# Final Basic Assessment Report:

## DEA REF# 14/12/16/3/3/1/663

## NEAS REF# DEA/EIA/0001363/2012

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| | |
|---|---|
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Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

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**Kindly note that:**

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **1 September 2012**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included on the electronic copy of the report submitted to the competent authority.

## SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? [redacted] NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

### 1. PROJECT DESCRIPTION

**a) Describe the project associated with the listed activities applied for**

**INTRODUCTION**

The South African National Roads Agency (SANRAL) proposes to upgrade the National Route (N) 10 Section (/) 3 between Riet River Bridge (km 45.2) and Tarka Bridge (km 68.5) situated in the Inxuba Yethemba Municipal jurisdiction area (Figure 1). The project involves the complete upgrade of the section described above together with reconstruction and in some cases rehabilitation of appurtenant works. Climbing lanes will be constructed where required in the existing road reserve of 31,25m with possible expropriation along certain areas. The existing road will be reconstructed in half widths and deviations will be constructed where the entire existing road will be reconstructed.

The alignment over this section will be corrected for an operating speed of 100km/h. WorleyParsons has been appointed by SANRAL as the project managers who subcontracted Coastal & Environmental Services (CES) as the Environmental Assessment Practitioner (EAP).

The activity will make use of local borrow pits to source required fill material. A mining permit application has also been submitted for possible borrow pit sites to the Department of Mineral Resources (DMR). This is in accordance with the regulations pertaining to the Minerals and Petroleum Resources Development Act (Act No.28 of 2002) regulated by the Department of Mineral Resources.

**ACTIVITIES ASSOCIATED WITH THE PROJECT**

The proposed activity includes widening the existing section of road from a minimum width of 13.4 m to a maximum of 14.7 m. Climbing lanes may be required where necessary. The widening will also include the widening of all stormwater structures along the length of the project. There will also be bridge and major culvert construction.

**Design Flood Frequency**

It was confirmed by the SANRAL Regional Project Leader that along this section of road the bridges be analysed for a Class 2 road category, while the culverts be analysed for a Class 3 road category. Class 2 road category (Regional distributor)

***Riet River Bridge***

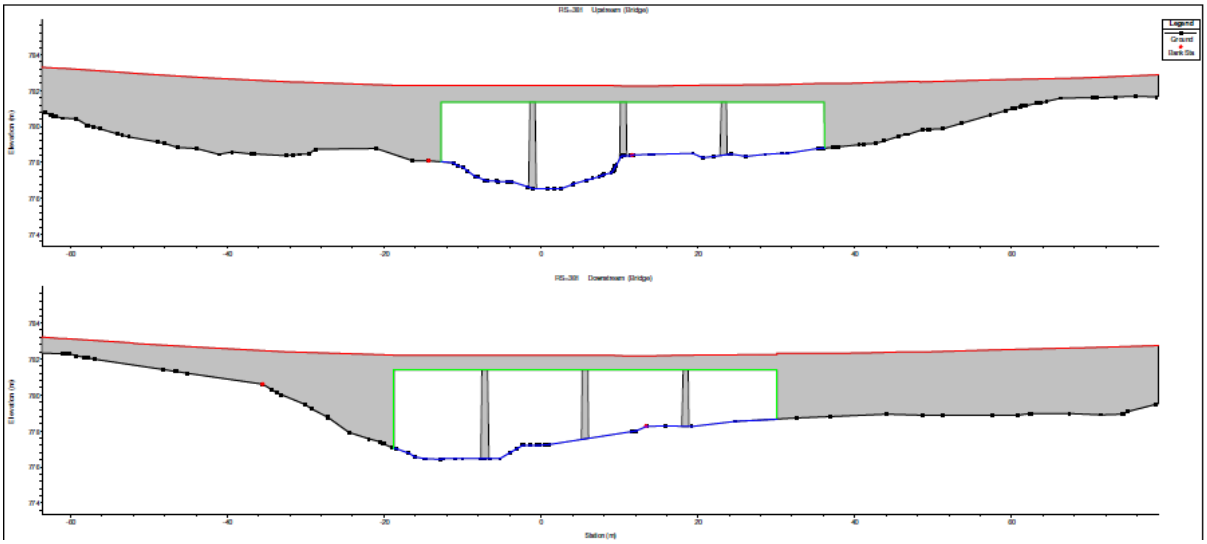
A road-over-river bridge exists across the Riet River at 45.18 km on the N10-3. This bridge has 2 spans, each 12.8 m wide and approximately 4.3 m high. The bridge was hydraulically analysed using the computer program HEC-RAS. The hydrological results obtained from the Standard Design Flood (SDF) method were used to analyze the bridge structure. The existing road bridge across the Riet River Bridge was hydraulically analysed with the available survey at hand. Table 1.2 shows the hydraulic

performance, utilising the program HEC-RAS.
The possible back-up flood effect of the Fish River (approximately 1,6km away) was not taken into account during the bridge hydraulic analysis. Mr Stegman ( Cell 082 4815 485), a farmer that has been farming for 56 years adjacent the Riet River, does not recall any overtopping of this bridge structure in the past.

It was found that the Riet River bridge capacity is inadequate to accommodate the required design flood frequencies in accordance with the Drainage Manual (SANRAL, 2006) for Classes 2, 3 and 4 road categories. After thorough investigation to the cause of the inadequate bridge capacity, it was found to be a result of natural sedimentation in the river bed in the vicinity of and downstream of the Riet River Bridge.

From the original design plans, later drawings prepared for the widening of the bridge and the current field survey, it is clear that the river bed had been elevated by approximately 1m due to sedimentation. The sharp curvature of the river stream downstream of the bridge, the flat gradient of the river in the vicinity of the bridge and downstream thereof, as well as dense vegetation downstream of the bridge are regarded as the main contributing factors for low flow velocities and consequential sedimentation. The river bed appears to have settled at this level and a larger bridge opening is required to accommodate the design flood.

It thus proposed that the existing bridge be demolished and replaced with a new bridge with four 12,8m spans and a higher soffit level. A minimum bridge soffit level of 782.36 m.a.m.s.l. is required to comply to a Class 2 road category. This implies that the road vertical alignment must be raised by approximately 1.34m. The current bridge is located in a vertical sag. The layout of the proposed bridge spans is shown in the figure below.



***Blaaukrantz River Bridge***

A road-over-river bridge exists across the Blaauwkrantz River at 53.14 km on the N10-3. This bridge consists of 1 span, 12.0 m wide and approximately 4,0 m high. The bridge hydraulics was analyzed with the computer program HEC-RAS.

The hydrological results, obtained by using the Standard Design Flood (SDF) method, were used to analyze the bridge structure. Peak floods obtained from the SDF method reflect slightly higher than the mean peak flow obtained from all the methods used.

The existing road bridge across the Blaauwkrantz River was hydraulically analysed with the available survey at hand together with the computer program HEC-RAS. The results of the hydraulic analysis indicate that the bridge capacity is adequate to accommodate the required design flood frequencies in accordance with the Drainage Manual (SANRAL, 2006) for Classes 2, 3 and 4 road categories.

***Tarka River Bridge***

A road-over-river bridge exists across the Tarka River Bridge at 58.70 km on the N10-3. This bridge consists of 3 spans, each 19.1 m wide and approximately 7.2 m high. The hydrological results obtained from the Standard Design Flood (SDF) method were discharged as the values calculated were unrealistically high comparing with the other methods. The report (Report No 344512/1) by Van Bladeren (2005) recommends that the SDF method under estimate the run-off during extreme events and that the run-off should be increase by approximately 40%. Existing flow data were obtained from the two dam structures within the catchment area, namely the Lake Athur and the Kommandodrift dams. The data set was incomplete and could not be used statistically to determine the peak flows. An existing Department Of Water Affairs weir (Q4H013) is situated directly upstream of the Tarka River Bridge structure. This weir has a maximum rating curve of 106.91 $m^3/s$ and could also not be used. Data was obtained from 1980 onwards and in this period the recorded flows exceeded the weir's rating curve on nine occasions. It is recommended that the alternative Rational peak flows be utilized for the hydraulic analysis.

Mnr L Du Preez (cell 083 415 1374) a local farmer for 22 years can't recall any overtopping of the bridge structures in the past. The existing road bridge across the Tarka River Bridge was hydraulically analysed with the available survey at hand together with the computer program HEC-RAS. It was found that the bridge capacity is inadequate to accommodate the latest required design flood frequencies in accordance with the Drainage Manual (SANRAL, 2006) for Class 2 road categories based on the freeboard requirement criterion. The other criterion, namely overtopping, was met for a Class 2 road. It is recommended that the existing bridge be retained based on the hydraulic performance for one category lower, namely a Class 3 road category.

It is recommended that the existing road over river bridge at the Riet River be upgraded by replacing it with a new bridge to provide adequate capacity in order for the road to be classified as a Class 2 road category.

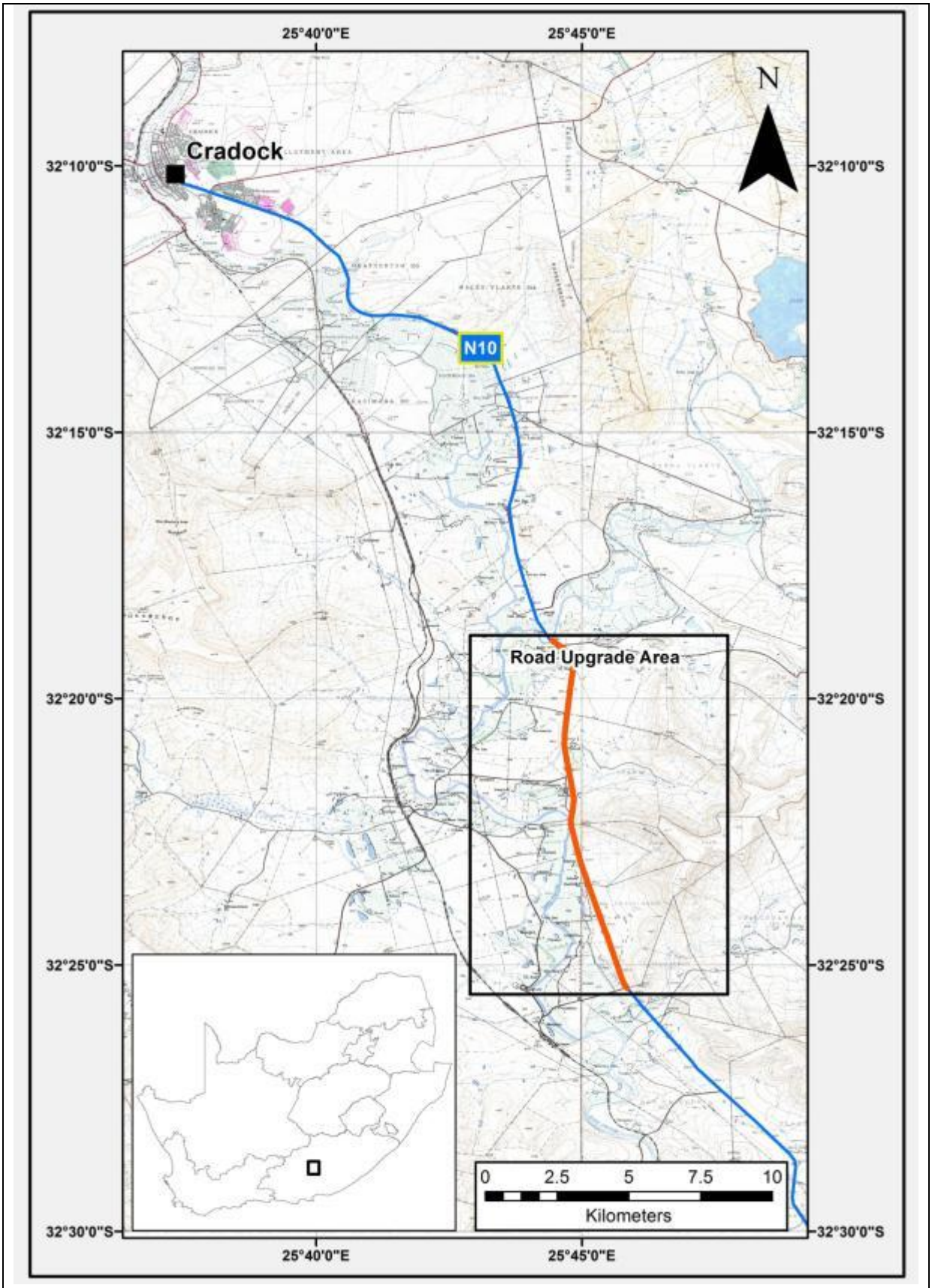



**Figure 1-1. Location of the proposed upgrade of the N10 between Riet River (km 45.2) to Tarka Bridge (km 68.5) in the Eastern Cape. The darkened red line indicates the affected road.**

## BIOPHYSICAL ENVIRONMENT

### Climate

Due to the location of the study area at the confluence of several climatic regimes, namely temperate and subtropical, the Eastern Cape Province of South Africa has a complex climate. There are wide variations in temperature, rainfall and wind patterns, mainly as a result of movements of air masses, altitude, mountain orientation and the proximity of the Indian Ocean (Stone, 1998).

