



DRAFT ENVIRONMENTAL IMPACT REPORT

PROPOSED N2 WILD COAST TOLL HIGHWAY

Volume 1: Main Report

Prepared for:

National Department of Environmental Affairs and Tourism,
Eastern Cape Department of Economic Development and Environmental Affairs, and
KwaZulu-Natal Department of Agriculture and Environmental Affairs

Prepared by:

CCA Environmental (Pty) Ltd

On behalf of:

The South African National Roads Agency Limited

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Volume 1

Main Report

Volume 1 comprises the Draft Environmental Impact Report and Appendices A to D for the proposed N2 Wild Coast Toll Highway

Volume 2

Specialist Reports

Appendix 1: Vegetation and Flora

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Specialist Reports

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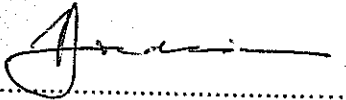
Appendix 12: Planning/Development

Appendix 13: Economic

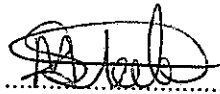
PROJECT INFORMATION

TITLE	Draft Environmental Impact Report: Proposed N2 Wild Coast Toll Highway
PROponent	The South African National Roads Agency Limited
ENVIRONMENTAL CONSULTANT	CCA Environmental (Pty) Ltd
DEAT REFERENCE NUMBER	12/12/20/701
REPORT REFERENCE	NRA01N2WC/DEIR
DATE	October 2008

REPORT COMPILED BY: Fuad Fredericks, assisted by Melita Steele



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Director



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REPORT REVIEW BY: Jonathan Crowther



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Managing Director

EXPERTISE OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

NAME	Fuad Fredericks
RESPONSIBILITY ON PROJECT	Project consultant, report writing and project management
DEGREE	M.Sc. (Bot.), H.D.E.
PROFESSIONAL REGISTRATION	Pr.Sci.Nat. – Registered Professional Natural Scientist in the field of practice Environmental Science – Registration No. 400085/07 CEAPSA – Certified Environmental Assessment Practitioner, The Interim Certification Board for Environmental Assessment Practitioners of South Africa – Registration No. 0078/06
EXPERIENCE IN YEARS	9
EXPERIENCE	Fuad Fredericks has been involved in environmental consulting since 1999 and is currently a Director of CCA Environmental (Pty) Ltd. He has experience in a wide range of environmental disciplines, including Environmental Impact Assessments (EIAs), Environmental Management Plans (EMPs), Environmental Monitoring and Auditing, Environmental Education and Public Consultation. He has been responsible for management and quality control of environmental assessments dealing with a number of highly complex and controversial projects, such as the proposed toll roads on the national routes in the Western Cape. He also has extensive experience in the environmental assessment, monitoring and auditing of projects related to landfill sites, wastewater treatment facilities, and water and sewage pipelines.

NAME	Melita Steele
RESPONSIBILITY ON PROJECT	Report writing
DEGREE	M.Sc. (Env. Sci.)
PROFESSIONAL REGISTRATION	-
EXPERIENCE IN YEARS	1
EXPERIENCE	Melita Steele has worked as an environmental assessment practitioner since the beginning of 2008 and has been involved in projects covering a range of environmental disciplines, including EMPs and EIAs. She has been exposed to some major projects related to infrastructure.

NAME	Jonathan Crowther
RESPONSIBILITY ON PROJECT	Project management and report review
DEGREE	B.Sc. Hons (Geol.), M.Sc. (Env. Sci.)
PROFESSIONAL REGISTRATION	Pr.Sci.Nat., EAPSA Certified
EXPERIENCE IN YEARS	20
EXPERIENCE	Jonathan Crowther has been involved in environmental consulting since 1988 and is currently the Managing Director of CCA Environmental (Pty) Ltd. He has expertise in a wide range of environmental disciplines, including EIAs, Environmental Management Plans / Programmes, Environmental Planning & Review, Environmental Auditing & Monitoring, Environmental Control Officer, Public Consultation & Facilitation. He has project managed and has extensive experience in a range of projects with specific expertise in the oil and gas industry, infrastructure (roads, pipelines, waste land fill sites), industry and property developments.

EXECUTIVE SUMMARY

1. INTRODUCTION

This Executive Summary incorporates the main findings of the Impact Assessment phase of the Environmental Impact Assessment (EIA) that is being undertaken for the proposed N2 Wild Coast Toll Highway. The proposed project extends over a total distance of approximately 560 km between the N2 Gonubie Interchange (near East London in the Eastern Cape) and the N2 Isipingo Interchange (south of Durban in KwaZulu-Natal) (see Figure 1).

1.1 BACKGROUND TO THE STUDY

A previous EIA for the proposed N2 Wild Coast Toll Highway resulted in the issuing of an environmental Record of Decision (RoD), on 3 December 2003, which authorised the South African National Roads Agency Limited (SANRAL) to undertake the proposed project. However, numerous appeals were subsequently lodged with the Minister of Environmental Affairs and Tourism objecting to the authorisation granted to SANRAL. On 9 December 2004 the Minister upheld the appeals and set aside the authorisation on the grounds that the appointed environmental consultant did not meet the requirement for independence as contemplated in the EIA Regulations (Government Notice R1183 of 5 September 1997, as amended) promulgated under the Environment Conservation Act, 1989 (ECA, Act No. 73 of 1989). In addition to a number of other items, the Minister's decision also indicated that this did not preclude a new application for environmental authorisation from being submitted.

Following a proposal call by SANRAL in January 2005, SANRAL subsequently appointed CCA Environmental (Pty) Ltd (CCA), in association with NMA Effective Social Strategists (formerly Nomi Muthialu & Associates (Pty) Ltd; NMA), as independent environmental consultant to submit a new application for environmental authorisation and to undertake the required EIA of the proposed project as per the requirements of the ECA EIA Regulations.

1.2 TERMS OF REFERENCE FOR THE CURRENT EIA

The terms of reference for the current EIA includes the following:

- To undertake a thorough review of the previous EIA process in order to identify appropriate and/or adequate information suitable for use in the current EIA;
- To undertake a comprehensive audit of all the issues and concerns raised during the previous EIA's Scoping Study, Impact Assessment and Appeals phases in order to identify key shortcomings and/or gaps that need to be addressed in the current EIA;
- To formulate Terms of Reference for specialist studies in order to update existing, appropriate information and/or to address identified shortcomings and/or gaps;
- To include a formal public consultation process in the study, which specifically addresses the distribution of information to Interested and Affected Parties (I&APs), provision of opportunities for I&APs to raise any new issues and concerns and the provision of opportunities for I&APs to comment on the EIA documentation; and
- To ensure the study complies with the relevant requirements of the ECA and the National Environmental Management Act, 1998 (NEMA, Act No. 107 of 1998), as appropriate.

1.3 BRIEF OVERVIEW OF STUDY PROCESS TO DATE

1.3.1 APPLICATION FOR AUTHORISATION AND PLAN OF STUDY FOR SCOPING

CCA duly submitted the required Application for Authorisation forms and a Plan of Study for Scoping (April 2005), on behalf of SANRAL, to the Department of Environmental Affairs and Tourism (DEAT; the lead environmental authority), the Eastern Cape Department of Economic Development and Environmental Affairs (formerly the Eastern Cape Department of Economic Affairs, Environment and Tourism) and the KwaZulu-Natal Department of Agriculture and Environmental Affairs. DEAT, with due consideration of comments received from the relevant provincial environmental authorities, accepted the Plan of Study for Scoping on 20 June 2005.

1.3.2 SCOPING STUDY

A Scoping Study was undertaken in accordance with the requirements of the ECA EIA Regulations (Government Notice R1183 of 5 September 1997, as amended). The findings of the Scoping Study were presented in the Final Scoping Report (FSR), which was submitted to the relevant environmental authorities for consideration during March 2007.

1.3.3 PLAN OF STUDY FOR EIA

A Plan of Study for EIA was submitted to the relevant environmental authorities in April 2007. DEAT accepted the FSR and Plan of Study for EIA during May 2007 and requested that SANRAL submit an Environmental Impact Report (EIR) which should comply with the requirements of Regulation 8 of the ECA EIA Regulations.

1.3.4 SPECIALIST STUDIES

Suitable, independent specialists were thus duly commissioned, between May and July 2007, to undertake 13 specialist studies on potential impacts associated with the construction and operation of the proposed project, as per the Terms of Reference formulated in Chapter 9 of the FSR. Specialist studies were undertaken in the following fields: vegetation and flora; fauna; aquatic ecosystems; soils, land use and agriculture; social; tourism; cultural and historical heritage; noise; air quality; visual; traffic; planning/development; and economic. Draft specialist reports were subjected to external peer specialist review, which informed the compilation of the final draft specialist reports.

1.3.5 COMPILATION OF DRAFT EIR

The Draft EIR primarily serves to present the key findings of the specialist studies undertaken to assess the potential biophysical, social and economic impacts of the proposed project and the alternatives brought forward for investigation in this phase of the EIA. The report integrates and synthesises the results of these specialist studies and other relevant, available information and provides an overall assessment of the potential impacts of the proposed project and the identified feasible alternatives. The findings of a comparative assessment of the alternative route alignments and toll plaza locations are presented and recommendations are made in terms of mitigation, enhancement and management measures that would be applicable to the further planning, design, construction and operation of the proposed project (if authorised).

1.4 COMMENT ON THE DRAFT EIR

The Draft EIR will be made available for an eight-week comment period from **Monday 10 November 2008 to Friday 9 January 2009** in order to provide I&APs an opportunity to comment on any aspect of the EIA to date. The Executive Summary of the report has been forwarded to all I&APs on the project database.

Copies of the full report have been lodged in the following public libraries/venues for public review:

Eastern Cape

East London Central Library	Tabankulu Library
Gonubie Library	Port St Johns Library
Komga Library	Lusikisiki Information Centre
Butterworth Public Library	Ingquza Hill Municipal Offices (Lusikisiki)
Dutywa Public Library	Flagstaff Information Centre
Mthatha Public Library	Ingquza Hill Municipal Offices (Flagstaff)
Mhlonto Municipal Offices (Qumbu)	Bizana Library
Umzimvubu Municipal Offices (Mount Ayliff)	Matatiele Library
Nyandeni Municipal Offices (Libode)	

KwaZulu-Natal

Kokstad Public Library	Scottburgh Memorial Library
Harding Public Library	Park Rynie Library
Ezingoleni Municipal Offices (Izingolweni)	Umzinto Library
Durban Central Reference Library	Pennington Library
Isipingo Civic Library	Hibberdene Library
Isipingo Beach Library	Umtentweni Library
Athlone Park Public Library	Port Shepstone Library
Amanzimtoti Library	Uvongo Library
Kwamakhuta Library	Margate Library
Kingsburgh Library	Southbroom Library
Umkomaas Library	Munster Library
Adams Mission Library	Port Edward Library
Cragieburn Library	

The full report will also be made available on the websites www.ccaenvironmental.co.za and www.nra.co.za.

I&APs are also invited to attend any of the 17 Public Open Days that will be held at central locations along the route of the proposed project during the comment period on the Draft EIR. Relevant details of the proposed project and findings of the EIA will be presented on posters and maps and the public will be given the opportunity to interact directly with members of the EIA and specialist teams, and representatives of SANRAL regarding the findings of the EIA. Details of the Public Open Days are set out below.

DATE	TIME	VENUE
Monday 17 November 2008	10h00 – 19h30	Scottburgh Town Hall
Tuesday 18 November 2008	10h00 – 19h30	Amanzimtoti Civic Centre Main Hall
Wednesday 19 November 2008	10h00 – 17h00	Libode Town Hall
Thursday 20 November 2008	10h00 – 19h30	Mthatha Town Hall

DATE	TIME	VENUE
Friday 21 November 2008	10h00 – 17h00	Qunu – Nelson Mandela Museum
Monday 24 November 2008	10h00 – 17h00	TRC Hall, Dutywa
Tuesday 25 November 2008	10h00 – 17h00	Butterworth Town Hall
Wednesday 26 November 2008	10h00 – 17h00	Komga Town Hall
Thursday 27 November 2008	10h00 – 19h30	East London City Hall
Friday 28 November 2008	10h00 – 17h00	Thombo Community Centre
Monday 1 December 2008	10h00 – 17h00	Lusikisiki Teacher Training College
Tuesday 2 December 2008	10h00 – 17h00	Mahaha Junior Secondary School
Wednesday 3 December 2008	10h00 – 17h00	Baleni Clinic
Monday 8 December 2008	10h00 – 19h30	Wild Coast Casino, Egret Ballroom
Tuesday 9 December 2008	10h00 – 17h00	Holy Cross Community Hall
Wednesday 10 December 2008	10h00 – 17h00	Taleni Community Hall
Thursday 11 December 2008	10h00 – 19h30	Port Shepstone Town Hall

Comments must reach the offices of NMA by no later than **Friday 9 January 2009** to be considered in compilation of the Final EIR. Comments may be submitted at the Public Open Days or may be forwarded via e-mail, facsimile or letter to the contact details given below.

NMA EFFECTIVE SOCIAL STRATEGISTS
ATTENTION: THEO HANSFORD
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BRAAMFONTEIN, 2017
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2. GENERAL PROJECT INFORMATION

2.1 RATIONALE FOR TOLLING AT A NATIONAL LEVEL

A portion of the fuel levy was historically allocated to a dedicated road fund and was used for that purpose. However, in April 1987 this allocation was terminated. All national road funding was thereafter allocated from Central Revenues. The country's fiscal system treats all tax revenue as fungible and precludes revenue targeting for infrastructure. Revenues raised through a particular tax cannot be preserved for a single pre-specified infrastructure use; instead they go into a central fund and are then allocated across all competing uses via the budgetary process.

Thus, despite widely held public belief, the fuel levy is not allocated automatically to SANRAL. To put this into context, in 2006 the amount paid into the national fiscus by road users was in the region of R 44 billion (derived from the fuel levy, customs and excise duties, VAT on new and second-hand vehicle sales, VAT on vehicle parts and repairs, import duties on vehicles and parts, licence fees and VAT on toll fees). This was far in excess of the approximately R 10.6 billion spent by the state in 2004/05 on building and maintaining national and provincial roads and/or contributed by the State to the cost of metropolitan and municipal roads.

SANRAL's budget allocation for 2003 and 2004 was R 1.1 billion and R 1.4 billion, respectively. According to SANRAL, this funding was only sufficient to manage about half of the non-toll national road network at that time (11 550 km). It is envisaged that SANRAL would eventually be responsible for a 20 000 km national road network. In addition, the primary road network is old and requires structural

strengthening and, thus, major capital investment (more than 60% of the non-toll road network is older than its 20 to 25-year design life).

Most of the primary road networks in and around South Africa's major economic centres are operating beyond their operational traffic capacity and require an increase in capacity (widening) and/or additional infrastructure. Some of the routes between these centres also require improvements in capacity. Currently 65% of SANRAL's budget allocation is spent on preserving or maintaining the primary road network while the remainder is spent on upgrading the assets. Inherent in this expenditure is keeping the roads in a safe condition for daily use. With an assumed funding level of R 4.4 billion a year for the non-toll national road network, the existing system will deteriorate over the next eight years to a forecasted backlog of R 9.6 billion. Thus, SANRAL sees tolling as an appropriate and successful funding mechanism to create new road infrastructure and to upgrade and maintain existing national routes where this is equitable, achievable and feasible. Furthermore, it allows tax-based revenues to be utilized for the non-toll road network and other much-needed social projects.

In order to constructively engage the private sector SANRAL's predecessor, the South African Roads Board, in September 1997 developed the policy in respect of Unsolicited Proposals. This policy was revised in 1999 (the current version) by SANRAL to take into account the comments received from both national and international institutions. Through the policy the private sector is able to submit unsolicited proposals for the development of national road infrastructure, that forms part of the strategic national road network identified by SANRAL, and which could ultimately be implemented as toll road concessions such as the N4 Maputo Development Corridor, the N3 Toll Highway and the N4 Platinum Toll Highway.

2.2 MOTIVATION FOR THE PROPOSED PROJECT

2.2.1 NATIONAL AND REGIONAL ECONOMIC CONTEXT

National road networks link together the main cities and economic regions of a country and thus play an important developmental role in economic growth and social upliftment. National road networks are primarily designed to facilitate the safe and efficient movement of people, goods and services over medium to long distances between economic centres. Trips are undertaken by private vehicles (commuter, business and recreational trips), public transport and commercial heavy vehicles to satisfy the needs and requirements of the unitary economic unit, i.e. the household, in a particular corridor, adjacent regions and the rest of the country. At a regional level, the provincial and local road networks provide the necessary linkages to the local communities thereby providing, with the national network, the required mobility to provide the basic ingredients for socio-economic growth.

