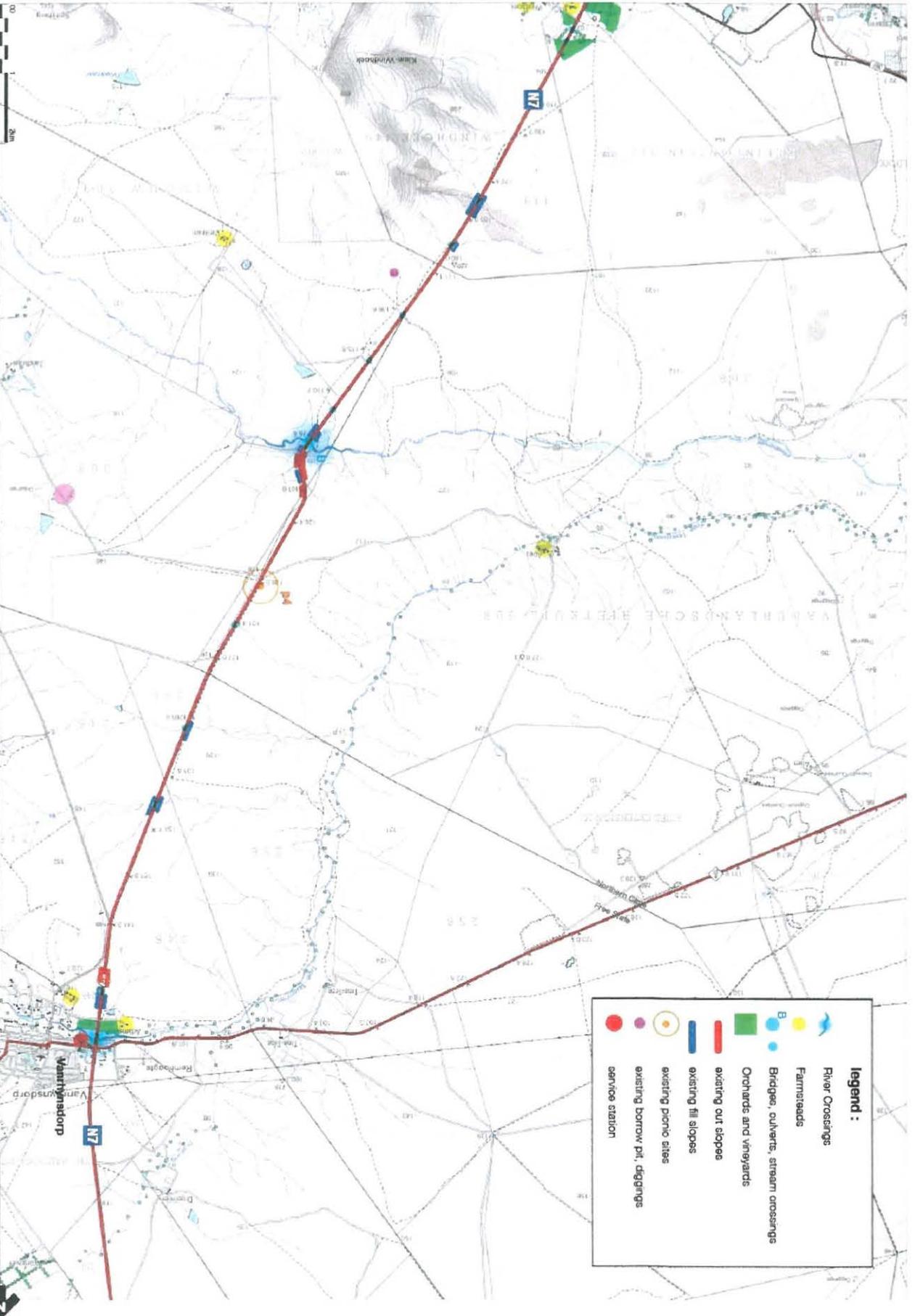
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Base Map Source : Civil Directorate : National Geo-Spatial Information + 1:50 000 Topographic Series + 3170CC Rowers (2) 2003  
 Figure 2 - N7 Section 4 Upgrade - Visual and Scenic Features (Trawal to Wainthoek Farm - 42 to 58km)

Base Map Source : CNR Directorate : National Geo Spatial Information • 1:20 000 Topographic Sheet • 31 1204 Vantynsdorp (2) 2000  
 Figure 3 : N7 Section 4 Upgrade - Visual and Scenic Features (Windhoek Farm to Vantynsdorp - 58 to 75.5km)