There is data available for climatic conditions in Cradock, which is close to the study site (Figure 1-2). The annual mean rainfall is 248mm with a March high of 46 mm and an August low of 4 mm. The mean monthly daily temperature high in January of 29.5°C and low in June of 16.8°C (www.saexplorer.co.za, 2012).

Section 3 of the N10 falls within the summer rainfall region of the Eastern Cape. Rainfall along the route varies from 320mm to 377mm per annum. See Table 1.1 and Figure A below for rainfall stations and their locations. The road starts at 32° 25' 59" Latitude and 25° 46' 19" Longitude and ends at 32° 13' 49" Latitude and 25° 43' 22" Longitude, with the centre of the catchment areas at 32° 00' 43" Latitude and 26° 02' 41" Longitude, for the Tarka River Bridge. A mean annual rainfall of 320mm, Semaphore Rainfall station, was assumed for the catchment areas of the Riet River and the Blaauwkrantz Bridge structures and a mean annual rainfall of 377mm for the for the Tarka River Bridge. The assumption is based on the years of records and the altitude of the particular station.

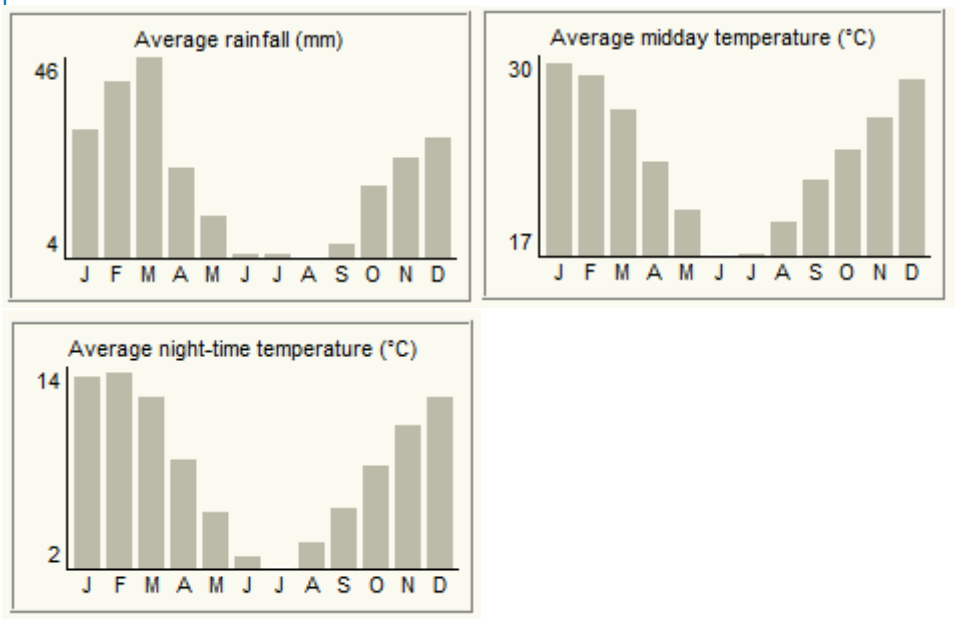



**Figure 1-2. Average rainfall, midday temperature and night time temperature for Cradock.** (taken from http://www.saexplorer.co.za/south-africa/climate/cradock_climate.asp)

### Geology and Topography

The study site occurs in the Karoo Supergroup and comprise mainly of the Beaufort Group with some Karoo Dolerite (Mucina and Rutherford, 2006). The Beaufort group overlays the Ecca Group and was deposited on land through alluvial processes. It is characterised by reddish-purple and mottled, greenish, mudstone beds, interbedded with lenticular, creamy and buff coloured sandstone beds. The mudstone beds are a diagnostic feature of the Beaufort Group. A couple of long Dolerite outcrops occur in the area (Mucina and Rutherford, 2006).

The topography of the study area is relatively complex, with mountainous terrain that steepens to form river valleys. The study site occurs along the valley floor which is relatively flat and is bisected by perennial and non-perennial rivers (figure 1.3).

**Vegetation and Fauna**

The vegetation along the N10 consists of predominantly karooid grasslands with small patches of riparian vegetation along the watercourses (figure 1.4). The vegetation was in poor condition. This is due to the road reserve being kept clear by mowing and due to it being cleared before initial construction of the road. Despite the vegetation being in poor condition, a few species of special concern (such as species of the Mesembryanthemaceae family that occur on the Provincial Nature Conservation Ordinance or PNCO) were identified along the route. No wetlands were identified during the vegetation assessment.

Faunal populations along the proposed road upgrade are limited. No endemic or threatened species were observed.

**Archeological**

The survey for the proposed rehabilitation of the national route N10 Section 3 from Riet River (KM 45.2) to Tarka Bridge (KM 68.5) was limited to the 23.30km stretch within the road reserve. Three main bridges occur along this stretch of road; however, they have been determined as younger than 60 years. A historically significant distance marker that marked the early route between Cradock and Grahamstown was encountered within the road reserve. No other archaeological material remains, sites, or features were documented within this area

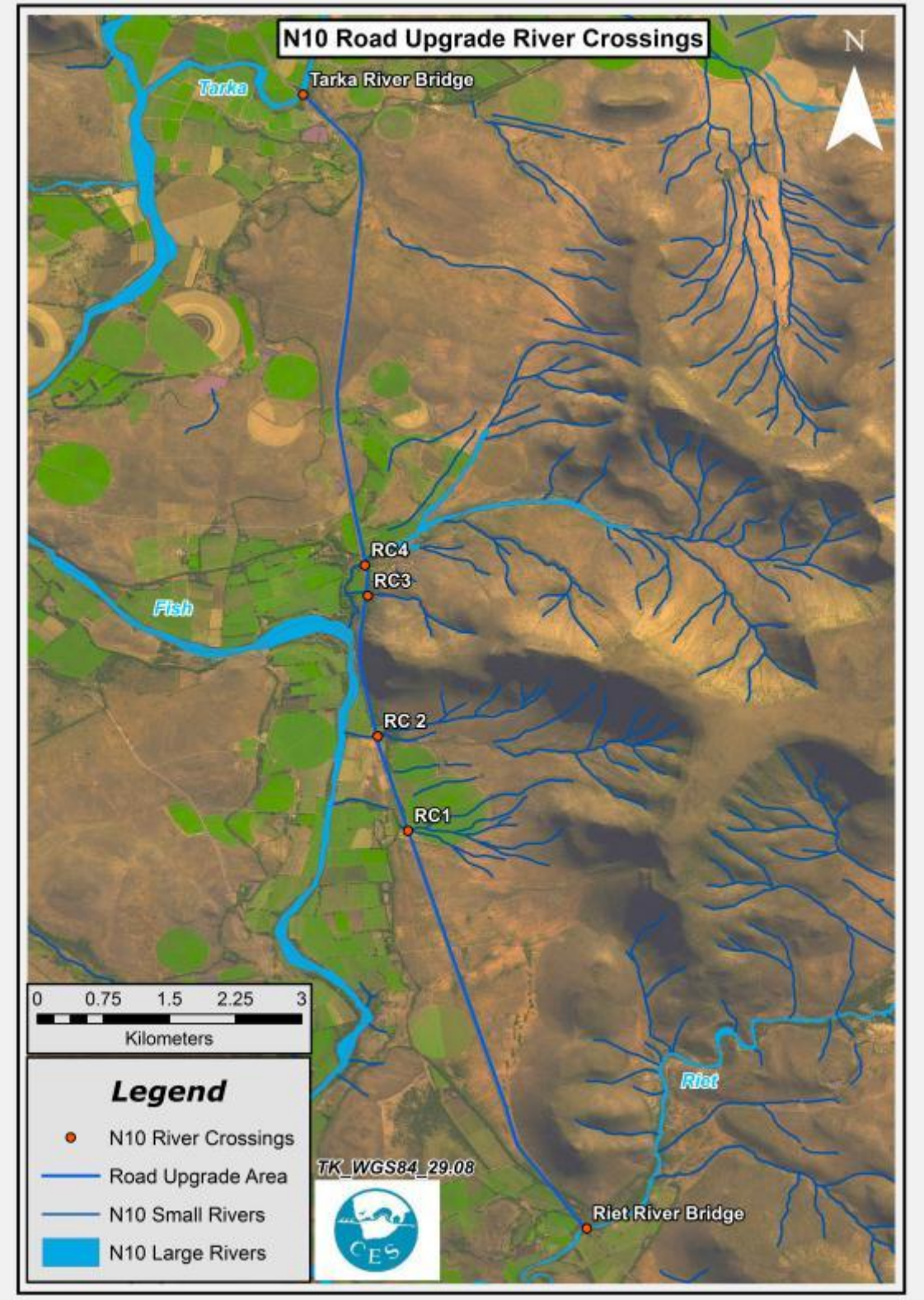



Figure 1-3. River crossings along the proposed road upgrade.