The former Transkei, particularly the region between the Kei River and the Mthamvuna River is doubly handicapped in this respect. Not only does it currently have few economically realisable natural resources but the rugged and mountainous terrain has ensured that access is barely adequate at best and rudimentary at worst. The alignment of the existing N2, for instance, was determined in 1936 (the actual road was substantially completed by 1946) and has remained the only primary access to the area to date. The paved R61, which is the only other primary access, was only completed in the late 1970's and early to middle 1980's. There has been no improvement in provision of access since then. Secondary and local road networks are inadequate, at best, where they exist or are non-existent.

The existing N2 and R61 tend to follow "watershed alignments" in order to avoid crossing deeply incised gorges and river valleys on the scale and extent of the "Valley of a Thousand Hills" and the Oribi Gorge in KwaZulu-Natal. Hence, the existing N2 is located up to more than 100 km inland (at Mount Frere) and reaches a height of approximately 1 700 metres above mean sea level at Brookes Nek before it descends

to sea level at Port Shepstone. The R61, in turn, is located up to almost 60 km inland (at Flagstaff) and is at a height of about 1 000 m at that point. Access to the coast is poor where it exists at all. Access parallel to the coast is non-existent because of the deeply incised gorges and valleys. For example, in many cases it is only possible to drive between certain locations along the coast by first returning to the R61. This can involve a round trip of about 100 to 120 km, whereas the locations are often only 20 to 30 km apart. Not surprisingly, this region is one of the most impoverished areas in South Africa. The proposed project aims to improve access and linkage to the Wild Coast region while reducing road-user costs and optimising safety and socio-economic benefits.

The Wild Coast region has been identified as an area for strategic economic development in accordance with Government's Spatial Development Initiative (SDI) strategy. The Wild Coast SDI identified the provision of a major road, such as the proposed toll road, as an important catalyst for achievement of its objectives since it would enhance access to the region and would facilitate development of the eco-tourism potential of the area.

The existing N2 south of Mthatha requires major upgrades to fulfil its function as a primary national road between economic centres and to cater for rapidly growing traffic volumes. The existing R61 and N2 between Port Edward and Durban are currently in a good to fair condition. The section between the Adams Road and Isipingo interchanges is currently operating at or beyond its maximum Level of Service D capacity. Traffic growth in the medium- to long term is likely to induce unstable flow and thus severe congestion (stop-start conditions).

The proposed N2 Wild Coast Toll Highway aims to provide an improved, shorter and safer road link between the Eastern Cape/Western Cape and KwaZulu-Natal. A shorter, more efficient transport route is viewed as an improvement to the national road network and is considered of strategic importance to the region and the country as a whole. It is considered that such a national road or "spine" would provide the necessary linkages and impetus to improve the secondary and local networks while facilitating sustainable economic growth along the entire corridor.

2.2.2 SUMMARY OF KEY ROAD PROBLEMS ALONG THE EXISTING N2 AND R61 SECTIONS OF THE PROPOSED N2 WILD COAST TOLL HIGHWAY AND POTENTIAL BENEFITS TO THE ROAD USER

The key road problems currently experienced along the existing N2 and R61 sections of the proposed toll highway and the potential benefits of the proposed project to the road user are provided in Table 1.

Table 1: Current road problems along the existing N2 and R61 sections of the proposed toll highway and potential benefits of the proposed project to the road user

ROAD SECTIONS AND CURRENT PROBLEMS	POTENTIAL BENEFITS TO THE ROAD USER
GONUBIE INTERCHANGE TO NGOBOZI (77.9 km; existing N2)	
<ul style="list-style-type: none"> • Extensive deterioration of the pavement (rutting and cracking) on certain sections. • Some capacity problems at steep inclines. • Extensive pot-hole/patching repairs on certain sections. • Few climbing/passing lanes. 	<ul style="list-style-type: none"> • Improved riding quality. • Improved road user safety. • Reduced Vehicle Operating Cost (VOC).

ROAD SECTIONS AND CURRENT PROBLEMS	POTENTIAL BENEFITS TO THE ROAD USER
NGOBOZI TO DUTYWA (52.6 km; existing N2)	
<ul style="list-style-type: none"> • Pedestrian and livestock traffic pose a safety risk in some areas due to proximity of rural settlements. • Conditions at Ndabakazi Intersection are very dangerous due to turning traffic and pedestrians. • Road markings very indistinct on the main street through Butterworth. • Large numbers of vehicles executing turns at intersections in Butterworth. • Large numbers of pedestrians in Butterworth. • Riding quality fair to poor. • Fencing and signage poor. 	<ul style="list-style-type: none"> • Improved capacity. • Improved riding quality. • Improved road user safety. • Reduced VOC. • Reduced travel time. • Improved safety for communities, pedestrians and other road users.
DUTYWA TO MTHATHA (84.7 km; existing N2)	
<ul style="list-style-type: none"> • Riding quality fair to very poor. • Road surface is extensively deformed with frequent potholes/patching repairs in some areas. • Many illegal accesses. • Surface is extensively deformed with widespread cracking over entire length and width between Viedgesville and Mthatha. • Large numbers of vehicles executing turning movements at intersections through Mthatha. • Large numbers of pedestrians in Mthatha. 	<ul style="list-style-type: none"> • Improved capacity. • Improved riding quality. • Improved road user safety. • Reduced VOC. • Reduced travel time. • Improved safety of communities, pedestrians and road users.
MTHATHA TO NDWALANE (79.5 km; existing R61)	
<ul style="list-style-type: none"> • Section of the route near Mthatha characterised by peri-urban development along the road corridor, which requires the formalisation of access and cross-access. • Road in very poor condition in some sections. • The route passes through an area of geotechnical instability in the mountain pass (Tutor Ndamase Pass). • Culvert failure near Ndwalane in 2001. 	<ul style="list-style-type: none"> • Improved road user safety. • Improved and controlled access. • Increased traffic capacity. • Improved riding quality. • Reduced VOC. • Reduced travel time.
NDWALANE TO NTAUFUFU RIVER (16.5 km; new road section)	
<ul style="list-style-type: none"> • Existing design speed is 40-50 km/h. 	<ul style="list-style-type: none"> • Much reduced travel time since the proposed new route would be 12 km shorter than the existing pass between Ndwalane and Ntafufu. The alignment and design speed (100-120 km/h) of the proposed new route would also be far superior to the existing pass. • Reduced VOC. • Improved road user safety.
NTAFUFU RIVER TO LUSIKISIKI (18 km; existing R61)	
<ul style="list-style-type: none"> • Design speed of existing road 40 km/h over certain sections to minimise initial construction costs. • Pavement deterioration evident. • Patches and cracks. 	<ul style="list-style-type: none"> • Reduced VOC. • Reduced travel time. • Improved road user safety.

ROAD SECTIONS AND CURRENT PROBLEMS	POTENTIAL BENEFITS TO THE ROAD USER
LUSIKISIKI TO MTHAMVUNA RIVER (80 km; new road section)	
<ul style="list-style-type: none"> No access or road link exists. 	<ul style="list-style-type: none"> Much reduced travel time associated with approximately 80 km shorter route. Reduced VOC. Improved road user safety. Provide access across major river gorges where none currently exists.
MTHAMVUNA RIVER TO ISIPINGO INTERCHANGE (147.5 km; existing R61 and N2)	
<ul style="list-style-type: none"> Mthamvuna River to Southbroom section is characterised by frequent access points, which currently serve a number of coastal resorts and the more rural areas of KwaZulu-Natal. Sub-standard interchange at Adams Road. Capacity problems during peak periods between Adams Road and Isipingo interchanges. 	<ul style="list-style-type: none"> Improved road user safety. Improved access control. Reduced VOC. Reduced travel time. Improved riding quality. Alleviation of traffic congestion. Safer access at Adams Road Interchange.

2.3 TOLL STRATEGY AND TOLL SECTIONS

The toll strategy and location of the plazas would be such that, as equitably as possible, the motorist would pay only for the extent of the road that is used. Consequently each plaza would have a unique toll applicable to each individual class of vehicle. The applicable toll tariffs would be within the norms currently utilised in South Africa.

The proposed N2 Wild Coast Toll Highway would include seven mainline toll plazas (four mainline plazas in the Eastern Cape and three in KwaZulu-Natal) and 24 ramp/interchange toll plazas (i.e. 12 sets of ramp plazas), of which one mainline and four sets of ramp toll plazas already exist on the N2 South Coast Toll Road. Table 2 shows the proposed toll sections, the preferred mainline toll plazas, the possible lengths of the toll sections of the proposed project and a range of possible toll tariffs.

Table 2: Toll sections, associated mainline toll plazas and possible range of toll tariffs

PROPOSED TOLL SECTION	ASSOCIATED MAINLINE TOLL PLAZA	LENGTH OF PROPOSED TOLL SECTION	POSSIBLE RANGE OF TOLL TARIFFS (R) (2006 prices; Class 1 vehicle)		
			Low	High	Mid
East London to Butterworth	Ngobozi	97.8 km	17	46	28
Butterworth to Mthatha	Candu	120.8 km	21	57	35
Mthatha to Ntafufu	Ndwalane	92.3 km	16	43	27
Ntafufu to Southbroom	Mthentu	121.1 km	41	114	70
Southbroom to Hibberdene	Existing Oribi	50.1 km	9	24	15
Hibberdene to Winklespruit	Park Rynie	60.7 km	10	29	18
Winklespruit to Isipingo	Isipingo	16.2 km	3	8	5

NOTE: The possible ranges of toll tariffs given above are based on typical tariffs on existing similar toll roads in South Africa and as such are highly speculative. Tariffs are usually based on the length of toll road that is used. These tariffs also do NOT include regional or local discounts or frequent user discounts. It should be further noted that the possible toll tariff ranges provide some indication only as to what the potential toll tariffs at the various mainline toll plazas could be and are based on current (2006) prices. Ramp toll tariffs are determined on a comparable basis. The actual toll tariffs when the toll highway is put into operation are subject to a competitive tender process and the Notice of Intent for Declaration of a Toll Road process, including the negotiation and determining of discounts before it can finally be approved and promulgated by the Minister of Transport.

3. PROJECT DESCRIPTION

3.1 BROAD DESCRIPTION OF PROPOSED PROJECT

It is proposed that the design, construction, financing, operation and maintenance of the proposed highway be undertaken as part of a 30-year Concession Contract.

The key components of the proposed project include:

- Upgrading and widening of existing road sections (of the N2 and R61) included within the proposed project (approximately 470 km);
- New road construction within two greenfields sections (approximately 90 km);
- Construction of nine new bridges;
- Upgrading and/or construction of new road interchanges and intersections; and
- Construction of associated structures (such as toll plazas, pedestrian overpasses and animal underpasses).

The proposed project aims to provide a national route that improves access and linkage to the east coast region of South Africa while reducing road-user costs and optimising safety, comfort and socio-economic benefits, through the following:

- Upgrading and/or construction of the route to an appropriate design speed (90 to 120 km/h) for the majority of its length, while maintaining a minimum of 60 km/h design speeds in short sections such as mountain passes (e.g. the Kei Cuttings);
- Construction of a two-lane single carriageway with wide shoulders, while dual carriageways and/or climbing lanes would be constructed where warranted by traffic volumes and safety requirements;
- Construction and maintenance of appropriate safety devices such as fencing and vehicular / pedestrian / livestock over- or underpasses and walkways while maintaining an attractive road reserve along the length of the route;
- Consolidation and formalisation of accesses onto the proposed toll highway in order to ensure road user safety (in terms of sight distances and provision of traffic turning lanes);
- Rehabilitation and overall improvement of the road surface along existing sections of the route;
- Installation and maintenance of road signage, road furniture and roadside emergency facilities; and
- Provision of a well-maintained road reserve along the length of the proposed route.

The proposed route alignment (see Figure 1) would connect major economic centres, including East London, Butterworth, Mthatha, Lusikisiki, Port Edward, Port Shepstone and Durban, and would be approximately 75 km shorter than the existing N2 route between East London and Durban via Mount Frere, Kokstad and Harding. Approximately 80% of the proposed route utilises existing road sections, as follows:

- Existing N2 between the Gonubie Interchange and Mthatha;
- Existing R61 between Mthatha and Ndwalane;
- Existing R61 between Ntafufu River and Lusikisiki; and
- Existing R61 and N2 between the Mthamvuna River and the Isipingo Interchange.

New road construction is proposed between Ndwalane and Ntafufu, and between Lusikisiki and the Mthamvuna River (“greenfields” sections). Within the new road sections, bridge crossings are required at the Mzimvubu, Ntafufu, Msikaba, Kwadlambu, Mthentu, Mnyameni, Kulumbe, Mpahlane and Mzamba rivers.

3.2 DESCRIPTION OF INITIAL CONSTRUCTION WORKS

The proposed Initial Construction Works would take place within the first three years of the concession. The description of the initial works has, for convenience, been divided into seven sections.

3.2.1 SECTION 1: GONUBIE INTERCHANGE TO NGOBOZI

All construction activities are proposed to take place within the existing road reserve, with the exception of the Komga Interchange and the mainline toll plaza at Ngobozi.

The proposed construction activities per road section between the Gonubie Interchange and Ngobozi are provided in Table 3.

Table 3: Proposed construction activities per road section between the Gonubie Interchange and Ngobozi

ROAD SECTION	PROPOSED CONSTRUCTION ACTIVITIES
Gonubie Interchange to Mooiplaas (31 km)	<ul style="list-style-type: none"> • Rehabilitation, where required. • Resurfacing. • Upgrading of intersections, where required. • Repairing of structures, as required. • Replacement of guard rails, signage and fencing, where required.
Mooiplaas to Komga (20.4 km)	<ul style="list-style-type: none"> • Rehabilitation. • Widening to make provision for climbing lanes, where required. • Repairing of structures, as required. • Safety features such as over- and underpasses, improved intersections, fencing, road signs and guard rails.
Komga to Great Kei River (10.5 km)	<ul style="list-style-type: none"> • Resurfacing. • Upgrading of intersections, where required. • Construction of Komga Interchange. • Repairing of structures, as required. • Safety features such as over- and underpasses, improved intersections, fencing, road signs and guard rails.
Great Kei River to Ngobozi (16 km)	<ul style="list-style-type: none"> • Construction of mainline toll plaza at Ngobozi. • Safety features such as over- and underpasses, improved intersections, fencing, road signs and guard rails. • Community access roads.

It is proposed to construct a mainline toll plaza north-east of the Kei River crossing, just outside Ngobozi – the Ngobozi Toll Plaza.

3.2.2 SECTION 2: NGOBOZI TO MTHATHA (NGQELENI)

All proposed initial construction works would take place within the existing road reserve, with the exception of the interchanges, intersection upgrades, community access roads, safety and access upgrades in Butterworth and Dutywa and the mainline toll plaza near the Candu River.

The proposed construction activities per road section between Ngobozi and Mthatha are provided in Table 4.

Table 4: Proposed construction activities per road section between Ngobozi and Mthatha (Ngqeleni)

ROAD SECTION	PROPOSED CONSTRUCTION ACTIVITIES
Ngobozi to Butterworth (18.2 km)	<ul style="list-style-type: none"> • Safety features such as over and underpasses, improved intersections, fencing, road signs and guard rails. • Construction of Ndabakazi Interchange. • Upgrade of section between Ndabakazi and Butterworth to a 4-lane undivided road. • Provision of pedestrian walkways and guard rails, where required.
Main Street through Butterworth (1.4 km)	<ul style="list-style-type: none"> • Upgrade of through-road to support traffic flow and safety (such as median and pedestrian barriers, restricted turning movements, restricted parking in through-road, improved access to taxi pick-up points, provision of lighting, traffic signals, etc.)
Butterworth to Ibika (8.8 km)	<ul style="list-style-type: none"> • Upgrading of intersections, including widening of road where required. • Upgrade of section between Butterworth and Msobomvu Intersection to a 4-lane undivided road. • Replacement of guard rails, signage and fencing, where required. • Repairing of structures, where required. • Safety features such as over- and underpasses, improved intersections, fencing, road signs and guard rails.
Ibika to Dutywa (24.2 km)	<ul style="list-style-type: none"> • Resurfacing. • Repairing of structures, as required. • Safety features such as over- and underpasses, improved intersections, fencing, road signs and guard rails. • Community access roads.
Main street through Dutywa Municipal Area (1.2 km)	<ul style="list-style-type: none"> • Traffic flow and safety upgrades (such as median and pedestrian barriers, restricted turning movements, restricted parking in through-road, improved access to taxi pick-up points, provision of lighting, traffic signals, etc.)
Dutywa to Candu River (26.6 km)	<ul style="list-style-type: none"> • Construction of mainline toll plaza near the Candu River. • Resurfacing. • Widening, where required. • Replacement of guard rails, signage and fencing, where required. • Repairing of structures, as required. • Provision of pedestrian walkways and guard rails, where required. • Safety features such as over- and underpasses, improved intersections, fencing, road signs and guard rails. • Community access roads.
Candu River to Viedgesville (38.5 km)	<ul style="list-style-type: none"> • Resurfacing/rehabilitation. • Widening to 12.5 m and to make provision for climbing lanes, where required. • Upgrading of intersections, where required. • Repairing of structures, as required. • Provision of pedestrian walkways and guard rails, where required. • Safety features such as over- and underpasses, improved intersections, fencing, road signs and guard rails. • Community access roads. • Construction of Elliotdale Interchange.
Viedgesville to Mthatha (12.9 km)	<ul style="list-style-type: none"> • Rehabilitation. • Construction of Viedgesville Interchange. • Widening to make provision for climbing lanes, and 4-lane undivided road where required. • Upgrading of intersections, where required. • Repairing of structures, as required. • Provision of pedestrian walkways and guard rails, where required. • Safety features such as over- and underpasses, improved intersections, fencing, road signs and guard rails. • Community access roads.
Mthatha (Ultra City) to Ngqeleni (14.5 km)	<ul style="list-style-type: none"> • Widening to 4-lane dual carriageway, rehabilitation and resurfacing as required. • Upgrading of intersections, where required. • Implementation of one-way system at Madeira and Sprigg Streets. • Improved signage, lighting, etc. • New carriageway bridges at Corana and Mthatha rivers.