**Legend :**

- River Crossings
- Farmsteads
- Bridges, culverts, stream crossings
- Orchards and vineyards
- existing out slopes
- existing fill slopes
- existing borrow pit, diggings
- existing picnic sites
- service station

scale 1 : 50 000

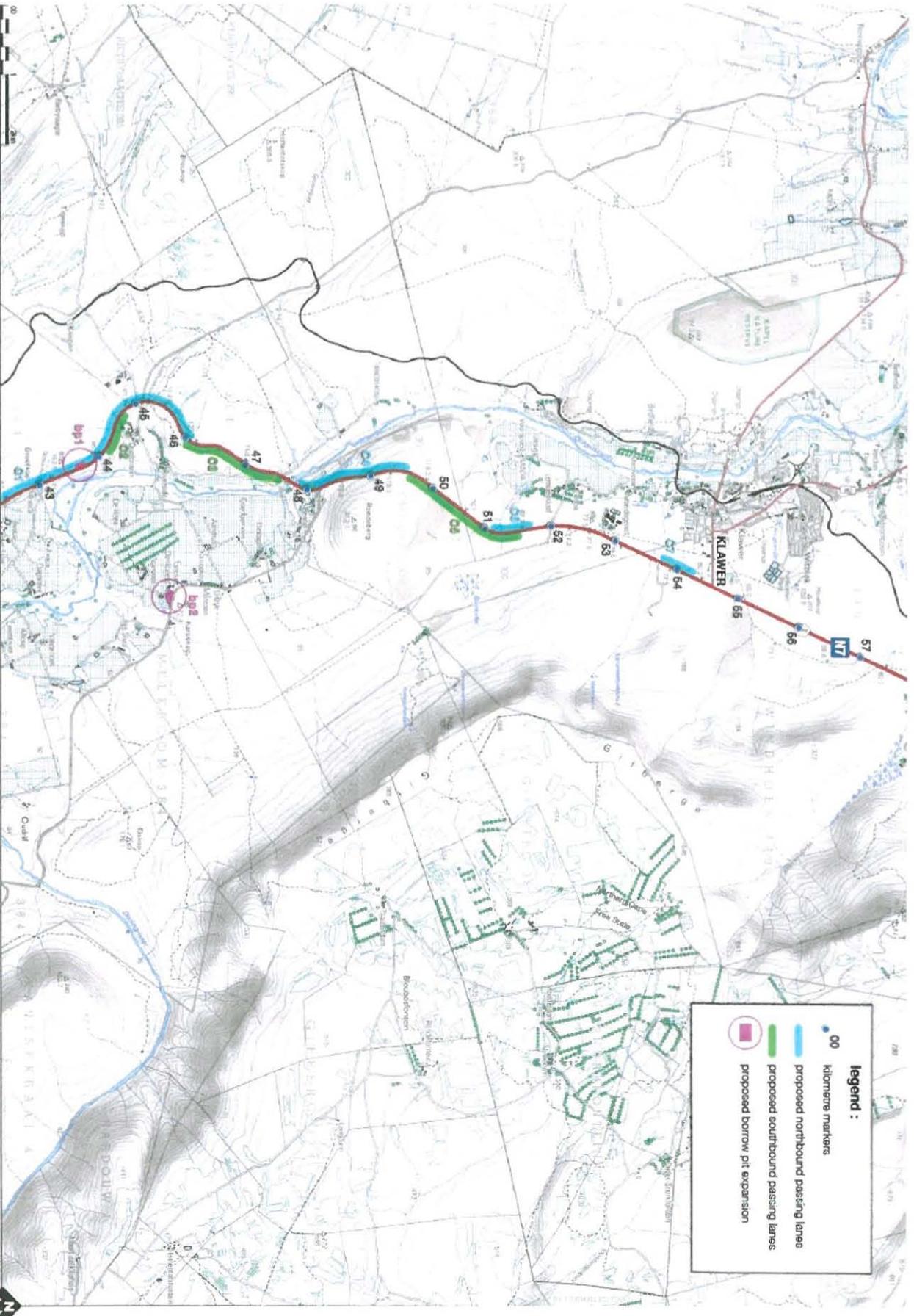


Figure 4 - N7 Section 4 Upgrade - Proposed Passing Lanes (Trawal to Windhoekdooi - 42 to 58km)

Data Map Source : Civil Engineering : National Geo-Spatial Information : 1:50 000 Topographic Series - 3178CC Rawer (9 2003)