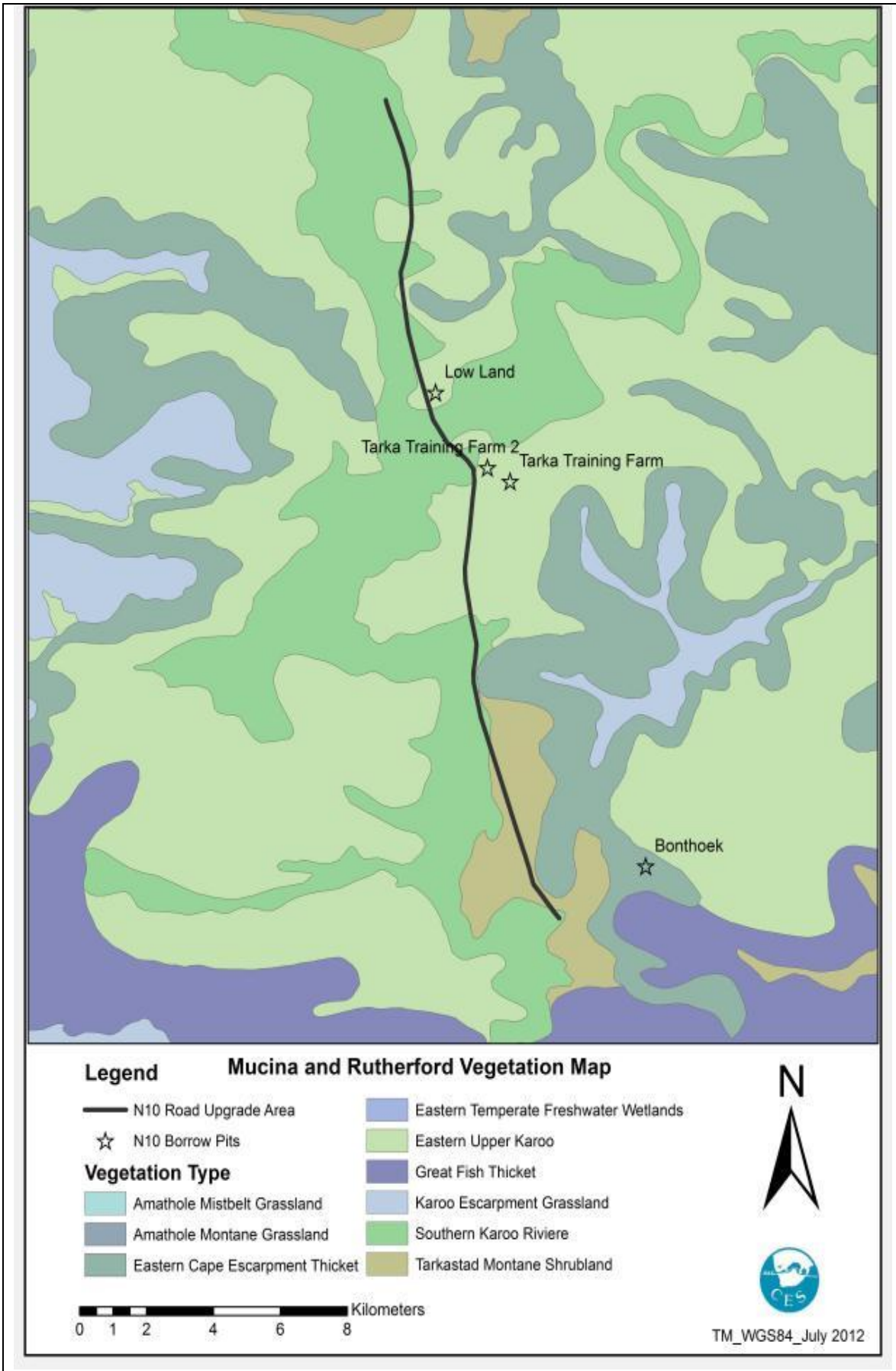



**Figure 1-4. Mucina and Rutherford Vegetation Map of the proposed road upgrade along N10 section 3.**

**b) Provide a detailed description of the listed activities associated with the project as applied for**

| Listed activity as described in GN R.544, 545 and 546 | Description of project activity |
|---|---|
| **GN R.544 Activity 11(xi):** The construction of infrastructure or structures covering 50 square meters or more where such construction occurs within a watercourse or within 32 meters of a watercourse, measured from the edge of a watercourse. | The proposed activity includes widening the existing section of road where the widening will also include the widening of all stormwater structures along the length of the project. Construction activities will occur as new 'pieces' of road will be constructed in order to expand on the existing section of road as well as bridges. |
| **GN R.544 Activity 39:** The expansion of<br>(i) canals;<br>(ii) channels;<br>(iii) bridges;<br>(iv) weirs;<br>(v) bulk storm water outlet structures;<br>(vi) marinas;<br>within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, where such expansion will result in an increased development footprint but excluding where such expansion will occur behind the development setback line. | The proposed activity includes expanding the existing section of road where the widening will also include the widening of all stormwater structures along the length of the project. Three bridges, namely the Riet River, Blaaukrantz River and the Tarka River Bridges will also be expanded. |
| **GN R.544 Activity 47(i):** The widening of a road by more than 6 meters, or the lengthening of a road by more than 1 kilometre where the existing reserve is wider than 13.5 meters. | The proposed activity includes widening the existing section of road to a minimum width of 13.4m and maximum of 22.4 including climbing lanes where necessary. The widening will also include the widening of all stormwater structures along the length of the project |
| **GN R.546 Activity 13:**<br>**The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation,** Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority.<br><br>**(a) In Eastern Cape,**<br>Outside urban areas, the following:<br>(aa) National Protected Area Expansion Strategy Focus areas;<br>(bb) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;<br>(cc) Core areas in biosphere reserves; | The total size of the road servitude will be 700 000 $m^2$. Indigenous vegetation which is currently within the road reserve will be cleared. The majority of the road reserve is degraded, however a permit to clear indigenous vegetation as well species of special concern will be required. |

| | |
|---|---|
| **GN R.546 Activity 19:**<br>**The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.**<br>**(a) In Eastern Cape**<br>Outside urban areas, in:<br>(aa) National Protected Area Expansion Strategy Focus areas;<br>(bb) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;<br>(cc) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;<br>(dd) Core areas in biosphere reserves;<br>(ee) Areas on the watercourse side of the development setback line or within 100 metres from the edge of a watercourse where no such setback line has been determined. | The proposed activity includes widening the existing section of road to a minimum width of 13.4m and maximum of 22.4 including climbing lanes where necessary. The widening will also include the widening of all stormwater structures along the length of the project which includes upgrading of four bridges which are within 32 m of a watercourse. |

## 2. FEASIBLE AND REASONABLE ALTERNATIVES

***"alternatives"***, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Regulation 22(2)(h) of GN R.543. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

**The proposed activity is a road upgrade of the national route N10 Section 3. No route alignment is therefore considered as the upgrade will address traffic capacity deficiencies on the existing road by widening the carriageway and, in some places, constructing passing lanes. The no-go alternative is discussed later in this report.**

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

**a) Site alternatives**

**This section is not applicable as the proposed activity is to address deficiencies on an existing road and, accordingly, it is neither feasible nor reasonable to consider alternative sites.**

| **Alternative 1 (preferred alternative)** | | |
|---|---|---|
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| N/A | | |
| **Alternative 2** | | |
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| N/A | | |
| **Alternative 3** | | |
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| N/A | | |

**NOTE: No other fundamental site alternatives other than the current road reserve were investigated. No activity alternative, other than the No-Go Option has been assessed as it is considered that any activity other than upgrading of the road would not be compatible with this project. Alternatives in terms of design and layout are not feasible as this is an already existing national route and a registered road reserve.**

In the case of linear activities:

| **Alternative:** | **Latitude (S):** | **Longitude (E):** |
|---|---|---|
| Alternative S1 (preferred) | | |
| • Starting point of the activity | **32°25.842'** | **25°46.194'** |
| • Middle/Additional point of the activity | **32°20.274'** | **25°44.73'** |
| • End point of the activity | **32°13.854'** | **25°43.392'** |
| Alternative S2 (if any) | | |
| • Starting point of the activity | | |
| • Middle/Additional point of the activity | | |
| • End point of the activity | | |
| Alternative S3 (if any) | | |
| • Starting point of the activity | | |
| • Middle/Additional point of the activity | | |

| | | |
|---|---|---|
| • End point of the activity | | |

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

| | Latitude (S): | | Longitude (E): | |
|---|---|---|---|---|
| • Starting point of the activity (0 m) | 32 | 25.842 | 25 | 46.194 |
| • 250 m | 32 | 25.782 | 25 | 46.134 |
| • 500 m | 32 | 25.692 | 25 | 46.062 |
| • 750 m | 32 | 25.608 | 25 | 45.99 |
| • 1 km | 32 | 25.518 | 25 | 45.918 |
| • 1250 m | 32 | 25.434 | 25 | 45.846 |
| • 1500 m | 32 | 25.344 | 25 | 45.774 |
| • 1750 m | 32 | 25.236 | 25 | 45.744 |
| • 2 km | 32 | 25.116 | 25 | 45.708 |
| • 2250 m | 32 | 24.996 | 25 | 45.666 |
| • 2500 m | 32 | 24.87 | 25 | 45.618 |
| • 2750 m | 32 | 24.738 | 25 | 45.57 |
| • 3 km | 32 | 24.6 | 25 | 45.522 |
| • 3250 m | 32 | 24.468 | 25 | 45.474 |
| • 3500 m | 32 | 24.318 | 25 | 45.42 |
| • 3750 m | 32 | 24.162 | 25 | 45.366 |
| • 4 km | 32 | 24.012 | 25 | 45.318 |
| • 4250 m | 32 | 23.874 | 25 | 45.264 |
| • 4500 m | 32 | 23.742 | 25 | 45.222 |
| • 4750 m | 32 | 23.604 | 25 | 45.174 |
| • 5 km | 32 | 23.478 | 25 | 45.126 |
| • 5250 m | 32 | 23.346 | 25 | 45.084 |
| • 5500 m | 32 | 23.22 | 25 | 45.036 |
| • 5750 m | 32 | 23.082 | 25 | 44.988 |
| • 6 km | 32 | 22.938 | 25 | 44.94 |
| • 6250 m | 32 | 22.776 | 25 | 44.898 |
| • 6500 m | 32 | 22.644 | 25 | 44.868 |
| • 6750 m | 32 | 22.512 | 25 | 44.838 |
| • 7 km | 32 | 22.374 | 25 | 44.808 |
| • 7250 m | 32 | 22.23 | 25 | 44.808 |
| • 7500 m | 32 | 22.098 | 25 | 44.826 |
| • 7750 m | 32 | 21.966 | 25 | 44.844 |
| • 8 km | 32 | 21.828 | 25 | 44.856 |
| • 8250 m | 32 | 21.696 | 25 | 44.826 |
| • 8500 m | 32 | 21.57 | 25 | 44.802 |

| | | | | |
|---|---|---|---|---|
| • 8750 m | 32 | 21.444 | 25 | 44.772 |
| • 9 km | 32 | 21.294 | 25 | 44.748 |
| • 9250 m | 32 | 21.156 | 25 | 44.724 |
| • 9500 m | 32 | 21.012 | 25 | 44.694 |
| • 9750 m | 32 | 20.874 | 25 | 44.676 |
| • 10 km | 32 | 20.73 | 25 | 44.67 |
| • 10 250 m | 32 | 20.592 | 25 | 44.688 |
| • 10 500 m | 32 | 20.448 | 25 | 44.706 |
| • 10 750 m | 32 | 20.274 | 25 | 44.73 |
| • 11 km | 32 | 20.1 | 25 | 44.748 |
| • 11 250 m | 32 | 19.944 | 25 | 44.766 |
| • 11 500 m | 32 | 19.764 | 25 | 44.784 |
| • 11 750 m | 32 | 19.602 | 25 | 44.802 |
| • 12 km | 32 | 19.446 | 25 | 44.826 |
| • 12 250 m | 32 | 19.302 | 25 | 44.808 |
| • 12 500 m | 32 | 19.188 | 25 | 44.748 |
| • 12 750 m | 32 | 19.098 | 25 | 44.67 |
| • 13 km | 32 | 19.008 | 25 | 44.568 |
| • 13 250 m | 32 | 18.918 | 25 | 44.448 |
| • 13 500 m | 32 | 18.816 | 25 | 44.346 |
| • 13 750 m | 32 | 18.69 | 25 | 44.256 |
| • 14 km | 32 | 18.54 | 25 | 44.154 |
| • 14 250 m | 32 | 18.378 | 25 | 44.1 |
| • 14 500 m | 32 | 18.24 | 25 | 44.058 |
| • 14 750 m | 32 | 18.09 | 25 | 44.01 |
| • 15 km | 32 | 17.94 | 25 | 43.956 |
| • 15 250 m | 32 | 17.784 | 25 | 43.908 |
| • 15 500 m | 32 | 17.634 | 25 | 43.86 |
| • 15 750 m | 32 | 17.472 | 25 | 43.818 |
| • 16 km | 32 | 17.322 | 25 | 43.776 |
| • 16 250 m | 32 | 17.16 | 25 | 43.74 |
| • 16 500 m | 32 | 17.022 | 25 | 43.722 |
| • 16 750 m | 32 | 16.872 | 25 | 43.698 |
| • 17 km | 32 | 16.71 | 25 | 43.668 |
| • 17 250 m | 32 | 16.548 | 25 | 43.644 |
| • 17 500 m | 32 | 16.374 | 25 | 43.632 |
| • 17 750 m | 32 | 16.224 | 25 | 43.68 |
| • 18 km | 32 | 16.08 | 25 | 43.722 |
| • 18 250 m | 32 | 15.93 | 25 | 43.752 |
| • 18 500 m | 32 | 15.762 | 25 | 43.788 |

| | | | | |
|---|---|---|---|---|
| • 19 750 m | 32 | 15.6 | 25 | 43.806 |
| • 20 km | 32 | 15.444 | 25 | 43.8 |
| • 20 250 m | 32 | 15.27 | 25 | 43.794 |
| • 20 500 m | 32 | 15.09 | 25 | 43.782 |
| • 20 750 m | 32 | 14.916 | 25 | 43.764 |
| • 21 km | 32 | 14.742 | 25 | 43.716 |
| • 21 250 m | 32 | 14.592 | 25 | 43.674 |
| • 22 500 m | 32 | 14.442 | 25 | 43.614 |
| • 22 750 m | 32 | 14.298 | 25 | 43.56 |
| • 23 km | 32 | 14.154 | 25 | 43.506 |
| • 23 250 m | 32 | 14.01 | 25 | 43.446 |
| • End of activity | 32 | 13.854 | 25 | 43.392 |

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A.

**b) Lay-out alternatives**

**The upgrade of the existing road does not involve any deviation from the existing horizontal (palm form) alignment. The final layout of the upgraded road will, therefore, be identical to the existing layout. Accordingly, it is neither feasible not reasonable to consider alternative layouts.**

| **Alternative 1 (preferred alternative)** | | |
|---|---|---|
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| **This is not applicable due to the nature of the project being road rehabilitation of an existing road on the same horizontal alignment** | | |
| **Alternative 2** | | |
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| **N/A** | | |

**c) Technology alternatives**

| **Alternative 1 (preferred alternative)** |
|---|
| **The existing road was evaluated and it satisfies the minimum require design standards. Vertical alternatives were investigated and where feasible improvements were made to higher design standards.** |
| **Alternative 2** |
| **Alternative horizontal standards were considered but will not render any improvement horizontally. It would also be not cost effective.The volume of traffic does not warrant upgrading to a higher class of road.**<br>**This is not a feasible or reasonable alternative as it is not cost effective, construction period would be much longer.** |

**d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)**

| **Alternative 1 (preferred alternative)** |
|---|
| **Use manual labour as far as practically possible followed by machinery.** |
| **Alternative 2** |
| Use manual labour instead of machinery. This alternative would delay the completion of the proposed road upgrade as the use of manual labour would take longer compared to machinery. The use of manual labour for road resurfacing will not be able to provide the riding quality of the standard which is required on the national road. There will also be considerable time and cost implications, since the use of non-mechanised methods will delay the completion of the upgrade a, with associated additional costs and inconvenience to road users. Although this alternative would be advantageous for providing employment in the area, **it is not considered as a feasible and reasonable alternative due to the possibility of jeopardising the quality of the upgrade, and the additional delays to road users.** |
| **Scheduling alternative (preferred alternative)** |
| The road requires urgent upgrading as soon as possible.<br>The scheduling for upgrading is however dependant on the availability of funds.<br>This road falls under the jurisdiction of SANRAL who is responsible for providing funds.<br>The proposed improvements will be implemented as soon as funds become available.<br>The road is included in the list of roads budgeted for. |

**e) No-go alternative**

It may be argued from an environmental perspective that the no-go option is the favourable alternative as open space is maintained, however soil erosion is visible around the culverts along the N10 section 3 area and there is no guarantee of preventing further erosion should the proposed activity not go ahead. Current practices are therefore not necessarily beneficial to the long-term ecological functioning of the site. In addition to this are the economic benefits associated with a project of this nature which would not accrue from the "no-development" alternative.