SANRAL's preferred mainline toll plaza in this section is located in the Bashee Bridge region, close to the Candu River – the Candu Toll Plaza. An alternative toll plaza location approximately 1 km west of the preferred locality was considered, but was excluded based on poor sight distance and road geometrics.

3.2.3 SECTION 3: MTHATHA (NGQELENI) TO NDWALANE

All initial construction works would take place within the existing road reserve, with the exception of short sections requiring widening, intersection upgrades, vehicular overpasses and interchanges. Measures to stabilise cuts and fills may also require additional land outside the existing road reserve.

The proposed construction activities per road section between Mthatha and Ndwalane are provided in Table 5.

Table 5: Proposed construction activities per road section between Mthatha (Ngqeleni) and Ndwalane

ROAD SECTION	PROPOSED CONSTRUCTION ACTIVITIES
Mthatha (Ngqeleni) to Libode (23 km)	<ul style="list-style-type: none"> • Widening and resurfacing. • Upgrading of intersections, where required. • Improvement of access control. • Widening and construction of climbing lanes, where required. • Safety features such as over- and underpasses, improved intersections, fencing, road signs and guard rails.
Libode to Ntlaza (8.1 km)	<ul style="list-style-type: none"> • Widening and rehabilitation. • Upgrading of intersections, where required. • Climbing lanes, where required. • Provision of pedestrian and taxi facilities, where required. • Safety features such as over- and underpasses, improved intersections, fencing, road signs and guard rails. • Construction of dual carriageway at St Barnabas Hospital (2 km).
Ntlaza to Mgwenyana (15.7 km)	<ul style="list-style-type: none"> • Widening and resurfacing. • Construction of climbing lanes, where required. • Upgrading of intersections, where required. • Implementation of slope stability measures, where required. • Possible construction of alternative mainline toll plaza (Ntlaza). • Safety features such as over- and underpasses, improved intersections, fencing, road signs and guard rails.
Mgwenyana to Thombo (16.2 km)	<ul style="list-style-type: none"> • Widening and surface rehabilitation. • Addition of climbing lanes, where required. • Upgrading of intersections, where required. • Implementation of slope stability measures, where required. • Safety features such as over- and underpasses, improved intersections, fencing, road signs and guard rails. • Construction of dual carriageway at Thombo (2 km).
Thombo to Ndwalane (9.5 km)	<ul style="list-style-type: none"> • Widening and resurfacing. • Bridge widening at Mngazi River. • Provision of pedestrian and taxi facilities, where required. • Upgrading of intersections, where required. • Implementation of slope stability measures, where required. • Safety features such as over- and underpasses, improved intersections, fencing, road signs and guard rails.

SANRAL's preferred mainline toll plaza is located at Ndwalane – the Ndwalane Toll Plaza. An alternative toll plaza location in the vicinity of the Ntlaza Mission, near the Tutor Ndamase Pass, has been identified.

3.2.4 SECTION 4: NDWALANE TO NTAUFUFU RIVER

This section begins approximately 10 km inland of Port St Johns and would bypass the existing Mzimvubu Pondoland Bridge. It would involve the construction of a new “greenfields” road to national road standards between Ndwalane and Ntafufu. A major high-level bridge crossing would be required over the Mzimvubu River.

The proposed new road would comprise a 2-lane single carriageway highway, with climbing lanes where required and a minimum design speed of 100 to 120 km/h. The width of the road would generally be a minimum of 12.4 m (2x3.7 m lanes and 2x2.5 m paved shoulders) within a road reserve of 80 m.

The proposed construction activities for the road section between Ndwalane and the Ntafufu River are provided in Table 6.

Table 6: Proposed construction activities for the road section between Ndwalane and Ntafufu River

ROAD SECTION	PROPOSED CONSTRUCTION ACTIVITIES
Ndwalane to Ntafufu River (16.5 km)	<ul style="list-style-type: none"> • Construction of new road to national road standards. • Construction of new bridges across the Mzimvubu and Ntafufu rivers. • Construction of new interchanges at Ndwalane and Ntafufu. • Over- and underpasses, interchanges, fencing, road signs and guard rails. • Construction of new mainline toll plaza and ramp plazas at the proposed Ndwalane Interchange.

It is proposed to construct a mainline toll plaza in the vicinity of Ndwalane – the Ndwalane Toll Plaza. This toll plaza would toll future long-distance through-traffic on the proposed toll highway and traffic to/from Lusikisiki from/to Mthatha. Ramp plazas are proposed on the southern ramps of the proposed Ndwalane Interchange.

3.2.5 SECTION 5: NTAUFUFU RIVER TO LUSIKISIKI (MAGWA INTERSECTION)

The proposed construction activities for the road section between the Ntafufu River and Lusikisiki (Magwa Intersection) are provided in Table 7.

Table 7: Proposed construction activities for the road section between the Ntafufu River and Lusikisiki (Magwa Intersection)

ROAD SECTION	PROPOSED CONSTRUCTION ACTIVITIES
Ntafufu River to Lusikisiki (Magwa Intersection) (24.5 km)	<ul style="list-style-type: none"> • Upgrade pass to a minimum design speed of 60 km/h, widen and realign as required. • Construction of climbing lanes, where required. • Widening of road cross-section, where required. • Widening of the Mzintlava River bridge. • Construction of 4-lane undivided road through Lusikisiki. • Construction of Lusikisiki Interchange. • Upgrading of Magwa Intersection. • Safety features such as over and underpasses, improved intersections, fencing, road signs and guard rails.

3.2.6 SECTION 6: LUSIKISIKI (MAGWA INTERSECTION) TO MTHAMVUNA RIVER

This section would involve the construction of a new “greenfields” road to national road standards.

A number of deeply incised gorges and minor streams would be crossed. The gorges, some in the order of 200 to 300 m deep include, amongst others, the Msikaba, Mthentu and Mzamba River gorges.

The proposed construction activities per road section between Lusikisiki (Magwa Intersection) and the Mthamvuna River are provided in Table 8.

Table 8: Proposed construction activities per road section between Lusikisiki (Magwa Intersection) and the Mthamvuna River

ROAD SECTION	PROPOSED CONSTRUCTION ACTIVITIES
Lusikisiki (Magwa Intersection) to Msikaba River (19.5 km); new road section	<ul style="list-style-type: none"> • New road construction on alignment of existing district road up to Msikaba Village, new frontage and feeder roads. • New greenfields construction from Msikaba Village to Msikaba Gorge on a preferred alignment. • High-level bridge crossing over Msikaba River. • Safety features such as over- and underpasses, improved and new intersections, fencing, road signs and guard rails.
Msikaba River to Mthentu River (22 km); new road section	<ul style="list-style-type: none"> • New road construction on a preferred alignment. • Bridge crossing over Kwadlambu River. • High-level bridge crossing over the Mthentu River. • Safety features such as over- and underpasses, new intersections, fencing, road signs and guard rails.
Mthentu River to Mthamvuna River (33 km); new road section	<ul style="list-style-type: none"> • New road construction on a preferred alignment. • New R61 Interchange. • Construction of high-level bridge structures across the Mnyameni, Kulumbe, Mpahlane and Mzamba Rivers. • Maintenance and rehabilitation of the existing Mthamvuna River bridge. • Safety features such as over and underpasses, new intersections, fencing, road signs and guard rails.

It is proposed to construct a mainline toll plaza in the greenfields section north of the Mthentu River crossing – the Mthentu Toll Plaza. An alternative locality for a toll plaza in this section has been identified, namely in the vicinity of the proposed intersection with the Holy Cross/Mkambati road.

3.2.7 SECTION 7: MTHAMVUNA RIVER TO ISIPINGO INTERCHANGE

All construction activities would occur within the existing road reserve, with the exception of the Adams Road Interchange and the proposed mainline toll plazas at Park Rynie and Isipingo.

A detailed description of the proposed construction activities per road section between the Mthamvuna River and the Isipingo Interchange is provided in Table 9.

Table 9: Proposed construction activities per road section between the Mthamvuna River and the Isipingo Interchange

ROAD SECTION	PROPOSED CONSTRUCTION ACTIVITIES
Mthamvuna River to Southbroom (23 km)	<ul style="list-style-type: none"> Upgrading of at-grade intersections. Construction of Port Edward and Southbroom interchanges. Improvement of intersection layout, where required. Consolidation of access points – illegal and dangerous accesses would be closed and feeder roads constructed to provide access at new, safe and appropriate access points.
Southbroom to Marburg Interchange (22 km)	<ul style="list-style-type: none"> Safety improvements. Minor rehabilitation and resurfacing, as required.
Marburg Interchange to St Faiths Interchange (6 km)	
St Faiths Interchange to Umhlungwa Interchange (Hibberdene) (23 km)	
Umhlungwa Interchange (Hibberdene) to Park Rynie Interchange (31.7 km)	<ul style="list-style-type: none"> Safety improvements. Minor rehabilitation and resurfacing, as required. Construction of ramp plazas on the southern ramps of the Pennington Interchange. Construction of ramp plazas on the southern ramps of the Park Rynie Interchange.
Park Rynie Interchange to Winklespruit Interchange (29 km)	<ul style="list-style-type: none"> Safety improvements. Minor rehabilitation and resurfacing, as required. Construction of proposed Park Rynie mainline toll plaza. Construction of ramp plazas on the northern ramps of the Scottburgh Interchange. Construction of ramp plazas on the northern ramps of the Umkomaas Interchange.
Winklespruit Interchange to Adams Road Interchange (Amanzimtoti) (5.5 km)	<ul style="list-style-type: none"> Resurfacing and rehabilitation, as required. Widening of Amanzimtoti River Bridge. Addition of third lane and paved shoulder from Amanzimtoti River northwards. Reconstruction of Adams Road Interchange to improve the operational safety of the interchange. Construction of ramp plazas on the southern ramps of the Adams Road Interchange.
Adams Road Interchange (Amanzimtoti) to Dickens Road Interchange (Athlone Park) (5.1 km)	<ul style="list-style-type: none"> Resurfacing and rehabilitation of existing road pavement. Addition of a third lane in each direction. Construction of ramp plazas on the southern ramps of the Moss Kolnick Drive Interchange.
Dickens Road Interchange (Athlone Park) to Isipingo Interchange (4.0 km)	<ul style="list-style-type: none"> Resurfacing and rehabilitation of existing road pavement. Addition of a third lane and paved shoulders in each direction. Addition of a fourth lane between Dickens Road and Joyner Road in each direction. Construction of ramp plazas on the southern ramps of the Joyner Road Interchange. Construction of proposed Isipingo mainline toll plaza south of the Prospecton Road (Isipingo) Interchange.

A mainline toll plaza is proposed in the Park Rynie area, in close proximity to the Park Rynie on- and off-ramps – the Park Rynie Toll Plaza while a second mainline toll plaza is proposed between the Joyner Road Interchange and the Prospecton Road (Isipingo) Interchange, at the limit of the concession – the Isipingo Toll Plaza. Seven sets of ramp plazas are proposed on existing interchanges, as indicated in Table 9.

The existing Oribi mainline Toll Plaza between Izotsha and Umtentweni would be incorporated into the proposed project. The following existing ramp plazas would also be included:

- Shelly Beach Interchange (existing Izotsha ramp plazas);
- Marburg Interchange (existing Oribi northern and southern ramp plazas); and
- Umtentweni Interchange (existing Umtentweni ramp plazas).

4. CONSIDERATION OF ALTERNATIVES

The Scoping Study included consideration of various alternatives, namely the “do nothing” alternative, alternative route alignments and alternative positions for certain proposed mainline toll plazas. The following alternatives were considered in the Scoping Study:

- Upgrading the existing N2 between Mthatha and Port Shepstone in relation to the “do nothing” alternative;
- Upgrading the existing R61 between Mthatha and Port Shepstone in relation to the “do nothing” alternative;
- Gallagher route (see Figure 2) between Mthatha and Port Shepstone in relation to the “do nothing” alternative; and
- Alternative greenfields routes between Lusikisiki and the Mthamvuna River, as follows:
 - SANRAL’s preferred alignment (see Figure 2);
 - The Inland Mzamba route (see Figure 2);
 - The coastal route;
 - The SDI route;
 - The WESSA route (see Figure 2); and
 - The Coastal Mzamba route (see Figure 2).

In addition, a number of localised alternative route alignments were considered in the FSR, as follows:

- Upgrading the existing R61 between Ndwalane and Ntafufu River via the Pondoland Bridge; and
- Site-specific alternative route alignments in the greenfields sections of the proposed route, i.e. between Ndwalane and the Ntafufu River and between Lusikisiki and the Mthamvuna River.

The FSR provided a comparative analysis of the environmental, technical, financial and economic implications of the alternative route alignments, as appropriate, and indicated which ones would be carried forward for assessment in the Impact Assessment phase of this EIA. The following alternatives were considered “feasible” and were taken forward for further investigation and assessment in the Impact Assessment phase of the EIA:

- The “do nothing” alternative;
- SANRAL’s preferred alignment between Lusikisiki and the Mthamvuna River (see Figure 2);
- The Coastal Mzamba route between Lusikisiki and the Mthamvuna River (see Figure 2);
- Alternative mainline toll plaza positions to SANRAL’s preferred Ndwalane and Mthentu mainline toll plazas; and
- The site-specific alternative route alignments in the greenfields sections of the proposed project, i.e. in the sections between Ndwalane and Ntafufu and between Lusikisiki and the Mthamvuna River, as follows:
 - for the proposed alignment between Ndwalane and the Mzimvubu River (see Figure 3);
 - for the proposed alignment in the vicinity of Ntafufu village and the Ntafufu River (see Figure 4);
 - for the proposed alignment across the Msikaba River (see Figure 5);
 - for the proposed alignment across the Mthentu River (see Figure 6); and
 - for the proposed alignment across the Mnyameni River (see Figure 7).

The potential implications of the “do nothing” alternative were used mainly as a “base case” against which the potential impacts of the proposed project and the other identified feasible alternatives were measured.

5. THE AFFECTED ENVIRONMENT

The proposed N2 Wild Coast Toll Highway Project would be located in the eastern part of South Africa, and would traverse sections of both the Eastern Cape and KwaZulu-Natal provinces. The region is predominantly a summer rainfall area with most rains occurring in the spring and summer months (October to March). There is a gradation in climatic regime across the study area, with the northern part of the Eastern Cape experiencing cool sub-tropical conditions, while KwaZulu-Natal is classified as warm sub-tropical.

The general topography of the route is characterised by undulating to rolling terrain with deeply incised river valleys, particularly within the greenfields section between Lusikisiki and the Mthamvuna River. The area inland of the coastal plateau is characterised by extremely broken and rugged mountainous terrain with widely eroded river basins. The terrain generally rises steeply inland (800 m at Holy Cross, 1000 m at Flagstaff) to culminate in the 3000 m high Drakensberg range some 200 km inland.

The proposed project would cross numerous drainage lines and rivers, ranging from low to very high importance. Estuaries along the Wild Coast have been identified nationally as having high botanical importance, include the Mngazana and Mbashe. Estuaries north of Port Edward, although more disturbed by development, are also reservoirs of biodiversity and play an important role in the ecosystem. No major wetland systems would be crossed by the proposed road alignment. In general, the wetlands along the route are small, occurring in the form of palustrine seepage slope systems due to the topography and geology of the region. A variety of Red Data Book fish species occur in the aquatic systems along the entire route.

The study area includes a variety of grassland, thicket and forest vegetation types. The greenfields section between Lusikisiki and Port Edward would bisect the Pondoland Centre of Endemism (PCE) and would pass through sections of the proposed Wild Coast/Pondoland National Park. The PCE has recently been recognised by Conservation International, the IUCN and World Wildlife Foundation as one of 235 botanical global hotspots of plant diversity. A call for its protection has also come from the Strategic Assessment of Biodiversity in the Eastern Cape. The Pondoland Biosphere Reserve would extend from the north banks of the Mzimvubu River at Port St Johns to the south bank of the Mthamvuna River near Port Edward, an overall distance of about 80 km.