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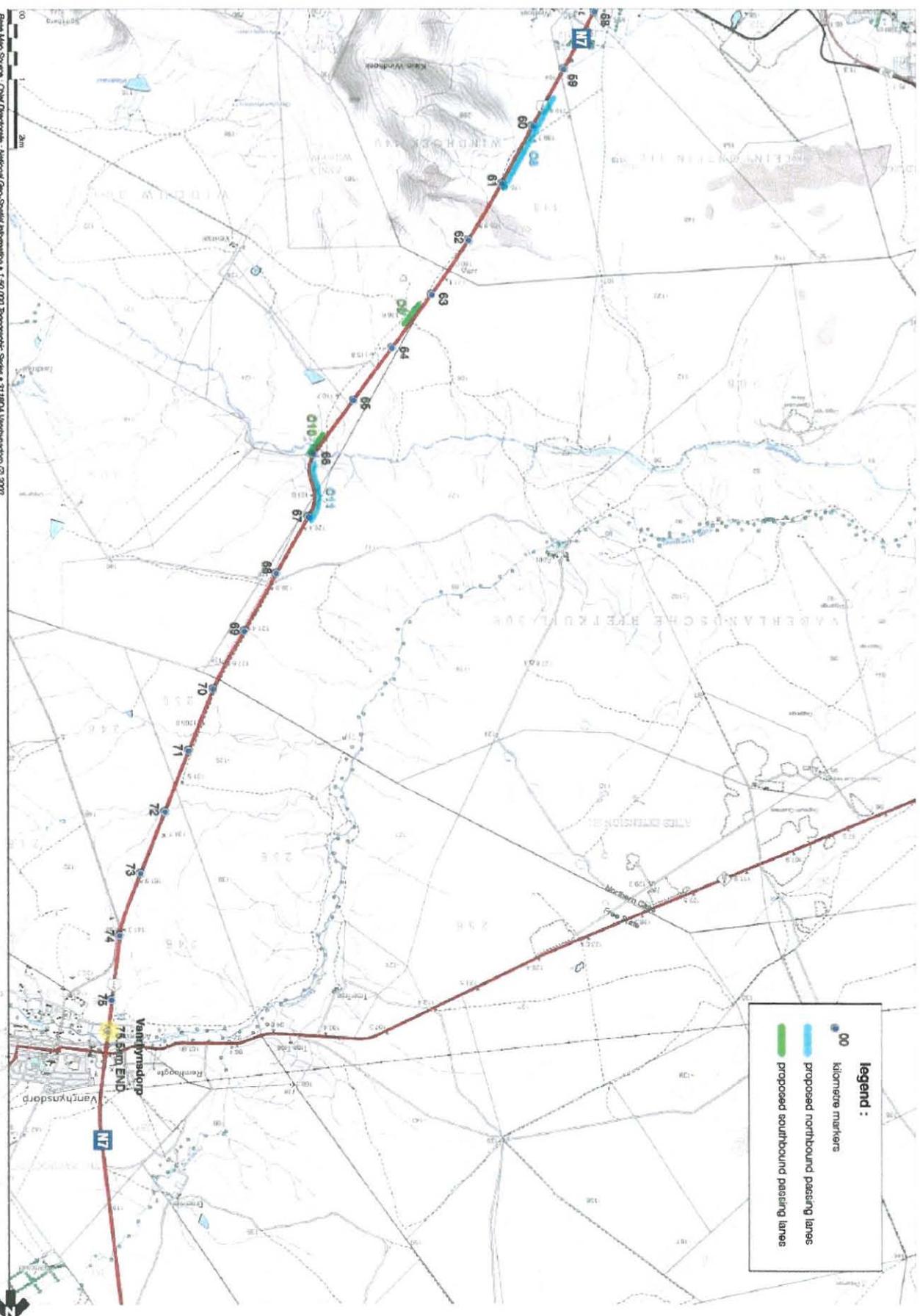


Figure 5 - N7 Section 4 Upgrade - Proposed Passing Lanes (Windhoek Farm to Vantynsdorp - 58 to 75.5km)

Base Map Source: Civil Directorate - National Geo-Spatial Information + 1:50 000 Topographic Series - 3118CA Vantynsdorp (2 2003)

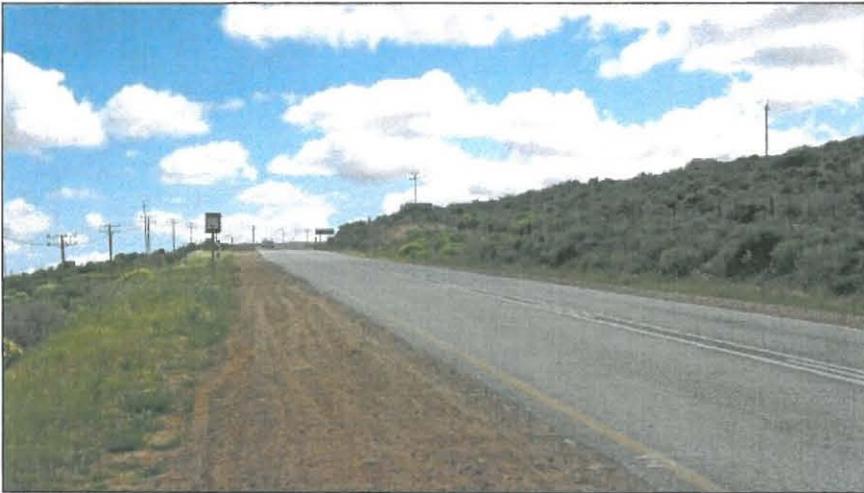
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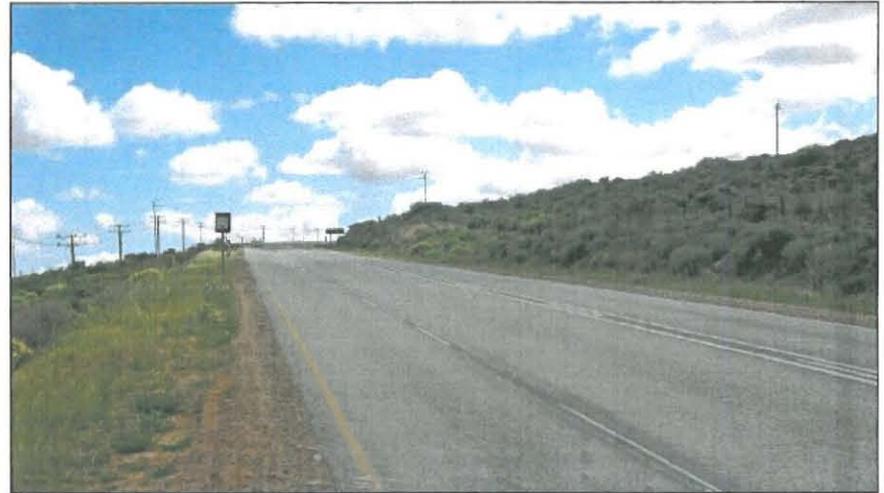
C1 • existing alignment