The No-go alternative would mean abandoning the proposed activity and as such there will be no negative impacts on the environment as identified as a result from the development. Abandoning the proposed activity will however, result in none of the positive impacts such as upgrading a deteriorating road (making the road safer), upgrading culverts (decreasing soil erosion and attendant damage to the road) and creating temporary employment as well as enhancing skills of local employees.

The hydraulic capacity of the bridges will be considerably increased by the construction of the new bridge, thereby reducing the probability of the bridge being overtopped during high flows in the river, and reducing the potential for erosional damage to the approach embankments, with consequential deposition of embankment fill material into the river channel downstream of the bridge. The hydraulic analysis of the bridge waterway indicates that the bridge deck is likely to overtop during high-flood events. If the no-go alternative is selected, there is likelihood that the bridge will overtop which will be hazardous to road uses. **This is therefore not a reasonable or feasible alternative.** It is therefore recommended that the 'no-go' option may not be viable in terms of ecological and economical sustainability and that it should therefore not be considered.

**Paragraphs 3 – 13 below should be completed for each alternative.**

## 3. PHYSICAL SIZE OF THE ACTIVITY

**a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):**

| **Alternative:** | **Size of the activity:** |
|---|---|
| Alternative A1[1] (preferred activity alternative) | **N/A** |
| Alternative A2 (if any) | **N/A** |
| Alternative A3 (if any) | **N/A** |

or, for linear activities:

| **Alternative:** | **Length of the activity:** |
|---|---|
| Alternative A1 (preferred activity alternative) | **23.3 km** |
| Alternative A2 (if any) | **N/A** |
| Alternative A3 (if any) | **N/A** |

**b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):**

| **Alternative:** | **Size of the site/servitude:** |
|---|---|
| Alternative A1 (preferred activity alternative) | **700 000m²** |
| Alternative A2 (if any) | **N/A** |
| Alternative A3 (if any) | **N/A** |

## 4. SITE ACCESS

| | |
|---|---|
| Does ready access to the site exist? | **YES** |
| If NO, what is the distance over which a new access road will be built | **N/A** |

Describe the type of access road planned:

| |
|---|
| **N/A** |

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

## 5. LOCALITY MAP

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

[1] "Alternative A.." refer to activity, process, technology or other alternatives.

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s;)
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

## 6. LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

## 7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

## 8. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to

this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

## 9. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

## 10. ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

| | | | |
|---|---|---|---|
| **1. Is the activity permitted in terms of the property's existing land use rights?** | YES | | Please explain |
| Upgrades and maintenance on a national road is a South African National Roads Agency Limited (SANRAL) mandate (SANRAL takes responsibility for upgrades and maintenance of national routes). | | | |
| **2. Will the activity be in line with the following?** | | | |
| **(a) Provincial Spatial Development Framework (PSDF)** | | NO | See below |
| **(b) Urban edge / Edge of Built environment for the area** | | NO | See below |
| **(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).** | | NO | See below |
| **(d) Approved Structure Plan of the Municipality** | YES | | See below |
| **(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)** | | NO | See below |
| **(f) Any other Plans (e.g. Guide Plan)** | | NO | See below |
| Upgrades and maintenance on a national road is a South African National Roads Agency Limited (SANRAL) mandate (SANRAL takes responsibility for upgrades and maintenance of national routes). | | | |
| **3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?** | YES | | Please explain |
| The road currently has unacceptable quality of service. Improvements are normally applied to roads to improve quality of service on existing roads such as relieving traffic congestion, improve road safety, improve overtaking opportunities, etc. | | | |

| | | | |
|---|---|---|---|
| **4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)** | YES | | Please explain |
| Road safety improvements may result in fewer accidents. | | | |
| **5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)** | | NO | Please explain |
| N/A. | | | |
| **6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)** | | NO | Please explain |
| Upgrades and maintenance on a national road is a South African National Roads Agency Limited (SANRAL) mandate (SANRAL takes responsibility for upgrades and maintenance of national routes). | | | |
| **7. Is this project part of a national programme to address an issue of national concern or importance?** | YES | | Please explain |
| Upgrades and maintenance on a national road is a South African National Roads Agency Limited (SANRAL) mandate (SANRAL takes responsibility for upgrades and maintenance of national routes). | | | |
| **8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)** | YES | | Please explain |
| N/A | | | |
| **9. Is the development the best practicable environmental option for this land/site?** | YES | | Please explain |
| The development consists of the upgrade of an existing National road. | | | |
| **10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?** | YES | | Please explain |
| Improved road safety, less accidents | | | |
| **11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?** | | NO | Please explain |
| N/A | | | |
| **12. Will any person's rights be negatively affected by the proposed activity/ies?** | | NO | Please explain |
| N/A | | | |

| | | | |
|---|---|---|---|
| **13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?** | | NO | Please explain |
| The activity is on an existing road and takes place within an existing road reserve | | | |
| **14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?** | | NO | Please explain |
| N/A | | | |
| **15. What will the benefits be to society in general and to the local communities?** | | | Please explain |
| Job creation during the construction phase for skilled and semi-skilled workers as well as skills development. The road upgrade will result in a safer and better quality road for its users. | | | |
| **16. Any other need and desirability considerations related to the proposed activity?** | | | Please explain |
| The aim of this proposed project is to improve the quality of the National Road 10 Section 3 which may have adequate remaining structural life, but has an unacceptable quality of service. Improvements are normally applied to roads to improve quality of service on existing roads such as relieving traffic congestion, improve road safety, improve overtaking opportunities, etc. The proposed improvement works include the following works types:<br><br>LEVEL OF SERVICE: This comprises works that retain the existing pavement structure, but increase the width in selected areas (i.e. addition of climbing lanes) throughout the length of the section to improve its functional service-level.<br><br>CAPACITY: This comprises works that retain the existing pavement, but increase the width over the total length of the section. These include partial widening and climbing lane addition. BRIDGES: This comprises works that retain the existing bridges, but increase the width over the total length of the bridge. It also includes all work related to improvement of the horizontal and vertical clearances over and under the bridge. | | | |
| **17. How does the project fit into the National Development Plan for 2030?** | | | Please explain |
| Improved road safety and quality of service of provincial routes. | | | |
| **18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.** | | | |
| The potential and actual impacts of the activity on the environment, socio-economic and heritage conditions will be assessed. The risks, consequences and alternatives will be assessed and mitigated against, and potential benefits will be maximised. Public participation will be facilitated to further attempt to identify the best suitable environmental management strategies. | | | |
| **19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.** | | | |
| The project will be reviewed by the public and provincial government, after which National Government (DEA) will make an informed decision in accordance with national and provincial legislation. | | | |

## 11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

| Title of legislation, policy or guideline | Applicability to the project | Administering authority | Date |
|---|---|---|---|
| National Environmental Management Act (No 107 of 1998) | The activity triggers activities listed in NEMA GN R544 | Department of Environmental Affairs (DEA) | 1998 |
| Constitution Act (No. 108 of 1996) | | Constitution Assembly | 1996 |
| National Environmental Management: Biodiversity Act (Act No 10 of 2004) | The project will require section of vegetation be removed which will impact on the biodiversity of the area | Department of Environmental Affair (DEA) | 2004 |
| National Water Act (No. 36 of 1998) | The project occurs within 32meters of a watercourse | Department of Water Affair (DWA) | 1998 |
| National Forest Act (84 of 1998) | The project may have an impact on species of special concern along the proposed route | Department of Agriculture, Forestry and Fisheries (DAFF) | 1998 |
| Minerals and Petroleum Resources Development Act (No. 93 of 1996) | The project will make use of petroleum and mineral resources for the upgrade of the road | Department of Mineral Resources (DMR) | 2002 |
| National Road Traffic Act (No. 93 of 1996) | The project occurs on a national road route which will have an impact on traffic | Department of Transport | 1996 |

## 12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

### a) Solid waste management

| | |
|---|---|
| Will the activity produce solid construction waste during the construction/initiation phase? | YES |
| If YES, what estimated quantity will be produced per month? | 30m$^3$ |

How will the construction solid waste be disposed of (describe)?

**All solid waste will be collected at a central location and will be stored temporarily until removed to an appropriately permitted landfill site near the construction site. The nearest licensed landfill site is at Cradock.**

Where will the construction solid waste be disposed of (describe)?

**Solid waste to be removed to an appropriately permitted landfill site near the construction site. The nearest licensed landfill site is at Cradock.**

| | |
|---|---|
| Will the activity produce solid waste during its operational phase? | NO |
| If YES, what estimated quantity will be produced per month? | N/A |

How will the solid waste be disposed of (describe)?

N/A

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

N/A

Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?

N/A

*If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.*

| | |
|---|---|
| Can any part of the solid waste be classified as hazardous in terms of the NEM:WA? | NO |

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

| | |
|---|---|
| Is the activity that is being applied for a solid waste handling or treatment facility? | NO |

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

**b) Liquid effluent**

| | |
|---|---|
| Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? | NO |
| If YES, what estimated quantity will be produced per month? | N/A |
| Will the activity produce any effluent that will be treated and/or disposed of on site? | NO |

*If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.*

| | |
|---|---|
| Will the activity produce effluent that will be treated and/or disposed of at another facility? | NO |

If YES, provide the particulars of the facility:

| | | | |
|---|---|---|---|
| **Facility name:** | N/A | | |
| **Contact person:** | | | |
| **Postal address:** | | | |
| **Postal code:** | | | |
| **Telephone:** | | **Cell:** | |
| **E-mail:** | | **Fax:** | |

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

| |
|---|
| N/A |

**c) Emissions into the atmosphere**

| | | |
|---|---|---|
| Will the activity release emissions into the atmosphere other that exhaust emissions and dust associated with construction phase activities? | YES | |
| If YES, is it controlled by any legislation of any sphere of government? | | NO |

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.
If NO, describe the emissions in terms of type and concentration:

| |
|---|
| **Nuisance dust as a result of construction activities** |

**d) Waste permit**

| | | |
|---|---|---|
| Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA? | | NO |

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

**e) Generation of noise**

| | | |
|---|---|---|
| Will the activity generate noise? | YES | |
| If YES, is it controlled by any legislation of any sphere of government? | YES | |

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.
If NO, describe the noise in terms of type and level:

| |
|---|
| **Noise generated will be typical construction noise as a result of the movement of hauling trucks and graders. The noise nuisance will be managed in terms of the CEMP and the applicable sections of the Occupational Health and Safety Act (OHSA) and relevant Construction Regulations (CR).**<br><br>**Construction activities will only take place during the day, to prevent noise disturbance in the area during the evenings.** |

## 13. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

| Municipal | Water board | Groundwater | **River, stream, dam or lake** | Other | The activity will not use water |
|---|---|---|---|---|---|

| | |
|---|---|
| If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month: | **500 000 litres** |
| Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs? | YES |

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

## 14. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

Not applicable – the project will not use energy / electricity

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

Not applicable – the project will not use energy / electricity

## SECTION B: SITE/AREA/PROPERTY DESCRIPTION

**Important notes:**

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A): **N/A**

There are no significantly different environments along the proposed road upgrade

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section? NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

**Property description/physical address:**

| | |
|---|---|
| **Province** | Eastern Cape |
| **Nearest Town** | Cradock |
| **District Municipality** | Chris Hani District Municipality |
| **Local Municipality** | Inxuba Yethemba Local Municipality |
| **Farm name and number** | Please see appendix J |
| **Portion number** | Please see appendix J |
| **SG Code** | **SG No. NOF C02200000000051700001**<br>**SG No. NOF C02200000000051700004**<br>**SG No. NOF C02200000000051700006**<br>**SG No. NOF C02200000000051700010**<br>**SG No. NOF C02200000000051700013**<br>**SG No. NOF C02200000000051700014**<br>**SG No. NOF C02200000000051700015**<br>**SG No. NOF C02200000000051700017**<br>**SG No. NOF C02200000000051700019**<br>**SG No. NOF C02200000000051700020**<br>**SG No. NOF C02200000000051800003**<br>**SG No. NOF C02200000000051800004**<br>**SG No. NOF C02200000000051800022**<br>**SG No. NOF C02200000000051800023**<br>**SG No. NOF C02200000000051800024**<br>**SG No. NOF C02200000000051800026**<br>**SG No. NOF C02200000000051800032**<br>**SG No. NOF C02200000000052300003**<br>**SG No. NOF C02200000000052300004**<br>**SG No. NOF C0220000000005230002**<br>**SG No. NOF C02200000000052300023**<br>**SG No. NOF C02200000000052300026**<br>**SG No. NOF C02200000000052300027**<br>**SG No. NOF C02200000000052400000**<br>**SG No. NOF C02200000000052400001**<br>**SG No. NOF C02200000000052800003**<br>**SG No. NOF C02200000000052800000**<br>**SG No. NOF C02200000000055200000** |