Faunal knowledge of the former Transkei region, specifically the proposed greenfields corridor, remains poor. Available information does indicate that within protected areas there is high faunal biodiversity and numerous endemic species. Outside of these areas, the fauna of this region is, in general, considered to be impoverished due to large-scale overgrazing and other human-induced impacts. The birds of the region are relatively well studied.

The Eastern Cape is one of the poorer provinces in South Africa, with a consistently higher unemployment rate than the national average and a relatively large rural population. It includes the former Eastern Province, Border, north-eastern Cape areas and the former “homelands” of Transkei and Ciskei. Major communities along the proposed toll highway include commercial farming communities, small rural towns (e.g. Dutywa), larger secondary and regional towns (e.g. Mthatha), “subsistence” rural villages and scattered communities typical of the Eastern Cape. Some of these communities are among the poorest in South Africa.

Tourism is an important economic activity in the two regions through which the proposed toll highway would pass. The Eastern Cape is the fifth most popular province visited by foreign tourists, whilst KwaZulu-Natal is the third, after Gauteng and the Western Cape. In the category of domestic overnight trips, KwaZulu-Natal is placed second behind Gauteng, while the Eastern Cape is placed third.

The planning, legal and policy context of the proposed project is provided at a number of levels, i.e. national, provincial, district, metropolitan and local. Various pieces of national legislation would be applicable to the proposed project. These include a number of permit requirements that would apply to specific aspects of the proposed project, such as development of borrow pits or quarries and potential water use activities. In terms of biodiversity conservation in the Eastern Cape, a number of strategic documents have recently been compiled under the Wild Coast Conservation and Sustainable Development Programme including, amongst others, a Conservation Assessment, Biodiversity Strategy and Action Plan and Strategic Environmental Assessment.

6. ASSESSMENT OF POTENTIAL IMPACTS

6.1 ASSESSMENT OF ROAD SECTIONS

The key residual negative and positive impacts that would result from the proposed works along the various road sections are given in Table 10. It can be inferred from Table 10 that the most significant impacts would be associated with the proposed new road in the greenfields sections of the proposed toll highway.

6.2 COMPARATIVE ASSESSMENT OF SITE-SPECIFIC ALTERNATIVE ALIGNMENTS

6.2.1 COMPARATIVE ASSESSMENT OF ALTERNATIVE 1B VERSUS THE SANRAL PREFERRED ROUTE BETWEEN NDWALANE AND THE MZIMVUBU RIVER

Alternative 1b would present major advantages over the SANRAL preferred route in terms of limiting potential impacts on sensitive faunal habitats and potential noise impacts to nearest residences. However, this route would result in significant impacts on prime riparian irrigation land and good quality (true) forests at the location (interchange) where the route would divert from the existing R61. It is anticipated that both routes would, however, result in residual indirect impacts of **HIGH** significance due to increased recreational and development-related pressures which would be exerted on sensitive estuaries in the region due to improved access. Thus, consideration of the overall environmental implications of the two site-specific alternative routes does not reveal a clearly favoured route option. SANRAL has indicated that the construction of a major road in the floodplain of a river would not be preferable from a practical, strategic and technical perspective since the road would have to be raised to clear the 1:100 year flood line.

6.2.2 COMPARATIVE ASSESSMENT OF ALTERNATIVE 2A VERSUS THE SANRAL PREFERRED ROUTE IN THE VICINITY OF NTAUFUFU VILLAGE AND THE NTAUFUFU RIVER

It is considered that the key factor to be considered in determining a preferred route in the Ntafufu area would be the potential impacts on the two local Ntafufu schools, providing that adequate compensation/replacement of the affected irrigation scheme and school playing fields adjacent to the river occurs. In this regard, the SANRAL preferred route (Alternative 2f) is considered more favourable, due solely to the additional threat Alternative 2a would pose to the Ntafufu Senior Secondary School.

Table 10: Key potential residual impacts that would result from the proposed works along the various road sections

ROAD SECTIONS	KEY RESIDUAL NEGATIVE IMPACTS	KEY RESIDUAL POSITIVE IMPACTS
GONUBIE INTERCHANGE TO NGOBOZI	<p>It is anticipated that the proposed works along this road section would result in key residual negative impacts of MEDIUM significance in relation to the following:</p> <ul style="list-style-type: none"> • Impacts associated with water quality changes in estuaries during the operational phase; • Impacts associated with graves; and • Visual impacts associated with the proposed Ngobozi mainline toll plaza. 	<p>The following key residual positive impacts of POSITIVE HIGH significance are anticipated:</p> <ul style="list-style-type: none"> • Social impacts associated with increased employment opportunities during the construction phase; • Social impacts associated with improved livestock safety; and • Tourism impacts associated with an increase in the number of tourism products. <p>Key residual positive impacts of POSITIVE MEDIUM or POSITIVE MEDIUM-HIGH significance are anticipated in relation to the following:</p> <ul style="list-style-type: none"> • Social impacts associated with increased employment opportunities during the operational phase; • Social impacts associated with improved safety for vehicle road users; • Tourism impacts associated with an increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route; • Planning/development impacts associated with the nodal point at Mooiplaas; and • Planning/development impacts associated with the proposed Komga Interchange.

ROAD SECTIONS	KEY RESIDUAL NEGATIVE IMPACTS	KEY RESIDUAL POSITIVE IMPACTS
NGOBOZI TO MTHATHA (NGQELENI)	<p>It is anticipated that the proposed works along this road section would result in key residual negative impacts of HIGH significance in relation to social impacts associated with reduction of access points onto the road.</p> <p>The following key residual negative impacts of MEDIUM significance are anticipated:</p> <ul style="list-style-type: none"> • Impacts associated with water quality changes in estuaries during the operational phase; • Resettlement of affected households; • Rural severance effects; • Urban severance effects; • Impacts associated with graves; • Visual impacts associated with the proposed Candu mainline toll plaza; and • Planning/development implications for Butterworth and Dutywa. 	<p>The following key residual positive impacts of POSITIVE HIGH significance are anticipated:</p> <ul style="list-style-type: none"> • Social impacts associated with increased employment opportunities during the construction phase; • Social impacts associated with improved safety for vehicle road users; • Social impacts associated with improved traffic flow; • Social impacts associated with improved livestock safety; and • Tourism impacts associated with an increase in the number of tourism products. <p>Key residual positive impacts of POSITIVE MEDIUM or POSITIVE MEDIUM-HIGH significance are anticipated in relation to the following:</p> <ul style="list-style-type: none"> • Social impacts associated with increased employment opportunities during the operational phase; • Tourism impacts associated with an increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route; • Planning/development impacts associated with nodal points at Qunu and Viedgesville; and • Planning/development implications for Mthatha.

ROAD SECTIONS	KEY RESIDUAL NEGATIVE IMPACTS	KEY RESIDUAL POSITIVE IMPACTS
MTHATHA (NGQELENI) TO NDWALANE	<p>It is anticipated that the proposed works along this road section would result in key residual negative impacts of MEDIUM significance in relation to the following:</p> <ul style="list-style-type: none"> • Disruption of faunal movement during the operational phase; • Faunal impacts associated with noise and light pollution; • Impacts associated with water quality changes in estuaries during the operational phase; • Social impacts associated with resettlement of affected households; • Rural severance effects; • Negative influences on existing family networks and social structures; • Tourism impacts associated with increased access to environmentally sensitive areas; and • Impacts associated with graves. 	<p>The following key residual positive impacts of POSITIVE HIGH significance are anticipated:</p> <ul style="list-style-type: none"> • Social impacts associated with increased employment opportunities during the construction and operational phase; • Social impacts associated with improved safety for vehicle road users; • Social impacts associated with improved livestock safety; and • Tourism impacts associated with an increase in the number of tourism products. <p>Key residual positive impacts of POSITIVE MEDIUM or POSITIVE MEDIUM-HIGH significance are anticipated in relation to the following:</p> <ul style="list-style-type: none"> • Social impacts associated with improvement in transport provision; • Tourism impacts associated with an increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route; and • Planning/development implications for the Thombo area.

ROAD SECTIONS	KEY RESIDUAL NEGATIVE IMPACTS	KEY RESIDUAL POSITIVE IMPACTS
NDWALANE TO NTAUFUJU RIVER	<p>It is anticipated that the proposed works along this road section would result in key residual negative impacts of HIGH significance in relation to the following:</p> <ul style="list-style-type: none"> • Faunal impacts associated with loss of sensitive habitats during construction; • Impacts on estuaries associated with improved access; and • Noise impacts associated with operation of the proposed toll highway. <p>The following key residual negative impacts of MEDIUM significance are anticipated:</p> <ul style="list-style-type: none"> • Vegetation and flora impacts associated with loss of habitat, loss of biodiversity and fragmentation of habitat; • Vegetation and flora impacts associated with increased accessibility of remote habitats; • Vegetation and flora impacts associated with reduction in resilience/stability of ecosystems; • Faunal impacts associated with loss of faunal diversity and loss of Species of Special Concern; • Disruption of faunal movement during the operational phase; • Faunal impacts associated with chemical pollution; • Faunal impacts associated with noise and light pollution; • Impacts associated with water quality changes in estuaries during the operational phase; • Social impacts associated with increased safety hazards for pedestrians and traffic; • Social impacts associated with loss of use of the existing road reserve; • Rural severance effects; • Negative influences on existing family networks and social structures; • Tourism impacts associated with increased access to environmentally sensitive areas; • Impacts associated with graves; and • Visual impacts associated with the proposed new bridges. 	<p>The following key residual positive impacts of POSITIVE HIGH significance are anticipated:</p> <ul style="list-style-type: none"> • Social impacts associated with increased employment opportunities; • Social impacts associated with improved safety for vehicle road users; • Social impacts associated with improved livestock safety; and • Tourism impacts associated with an increase in the number of tourism products. <p>Key residual positive impacts of POSITIVE MEDIUM or POSITIVE MEDIUM-HIGH significance are anticipated in relation to the following:</p> <ul style="list-style-type: none"> • Social impacts associated with improvement in transport provision; and • Tourism impacts associated with an increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route.

ROAD SECTIONS	KEY RESIDUAL NEGATIVE IMPACTS	KEY RESIDUAL POSITIVE IMPACTS
NTAFUFU RIVER TO LUSIKISIKI (MAGWA INTERSECTION)	<p>It is anticipated that the proposed works along this road section would result in key residual negative impacts of HIGH significance in relation to impacts on estuaries as a result of improved access.</p> <p>The following key residual negative impacts of MEDIUM significance are anticipated:</p> <ul style="list-style-type: none"> • Loss of faunal diversity; • Invasion of faunal species; • Impacts associated with water quality changes in estuaries during the operational phase; • Social impacts associated with an increased risk of HIV/AIDS; • Social impacts associated with construction-related traffic delays; • Resettlement of affected households; • Rural severance effects; • Negative influences on existing family networks and social structures; • Tourism impacts associated with increased access to environmentally sensitive areas; and • Impacts associated with graves. 	<p>The following key residual positive impacts of POSITIVE HIGH significance are anticipated:</p> <ul style="list-style-type: none"> • Social impacts associated with increased employment opportunities during the construction and operational phase; • Social impacts associated with improved safety for vehicle road users; • Social impacts associated with improved livestock safety; and • Tourism impacts associated with an increase in the number of tourism products. <p>Key residual positive impacts of POSITIVE MEDIUM or POSITIVE MEDIUM-HIGH significance are anticipated in relation to the following:</p> <ul style="list-style-type: none"> • Social impacts associated with improvement in transport provision; • Tourism impacts associated with an increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route; and • Planning/development implications for the Mbotyi tourism node.

ROAD SECTIONS	KEY RESIDUAL NEGATIVE IMPACTS	KEY RESIDUAL POSITIVE IMPACTS
LUSIKISIKI (MAGWA INTERSECTION) TO MTHAMVUNA RIVER	<p>It is anticipated that the proposed works along this road section would result in key residual negative impacts of HIGH significance in relation to the following:</p> <ul style="list-style-type: none"> • Faunal impacts associated with loss of sensitive habitats during construction; • Impacts on estuaries associated with improved access; and • Noise impacts associated with operation of the proposed toll highway. <p>The following key residual negative impacts of MEDIUM significance are anticipated:</p> <ul style="list-style-type: none"> • Vegetation and flora impacts associated with loss of habitat, loss of biodiversity and fragmentation of habitat; • Vegetation and flora impacts associated with increased accessibility of remote habitats; • Vegetation and flora impacts associated with reduction in resilience/stability of ecosystems; • Faunal impacts associated with loss of faunal diversity and loss of Species of Special Concern; • Disruption of faunal movement during the operational phase; • Faunal impacts associated with chemical pollution; • Faunal impacts associated with noise and light pollution; • Impacts associated with water quality changes in estuaries during the operational phase; • Social impacts associated with increased safety hazards for pedestrians and traffic; • Social impacts associated with loss of use of the existing road reserve; • Rural severance effects; • Negative influences on existing family networks and social structures; • Tourism impacts associated with increased access to environmentally sensitive areas; • Impacts associated with graves; and • Visual impacts associated with the proposed new bridges. 	<p>The following key residual positive impacts of POSITIVE HIGH significance are anticipated:</p> <ul style="list-style-type: none"> • Social impacts associated with increased employment opportunities; • Social impacts associated with improved safety for vehicle road users; • Social impacts associated with improved livestock safety; and • Tourism impacts associated with an increase in the number of tourism products. <p>Key residual positive impacts of POSITIVE MEDIUM or POSITIVE MEDIUM-HIGH significance are anticipated in relation to the following:</p> <ul style="list-style-type: none"> • Social impacts associated with improvement in transport provision; and • Tourism impacts associated with an increase in growth in transit tourists on a KZN/Eastern Cape/Western Cape route.
MTHAMVUNA RIVER TO ISIPINGO INTERCHANGE	<p>It is anticipated that the proposed works along this road section would result in key residual negative impacts of MEDIUM significance in relation to the following:</p> <ul style="list-style-type: none"> • Faunal impacts associated with noise and light pollution; and • Impacts associated with water quality changes in estuaries during the operational phase; • Social impacts associated with construction-related traffic delays; and • Impacts associated with anticipated increased traffic volumes and the proposed Isipingo Toll Plaza in the Prospecton area. <p>Applicable noise mitigation associated with the proposed Adams Road ramp toll plazas and the proposed additional lanes between the Amanzimtoti River bridge and the Isipingo Interchange would need to be determined and incorporated at the detailed design stage, with due regard to cost implications of each alternative and/or combined noise mitigation procedure.</p>	<p>Key residual positive impacts of POSITIVE HIGH significance are anticipated in relation to social impacts associated with increased employment opportunities during the construction and operational phase.</p>

6.2.3 COMPARATIVE ASSESSMENT OF ALTERNATIVES 5E AND 5G VERSUS THE SANRAL PREFERRED ROUTE ACROSS THE MSIKABA RIVER

Alternative 5e is considered the least favourable route alignment from vegetation/flora and faunal perspectives since it would result in most severe impacts on forests and faunal habitat, including disturbance to Lanner Falcon nests on the cliffs at the Mateku Waterfall, and would pose the greatest potential risk of erosion. While Alternative 5g would be marginally favoured over the SANRAL preferred route (Alternative 5g4) from a botanical point of view, it is less favoured in terms of potential noise impacts. Thus, consideration of the overall implications of Alternatives 5g and 5g4 does not reveal a clearly favoured route option. It should be noted, however, that Alternative 5g and the SANRAL preferred route would both result in potential residual impacts of **HIGH** significance in terms of loss of habitat, increased accessibility of remote areas and noise impacts.

6.2.4 COMPARATIVE ASSESSMENT OF ALTERNATIVE 9D5 VERSUS THE SANRAL PREFERRED ROUTE ACROSS THE MTHENTU RIVER

The comparative assessment indicates that the SANRAL preferred route would be favoured in terms of fauna, soils, land use and agriculture and social aspects. Neither alignment is considered more favourable from botanical and cultural/historical heritage perspectives. In terms of potential noise impacts, certain sections of both routes are considered more suitable than the other. Thus, on balance, the SANRAL preferred route (Alternative 9e) is considered more favourable. It should be noted, however, that potential residual impacts of **HIGH** significance are anticipated in terms of loss of habitat, loss of biodiversity and noise impacts.

6.2.5 COMPARATIVE ASSESSMENT OF THE COASTAL MZAMBA ROUTE VERSUS THE SANRAL PREFERRED ROUTE BETWEEN LUSIKISIKI (MTHENTU RIVER) AND THE MTHAMVUNA RIVER

The Coastal Mzamba route would offer a number of advantages over the SANRAL preferred route between the Mthentu and Mthamvuna rivers, in particular relating to its compatibility with the Wild Coast SDF's proposed Land Use Management Areas and lower potential social and visual impacts. Also, should uncontrolled ribbon development or attraction of settlements take place along the SANRAL preferred route, this would affect a greater proportion of the planned area for the proposed Wild Coast/Pondoland National Park and identified "nature tourism" zones.