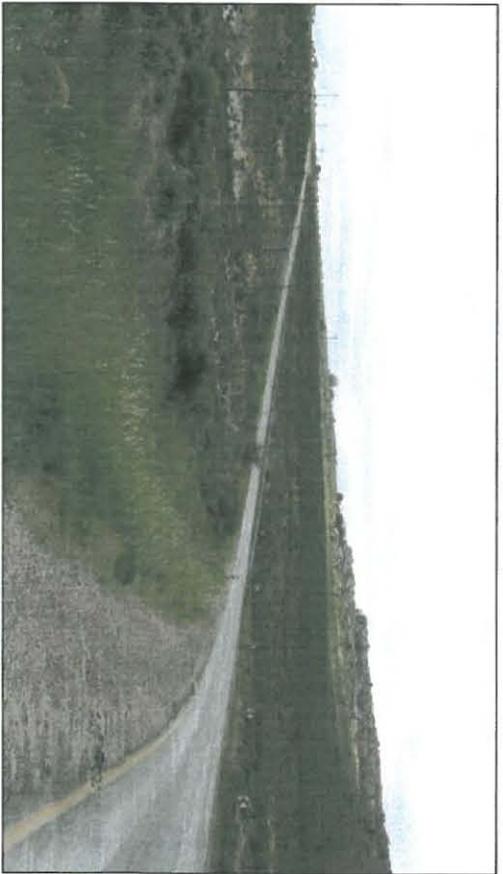
C1 • northbound passing lane starting at 42.43km - 3630m long



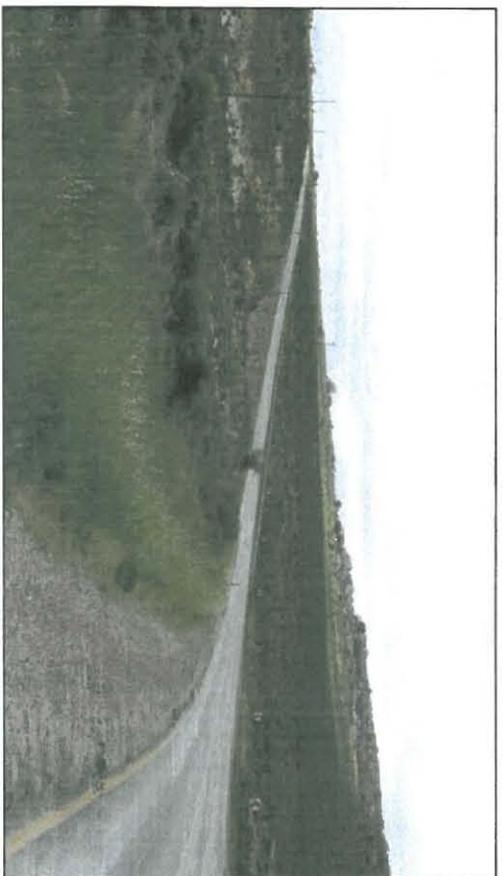
C4 • existing alignment



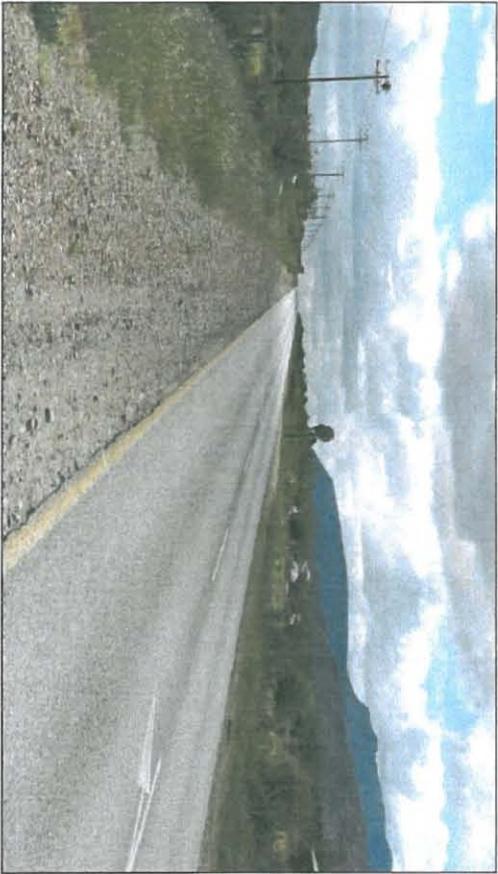
C4 • northbound passing lane starting at 47.86km - 1660m long