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

**Current land-use zoning as per local municipality IDP/records:**

**Affected land :Road Reserve**
**Surrounding land: Agriculture (not affected by the proposed road upgrade development)**

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required? NO

## 1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

**Alternative S1:** Preferred road option (only alternative)

| | | | | | | |
|---|---|---|---|---|---|---|
| Flat | 1:50 – 1:20 | 1:20 – 1:15 | 1:15 – 1:10 | **1:10 – 1:7,5** | 1:7,5 – 1:5 | Steeper than 1:5 |

**Alternative S2 (if any):** No-go option

| | | | | | | |
|---|---|---|---|---|---|---|
| Flat | 1:50 – 1:20 | 1:20 – 1:15 | 1:15 – 1:10 | **1:10 – 1:7,5** | 1:7,5 – 1:5 | Steeper than 1:5 |

**Alternative S3 (if any):**

| | | | | | | |
|---|---|---|---|---|---|---|
| Flat | 1:50 – 1:20 | 1:20 – 1:15 | 1:15 – 1:10 | 1:10 – 1:7,5 | 1:7,5 – 1:5 | Steeper than 1:5 |

## 2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

| | | | | | |
|---|---|---|---|---|---|
| 2.1 Ridgeline | | 2.4 Closed valley | | 2.7 Undulating plain / low hills | |
| 2.2 Plateau | | 2.5 Open valley | | 2.8 Dune | |
| 2.3 Side slope of hill/mountain | | 2.6 Plain | | 2.9 Seafront | |

## 3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

| | **Alternative S1:** | **Alternative S2 (if any):** | **Alternative S3 (if any): N/A** |
|---|---|---|---|
| Shallow water table (less than 1.5m deep) | **NO** | **NO** | |
| Dolomite, sinkhole or doline areas | **NO** | **NO** | |
| Seasonally wet soils (often close to water bodies) | **YES** | **YES** | **There are many culverts traversing the road, aiding in stream flow along the road upgrade.** |

| | | | |
|---|---|---|---|
| Unstable rocky slopes or steep slopes with loose soil | NO | NO | |
| Dispersive soils (soils that dissolve in water) | NO | NO | |
| Soils with high clay content (clay fraction more than 40%) | NO | NO | |
| Any other unstable soil or geological feature | NO | NO | |
| An area sensitive to erosion | YES | YES | **Soil erosion is present near culverts, indicating that larger culverts are required to improve stream flow.** |

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

## 4. GROUNDCOVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

**A few species of special concern (such as species of the Mesembryanthemaceae family and *Aloe variegata* that occur on the Provincial Nature Conservation Ordinance or PNCO) were identified along the route. The entire length of the route will need to be walked for the location of individual species of special concern to be identified. This would form part of a ground truthing and permit application procedure which is separate to this Basic Assessment.**

| | | | | |
|---|---|---|---|---|
| Natural veld - good condition[E] | **Natural veld with scattered aliens[E]** | **Natural veld with heavy alien infestation[E]** | Veld dominated by alien species[E] | Gardens |
| Sport field | Cultivated land | Paved surface | Building or other structure | Bare soil |

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

## 5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

| | | | |
|---|---|---|---|
| Perennial River | **YES** | | |
| Non-Perennial River | **YES** | | |
| Permanent Wetland | | **NO** | |
| Seasonal Wetland | | **NO** | |
| Artificial Wetland | **YES** | | |
| Estuarine / Lagoonal wetland | | **NO** | |

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

**The N10 section 3 is adjacent to the Fish River. The N10 section 3 traverses the Riet river, Blaaukrantz river as well as Tarka River which have have a low flow rate during dry periods but flow steadily during heavy rain.**

## 6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

| | | |
|---|---|---|
| **Natural area** | Dam or reservoir | Polo fields |
| **Low density residential** | Hospital/medical centre | Filling station [H] |
| Medium density residential | School | Landfill or waste treatment site |
| High density residential | Tertiary education facility | Plantation |
| Informal residential[A] | Church | **Agriculture** |
| Retail commercial & warehousing | Old age home | **River, stream or wetland** |
| Light industrial | Sewage treatment plant[A] | Nature conservation area |
| Medium industrial [AN] | Train station or shunting yard [N] | **Mountain, koppie or ridge** |
| Heavy industrial [AN] | Railway line [N] | Museum |
| Power station | Major road (4 lanes or more) [N] | Historical building |
| Office/consulting room | Airport [N] | Protected Area |
| Military or police base/station/compound | Harbour | Graveyard |
| Spoil heap or slimes dam[A] | Sport facilities | Archaeological site |
| Quarry, sand or borrow pit | Golf course | Other land uses (describe) |

The road considered for the proposed activity traverses agricultural areas (farms with farm and staff houses). These areas will be impacted upon in terms of construction activities such as noise, dust, access to properties and stop and go points. The proposed section for upgrade also traversers three rivers which will involve construction activities to upgrade the bridges (discussed above).

If any of the boxes marked with an "N "are ticked, how will this impact / be impacted upon by the proposed activity?

| |
|---|
| None marked as indicated above |

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

| |
|---|
| None marked as indicated above |

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

| |
|---|
| None marked as indicated above |

Does the proposed site (including any alternative sites) fall within any of the following:

| | | |
|---|---|---|
| Critical Biodiversity Area (as per provincial conservation plan) | YES | |
| Core area of a protected area? | | NO |
| Buffer area of a protected area? | | NO |
| Planned expansion area of an existing protected area? | | NO |
| Existing offset area associated with a previous Environmental Authorisation? | | NO |
| Buffer area of the SKA? | | NO |

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

## 7. CULTURAL/HISTORICAL FEATURES

| | | |
|---|---|---|
| Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain: | | NO |
| Three main bridge structures are situated on the N10 Section 3 that include the Riet River, Blaauwkrans, and Tarka River Bridges. The bridges were constructed between 1955 and 1960 and therefore are younger than 60 years. A distance road marker associated with the original road between Cradock and Grahamstown is also situated along this route and is of historical value. The structure currently has a fence around it and should be clearly demarcated and cordoned off during the road upgrade development activities. No other archaeological material remains, sites, or features were documented within this area. | | |

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

**Archaeology**

Three main bridge structures are situated on the N10 Section 3 that include the Riet River, Blaauwkrans, and Tarka River Bridges. The bridges were constructed between 1955 and 1960 and therefore are younger than 60 years. A distance road marker associated with the original road between Cradock and Grahamstown is also situated along this route and is of historical value. The structure currently has a fence around it and should be clearly demarcated and cordoned off during the road upgrade development activities. No other archaeological material remains, sites, or features were documented within this area. The proposed areas are of a low cultural sensitivity and development may proceed as planned, although the following recommendations must be considered:

1. The historical distance marker (Hist1) must be cordoned off to avoid any impact during the upgrade of the N10 (Section 3).
2. If concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/or the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken.
3. Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.

**Please see archaeologist specialist study in appendix D**

**Palaeontology**

A Site Survey was carried out on the 21st of July 2012. It was established that this section of road is by and large situated on a raised bed situated along the valley bottom of the Fish River. As a result very little paleontological bedrock is exposed. It is concluded that the construction of the road itself will have a very low chance of impacting on paleontological resources and this only in a very limited area. No mitigation will therefore be required before, during or after the envisioned cutting.

**Please see palaeontologist specialist study in appendix D**

| | |
|---|---|
| Will any building or structure older than 60 years be affected in any way? | **NO** |
| Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)? | **NO** |

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

## 8. SOCIO-ECONOMIC CHARACTER

### a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

**The unemployment rate for Inxuba Yethemba Local Municipality is as high as 80%**

Economic profile of local municipality:

**The bulk of the population, about 60% are children in the school going age group (0 – 19 years). About 7% falls within the pension age group, while only 33% are in the working age group (20 – 64 years). This means that there is high dependency ratio as the 67% of the population depend on the 33% workforce in the area.**

Level of education:

**The municipality has a high illiteracy rate with approximately 30% of the population with no schooling. Only 5% have matric and about 4% have post matric.**

### b) Socio-economic value of the activity

| | | |
|---|---|---|
| What is the expected capital value of the activity on completion? | **R 300 000 000.00** | |
| What is the expected yearly income that will be generated by or as a result of the activity? | **R0** | |
| Will the activity contribute to service infrastructure? | **YES** | |
| Is the activity a public amenity? | **YES** | |
| How many new employment opportunities will be created in the development and construction phase of the activity/ies? | **Not determined** | |
| What is the expected value of the employment opportunities during the development and construction phase? | **Not determined** | |
| What percentage of this will accrue to previously disadvantaged individuals? | **SANRAL might ask for 6% -12%** | |
| How many permanent new employment opportunities will be created during the operational phase of the activity? | **Not determined** | |
| What is the expected current value of the employment opportunities during the first 10 years? | **Not determined** | |
| What percentage of this will accrue to previously disadvantaged individuals? | **Not determined** | |

## 9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult http://bgis.sanbi.org or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

**a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)**

| **Systematic Biodiversity Planning Category** | | | | **If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan** |
|---|---|---|---|---|
| **Critical Biodiversity Area (CBA)** | Ecological Support Area (ESA) | Other Natural Area (ONA) | No Natural Area Remaining (NNR) | The widening of the road reserve might affect land classified as CBA 2, which should be maintained in near natural state with minimal loss of ecosystem integrity and no transformation of its natural habitat should be permitted. This is due to the possible occurrence of species of special concern in the area. |

**b) Indicate and describe the habitat condition on site**

| **Habitat Condition** | **Percentage of habitat condition class (adding up to 100%)** | **Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).** |
|---|---|---|
| Natural | 10% | There is some natural vegetation around. |
| Near Natural (includes areas with low to moderate level of alien invasive plants) | 10% | Some vegetation in its near natural state, including species of special concern. |
| Degraded (includes areas heavily invaded by alien plants) | 20% | Soil degradation, alien investation is visible along the road |
| Transformed | 65% | A large portion of the project area is within the road |

| | | |
|---|---|---|
| (includes cultivation, dams, urban, plantation, roads, etc) | | reserve which has been transformed (grass cutting). |

**c) Complete the table to indicate:**

(i) the type of vegetation, including its ecosystem status, present on the site; and

(ii) whether an aquatic ecosystem is present on site.

| **Terrestrial Ecosystems** | | **Aquatic Ecosystems** | | | | |
|---|---|---|---|---|---|---|
| **Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)** | Critical | Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands) | | Estuary | | Coastline |
| | Endangered | | | | | |
| | Vulnerable | | | | | |
| | Least Threatened | YES | | NO | | NO |

**d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)**

**The vegetation along the N10 consists of predominantly karooid grasslands with small patches of riparian vegetation along the watercourses. The vegetation was in poor condition. This is due to the road reserve being kept clear by mowing and due to it being cleared before initial construction of the road. Despite the vegetation being in poor condition, a few species of special concern (such as species of the Mesembryanthemaceae family that occur on the Provincial Nature Conservation Ordinance or PNCO) were identified along the route. No wetlands were identified during the vegetation assessment.**

**Faunal populations along the proposed road upgrade are limited. No endemic or threatened species were observed.**

# SECTION C: PUBLIC PARTICIPATION

## 1. ADVERTISEMENT AND NOTICE

| | | |
|---|---|---|
| **Publication name** | Cradock Courant; The Herald | |
| **Date published** | 19 July 2012; 24 May 2012 | |
| **Site notice position 1** | **Latitude** | **Longitude** |
| | 32°25'25.57" S | 25°45'49.68"E |
| **Site notice position 2** | **Latitude** | **Longitude** |
| | 32°15'27.04"S | 25°43'47.80"E |
| **Date placed** | 11 July 2012 | |

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

## 2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 54(2)(e) and 54(7) of GN R.543.

**Initiation of project**

- An advert was placed in a provincial newspaper (the Herald) on 24 May 2012 as well as in a local newspaper (The Cradock Courant) on 19 July 2012 to notify the public of the proposed project.
- An initiation letter as well as background information document was emailed as well as distributed to landowners and surrounding landowners
- Two site notices were placed along the N10 section 3.

**Availability of Draft BAR and EMP for public review**

- A letter notifying the availability of the draft Basic Assessment report was sent to all I&AP's and stakeholders (Appendix E)
- The availability of the draft BAR for public review was advertised in the Cradock Courant.