In many other respects, especially in terms of direct, indirect and cumulative biophysical impacts associated with the presence of numerous source wetland areas, the Coastal Mzamba route is considered less favourable than the SANRAL preferred route. Key differences in this regard relate to loss and fragmentation of habitat and water quantity impacts on the indirectly affected estuaries.

Thus, the key factor to consider in selecting a preferred route is whether the relative importance attached to compatibility with the Wild Coast SDF's Land Use Management Areas and the additional area (4 %) of the proposed Park that would be incorporated east of the Coastal Mzamba route outweighs the likely direct, indirect and cumulative impacts on aquatic ecosystems that would be associated with this route. In terms of economic aspects, the economic specialist study calculated the Present Worth of Cost of the Coastal Mzamba route (R 1,597.91 million) to be higher than the SANRAL preferred route (R 1,587.59 million). Thus, from an economic (and technical - primarily associated with construction of a major road through numerous wetland areas) perspective the Coastal Mzamba route would be less favourable. However, irrespective of the selected route, it should be ensured that political and institutional will and capacity is developed to undertake pro-active and structured development planning, review and/or

development of detailed Land Use Management Systems and liaison between Traditional Authorities and Municipalities with regard to allocation of land according to a common vision for ecologically sustainable development, if the proposed project is approved.

6.2.6 COMPARATIVE ASSESSMENT OF ALTERNATIVES 10A AND 10E VERSUS THE SANRAL PREFERRED ROUTE ACROSS THE MNYAMENI RIVER

The key differences between the various alternative route alignments across the Mnyameni River relate to potential impacts associated with loss of habitat, loss of biodiversity, fragmentation of habitat and cultural and historical heritage. Since the SANRAL preferred route would generally result in lower impacts than Alternatives 10a and 10e it is considered the most favourable alignment. It should be noted, however, that potential residual impacts of **HIGH** significance are anticipated in terms of potential noise impacts, irrespective of the selected route.

6.3 COMPARATIVE ASSESSMENT OF ALTERNATIVE MAINLINE TOLL PLAZA LOCATIONS

6.3.1 ALTERNATIVE NDWALANE MAINLINE TOLL PLAZA LOCATION VERSUS THE SANRAL PREFERRED NDWALANE LOCATION

The Alternative Ndwalane mainline toll plaza would, overall, be more favourable than SANRAL's preferred Ndwalane mainline toll plaza location in terms of potential impacts relating to vegetation and flora, aquatic ecosystems and visual aspects. Moreover, the SANRAL preferred location would result in key potential residual impacts associated with potential loss of habitat.

6.3.2 ALTERNATIVE MTHENTU MAINLINE TOLL PLAZA LOCATION VERSUS THE SANRAL PREFERRED MTHENTU LOCATION

The key difference between the two alternative mainline plaza locations relates to potential residual visual impacts. The Alternative Mthentu Toll Plaza location is considered more favourable as it would result in lower potential visual impacts. Also, although the significance ratings for potential residual impacts on aquatic ecosystems are the same, it is considered that the Alternative Mthentu mainline toll plaza location would be preferred since it would avoid the risk of any potential negative impacts on larger wetland habitats. Key potential residual impacts on vegetation and flora are anticipated in terms of possible strip/ribbon/secondary development, irrespective of the selected mainline toll plaza location.

6.4 PROJECT-SCALE AND TOLL FUNDING-RELATED ISSUES

6.4.1 VEGETATION AND FLORA

Vegetation and flora

Overall impacts on the Pondoland Centre of Endemism

It is clear from published information on the PCE that it has a high conservation/biodiversity value and that it has been identified as having high conservation priority. Any impact that reduces the overall area of the PCE, reduces the ecological integrity of the area or would result in losses of key biodiversity components is potentially serious.

The assessment has shown that the proposed new road would result in residual impacts of **HIGH** significance in terms of loss of habitat, fragmentation of habitat, strip/ribbon/secondary development and increased accessibility of remote habitats.

An analysis of the impacts associated with a reduction in the opportunity to undertake effective conservation, biodiversity conservation planning or establish conservation areas in the region indicates that the SANRAL preferred alignment potentially reduces the core area of the proposed park to 88% of its planned area while the Coastal Mzamba alignment would result in this included proportion becoming almost 92% of the desired area.

Thus it is concluded that the proposed new road would result in potential impacts that would affect the overall conservation/ecosystem/biodiversity value of the PCE (and proposed Wild Coast/Pondoland National Park).

Ecological sustainability

The development of the proposed new road could potentially lead to some *loss of biological diversity*. It is unlikely to lead to a change in conservation status of any species but may lead to a change in conservation status (from Vulnerable to Endangered) of a vegetation type (Pondoland-Ugu Sandstone Coastal Sourveld).

The proposed new road may threaten some local scale *ecological process*. At a regional scale the proposed new road is thought to present a barrier that may result in dispersal and migration processes in a coastal-inland direction being affected, but is unlikely to affect regional scale movement of water or nutrients through the landscape.

There is a risk of *exceeding thresholds* at a local scale (primarily loss of habitat due to direct and indirect impacts), but these can be controlled by the implementation of mitigation measures (assuming management commitment and effective monitoring and reporting). There is less risk of exceeding thresholds at a regional scale, except for the overall loss of habitat due to direct and indirect impacts - the loss of habitat within Pondoland-Ugu Sandstone Coastal Sourveld could lead to a change in conservation status from Vulnerable to Endangered, which indicates that the threshold beyond which ecosystem processes and patterns can be maintained is being approached.

At a local scale, the road may *threaten some key ecological process* linked to life support systems, but this effect dissipates quickly with distance from the road and is unlikely to be important at a regional scale.

Pondoland grasslands are potentially at risk from the proposed new road and its associated impacts. The potential threat of the proposed new road to *protected, important, unique, sensitive, irreplaceable areas* is therefore potentially significant in the absence of effective conservation management of the area.

The proposed road cannot be considered potentially responsible for *exacerbating human-induced climate change*.

The proposed road would lead to the direct loss of areas of grassland in greenfields areas as well as some forest, which is considered by definition to be *irreversible loss of natural capital*. Due to the highly sensitive nature of the PCE as a whole, any loss of habitat may be considered to be incremental reduction in the ecological viability of the area. The proposed new road may therefore be considered to lead to irreversible loss of natural capital that is potentially significant.

It is considered unlikely that there are any *impacts that are unknown or uncertain* although there is some uncertainty about impacts in the study area due to social factors in the absence of the proposed project taking place.

It is considered very difficult to attribute *substantial negative cumulative impacts* to the presence of the proposed new road rather than current trends within the PCE area. It is estimated that the proposed new road and its potential secondary impacts (including possible strip/ribbon/nodal development) could lead to sufficient loss of habitat to result in Pondoland-Ugu Coastal Sourveld being re-categorised as an Endangered vegetation type. It is likely that other proposed projects in the area would further exacerbate this loss of habitat and make it more likely that habitat loss would lead to re-categorisation of the vegetation type.

In conclusion, on the basis of the above criteria, the proposed new road is considered not ecologically sustainable. However, if secondary impacts can be controlled and conservation measures can be put in place to effectively protect core components of the PCE then the assessment of five of these criteria may be reversed/become insignificant and the proposed project could then be considered to be ecologically sustainable.

6.4.2 AQUATIC ECOSYSTEMS

Although the systems within the study area were found to be largely in a natural condition, current land use practices, sand winning, poor secondary roads and bridges, and alien plant infestations have impacted on the status of the aquatic environment. In the interests of pro-active environmental management, future developments should thus not result in further degradation. Areas of particular concern are the greenfields routes, where the majority of the headwaters already require some form of rehabilitation due to the impacts mentioned above. Rivers that presently require rehabilitation would include, amongst others, the Mzimvubu, Kwadlambu and Mnyameni rivers, but concerted effort to eradicate all alien plants throughout the entire study area would be required.

With implementation of suitable mitigation and proactive management most of the impacts related directly to the proposed toll highway could be managed. SANRAL should take as many precautions to manage and monitor all phases of the development and should form part of any forum to manage the region.

6.4.3 SOCIAL

The upgrading of the route between Gonubie Interchange and Mthatha would likely vastly improve the safety of this section of road and could lead to a reduction in serious road accidents. Death and severe injury are amongst the most severe of negative social impacts and that any significant progress in reducing injury and death would have a high and positive social impact.

Along the section between Mthatha and the Mthamvuna River, despite the anticipated negative impacts associated with development in greenfields areas, the overwhelming opinions of people consulted was a need for greater access into the area. Reasons given for this varied from a need to ease the burden of travel into and out of the area, providing better access to health and other services and the creation of jobs.

One of the significant issues identified is the potential negative impacts of tolling the existing section of road between Port Shepstone and the Isipingo Interchange. This issue relates to the availability of alternative routes, travel options, economics and the political reasons for tolling.

Although not entirely within the control of SANRAL, the matter of capacity amongst the various role players along the route is also of concern. Consequently, if the project were to proceed, it would be

important for all authorities to consider the need to coordinate their efforts towards making the project a success.

Overall, it is considered that the potential social benefits of the proposed project, as assessed along the entire route, and if enhanced as recommended, would outweigh the potential negative impacts, and that the proposed project would be of social benefit on a national basis as well as being beneficial for both the Eastern Cape and KwaZulu-Natal provinces.

In order to minimise the anticipated negative impacts and enhance potential benefits, it is recommended that key policies and plans (such as resettlement, employment, skills development, community empowerment, etc.) be developed to effectively manage key social issues associated with the proposed project. It is also recommended that a social monitoring and evaluation programme be developed for the construction phase of the proposed project.

6.4.4 TRAFFIC DIVERSION

It is apparent from the capacity analysis that the N2 between Prospecton and Moss Kolnik is running close to or exceeding capacity in the so-called design hour (the 30th highest hourly volume of the year), while the R102 is currently still operating at acceptable levels of service.

The highly probable impact of traffic diversion on the N2 Prospecton-Southbroom section is assessed to be of **medium** and **high** intensity and significance during the construction and operational phases, respectively. Implementation of the mitigation measures would reduce the traffic diversion impact to **LOW** significance during the construction and operational phases.

6.4.5 NOISE

The existing day-time noise rating level of 74 dBA on residential land flanking Kingsway, Umbogintwini, is exceptionally high - exceeding the acceptable outdoor day-time noise rating level in a suburban district (with little road traffic) by 24 dB and in an urban residential district by 19 dB. Based on the ADT values the predicted increase in the day-time noise rating level over the subsequent 10 and 15 years would be barely significant, with or without tolling of the existing N2. However, any increase would exacerbate an already unacceptably high exposure to road traffic noise on residential land in this suburb. The existing, and potential future noise impact along on the alternative R102 at Umbogintwini (without and with tolling of the existing N2) is assessed to be of **VERY HIGH** intensity and significance. In this instance, inadequate planning has resulted in a situation whereby technical noise mitigation alternatives cannot be practically implemented.

6.4.6 AIR QUALITY

It is predicted that potential localised air quality impacts on the R102 and R620 alternative routes would be of **LOW-MEDIUM** intensity and significance without and with mitigation. It is considered unlikely that the significance of the potential impact could be reduced. However, it is recommended that discussions be held with the local municipalities, in particular the eThekweni Municipality, to address the long-term plans for air quality management in the relevant areas.

6.4.7 TOURISM

Impacts on bypassed towns on the existing N2

Towns along the existing N2 between Mthatha and Port Shepstone include Qumbu, Mount Frere, Mount Ayliff, Kokstad and Harding. These towns rely primarily on transit along the existing N2 section. Most of the towns on the existing N2 section are undeveloped as tourism destinations. However, Kokstad and

Harding have become stop-over destinations. The potential negative tourism impacts on bypassed towns on the existing N2 are deemed to be of **MEDIUM** intensity and significance without and with mitigation. It is considered that tourism promotion along the existing N2 could change the potential negative impact to neutral status.

High-volume tourism versus eco-tourism

The tourism specialist believes that there is room for more intensive tourism developments on the Wild Coast as well as eco-tourism enterprise. This is seen to be particularly the case if the proposed Wild Coast/Pondoland National Park plans go ahead, but with the number of nature reserves in the area it is considered that eco-tourism will be viable with or without the proposed Park.

6.4.8 ECONOMIC

Overall economic sustainability

The economic analysis indicates that the proposed project, given the various assumptions (of which the most critical were those related to the value of time and the traffic growth rate), would definitely be economically justified, with an IRR of 15.4 %. The proposed project is also considered to be financially viable, with an IRR of 10.4 %. In the financial analysis it was assumed that the toll income would be 75 % of the total savings in road user costs.

The freeway section between Winklespruit and Isipingo Interchange would, similarly, be economically justified, with an IRR of 37.9 %.

In addition to being justified from a micro-economic viewpoint, the project's "very good" one-off income-multiplier effect and significant recurring non-user benefits would support the macro-economic objectives of (1) full employment, (2) economic growth, (3) price stability, and (4) equitable distribution of income. On aggregate it is considered that the proposed project would make a significant contribution to the primary macro-economic goal of improving the wealth of the Eastern Cape and KwaZulu-Natal provinces. In view of the fact that these benefits would not be diverted or transferred from other provinces, but be generated locally, the average annual net macro-economic gain of R 2,612 million would also accrue to the country as a whole (i.e. the road would be instrumental that South Africa's national product increases by R 2,612 million annually).

6.5 OVERALL KEY RESIDUAL IMPACTS OF THE PROPOSED PROJECT

The identified overall key residual positive and negative impacts are set out below:

6.5.1 OVERALL KEY RESIDUAL POSITIVE IMPACTS

The following overall key residual positive impacts would result from the proposed project:

- a) The proposed toll highway should benefit all users along the entire length of the road if the principle that "the toll fee is less than the road user benefits" is applied. Benefits include (1) reductions in road user costs (where road user costs comprise vehicle operating costs plus travel time cost plus accident cost) and/or road user revenue increases as a result of new road usage. The largest portion of the benefits to road users would accrue in the Eastern cape because this would be where the major distance saving would occur and most new business would be created. The economic analysis indicates that the proposed project, given the various assumptions (of which the most critical were those related to the value of time and the traffic growth rate), would definitely be economically justified, with an IRR of 15.4 %. The proposed project is also considered to be

financially viable, with an IRR of 10.4 %. In the financial analysis it was assumed that the toll income would be 75 % of the total savings in road user costs;

- b) The proposed additional lanes along the freeway section between Winklespruit and Isipingo Interchange would, similarly, be economically justified, with an IRR of 37.9 %;
- c) The regional income-multiplier effect would increase the present (2007) value of the investment amount of R 4,309 million to an eventual once-off regional gross income of R 17,884 million. After deduction of this investment amount, the net increase in one-off regional income is expected to equal R 13,575 million;
- d) Once the road is in operation regional economic income would be accelerated on a recurring basis. The following economic sectors in the Eastern Cape and KwaZulu-Natal would enjoy increased income: (1) agriculture; (2) forestry; (3) manufacturing; (4) construction (i.e. property development); (5) finance and real estate; and (6) trade, tourism and catering. The estimated present (2007) value of this additional income is approximately R 15,829 million;
- e) The present (2007) value of the net regional developmental economic benefits that implementation and use of the proposed toll highway would yield is the total of the net regional income-multiplier effect of R 13,575 million, and the present value of accelerated business income of R 15,829 million. These add up to R 29,404 million. Over the 30-year analysis period of the road at a real discount rate of eight percent this value is equivalent to additional domestic income of R 2,612 million per annum;
- f) Although the proposed new link between Mthatha and Port Edward would attract traffic from the existing N2 route, the newly generated traffic benefits on the proposed new road would by far exceed any reduction of business on the existing road section. (It is estimated that traffic generation in the first year of operation would translate into an economic benefit of over R 500 million in the Eastern Cape Province and KwaZulu-Natal. Of this, approximately R 150 million would accrue to existing and new business between Mthatha, Port St Johns and Port Edward);
- g) Approximately 6 800 project-related jobs would be generated annually during the construction phase. There is a high probability to generate up to 21 300 indirect or non-project-related jobs annually during this phase, resulting in a total employment creation of 28 100 jobs annually during construction. This would have a positive economic impact on a regional level in the short term;
- h) During the service period of the road there is the potential to generate approximately 900 directly road-related permanent (sustainable) jobs annually. Usage and operation of the road would generate approximately 18 000 indirect job opportunities per annum, resulting in an average employment creation of 18 900 jobs annually during the service period of the road;
- i) The proposed toll highway would result in an increase in the number of tourism products in the study area due to an expected increase in growth in overnight tourists;
- j) It is anticipated that the proposed project would result in improved livestock safety on the Eastern Cape sections of the existing N2 and R61, that would be incorporated into the proposed toll highway, which are characterised by significant safety hazards associated with the presence of livestock on the road, providing fencing is kept intact; and
- k) The proposed toll highway would significantly improve safety for vehicle road users along the existing N2 through the former Transkei, which has been identified as amongst the most accident-prone roads in the country.