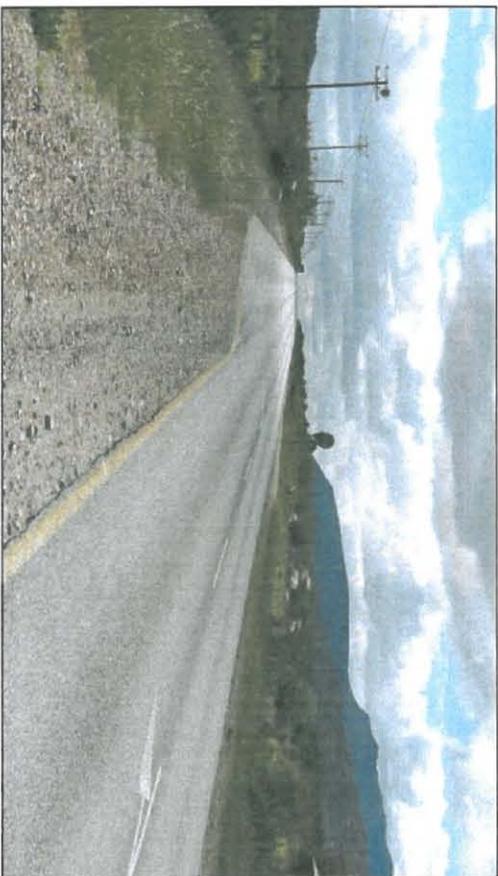
**C8 • existing alignment**



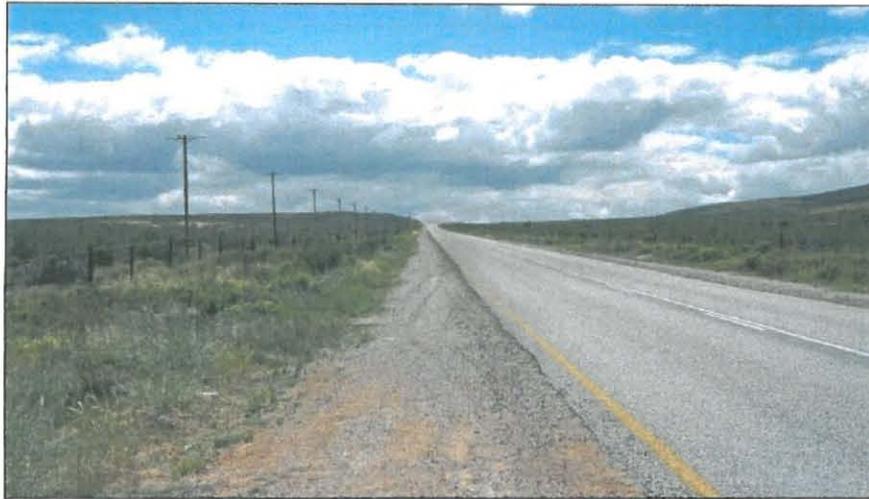
**C9 • northbound passing lane starting at 51.12km - 580m long  
(C8 • southbound passing lane on opposite side)**



**C7 • existing alignment**



**C7 • northbound passing lane starting at 53.76km - 480m long**



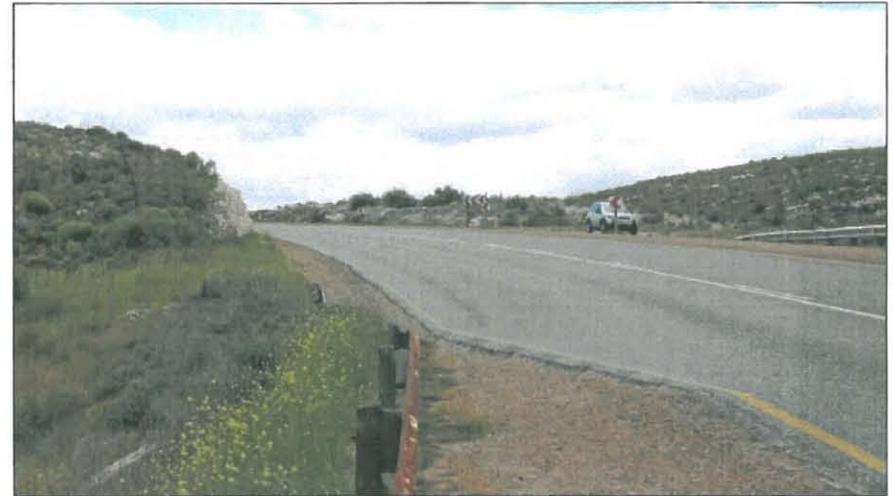
**C8** • existing alignment



**C8** • northbound passing lane starting at 59.5km - 1600m long



**C11** • existing alignment



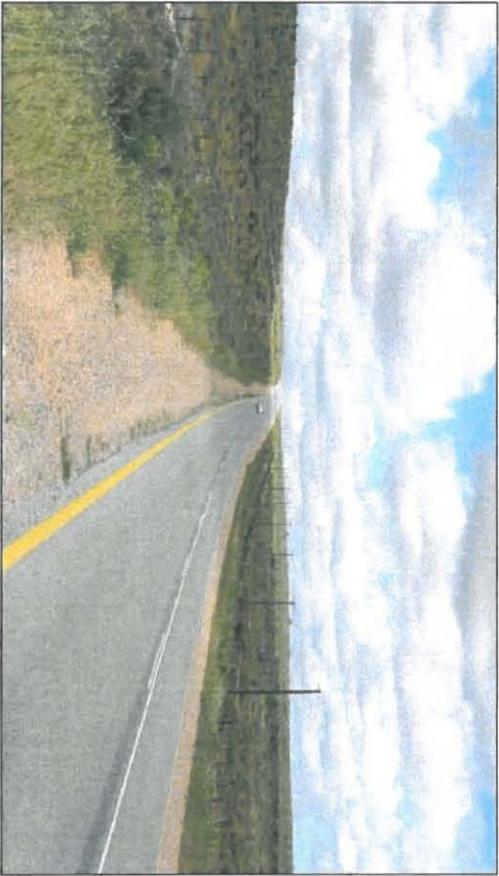
**C11** • northbound passing lane starting at 66.19km - 890m long