Key stakeholders (other than organs of state) identified in terms of Regulation 54(2)(b) of GN R.543:

| Title, Name and Surname | Affiliation/ key stakeholder status | Contact details (tel number or e-mail address) |
|---|---|---|
| **Mr. Mzwandile Tantsi<br>1 J.A Calata Street,<br>Cradock<br>5880** | **Inxuba Yethemba Local Municipality** | **048 801 5000** |
| **104 Cathcart Road<br>Old Royal Building<br>Queenstown<br>5320** | **Department of Economic Development and Environmental Affairs** | **0458084000** |
| **Department of Transport,** | **Department of Transport, Eastern** | **(043) 6047 400** |

| | | |
|---|---|---|
| Eastern Cape Province<br>Stellenbosch Park<br>Flemming Street,<br>Schornville<br>KING WILLIAM'S TOWN,<br>5601 | Cape Province | |
| Department of Public Works<br>Mr Johan van der Walt<br>Private Bag X3913,<br>Port Elizabeth,<br>6056 | Department of Public Works | 041 408 2003 |
| Mr B. Gxilishe<br>Private Bag X0022<br>Bisho<br>56055 | Head of Department: Road and Public Works | 040 609 4472 |
| Mr Sello Mokhanya<br>74 Alexander Road<br>King Williams Town<br>5600 | Eastern Cape Provincial Heritage Resources Authority | 0436422811<br>Smokhanya @ecphra.org.za |

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

## 3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

| Summary of main issues raised by I&APs | Summary of response from EAP |
|---|---|
| No issues raised by I&APS thus far | |
| | |

## 4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E3.

## 5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

| Authority/Organ of State | Contact person (Title, Name and Surname) | Tel No | Postal address |
|---|---|---|---|
| Inxuba Yethemba Local Municipality | Mr. Mzwandile Tantsi | 048 801 5000 | 1 J.A Calata Street,<br>Cradock<br>5880 |
| Department of Economic Development and Environmental Affairs | | 0458084000 | 104 Cathcart Road<br>Old Royal Building<br>Queenstown<br>5320 |
| Department of Transport, Eastern Cape Province | Mr Johan van der Walt | (043) 6047 400 | Stellenbosch Park<br>Flemming Street, Schornville<br>King William's Town,<br>5601 |
| Department of Public Works | | 041 408 2003 | Private Bag X3913,<br>Port Elizabeth,<br>6056 |
| Head of Department: Road and Public Works | Mr B. Gxilishe | 040 609 4472 | Private Bag X0022<br>Bisho<br>56055 |
| Eastern Cape Provincial Heritage Resources Authority | Mr Sello Mokhanya | 0436422811 | 74 Alexander Road<br>King Williams Town<br>5600 |

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

## 6. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as appendix E5.
Copies of any correspondence and minutes of any meetings held must be included in Appendix E6

## SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

### 1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

**NO comments have been received thus far.**

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report as Annexure E):

### 2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report

<table>
<tr><th>Impact</th><th>Cause and Comment</th><th>Mitigation and Management</th><th>Significance statement</th></tr>
<tr><td colspan="4">PLANNING AND DESIGN PHASE IMPACTS</td></tr>
<tr><td>Impact 1: Incorrect planning in the design of the road upgrade</td><td>Failure to consider potential environmental impacts in the design of the road upgrade may exacerbate negative environmental impacts and fail to optimise positive environmental impacts.</td><td>Ensure all relevant legislation eg. ECBCP, municipal by laws, SDF's are adhered to.</td><td>Incorrect planning and design of the road upgrade could have long term consequences for the regional area of a moderate magnitude resulting in a moderately negative impact. Ensuring all relevant legislation is adhered to will result in a high positive impact.
<table>
<tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr>
<tr><td>long</td><td>regional</td><td>moderate</td><td>May occur</td><td>MOD -</td><td>HIGH +</td></tr>
</table></td></tr>
<tr><td>Impact 2: Poor bridge design</td><td>Upgrading and widening of bridges over rivers may result in water flow problems such as hampering flow or bank erosion.</td><td>Ensure that the bridge design does not impede the flow of water or cause erosion in these rivers/streams</td><td>A poorly designed bridge/upgrade can impede flow resulting in a high negative impact. Upgrading the bridges in a correct manner may in some cases enhance stream flow and biological life within the streams resulting in a moderately positive impact instead.
<table>
<tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr>
<tr><td>long</td><td>regional</td><td>severe</td><td>Definite</td><td>HIGH -</td><td>MOD +</td></tr>
</table></td></tr>
<tr><td colspan="4">CONSTRUCTION PHASE – DIRECT IMPACTS</td></tr>
<tr><td colspan="4">Paleontological</td></tr>
<tr><td>Impact 1: Cutting back of roadcuttings</td><td>This is not particularly significant as only one small roadcutting will be affected, which was not found to be fossiliferous on inspection, though fossils could be contained in the material to be cut away</td><td>Mitigation is probably not warranted in this case.</td><td>Due to the nature of palaeontological resources the standard impact rating system used in this study is not entirely appropriate.<br><br>According to this system it can be stated that any loss of palaeontological material would be permanent. If this material happened to be important its loss would be very severe and of international affect. However in this case it would be very unlikely.
<table>
<tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr>
<tr><td>permanent</td><td>international</td><td>Very severe</td><td>unlikely</td><td>HIGH -</td><td>MOD -</td></tr>
</table></td></tr>
<tr><td colspan="4">Archaeological</td></tr>
<tr><td>Impact 1: The destruction of the historical road distance marker (N10 Section 3)</td><td>These historically significant road markers occur between Cradock and Grahamstown along the original route that would have been used to travel between the two towns and can still be observed along the Bedford-Grahamstown road. This feature has been</td><td>The historical distance marker (Hist1) should be treated as a no-go area and must be clearly demarcated and cordoned off to avoid any impact during the construction phase ofupgrade of the N10 (Section 3).</td><td>Should the historical marker be destroyed it would be a very high negative impact. Should the mitigation measure be implemented the likelihood of this impact occurring would be unlikely, and therefore of low significance.
<table>
<tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr>
</table></td></tr>
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<table>
<tr><td></td><td>fenced, however, must clearly be cordoned off and avoided during the upgrade of the road. The feature is protected under Section 34 of the National Heritage Resources Act 25 of 1999.</td><td></td><td><table><tr><td>Short term</td><td>regional</td><td>Very severe</td><td>Definite</td><td>VERY HIGH -</td><td>LOW -</td></tr></table></td></tr>
<tr><td colspan="4">Ecological</td></tr>
<tr><td>Impact 1: Pollution of watercourses during bridge and culvert construction / reconstruction.</td><td>Pollution of watercourses may arise from the accidental or negligent deposition into the active channel of:<ul><li>Debris from the demolition of existing structures;</li><li>Fill material during excavation or placement;</li><li>Concrete during placement into formwork;</li><li>Fuel and oil from plant and machinery.</li></ul>The impacts of spills of wet concrete, fuel and oil will be more severe and longer-lasting than spills of inert materials.</td><td>Without mitigation:<br>Without mitigation it is probable that watercourses will be polluted, with associated impacts on aquatic biota and water users downstream of the road.<br><br>With mitigation:<br>Mitigation measures are:<ul><li>Construction vehicles must be serviced in designated areas (off site or approved by the ECO)</li><li>Any contaminated water/liquid must be disposed of appropriately.</li><li>Any construction debris must be removed from the river bed</li><li>A specialist or ECO must check the state of the rivers after construction</li></ul></td><td>Debris and fill:<br>Spills of debris and fill material into watercourses will probably occur over a short period of time and, without mitigation, will result on moderately severe impacts for a short distance downstream of the crossing. The significance of the impacts will be moderate negative.<br>Implementation of effective mitigation measures will reduce the significance to low negative.<table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>Short</td><td>Local</td><td>Moderate</td><td>Probable</td><td>MOD -</td><td>LOW -</td></tr></table>Concrete, fuel and oil:<br>Spills of concrete, fuel and oil into watercourses will probably occur over a short period of time and, without mitigation, could result on severe impacts for a considerable distance downstream of the crossing. The significance of the impacts will be high negative.<br>Implementation of effective mitigation measures will reduce the significance to low negative.<table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>Medium</td><td>Study area</td><td>severe</td><td>Probable</td><td>HIGH -ve</td><td>LOW -ve</td></tr></table></td></tr>
<tr><td>Impact 2: Loss of vegetation</td><td>For the road and bridges to be widened, the road reserve as well as area around the bridges will need to be cleared of vegetation resulting in the loss of vegetation communities. The road reserve is currently kept clear by mowing. The road reserve has been cleared before for initial construction of the road. As a result, the vegetation within</td><td>Mitigation measures include<ul><li>limiting the constructional activities to the road reserve, and</li><li>search and rescue of Species of Special Concern.</li></ul></td><td>Current removal of the vegetation to increase the width of the road definitely has a <u>permanent</u> impact within the Local scale. The environmental significance of this unmitigated impact would be LOW negative since the road will be widened within the road reserve and can be reduced to NO SIGNIFICANCE if measures of mitigation are taken<table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>permanent</td><td>local</td><td>moderate</td><td>definite</td><td>LOW -</td><td>NONE</td></tr></table></td></tr>
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<table>
<tr><td></td><td>the road reserve is quite disturbed with no vegetation of conservation concern.</td><td></td><td></td></tr>
<tr><td>Impact 3: Loss of species of Special Concern</td><td>The clearing of the vegetation will result in the loss of species of special concern that were noted within the road reserve. These include some Mesembryanthemaceae and Aloeaceae species. Although the entire road route could not be surveyed for Species of Special Concern, those that were seen during the site visit were noted. Before clearing commences a survey of the entire road route, including the areas around the bridges, for species of special concern, as well as permit applications will need to be done.</td><td>Mitigation measures include search and rescue of Species of Special Concern.</td><td>Current removal of these species definitely has a <u>permanent</u> slight impact at the Local scale. The environmental significance of this unmitigated impact would be MODERATE negative but can be reduced to LOW negative if measures of mitigation are taken.<br><br><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>permanent</td><td>local</td><td>slight</td><td>definite</td><td>MOD -</td><td>LOW -</td></tr></table></td></tr>
<tr><td>Impact 4: Soil compaction and soil erosion</td><td>Soil will be compacted by construction vehicles, and the movement of construction vehicles and human traffic could also lead to erosion.</td><td>Mitigation measures include confining construction activity within the road reserve which has already been subject to soil compaction and erosion.</td><td>Soil compaction and soil erosion definitely has a medium term slight impact at the Local scale. The environmental significance of this unmitigated impact would be LOW negative and can easily be mitigated to NO SIGNIFICANCE.<br><br><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>medium</td><td>local</td><td>slight</td><td>definite</td><td>LOW -</td><td>NONE</td></tr></table></td></tr>
<tr><td>Impact 5:<br>Impeding the flow of water in watercourses during bridge and culvert construction / reconstruction</td><td>The flow in watercourses will be impeded by any instream activity, including the construction of foundation slabs for culverts, new bridge piers, and the supporting structures for bridge deck framework. Depending on the nature of the watercourse the restriction of flow could interfere with the longitudinal migration patterns of instream fauna.</td><td>Without mitigation:<br>Without mitigation it is probable that the flow regime will be disrupted, with possible consequential disruptions to aquatic biota.<br>With mitigation:<br>Mitigation measures are:<ul><li>As far as possible restrict the timing and duration of instream activities to low-flow periods.</li><li>Where possible, and where necessary on the advice from an aquatic specialist, avoid impeding the flow periods critical to biological cycles of valued flora and fauna (for, for example, spawning migration)</li><li>Maintain an active channel by</li></ul></td><td>Instream construction activities will definitely impede the flow regime in watercourses for a short period of time. Without mitigation moderately severe impacts will occur, which could affect considerable lengths of the rivers and streams, both upstream and downstream of the crossing.. The significance of the impacts will be moderate negative.<br>Implementation of effective mitigation measures will reduce the significance to low negative.<br><br><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>Short</td><td>Regional</td><td>Moderate</td><td>Probable</td><td>MOD -</td><td>LOW -</td></tr></table></td></tr>
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<table>
<tr><td></td><td></td><td>diversions or berming.</td><td></td></tr>
<tr><td colspan="4">Social</td></tr>
<tr><td>Impact 5: Noise</td><td>Noise will be generated by construction vehicles, equipment as well as by employees</td><td>• Blasting activities shall be restricted to normal working hours (07h00 – 17h00 during weekdays)<br>• Residents must be made aware of whom they can address complaints to;<br>• No loud music to be allowed on site.</td><td>Noise generated as a result of construction activities is considered to be a short term, moderate negative impact on a local scale. Implementation of mitigation measures will reduce the severity to a low negative impact.<br><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>short</td><td>local</td><td>moderate</td><td>definite</td><td>MOD -</td><td>LOW -</td></tr></table></td></tr>
<tr><td>Impact 6: Dust</td><td>Dust will be generated as a result of construction activities. Unconsolidated sediment may also cause dust in the presence of wind.</td><td>• Topsoil should be cleared in a phased manner to avoid large areas of unconsolidated soils;<br>• Topsoil shall be covered wetted or otherwise stabilised to prevent erosion or dust generation; and<br>• Residents must be made aware of whom they can address complaints to.</td><td>Dust generation is expected to be negligible, resulting in a short term, low negative impact on a local scale. This will remain a low negative impact with the implementation of mitigation measures.<br><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>short</td><td>local</td><td>slight</td><td>definite</td><td>LOW -</td><td>LOW -</td></tr></table></td></tr>
<tr><td>Impact 7: Visual</td><td>Construction workers, machinery and signage will be visible to motorists along the length of the road upgrade.</td><td>This impact can not be mitigated</td><td>The visibility of the construction workers, machinery and signage is necessary and can’t be mitigated. As this will be confined to a localised area for a short-term and is slight in severity, it is considered a low negative impact.<br><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>short</td><td>local</td><td>Slights</td><td>definite</td><td>LOW -</td><td>LOW -</td></tr></table></td></tr>
<tr><td>Impact 8: Disturbance to Traffic flow</td><td>Half of the road will be closed off during construction on each piece of road. This will delay traffic and cause traffic congestion along some areas.</td><td>• Signage and signal personnel must be visible to motorists, indicating duration of delay<br>• Traffic must only be stopped/delayed when necessary</td><td>This will be a short term impact, moderate in severity and confined to the study area resulting in a significance rating of medium negative. With mitigation measures in place, this will be reduced to a low negative impact.<br><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>short</td><td>study</td><td>moderate</td><td>definite</td><td>MOD -</td><td>LOW -</td></tr></table></td></tr>
<tr><td>Impact 9: Disturbance to land owners</td><td>As there are many ‘turn offs’ to properties located along the route, land owners may find it difficult to travel to and from their properties. Presence of construction workers and machinery in the area may disturb land owners.</td><td>• Land owners must be considered so that they have adequate access to and from their properties in cases where construction work affects their access points</td><td>This impact is considered to be short term, confined to study area, and of medium probability and therefore has the potential to be a moderately negative impact due to risk to land owners and their properties. This can however be reduced to a low negative impact if mitigation measures are implemented.</td></tr>
</table>