6.5.2 OVERALL KEY RESIDUAL NEGATIVE IMPACTS

The following overall key residual negative impacts would result from the proposed project:

- a) Reduction of access points along the section between Ngobozi and Mthatha would result in high numbers of users having to walk or drive greater distances to access the proposed toll highway and/or to get to their destinations. This would also have cumulative impacts on time and effort invested in other productive and domestic activities;
- b) The habitats which occur between Ndwalane and the Ntafufu River, such as the forest and thicket patches, are considered sensitive faunal habitats due to their isolated and fragmented nature. The proposed toll highway would bisect and thus increase the fragmentation of these habitats. It is recommended that SANRAL engages the regional conservation authorities to assist in the formal protection of comparable habitats elsewhere in the Pondoland region, if the proposed project is approved;
- c) It is anticipated that increased recreational and development-related pressures would be exerted on important and sensitive estuaries in the region as a result of the improved access to the region. These would result in significant negative impacts on the ecological functioning and aesthetics of the estuaries;
- d) The proposed new road would be located between 10 m and 250 m from numerous dwellings in the section from Ndwalane to the Ntafufu River. A noise barrier would have little effect due to the residences generally being at a higher elevation than the proposed new road while a low-noise road surface would only reduce the intensity of the noise at the nearest residences to 60 dBA;
- e) The construction of the proposed greenfields section between Lusikisiki and the Mthamvuna River would result in significant loss of habitat, including habitat associated with the Pondoland-Ugu Sandstone Coastal Sourveld vegetation (Vulnerable). This vegetation type forms one of the two primary habitats constituting the PCE. Approximately 0.3 % of the remaining extent of this vegetation type would be lost directly as a result of construction of the proposed new road;
- f) The proposed toll highway would result in fragmentation of habitat between the Mthentu and the Mthamvuna rivers. Vegetation and flora could be significantly impacted by way of impaired gene flow within fragmented populations and creation of edges. However, the area between the Mthentu and Mthamvuna rivers also suffers from the greatest degree of transformation and degradation due to cultivation;
- g) Using the precautionary approach and assuming that there would be no limitation to development along the coast due to increased accessibility of these areas as a result of the proposed new road, there would be a risk of significant loss (approximately 9.6 % of the remaining extent) of Pondoland-Ugu Sandstone Coastal Sourveld due to strip/ribbon/secondary development;
- h) The proposed new road and bridges over the Msikaba and Mthentu rivers would probably make previously inaccessible areas more accessible, especially for the removal of medicinal products and other species for which there may be horticultural interest. The current rates of harvesting of medicinal plants have already lead to the depletion of many species near existing settlements;
- i) The proposed new road in the greenfields section between Lusikisiki and the Mthamvuna River would affect the ability of communities to continue utilising places and resources associated with the oral traditions and living heritage within the Amadiba Tribal Authority area. Also, the entire area

may be considered as an integral part of an ethnographic landscape that has evolved over the last 1 000 years and would be significantly affected by the proposed new road;

- j) It is expected that the day-time noise rating level at residential dwellings located within 50 m of the proposed new road between Lusikisiki and the Mthamvuna River would be in excess of 65 dBA. In terms of the Noise Control Regulations noise mitigation would be required in order to ensure that the noise rating level does not exceed 65 dBA at any of the affected residential dwellings;
- k) It is likely that ribbon/strip/secondary development would gradually occur alongside the proposed new road between Lusikisiki and the Mthamvuna River. This would place a strain on Municipalities as a result of growing demands for new infrastructure and social services in these areas. As a consequence, large public-funded investments along the existing major routes may need to be re-prioritised to meet demands in the new areas, and competition for resources and delivery may occur;
- l) Significant negative impacts on the volume/capacity ratio on the R102 and, consequently, the level of service and quality of travel are predicted if full toll tariffs were charged at the mainline toll plazas in KwaZulu-Natal; and
- m) The existing day-time noise rating level of 74 dBA on residential land flanking Kingsway, Umbogintwini, is exceptionally high. Based on the ADT values the predicted increase in the day-time noise rating level over the next 10 and 15 years would be barely significant, with or without tolling of the existing N2. However, any increase would exacerbate an already unacceptably high exposure to road traffic noise on residential land in this suburb.

6.6 RECOMMENDATIONS

This section provides recommendations for further required investigations and presents recommended mitigation/enhancement and/or monitoring measures that should be implemented during the further planning and design, construction and operational phases of the proposed project (if authorised).

6.6.1 FURTHER INVESTIGATIONS

- a) The potential noise impacts, and relevant noise mitigation measures, associated with the proposed Adams Road ramp toll plazas and proposed additional lanes between the Amanzimtoti River and Prospecton should be determined and incorporated during the detailed design stage; and
- b) A heritage practitioner should be appointed to (1) complete an assessment of the final alignment chosen for the proposed toll highway, as well as the locations of new access roads, construction camps and all other infrastructure; and (2) to undertake an oral history recording project within the Amadiba Tribal Authority Area in order to capture all significant places to which oral traditions are attached or which are associated with living heritage in order to inform the final design of the proposed new road.

6.6.2 GENERAL RECOMMENDATIONS

- a) The management of all site preparation and construction activities should be undertaken by way of the compilation of a comprehensive Construction EMP;
- b) Effective implementation and management of the Construction EMP should be ensured by appointment of a suitably qualified and experienced ECO; and
- c) Recommendations applicable to the post-construction phase should be incorporated in an Operational EMP, including provision for ongoing monitoring and management.

6.6.3 VEGETATION AND FLORA

- a) Off-site mitigation, e.g. facilitation of the conservation of an equivalent-sized area of grassland or forest elsewhere for which the future conservation can be guaranteed;
- b) Post-construction commitment to monitoring and management of biodiversity should be ensured;
- c) Relevant biodiversity management requirements must be incorporated into contract specifications. Contract specification clauses should be reviewed (and preferably prepared) by someone with the appropriate biological skills and knowledge;
- d) Where practical, roadside landscaping and revegetation should attempt to use locally indigenous species;
- e) Preparation and implementation of a Vegetation and Flora Management Plan, including a Revegetation Plan;
- f) Preparation and implementation of a Weed Management Plan as part of the Vegetation and Flora Management Plan;
- g) Retention of indigenous species where possible along the alignment;
- h) On-site seed collection and transplanting of indigenous plant species should be implemented and included in revegetation works. These works should be started early to establish a source of plants for regeneration;
- i) Cleared indigenous vegetation should be chopped and mulched for use in revegetation works;
- j) Any revegetation works should be undertaken by qualified and experienced personnel;
- k) Identification and temporary fencing of areas of vegetation to be retained during construction activities;
- l) Clearing should be minimised and restricted to the area required for road construction purposes only and disturbance to adjacent vegetation communities and/or remnant trees within the corridor should be strictly controlled. This planning can take place during the design phase of the project;
- m) It is important to ensure that contractors are made aware of the environmental issues and associated risks prior to commencement of construction work. Biodiversity aspects that need to be included in the induction process include:
 - Extent of no-go zones
 - Areas of significant vegetation and habitat
 - Potential of discovery of additional populations of sensitive species and what to do in this event
- n) Potential biodiversity risks that need to be addressed in the EMP include:
 - Appropriate locating of stockpiles, site offices and infrastructure, to limit damage to sensitive vegetation
 - Weed control to avoid spread of weeds due to failure to appropriately identify and control weeds
 - Site protection measures for vegetation and flora
- o) All necessary permits must be obtained prior to construction, e.g. for removal of flora or protected species;
- p) Protection of habitat through implementation of erosion and sediment control measures. For example, drainage of road runoff through grassy channels, as an erosion and sediment control measure, greatly reduces toxic solid- and heavy-metal concentrations. Dense vegetation also increases soil infiltration and storage and reduces the erosion effects of runoff water;
- q) Lobbying for the implementation of an effective conservation plan for the Pondoland area will provide impetus for the development of conservation areas that will protect key components of the PCE. This will reduce the significance of potential secondary impacts on these areas due to the proposed road; and
- r) Ongoing monitoring should take place during the construction phase in order to assess the success of mitigation measures. This may be done at different levels of detail, e.g. visual assessments, sampling, monitoring of alien plants, etc.

6.6.4 FAUNA

- a) Ensure vegetation in road reserve is kept short by way of regular maintenance;
- b) Rest stops and other associated structures should not be situated adjacent to sensitive habitats (forests or wetlands);
- c) Restrict and control the use of herbicides in the road reserve and at toll plazas;
- d) Storm water outlets, particularly from toll plazas, should not drain directly into natural wetlands;
- e) Monitor the number of road mortalities and disturbance; where appropriate, install under-road culverts for breeding toads;
- f) Power and telephone lines should be installed at the extreme edge of the road reserve and incorporate bird deflectors where they cross major river gorges;
- g) Active culling programmes of problem animals by conservation authorities should be promoted;
- h) Joint action with regional conservation authorities should be explored to assist in the formal protection of comparable forest and grassland habitats elsewhere in the Pondoland region, particularly in association with the proposed Wild Coast/Pondoland National Park;
- i) Ensure mitigation measures for potential direct impacts (e.g. habitat loss) are implemented successfully;
- j) Activities associated with construction, access roads, borrow pits and cut-fill construction should avoid sensitive habitats;
- k) Natural drainage should be maintained, and the silt loads into rivers, streams and wetlands must be carefully managed and monitored and stay within acceptable limits;
- l) Road reserves should be maintained in order to function as effective fire breaks;
- m) Underpasses should be large enough to allow maintenance of water flow and soil hydrodynamics, and to serve as migratory paths for small animals; and
- n) Avoid disturbances to the breeding colonies of the Cape Griffon Vulture - air and road traffic should observe the maximum possible exclusion zone around the Msikaba colony – helicopter and fixed wing flights down the gorge from the Msikaba bridge should be banned, or maintain a maximum height of 1 000 m; access to breeding ledges by humans (other than registered researchers) and feral dogs must be prohibited; all cables across the major river gorges should have suitable bird diverters installed – the most suitable type and spacing should be determined in consultation with experts – dead or injured birds discovered below bridge crossing points should be identified and recorded and communicated to the Vulture Study Group; no borrow pits or associated requirements should be sited in the vulture exclusion zone; blasting operations should be restricted to the day, and should avoid the egg-laying season (March-July); off-set the loss of carcasses (associated with reduced livestock mortalities from the fenced road) and foraging habitat – supplementary feeding with vulture restaurants may be required – consult the Vulture Study Group in this regard.

6.6.5 AQUATIC ECOSYSTEMS

- a) The Construction EMP should include detailed mitigation measures to be undertaken to avoid excessive sediment loads and other contaminants in rivers;
- b) Ensure flows would not be diverted or impounded by the physical structure of the road;
- c) Where possible, bridges must span the entire width of the channel and floodplain so as to avoid disturbance to the riparian zones of rivers;
- d) Pillars, columns or bridge buttresses should not be placed in instream or in riparian zones, if possible. The disturbance of instream channels and riparian zones during bridge construction must be minimized. The number and width of pillars, vertical columns and buttresses placed within the river channel and floodplain should be minimised;
- e) Physical structures, which could later alter hydrological regimes, should not be placed in the vicinity of any wetlands;

- f) Adequate drainage must be included in road design so as to ensure effective drainage of wetland areas;
- g) Stormwater drainage from the road surface should be deviated from wetlands and drainage areas. The use of Reno mattresses and Armourflex is recommended for the diversion of stormwater from entering wetlands or streams directly;
- h) The velocity of water that may reach wetlands should be slowed before it is intercepted by virgin soils using a siltation and erosion control structure, which abuts with natural bedrock. The plans and specification for this structure should be forwarded to the relevant stakeholders such as Working for Wetlands and local municipalities;
- i) Emergency plans must be in place in case of spillages onto road surfaces and/or into river and wetland systems;
- j) The oil traps incorporated into the design of toll plazas should be serviced on a monthly basis, especially before the summer rainfall period;
- k) Erosion control measures should be monitored to ensure their effectiveness. Silt traps and culverts should be regularly maintained and cleared so as to ensure effective drainage;
- l) Local people should be employed to act as litter patrols on a weekly or daily basis if necessary during the operational phase, to ensure that pollution (solid waste) is reduced at all times; and
- m) Rehabilitation of slopes must be carried out (e.g. particularly where bridge-building will take place in river gorges) so as to ensure the recovery of established drainage patterns.

6.6.6 SOILS, LAND USE AND AGRICULTURE

- a) The location of over- and underpasses should be discussed with affected farmers;
- b) Maximise the positive impact of the proposed toll road through facilitating the development of markets and producers co-operatives for such commodities as sugarcane, timber, maize and livestock. It is suggested that SANRAL could make it the task of their socio-economic team to facilitate discussion between leaders in commerce, agricultural officers and leaders of the community towards reopening discussion and planning towards developing sugar and timber industries in Pondoland;
- c) Farmers should be warned before blasting is to occur to be able to save poultry in communal broiler houses from suffocation by corralling them into smaller groups. Loss of production is however inevitable and compensation the only option. Mitigation should aim at minimising losses. Future poultry houses should not be built within 500 m of the proposed toll road especially where there are steep down-hills where the possibility of vehicle backfiring increases;
- d) Topsoil should be stockpiled separately from subsoil. Stockpiles should not be higher than 2 m to avoid compaction. Stockpiled soil should be seeded to maintain biological activity and to keep alien invader species from establishing on it and seeding it. Care must be taken not to allow heavy traffic over the soil;
- e) The road must be fenced to safeguard both traffic and livestock. Grass within the road reserve should be mown/cut each year where possible to help prevent the spread of fires; and
- f) Liaise with government extension services to determine how to assist with aiding the extension workers perform their work efficiently.

6.6.7 SOCIAL

Design and Construction

- a) The Social Impact Assessment must be taken forward into a Social Management Plan. The Social Management Plan should set out the process and criteria for mitigation of negative social impacts and a monitoring regime;
- b) It is strongly recommended that as many employment opportunities as is practical are reserved for local people. In particular the developer should;
 - Where possible use labour-intensive methods of construction.

- Develop a community labour agreement with targets for employment and for progression.
 - Go beyond the bare minimum wage rate and invest in local staff – quality is dependent upon well-motivated staff
 - Actively work towards facilitating access to Basic Skills Training.
- c) It is recommended that the Developer generate a policy for small, medium and micro-enterprises and that the various policies and provisions developed by the Department of Trade and Industry be adhered to. Contractors must be aware of these provisions and adhere to them;
 - d) The recommendations of the noise specialist must be complied with;
 - e) The recommendations of the archeological and cultural heritage study must be followed;
 - f) The Developer and Contractor must follow the mitigation measures suggested by the visual specialist;
 - g) The recommendations of the air quality specialist must be complied with;
 - h) During construction the road is to be fenced. Fencing is to be inspected weekly and maintained properly by the Contractors;
 - i) The Contractor should, in consultation with local HIV/AIDS organisations and government structures, design and implement an HIV/AIDS and STD awareness and prevention campaign;
 - j) The Contractor should make HIV/AIDS and STD awareness and prevention programmes a condition of contract for all suppliers and sub-contractors;
 - k) The Contractor should provide an adequate supply of free condoms to all workers;
 - l) A voluntary counselling and testing programme should be introduced during the construction phase and continue during the operational phase;
 - m) The Contractor should undertake a HIV/AIDS and STD prevalence survey amongst all workers on a regular basis;
 - n) The Contractor should establish liaison structures with local police to monitor changes during the construction phase and where necessary additional security should be provided;
 - o) Resettlement must be conducted in terms of international best practice and accompanied by a comprehensive resettlement action plan;
 - p) The Developer must design and provide crossing points that are sufficiently distributed so as to replace and/or mimic those internal routes currently used by the communities and their livestock;
 - q) Where it could be demonstrated that the introduction of the toll road had been directly responsible for the creation of sub-economic farming units, the Developer should expropriate the units in their entirety providing adequate compensation; and
 - r) The Developer must design adequate numbers of strategically placed access points allowing ingress and egress to the road.

Operation

- a) The road is to be fenced. Fencing is to be inspected weekly and maintained properly by the Operator.
- b) The Operator is to ensure that signs, which should be graphic and in the vernacular, are erected on all boundary fences warning against entering the road reserve.
- c) It is imperative that a safety-based public awareness programmes should be developed by the Operator.
- d) The Operator should enter into negotiations with taxi associations well in advance of implementation of toll fees;
- e) The Operator should ensure that either sufficient discounts are in place such that no particular local user is significantly penalised;
- f) In particular the Operator should introduce discounts for public transport providers;
- g) As part of a social responsibility programme the grass in the road reserve could be bailed and made available to the communities. This may help reduce the risk of fence cutting/damage and the hazard posed by unattended cattle grazing in the reserve and crossing the road;

- h) The Operator should actively engage with the local authorities to ensure that no unplanned nodes develop; and
- i) The recommendations of the air quality specialist must be complied with during the operational phase.