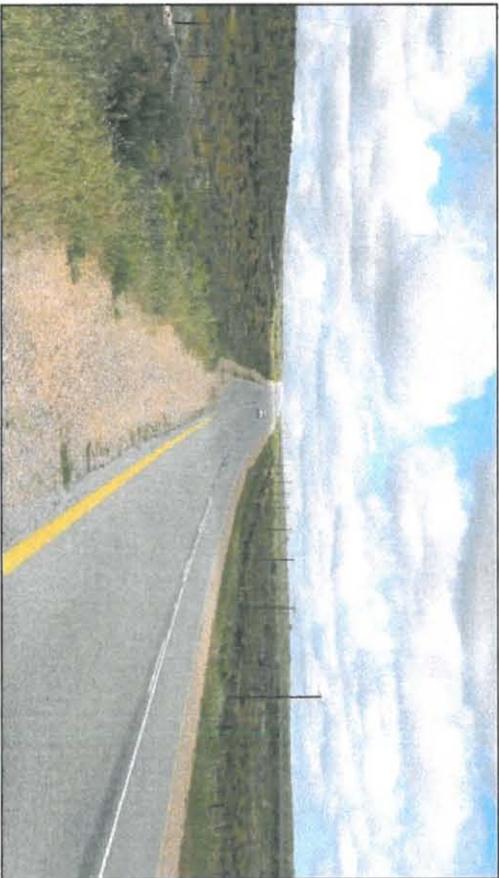
C-10 • existing alignment



C-10 • southbound passing lane starting at 66.08km - 360m long



C-9 • existing alignment

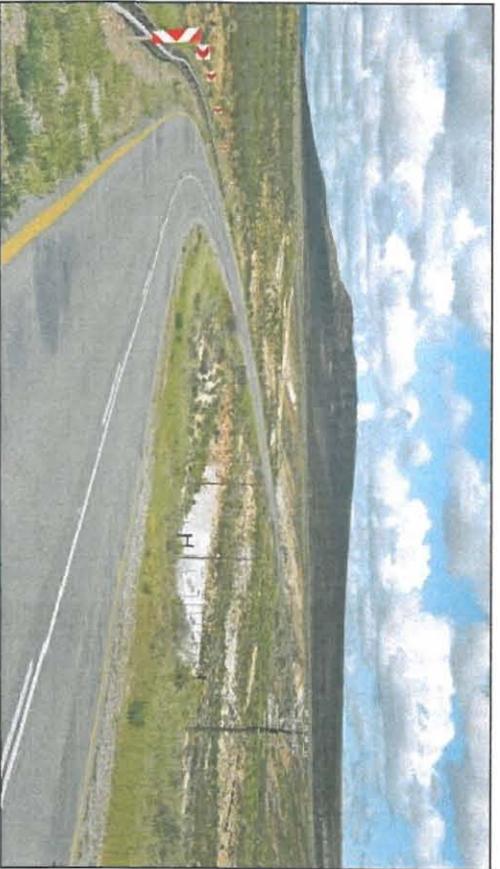


C-9 • southbound passing lane starting at 63.64km - 360m long

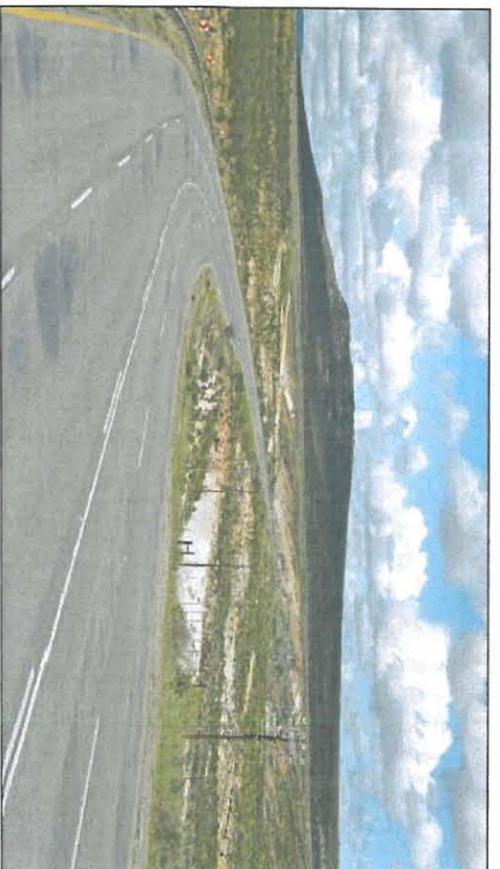
Photomontage by mtd/PCUA, Sept 2012