<table>
<tr><td></td><td></td><td>• Workers and machinery are prohibited from entering neighbouring properties without the landowner's consent.</td><td><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>short</td><td>study</td><td>moderate</td><td>probable</td><td>MOD -</td><td>LOW -</td></tr></table></td></tr>
<tr><td>Impact 10: Solid Waste Generation and littering</td><td>Normal construction waste (rubble) is expected as a result of the road upgrade, along with domestic waste from construction workers</td><td>• All solid waste will be collected at a central location and will be stored temporarily until transported to the licensed landfill site in Cradock. Ensure that a proper Waste Management Plan is designed and implemented.<br>• Construction rubble shall be disposed of in pre – agreed, demarcated spoil dumps that have been approved by Inxuba Yethemba Municipality.<br>• Littering by the employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite.</td><td>This impact is considered to be short term, confined to study area, definite probability and therefore has the potential to be a moderately negative impact due to risk to land owners and their properties. This can however be reduced to a low negative impact if mitigation measures are implemented.<table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>short</td><td>Study area</td><td>moderate</td><td>definite</td><td>MOD -</td><td>LOW-</td></tr></table></td></tr>
<tr><td>Impact 11: Health and Safety of construction workers</td><td>Construction workers may become injured sick on duty due to construction activities.</td><td>An occupational health and safety (OHS) plan is to be devised to manage OHS on site in an appropriate manner. An ECO must be appointed to ensure this plan is adhered to.</td><td>This impact is considered to be short term, localised, and of medium probability and therefore has the potential to be a moderately negative impact due to risk to land owners and their properties. This can however be reduced to a low negative impact if mitigation measures are implemented.<table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>short</td><td>local</td><td>moderate</td><td>May occur</td><td>MOD -</td><td>LOW-</td></tr></table></td></tr>
<tr><td colspan="4">"NO-GO" OPTION – DIRECT IMPACTS</td></tr>
<tr><td colspan="4">Paleontological</td></tr>
<tr><td>Impact 1 : Impact</td><td>If the project does not go ahead,</td><td>N/A</td><td>Paleontological resources will not be affected in any way.</td></tr>
</table>

<table>
<tr><td>on Paleontological resources</td><td>paleontological resources will not be affected in any way.</td><td></td><td><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td></tr></table></td></tr>
<tr><td colspan="4">Ecological</td></tr>
<tr><td>Impact 2: Maintenance of vegetation and species of special concern</td><td>The no-go option will result in the biodiversity of the site being maintained. This impact is considered to be a positive impact since the vegetation will not be removed and the species of special concern will remain intact. However, the entire length of the road reserve has already been disturbed by frequent mowing and from being cleared before the initial construction of the road.</td><td>N/A</td><td>For the no-go option the impact will be a medium term moderate impact at the Local scale. The environmental significance of this unmitigated impact would be LOW negative since the vegetation is frequently mowed, people constantly stop along the side of the road, there is a lot of litter and plants may be dug up.<table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>long</td><td>local</td><td>moderate</td><td>definite</td><td>LOW -</td><td>N/A</td></tr></table></td></tr>
<tr><td>Impact 3: Soil erosion</td><td>Soil erosion is evident around some of the culverts along this route. If the project does not go ahead, and therefore the existing culverts will not be widened, the current problem will be exasperated.</td><td>N/A</td><td>Soil erosion will have a definite long temporal impact of a moderate magnitude on the study area if not mitigated.<table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>long</td><td>Study area</td><td>moderate</td><td>definite</td><td>MOD -</td><td>N/A</td></tr></table></td></tr>
<tr><td>Impact 4:Traffic</td><td>If the road does not get upgraded, the current conditions of the road will continue to deteriorate, posing as a risk to motorists.</td><td>N/A</td><td><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>long</td><td>regional</td><td>moderate</td><td>probable</td><td>HIGH-</td><td>n/A</td></tr></table></td></tr>
<tr><td colspan="4">CONSTRUCTION PHASE – INDIRECT IMPACTS</td></tr>
<tr><td colspan="4">Ecological</td></tr>
<tr><td>Impact 1: Invasion of alien species</td><td>Current removal of the vegetation will allow colonisation by alien invasive plants.</td><td>Mitigation measures to reduce the impact of the introduction of alien invaders, as well as mitigation against alien invaders that have already been recorded on the site should be actively maintained throughout both the construction and operation phases. Removal of existing alien species should be consistently done. Also, rehabilitation of disturbed areas after construction should be done as soon as possible after construction is completed</td><td>The invasion of alien species definitely has a long term moderate impact at the Local scale. The environmental significance of this unmitigated impact would be MODERATE negative and can easily be mitigated to a LOW positive<table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>long</td><td>local</td><td>moderate</td><td>definite</td><td>MOD -</td><td>LOW +</td></tr></table></td></tr>
<tr><td>Impact 2:</td><td>Oil and fuel leaks as well as construction</td><td>• Construction vehicles must be</td><td>This impact can be mitigated from a potentially high negative impact to a</td></tr>
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<tr>
<td>Pollution of soil, surface water and groundwater</td>
<td>waste may pollute soil, surface water and groundwater.</td>
<td>serviced in designated areas (off site or approved by the ECO)<br>• Any contaminated water/liquid must be disposed of appropriately.</td>
<td>potentially low negative impact.<br><br><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>long</td><td>regional</td><td>moderate</td><td>probable</td><td>HIGH -</td><td>LOW -</td></tr></table></td>
</tr>
<tr>
<td>Impact 3: Site contamination due to use of hazardous substances</td>
<td>Cement, tar and bitumen mixing techniques and diesel/oil spillage occurring as a result of poorly<br>maintained machinery can lead to soil pollution.</td>
<td>• Concrete should not be mixed directly on the ground, or during rainfall events when the potential for transport to the stormwater system is the greatest (as per the EMPr).<br>• Concrete must be mixed only in the area demarcated for this purpose and on an impermeable substratum.<br>• Oil trays must be placed under the machinery to avoid soil contamination.<br>• All areas affected during the Construction Phase should be rehabilitated</td>
<td>This impact can be mitigated from a potentially moderate negative impact to a potentially low negative impact.<br><br><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>Short term</td><td>local</td><td>severe</td><td>probable</td><td>MOD -</td><td>LOW -</td></tr></table></td>
</tr>
<tr>
<td>Impact 4: Site contamination due to spillage of hazardous substances</td>
<td>Any hazardous spill (depending on quantity) can have a negative impact of the environment if not handled and managed correctly.</td>
<td>• Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act 85 of 1993 and the SABS Code of Practise must be adhered to. This applies to solvents and other chemicals possibly used in the construction process.<br>• Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated onsite. The ECO must determine the precise method of treatment of polluted soil.<br>• This could involve the application of soil absorbent materials or oil-</td>
<td>This impact can be mitigated from a potentially moderate negative impact to a potentially low negative impact.<br><br><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>Short term</td><td>local</td><td>severe</td><td>probable</td><td>MOD -</td><td>LOW -</td></tr></table></td>
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<tr><td></td><td></td><td>digestive powders to the contaminated soil.<br>• If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent materials.<br>• Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.</td><td></td></tr>
<tr><td colspan="4">Social</td></tr>
<tr><td>Impact 5: Public littering and loitering</td><td>Motorists/passengers may relieve themselves on the side of the road whilst waiting at a ‘stop and go’. Motorists may also discard litter/rubbish from their vehicles to the side of the road.</td><td>Have waste bins and Sanitation facilities (portable toilets) located at the ‘stop and go’ areas. These bind and facilities must be emptied and cleaned on a regular basis</td><td><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>short</td><td>study area</td><td>moderate</td><td>probable</td><td>MOD -</td><td>LOW -</td></tr></table></td></tr>
<tr><td colspan="4">‘NO GO” OPTION – INDIRECT IMPACTS</td></tr>
<tr><td colspan="4">Ecological</td></tr>
<tr><td>Impact 1: Invasion of alien species</td><td>The no-go option for the current infestation of alien invasive plants will result in the continued dispersal of these plants which is considered a negative impact since the alien infestation will continue to spread.</td><td>N/A</td><td>The invasion of alien species definitely has a long term moderate impact at the Local scale. The environmental significance of this unmitigated impact would be MODERATE negative.<table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>long</td><td>local</td><td>moderate</td><td>Definite</td><td>MOD -</td><td>N/A</td></tr></table></td></tr>
<tr><td>Impact 2: Visual impact on motorists</td><td>If the proposed road upgrade does not go ahead, there will be no construction activities to have a visual impact on the motorists</td><td>N/A</td><td><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td></tr></table></td></tr>
<tr><td>Impact 3:Littering and loitering</td><td>Motorists and passengers will still continue to discard their rubbish to the side of the road, and stop for ‘toilet breaks’. The presence of portable toilets and bins at the stop and go areas (should the project go ahead) would assist in keeping the environment clean as</td><td>N/A</td><td><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>short</td><td>local</td><td>slight</td><td>probable</td><td>LOW -</td><td>N/A</td></tr></table></td></tr>
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<table>
<tr><td></td><td>long as motorists make use of them.</td><td></td><td></td></tr>
<tr><td>Impact 4:Loss on job opportunities</td><td>If the proposed road upgrade does not go ahead, potential employees from the surrounding area will have to look for jobs elsewhere.</td><td>N/A</td><td><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>short</td><td>Study area</td><td>moderate</td><td>Definite</td><td>MOD -</td><td>N/A</td></tr></table></td></tr>
<tr><td colspan="4">OPERATIONAL PHASE – DIRECT IMPACTS</td></tr>
<tr><td colspan="4">Paleontological</td></tr>
<tr><td>Impact 1: Vandalism of paleontological resources</td><td>Exposure of paleontological material in roadcuttings and excavations leaves them vulnerable to vandalisation and removal by members of the public</td><td>A palaeontologist should be contracted at the end of the road cutting process but prior to any rehabilitation of the roadcuttings, to examine the newly exposed outcrop</td><td>If these new exposures are surveyed at or towards the end of works, as recommended in the mitigation of the construction phase, no significant impacts are expected during the operational phase.<table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td></tr></table></td></tr>
<tr><td>Impact 2: Improved road conditions</td><td>Improved road conditions will increase allowances for traffic to overtake and increase road safety</td><td></td><td>This is a moderately positive impact.<table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>long</td><td>regional</td><td>moderate</td><td>definite</td><td>MOD +</td><td></td></tr></table></td></tr>
<tr><td>Impact 3: Improved stormwater drainage</td><td>Widening of culverts will spread stormwater flow, decreasing effects of soil erosion.</td><td>Culverts must be upgraded in manner which is suitable to each area, taking into account water flow through each particular culvert.</td><td>The upgrading of culverts definitely has a long term moderately beneficial impact at the study area. Following correct design and construction procedures, enhancing stream flow will result in a moderately beneficial impact<table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>long</td><td>Study area</td><td>Moderately beneficial</td><td>definite</td><td>LOW +</td><td>MOD +</td></tr></table></td></tr>
<tr><td colspan="4">“NO-GO” OPTION – DIRECT IMPACTS</td></tr>
<tr><td>Impact 1: Unimproved road conditions</td><td>If the proposed road does not get upgraded, the road will continue to deteriorate and eventually become hazardous for motorists.</td><td>N/A</td><td><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>long</td><td>regional</td><td>moderate</td><td>Definite</td><td>HIGH -</td><td>N/A</td></tr></table></td></tr>
<tr><td colspan="4">OPERATIONAL PHASE – INDIRECT IMPACTS</td></tr>
<tr><td colspan="4">Ecological</td></tr>
<tr><td>Impact 1: Invasion of alien species</td><td>Removal of the vegetation will allow colonisation by alien invasive plants.</td><td>Mitigation measures to reduce the impact of the introduction of alien invaders, as well as mitigation against alien invaders that have already been recorded on the site should be actively maintained throughout the operation</td><td>The invasion of alien species definitely has a long term moderate impact at the Local scale. The environmental significance of this unmitigated impact would be MODERATE negative and can easily be mitigated to a LOW positive<table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>long</td><td>local</td><td>moderate</td><td>definite</td><td>MOD -</td><td>LOW +</td></tr></table></td></tr>
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<tr><td></td><td></td><td>phase. Removal of existing alien species should be consistently done within the road reserve, as well as on construction camp sites.</td><td></td></tr>
<tr><td>Impact 2: Soil Erosion around culverts</td><td>Upgrading the culverts will improve runoff flow, thereby decreasing soil erosion in the area.</td><td>Culverts must be upgraded in manner which is suitable to each area, taking into account water flow through each particular culvert.</td><td>The upgrading of culverts definitely has a long term moderately beneficial impact at the study area. Following correct design and construction procedures, enhancing stream flow will result in a moderately beneficial impact
<table>
<tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr>
<tr><td>long</td><td>Study area</td><td>Moderately beneficial</td><td>definite</td><td>LOW +</td><td>MOD +</td></tr>
</table></td></tr>
<tr><td colspan="4">‘NO GO” OPTION – INDIRECT IMPACTS</td></tr>
<tr><td>Impact 1: Soil erosion around culverts</td><td>If the proposed road upgrade does not go ahead, the culverts will not be upgraded, therefore runoff and stream flow will continue as is, increasing soil erosion</td><td>If the proposed road upgrade does not go ahead, no mitigation measures will be implemented.</td><td>Currently, soil erosion around culverts is definitely occurring which results in a moderately severe negative impact for the study area on a long term basis.
<table>
<tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr>
<tr><td>long</td><td>Study area</td><td>moderate</td><td>definite</td><td>MOD -</td><td>N/A</td></tr>
</table></td></tr>
<tr><td colspan="4">CUMULATIVE IMPACTS</td></tr>
<tr><td>Impact 1:Pollution of soil, surface and groundwater</td><td>As noted above</td><td>As noted above</td><td>This impact can be mitigated from a potentially high negative impact to a potentially low negative impact.
<table>
<tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr>
<tr><td>long</td><td>regional</td><td>moderate</td><td>probable</td><td>HIGH -</td><td>LOW -</td></tr>
</table></td></tr>
<tr><td>Impact 2: Site contamination due to use of hazardous substances</td><td>As noted above</td><td>As noted above</td><td>This impact can be mitigated from a potentially moderate negative impact to a potentially low negative impact.
<table>
<tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr>
<tr><td>Short term</td><td>local</td><td>severe</td><td>probable</td><td>MOD -</td><td>LOW -</td></tr>
</table></td></tr>
<tr><td>Impact 3: Improved road conditions</td><td>As noted above</td><td>As noted above</td><td>This is a moderately positive impact.
<table>
<tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr>
<tr><td>long</td><td>regional</td><td>moderate</td><td>definite</td><td>MOD +</td><td></td></tr>
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<tr><td>Impact 4: Improved stormwater conditions</td><td>As noted above</td><td>As noted above</td><td>This is a moderately positive impact.<br><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>long</td><td>Study area</td><td>moderate</td><td>definite</td><td>MOD +</td><td></td></tr></table></td></tr>
<tr><td colspan="4">“NO GO” CUMULATIVE IMPACTS</td></tr>
<tr><td>Impact 1: Loss of job opportunities</td><td>As noted above</td><td>As noted above</td><td><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>short</td><td>Study area</td><td>moderate</td><td>Definite</td><td>MOD -</td><td>N/A</td></tr></table></td></tr>
<tr><td>Impact 2: Soil erosion</td><td>As noted above</td><td>As noted above</td><td>Soil erosion will have a definite long temporal impact of a moderate magnitude on the study area if not mitigated.<br><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>long</td><td>Study area</td><td>moderate</td><td>definite</td><td>MOD -</td><td>N/A</td></tr></table></td></tr>
<tr><td>Impact 3:Traffic</td><td>As noted above</td><td>As noted above</td><td><table><tr><th>temporal</th><th>spatial</th><th>severity</th><th>likelihood</th><th>significance</th><th>mitigation</th></tr><tr><td>long</td><td>regional</td><td>moderate</td><td>probable</td><td>HIGH-</td><td>n/A</td></tr></table></td></tr>
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## 3. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