6.6.8 TOURISM

- a) Tourism promotion and tourism product marketing should be undertaken in partnership with relevant authorities and stakeholders;
- b) Tourism and hospitality-related skills should be promoted as part of the overall skills development programme;
- c) Access to coastal destinations could be improved through the improvement of secondary routes. Signage to destinations off the route should be improved as well;
- d) Impacts on environmentally sensitive areas should be minimised in order to sustain eco-tourism;
- e) Mitigation measures recommended for other specialist studies, such as vegetation and flora and visual, should be implemented; and
- f) Public participation with tourism stakeholders should be maintained particularly where valuable resources such as waterfalls may be affected.

6.6.9 CULTURAL AND HISTORICAL HERITAGE

- a) Compile a protocol to be followed by the contractors in the event that any heritage resources are discovered during the construction activities;
- b) Develop and conduct training courses for all relevant personnel to enable them to participate effectively in heritage resource management; and
- c) Undertake regular monitoring as construction activities proceed.

6.6.10 NOISE

- a) Implement noise mitigation measures along the relevant sections of the route and at the various toll plaza locations identified in the noise specialist report in order to reduce the day-time noise rating level to at least comply with the legal limit of 65 dBA on all residential or other noise sensitive land. This could involve the use of a low-noise porous road surface and/or the erection of noise barriers close to the edge of the road;
- b) It has been emphasised that compliance with the legal limit could still result in the intensity of noise large areas of land still being high. It is thus recommended that adequate noise mitigation procedures be implemented to ensure a day-time noise rating level of 55 dBA not be exceeded on residential and other noise-sensitive land; and
- c) For construction of the proposed new roads in rural areas it is recommended that machinery with the lowest noise emission be used and that a well planned and co-ordinated “fast track” procedure is implemented to complete the total construction process in any area in the shortest possible time.

6.6.11 AIR QUALITY

It is recommended that discussions be held with the eThekweni Municipality Health Department to address the long-term plans for air quality management in the area;

Toll plazas

- a) Sites where favourable meteorological dispersion prevails should be considered in finalising the location of toll plazas. The factors to consider are relatively elevated flat areas, avoiding valley sites and areas where the general wind flow is impeded by topography;

- b) Toll plazas should not be located in the immediate vicinity of areas where people live and carry out their daily business (e.g. homes, schools, shops, etc.);
- c) Emphasis should be placed on optimising the traffic flow through the toll plazas and that vehicle idling times are limited to a minimum, particularly at peak times;
- d) An occupational health study should be conducted to assess the impact on workers' health. This study may also assess design specifications for the toll booths to isolate the occupants as far as possible from the ambient environment; and
- e) Air quality in toll booths should be monitored for a period of time taking into account diurnal and seasonal traffic volumes.

Dust suppression

- a) Remove only limited vegetation to accommodate construction activities;
- b) Ensure unpaved site roads and access roads remain sufficiently moist throughout the construction period to suppress dust. Water can be used as a wetting or binding agent on the unpaved roads;
- c) Implement traffic control measures to limit vehicle-entrained dust from unpaved roads e.g. by limiting vehicle speeds and by restricting traffic volumes; and
- d) Re-vegetate verges and cuttings once all of the construction is completed, and when the lay down area/construction camp is vacated.

It is recommended that an Air Quality Management Plan be included in the Construction EMP.

6.6.12 VISUAL

- a) The route alignment should be adjusted out of the Mateku Waterfall viewshed and moved further east beyond the low ridge east of the proposed route;
- b) The disturbance footprint of bridges should be limited to the absolute minimum across valley bottoms and the disturbed areas should be rehabilitated immediately;
- c) Bridges should be designed with appropriate, high aesthetical design criteria;
- d) A tourist viewing point should be incorporated into the road design where visitors can stop and view from strategic points at the Msikaba and Mthentu River bridges;
- e) A landscape architect should be appointed during the design phase to integrate the project components with the surrounding landscape in order to ensure that the project blends in physically and aesthetically with the environment;
- f) Detailed specifications for effective rehabilitation of the construction area and road reserves should be included in the contract documentation so that the tasks can be costed and monitored for compliance;
- g) Colour variations on toll plazas should be considered to reduce their scale. Both horizontal and vertical colour differences should be used in a manner that would help to visually break up the large roof and side surfaces;
- h) The heights from which floodlights are fixed should be reduced and identify zones of high and low lighting requirements with the focus of the lights being inward, rather than outward;
- i) A Landscape Development Plan should be developed timeously for all toll plazas and interchanges;
- j) Screening berms should be constructed to limit the visual impact of toll plazas; and
- k) The detailed visual requirements should be monitored during construction.

6.6.13 TRAFFIC DIVERSION

- a) During construction it should be ensured that the same number of lanes on multi-lane sections are available during peak periods as are currently available;
- b) Introduce a system to allow local users on the N2 Prospecton-Winklespruit, Winklespruit-Hibberdene and Hibberdene-Southbroom sections to pay toll tariffs directly related to the distance of the toll section that is used (i.e. a local user discount linked to the use of electronic toll tags);

- c) Visitors could be included in the local user discount scheme as well by creating closed Electronic Toll Collection systems on the N2 Prospecton-Winklespruit and Winklespruit-Hibberdene sections and, ideally, also on the Hibberdene-Southbroom section; and
- d) The latter option can only be implemented if a decision were made, in future, that the upgraded freeways of the Durban metropolitan area would be tolled by means of Open Road Tolling.

6.6.14 PLANNING/DEVELOPMENT

- a) It should be ensured that proposed intersection upgrading accommodate planned land uses at identified nodes;
- b) Bypasses, with proper intersection to allow traffic to enter and leave the CBD, should be constructed at Butterworth, Dutywa and Mthatha;
- c) Interchanges should be considered at the Libode and Ngqeleni intersections;
- d) Consultation with the Regional Land Claims Commissioner's office and land claimants should be undertaken regarding the resolution of applicable land claims; and
- e) Ribbon development should be curtailed by way of pro-active and structured development planning following proper planning principles.

6.6.15 ECONOMIC

- a) Discounts should be negotiated where road users in the vicinity of toll plazas who would use the road for a distance shorter than that for which the fee is calculated, would be impacted negatively; and
- b) The majority of vulnerable people use bus and taxi transport and special rates for these types of vehicles should be considered.

6.6.16 GENERIC CONSTRUCTION-RELATED MITIGATION

All construction materials including fuels and oil should be stored in a demarcated area that is contained within a berm to avoid spread of any contamination. Cement and plaster should only be mixed within mixing trays. Washing and cleaning of equipment should also be done within a bermed area, in order to trap any cement or plaster and avoid excessive soil erosion. These sites must be rehabilitated prior to commencing the operational phase. Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any river channel.

Vegetation stripping should occur in parallel with the progress of road construction to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment. Large stands of Palmiet should be avoided during the construction phase and viable populations should remain *in situ* to allow for the possible recovery of these stands. Only selected plant species must be used in the re-vegetation process.

Construction should as far as possible not occur within any wetlands, thus resulting in their alteration or removal. This includes assessing the possible changes to wetland conditions, hydrological regimes, etc. on wetland function when selecting sites for borrow pits. The construction of a surface stormwater drainage system during the construction phase must be done in a manner that would protect the quality and quantity of the downstream system. The use of swales, which could then be grassed for the operational phase, is recommended as the swales would attenuate run-off water. The purpose of the retention swales is to ensure that stormwater containing silt and other sediments will settle out (commonly accepted sound environmental practice). It is expected that seepage, evaporation and overflow will occur in the swale retention areas ensuring that the water released off-site is of a better quality.

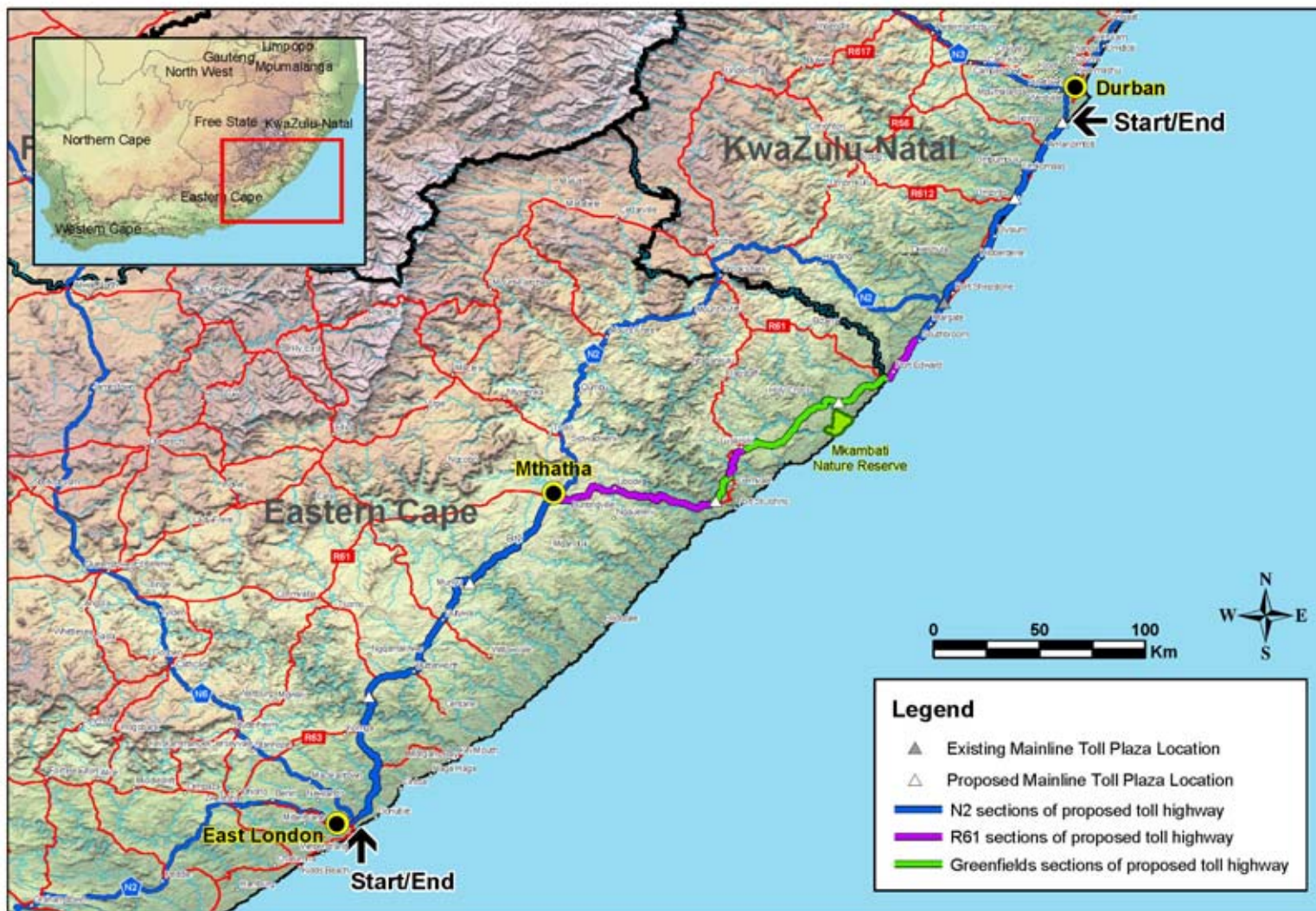


Figure 1: The proposed N2 Wild Coast Toll Highway route between the Gonubie Interchange (Eastern Cape) and the Isipingo Interchange (KwaZulu-Natal)

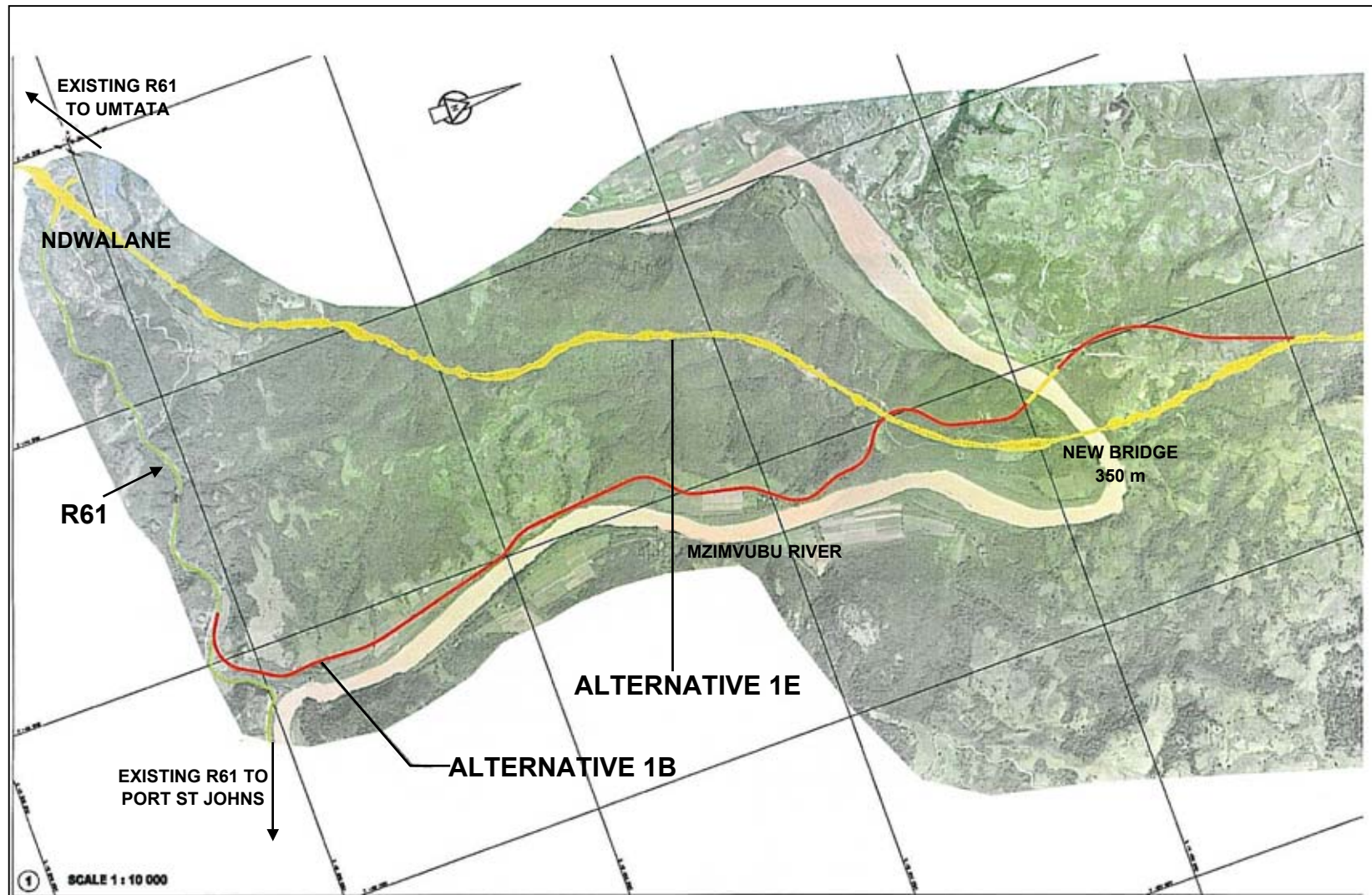


Figure 3: SANRAL preferred route (Alternative 1e) and the alternative alignment (Alternative 1b) between Ndwalane and the Mzimvubu River