Figure 9 - N7 Section 4 Upgrade - Passing Lane Photomontages

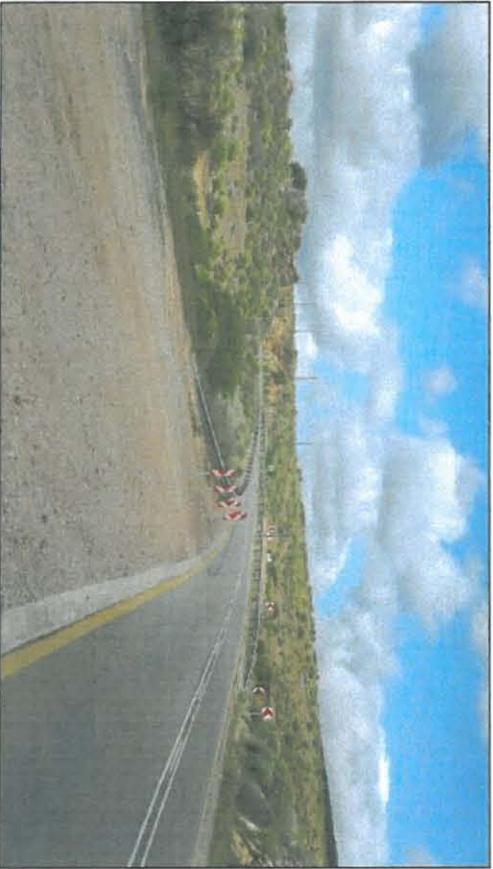
no scale



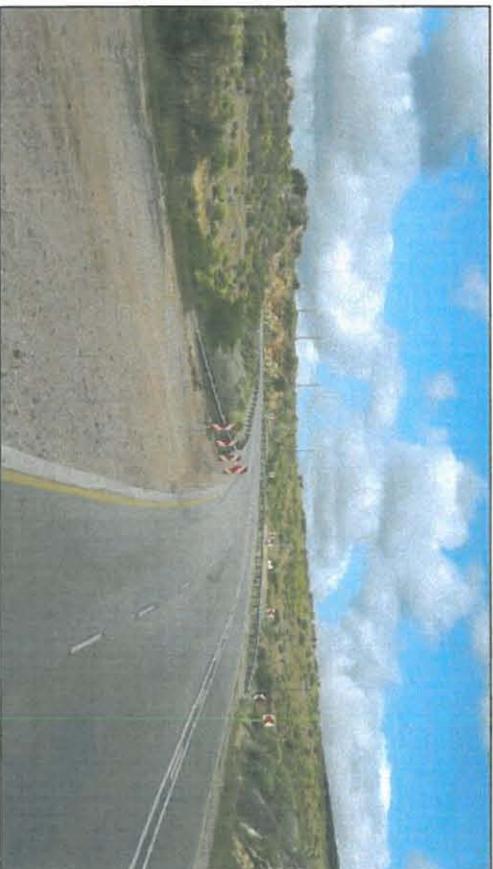
**C6 • existing alignment**



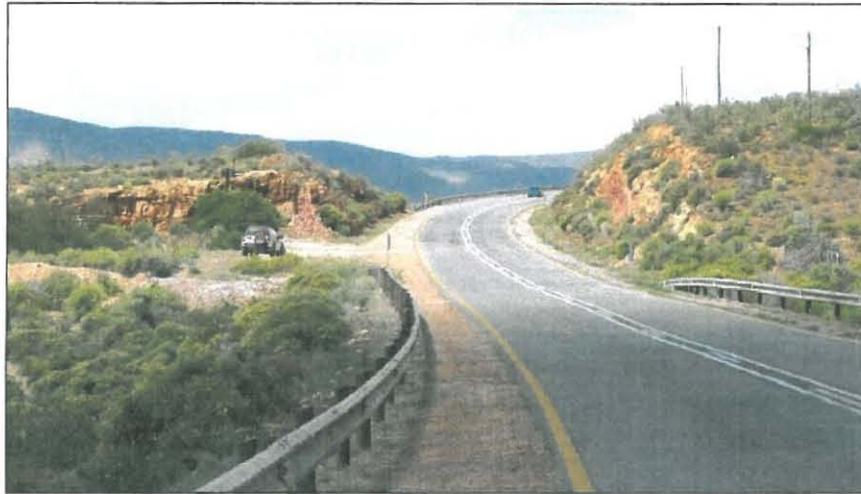
**C5 • southbound passing lane starting at 51.5km - 1880m long**  
(C6 • northbound passing lane on opposite side)