**Alternative A (preferred alternative)**

**Cultural**

1. It is concluded that the construction of the road itself will have a very low chance of impacting on paleontological resources and this only in a very limited area. No mitigation will therefore be required before, during or after the envisioned cutting.

2. The historical distance marker (Hist1) should be treated as a no-go area and must be clearly demarcated and cordoned off to avoid any impact during the construction phase ofupgrade of the N10 (Section 3).

3. Spills of debris and fill material into watercourses will probably occur over a short period of time and, without mitigation, will result on moderately severe impacts for a short distance downstream of the crossing. The significance of the impacts will be moderate negative. Implementation of effective mitigation measures will reduce the significance to low negative. Spills of concrete, fuel and oil into watercourses will probably occur over a short period of time and, without mitigation, could result on severe impacts for a considerable distance downstream of the crossing. The significance of the impacts will be high negative. Implementation of effective mitigation measures will reduce the significance to low negative.

**Ecological**

4. For the plant species of special concern, it is recommended that these species be identified and rescued before construction commence as permits are required for removal of PNCO listed species.
5. Any adittional land required for the construction phase of the proposed road upgrade that will not be used during the operation phase should be rehabilitated after construction is completed.

6. The invasion of alien species in the road reserve and other areas impacted on by construction definitely has a long term *moderate* impact at the *Local* scale. The environmental significance of this unmitigated impact would be MODERATE negative and can easily be mitigated to a LOW positive

7. Oil and fuel leaks as well as construction waste may pollute soil, surface water and groundwater. This impact can be mitigated from a potentially high negative impact to a potentially low negative impact.

8. Cement, tar and bitumen mixing techniques and diesel/oil spillage occurring as a result of poorly maintained machinery can lead to soil pollution. This impact can be mitigated from a potentially moderate negative impact to a potentially low negative impact.

9. Any hazardous spill (depending on quantity) can have a negative impact of the environment if not handled and managed correctly. This impact can be mitigated from a potentially moderate negative impact to a potentially low negative impact.

10. Normal construction waste (rubble) is expected as a result of the road upgrade, along with domestic waste from construction workers. This impact is considered to be short term, confined to study area, definite probability and therefore has the potential to be a moderately negative impact due to risk to land owners and their properties. This can however be reduced to a low negative impact if mitigation measures are implemented.

11. Soil compaction and soil erosion definitely has a medium term slight impact at the *Local* scale. The environmental significance of this unmitigated impact would be LOW negative and can easily be mitigated to NO SIGNIFICANCE.

**Social**

12. Noise generated as a result of construction activities is considered to be a short term, moderate negative impact on a local scale. Implementation of mitigation measures will reduce the severity to a low negative impact.
13. Dust generation is expected to be negligible, resulting in a short term, low negative impact on a local scale. This will remain a low negative impact with the implementation of mitigation measures.
14. The visibility of the construction workers, machinery and signage is necessary and can't be mitigated. As this will be confined to a localised area for a short-term and is slight in severity, it is considered a low negative impact.

**Despite the negative environmental impacts of the construction phase, there are significant positive impacts to the local community and road users in general (in terms of job opportunities and an improved road). The negative impacts can be reduced to low significance with the implementation of the suggested mitigation measures and will be outweighed by the positive impacts associated with the road upgrade.**

**In conclusion, the EAP recommends that Environmental Authorization (EA) be granted and issued to the applicant, the South African National Roads Agency Limited (SANRAL), so as to proceed with the proposed upgrade of the N10 section 3 from the Riet River (km 45.2) to Tarka Bridge (km 68.5) in the Eastern Cape Province.**

**No-go alternative (compulsory)**

It may be argued from an environmental perspective that the no-go option is the favourable alternative as open space is maintained, however soil erosion is visible around the culverts along the N10 section 3 area and there is no guarantee of preventing further erosion should the project not go ahead. Current practices are therefore not necessarily beneficial to the long-term ecological functioning of the site. In addition to this are the economic benefits associated with a project of this nature which would not accrue from the "no-development" alternative.

The No-go alternative would mean abandoning the proposed development and as such there will be no negative impacts on the environment as identified as a result from the development. Abandoning the proposed development may result in none of the positive impacts such upgrading a deteriorating road (making the road safer), upgrading culverts (decreasing soil erosion) and creating employment.

It is therefore recommended that the 'no-go' option may not be viable in terms of ecological and economical sustainability and that it should therefore not be considered.

## SECTION E. RECOMMENDATION OF PRACTITIONER

| | |
|---|---|
| Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)? | **YES** |

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

1. **An independent ECO must be appointed for the duration of the construction activities and must conduct monthly monitoring visits which may coincide with .**
2. **The ECO must ensure that construction is monitored for fossils during cutting of the roads and must ensure any material thought to contain fossils is rescued.**
3. **A palaeontologist should be contracted at the end of the road cutting process but prior to any rehabilitation of the roadcuttings, to examine the newly exposed outcrop.**
4. **The historical distance marker (Hist1) should be treated as a no-go area and must be clearly demarcated and cordoned off to avoid any impact during the construction phase ofupgrade of the N10 (Section 3).**
5. **For plant SSC, it is recommended that species are identified and rescued before construction commence as permits are required for removal of PNCO listed species.**
6. **Any additional land required for the construction phase of the proposed road upgrade that will not be used during the operation phase should be rehabilitated after construction is completed.**
7. **The spread of Alien vegetation in the road reserve and other impacted areas within the proposed road upgrade must be minimised as far as practically possible.**
8. **Removal of existing alien species within the road reserve and other impacted areas should be done when practically possible.**
9. **Blasting activities shall be restricted to normal working hours (07h00 – 17h00 during weekdays)**
10. **Residents must be made aware of whom they can address complaints to.**
11. **No loud music to be allowed on site.**
12. **Topsoil should be cleared in a phased manner to avoid large areas of unconsolidated soils;**
13. **Topsoil shall be covered wetted or otherwise stabilised to prevent erosion or dust generation; and**
14. **Signage and signal personnel must be visible to motorists, indicating duration of delay**
15. **Traffic must only be stopped/delayed when necessary**
16. **Land owners must be considered so that they have adequate access to and from their properties in cases where construction work affects their access points**
17. **Workers and machinery are prohibited from entering neighbouring properties without the landowner's consent.**
18. **An occupational health and safety (OHS) plan is to be devised to manage OHS on site in an appropriate manner. An ECO must be appointed to ensure this plan is adhered to.**
19. **Construction vehicles must be serviced in designated areas (off site or approved by**

**the ECO)**

20. **Any contaminated water/liquid must be disposed of appropriately.**
21. **Concrete should not be mixed directly on the ground, or during rainfall events when the potential for transport to the stormwater system is the greatest (as per the EMPr).**
22. **Concrete must be mixed only in the area demarcated for this purpose and on an impermeable substratum.**
23. **Oil trays must be placed under the machinery to avoid soil contamination.**
24. **All areas affected during the Construction Phase should be rehabilitated**
25. **Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act 85 of 1993 and the SABS Code of Practise must be adhered to. This applies to solvents and other chemicals possibly used in the construction process.**
26. **Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated onsite. The ECO must approve any proposed treatment of polluted soil**
27. **This could involve the application of soil absorbent materials or oil-digestive powders to the contaminated soil.**
28. **If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent materials.**
29. **Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.**
30. **Have waste bins and Sanitation facilities (portable toilets) located at the 'stop and go' areas. These bind and facilities must be emptied and cleaned on a regular basis**
31. **A palaeontologist should be contracted at the end of the road cutting process but prior to any rehabilitation of the roadcuttings, to examine the newly exposed outcrop**
32. **Adequate sanitary and ablution facilities must be provided for construction workers**

**Is an EMPr attached?** **YES**

The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

_____

NAME OF EAP

_____ _____

SIGNATURE OF EAP DATE

**SECTION F: APPENDIXES**

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information - Landowners Details