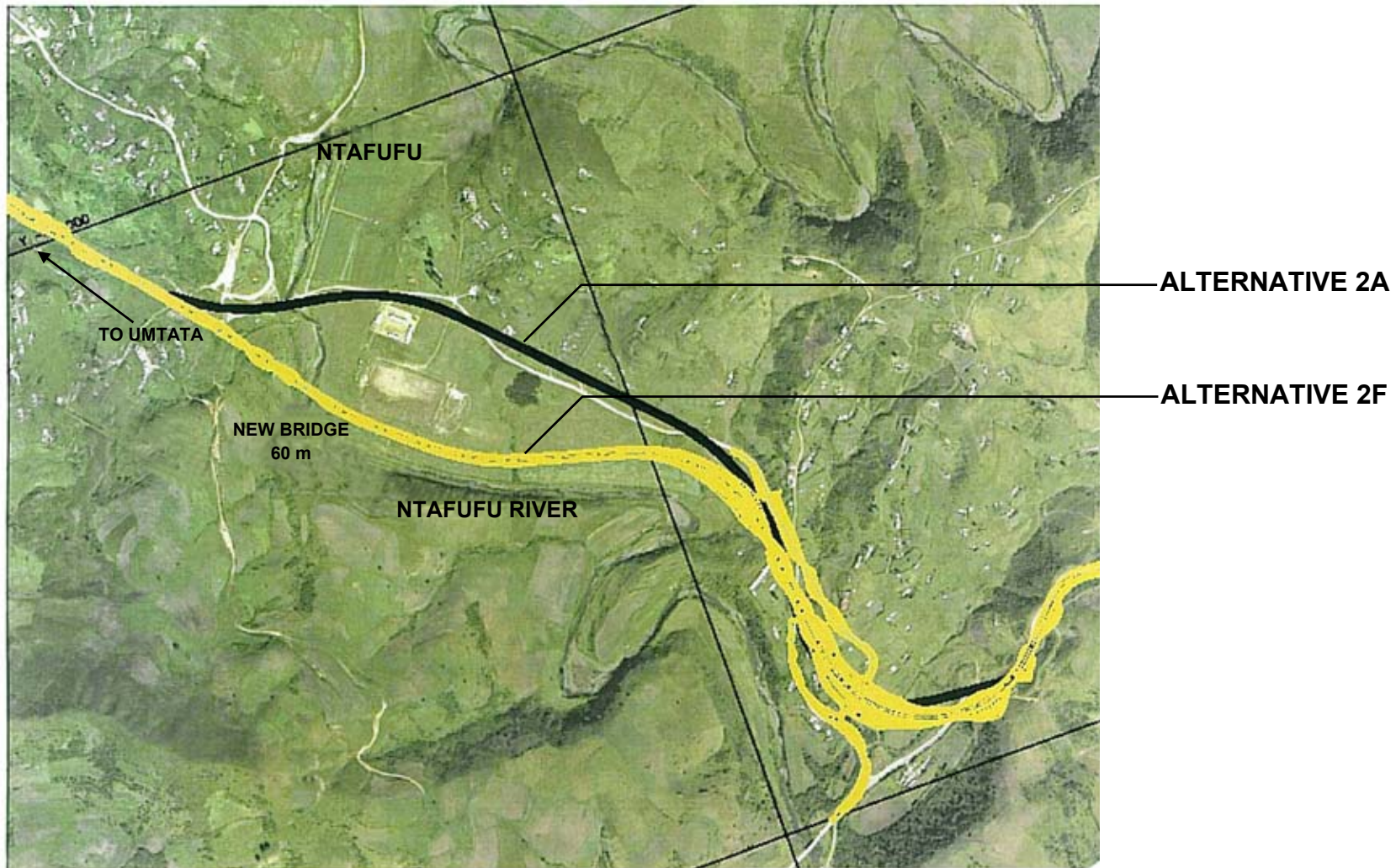


Figure 4: SANRAL preferred route (Alternative 2f) and the alternative alignment (Alternative 2a) in the vicinity of the Ntafufu village and Ntafufu River

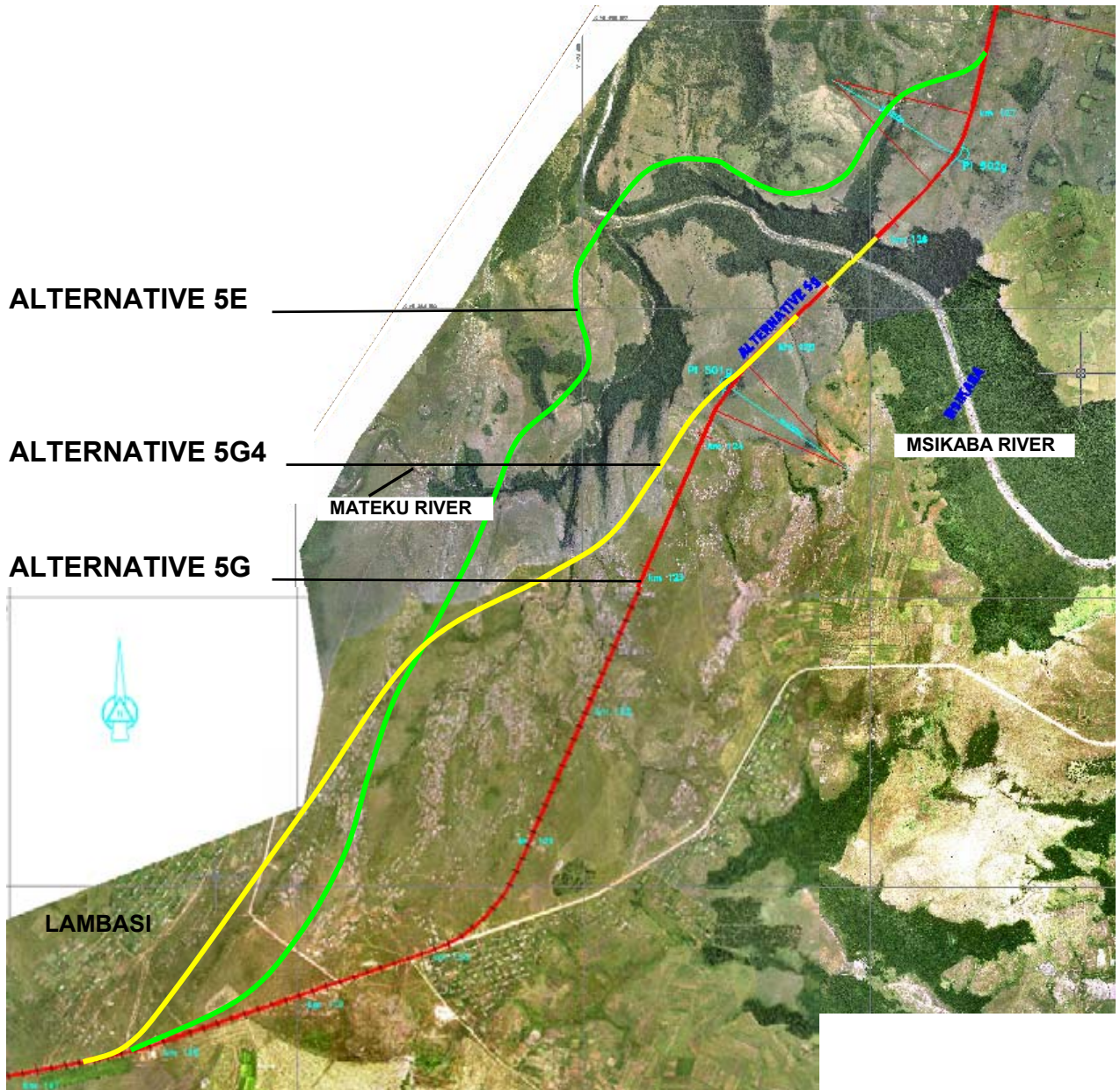


Figure 5: SANRAL preferred route (Alternative 5g4) and alternative alignments 5g and 5e across the Msikaba River

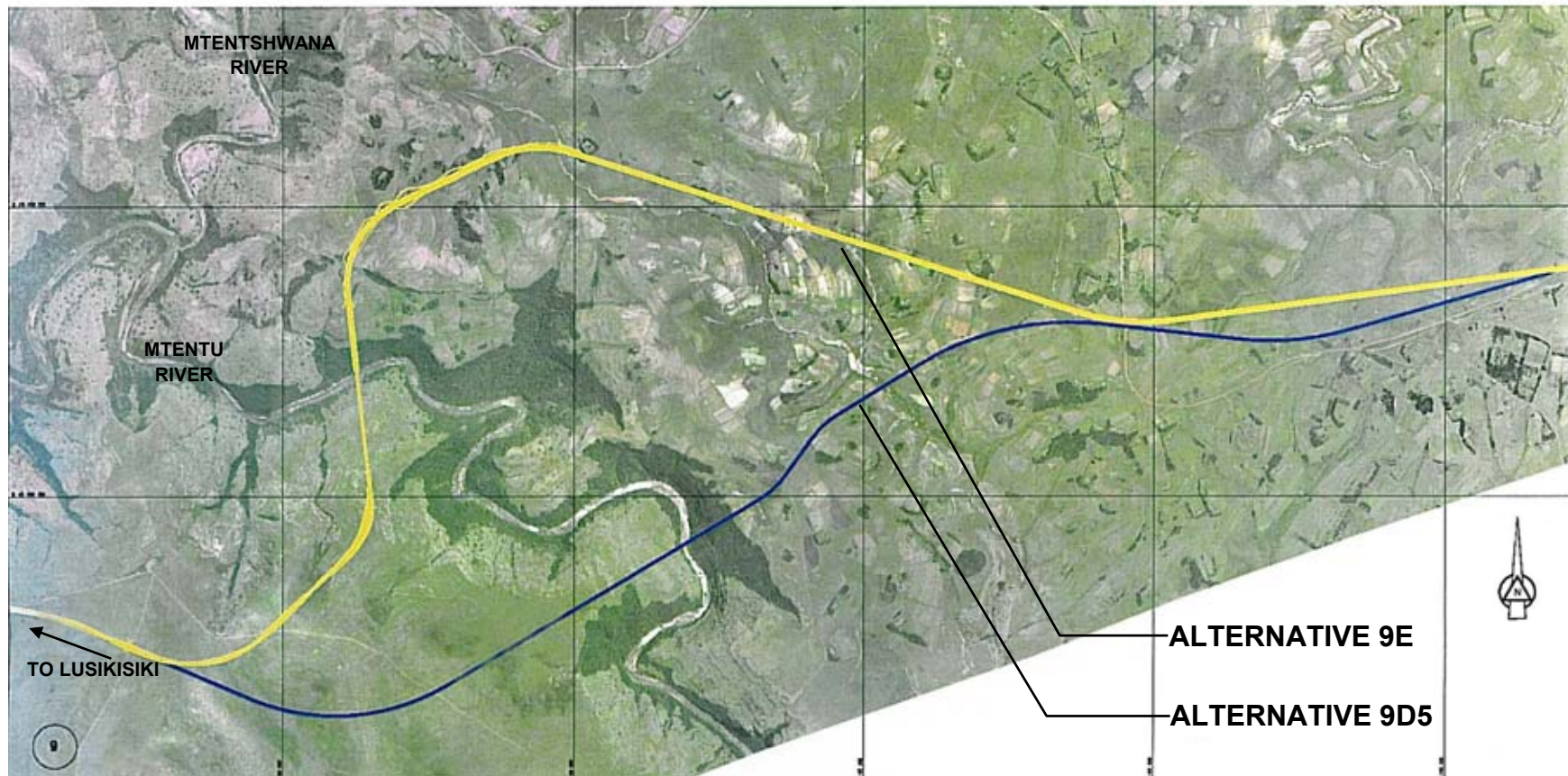


Figure 6: SANRAL preferred route (Alternative 9e) and the alternative alignment (Alternative 9d5) across the Mthentu River

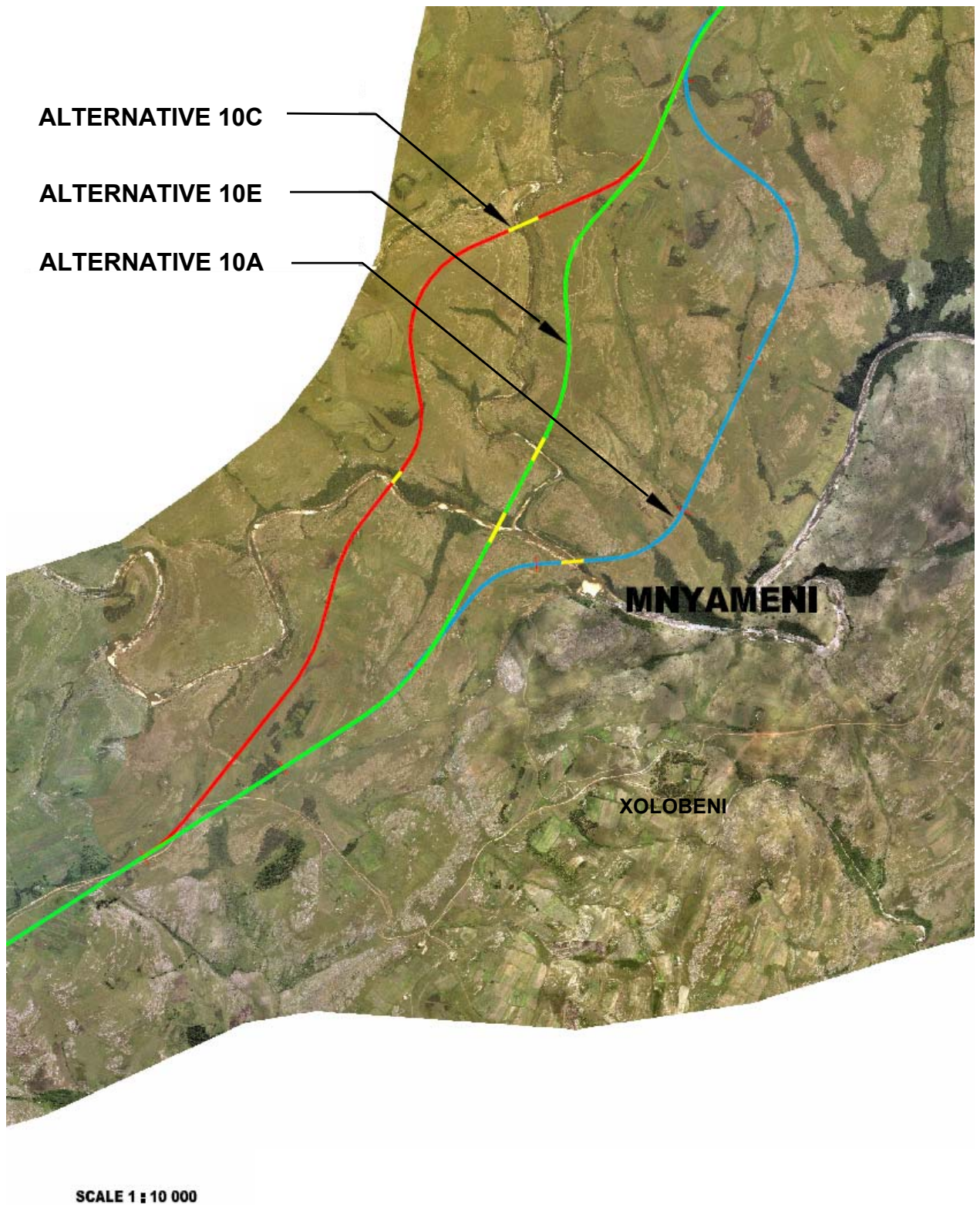


Figure 7: SANRAL preferred route (Alternative 10c) and alternative alignments 10a and 10e across the Mnyameni River

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LIST OF APPENDICES

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LIST OF ABBREVIATIONS

ABET	Adult Basic Education and Training
ADT	Average Daily Traffic
BAP	Biodiversity Action Plan
B/C	Benefit/Cost Ratio
BSAP	Biodiversity Strategy and Action Plan
CBD	Convention on Biological Diversity
CCA	CCA Environmental (Pty) Ltd
CPI	Consumer Price Index
DAEA	KwaZulu-Natal Provincial Department of Agriculture and Environmental Affairs
DBSA	Development Bank of Southern Africa
DEAET	Eastern Cape Provincial Department of Economic Affairs, Environment and Tourism
DEAT	Department of Environmental Affairs and Tourism
DM	District Municipality
DME	Department of Minerals and Energy Affairs
DWAF	Department of Water Affairs and Forestry
ECP	Eastern Cape Parks
ECA	Environment Conservation Act (Act No. 73 of 1989), as amended
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMP	Environmental Management Plan

ETC	Electronic Toll Collection
FSR	Final Scoping Report
GCS	Groundwater Consulting Services
GDP	Gross Domestic Product
GGP	Gross Geographic Product
GIS	Geographical Information Systems
HDI	Historically Disadvantaged Individual
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IRR	Internal Rate of Return
IUCN	World Conservation Union
LED	Local Economic Development
LM	Local Municipality
LOS	Level of Service
MPA	Maputaland-Pondoland-Albany
MPRDA	Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)
MRA	Mining Right Application
MRC	Mineral Resource Commodities
NEMA	National Environmental Management Act (Act No. 107 of 1998), as amended
NHRA	National Heritage Resources Act
NMA	Nomi Muthialu & Associates (Pty) Ltd
NPV	Net Present Value
PCE	Pondoland Centre of Endemism
PGDP	Provincial Growth and Development Plan
PV	Present Value
RDB	Red Data Book
RoD	Record of Decision
SAHRA	South African Heritage Resources Agency
SANParks	South African National Parks
SANRAL	South African National Roads Agency Limited
SANS	South African National Standards
SAPS	South African Police Services
SCA	Sensitive Coastal Areas
SDI	Spatial Development Initiative
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
SED	Socio-Economic Development
SMMEs	Small, Medium and Micro Enterprises
TEM	TransWorld Energy and Mineral Resources (S.A.) Pty Ltd
TOCE	Temporarily Open/Closed Estuaries
TRACOR	Transkei
UDM	Ugu District Municipality
UNCED	United Nations Conference on Environment and Development
UNDP-GEF	United Nations Development Programme's Global Environment Facility
VOC	Vehicle Operating Cost
WCSDF	Wild Coast Spatial Development Framework
WTP	Willingness to Pay