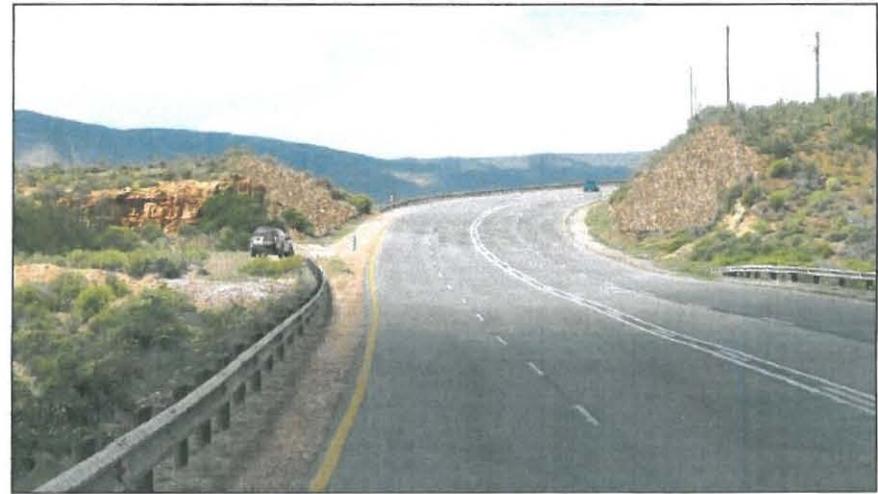
**C3 • existing alignment**



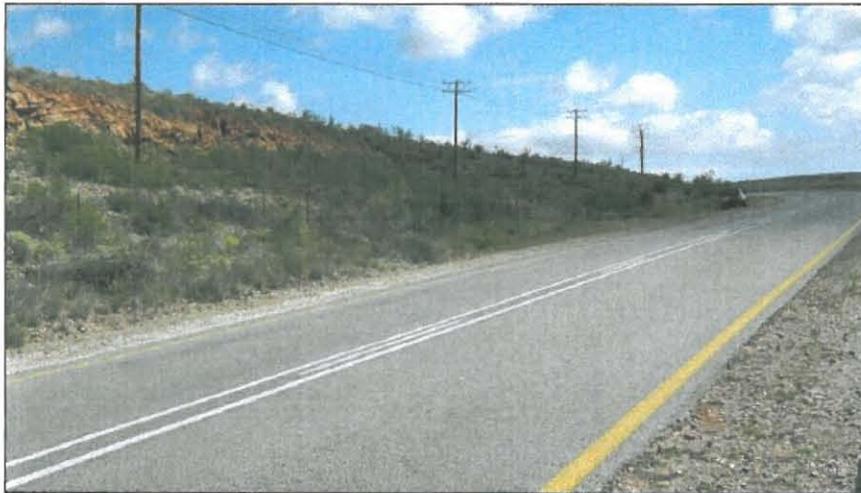
**C3 • southbound passing lane starting at 47.74km - 1660m long**



**C2 • existing alignment**



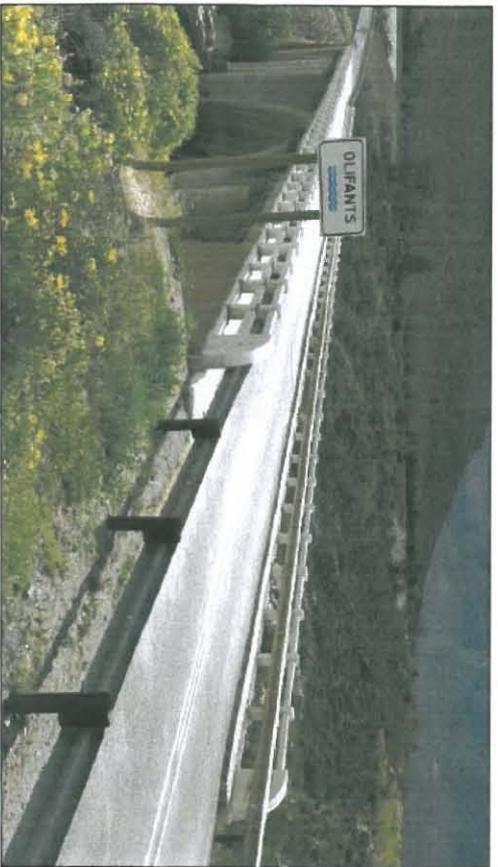
**C2 • southbound passing lane starting at 44.74km - 580m long**  
(C1 • northbound passing lane on opposite side)



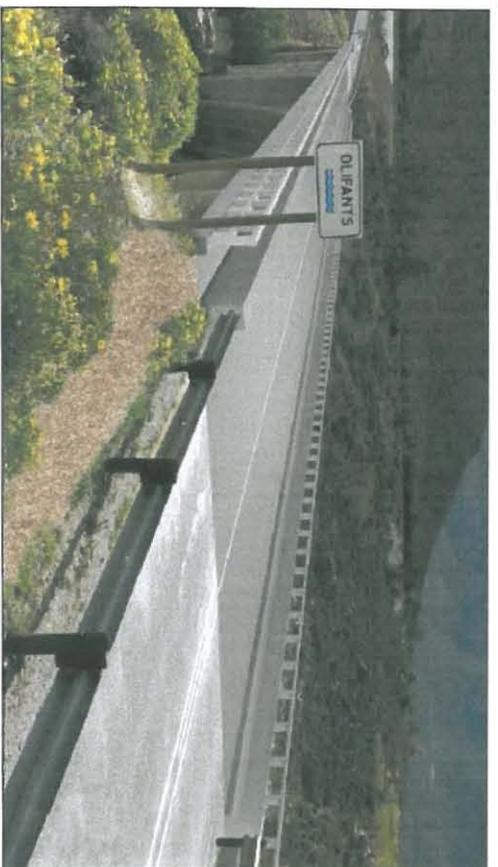
**Borrow Pit 2 • adjacent to N7 at 43.7km - ? ha**



**Borrow Pit 3 • adjacent to regional road R363 - ? ha**



Olfants River Bridge • existing alignment



Olfants River Bridge • widened