

SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED (SANRAL)

**STRATEGIC INFRASTRUCTURE PROJECT (SIP2)
PROPOSED CAPACITY UPGRADES TO THE N2 & N3**

BASIC ASSESSMENT 4

**CAPACITY UPGRADES TO THE N3 FROM THE CATO RIDGE
INTERCHANGE (KM 19.4) TO LYNNFIELD PARK (KM 30.6), ETHEKWINI
OUTER WEST, MKHAMBATHINI AND MSUNDUZI LOCAL
MUNICIPALITIES, KWAZULU-NATAL**

DRAFT BASIC ASSESSMENT REPORT

DEA REF NO: *TO BE ASSIGNED*

DRAFT BASIC ASSESSMENT REPORT FOR PUBLIC REVIEW

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DRAFT BASIC ASSESSMENT REPORT FOR PUBLIC REVIEW

This Draft BAR has been placed at the following public places in the project area. It will be available to members of the public for the comment period from **13 March – 12 April 2019**.

Area	Venue	Street Address	Telephone Number
Cato Ridge	Cato Ridge Public Library	Cnr. Doornrug & Old George Road, Cato Ridge, 3680	031 782 1632
Camperdown	Camperdown Public Library	18 Old Main Road, Camperdown, 3720	031 785 9337
Ashburton	Ashburton Public Library	1 Wally Hayward Drive Ashburton Pietermaritzburg	033 326 1844

YOUR COMMENTS PLEASE

Please submit your comments by no later than 12 April 2019 to:

**Ashleigh McKenzie/Salona Reddy ► P O Box 503, Mtunzini, 3867
► Tel: 035 340 2715 ► Fax: 035 340 2232 ► E-mail: N3batch2@acerafrica.co.za**

Please note that, in line with the EIA Regulations, all registered interested and affected parties are required to disclose any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

EXECUTIVE SUMMARY

INTRODUCTION AND LEGAL REQUIREMENTS

The South African National Roads Agency SOC Limited (SANRAL) intends to widen the N2 and N3 national roads between the Port of Durban and Pietermaritzburg, KwaZulu-Natal. The proposed project requires environmental authorisation from the national Department of Environmental Affairs. **This report is a Basic Assessment Report (BAR) for a section of the N3 capacity improvements between Cato Ridge and Lynnfield Park.** The BAR has been prepared on behalf of SANRAL by Metamorphosis Environmental Consultants (Metamorphosis), in terms of the requirements of the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended), published under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The Basic Assessment process has included technical investigations and public participation in accordance with GN R. 326. This Draft BAR has been made available for public review and comment during the period **13 March – 12 April 2019.**

Further to the requirement for environmental authorisation, several other environmental laws, policies and guidelines are applicable to this project and are listed in Table 7 of this report.

PROJECT NEED AND DESIRABILITY

The N2 and N3 carry large volumes of traffic, with a high percentage of heavy vehicles carrying freight to and from the Port of Durban, forming the backbone of South Africa's freight network. Sections of these national roads are operating at full or near full capacity. Traffic studies commissioned by SANRAL have projected traffic growth figures, which indicate the need to provide additional lanes to alleviate current traffic congestion and to accommodate future growth and improve road safety and efficiency. SANRAL (Eastern Region), therefore, proposes to provide additional lanes along a section of the N2 near the Port of Durban and a section of the N3 from the N2/N3 (EB Cloete) Interchange (I/C) on to Pietermaritzburg. The proposed capacity improvements, which are divided into sections and covered ultimately by several engineering work packages, will be implemented at different stages according to timing priorities and factors related to funding availability (albeit the reality is that there will be overlapping construction periods between the different work packages). The proposed capacity improvements will improve safety and accommodate traffic growth to 2047.

Importantly, the upgrades are planned in line with South Africa's Strategic Infrastructure Projects (SIPs) as described in the National Development Plan, 2011. Specifically, the proposed capacity improvements form the backbone of SIP2, which focuses on strengthening the Durban-Free State-Gauteng logistics and industrial corridor. In line with SIP2 goals, the capacity improvements will improve access to Durban's export and import facilities. National roads are essential infrastructure supporting the economy of the country and, therefore, of benefit to all citizens of South Africa either directly or indirectly. As such, this project has been taken into account by, and is compatible with, national, provincial and municipal development and planning frameworks.

PROJECT LOCATION AND MAIN COMPONENTS

The section of national road dealt with in this Basic Assessment falls between Cato Ridge and Lynnfield Park (see locality figure overleaf) and is mainly situated in the Mkhambathini Local Municipality (LM) within the uMgungundlovu District Municipality (DM). However, the upgrading of the Cato Ridge interchange and approximately 1.5 km of road upgrades fall within the Outer West planning region of the eThekweni Metropolitan Municipality (eThekweni). Also, a portion of the upgrades to the Dardanelles/Umlaas Road I/C and approximately 2 km of road upgrades will take place within the Msunduzi LM, which is also part of the uMgungundlovu DM.

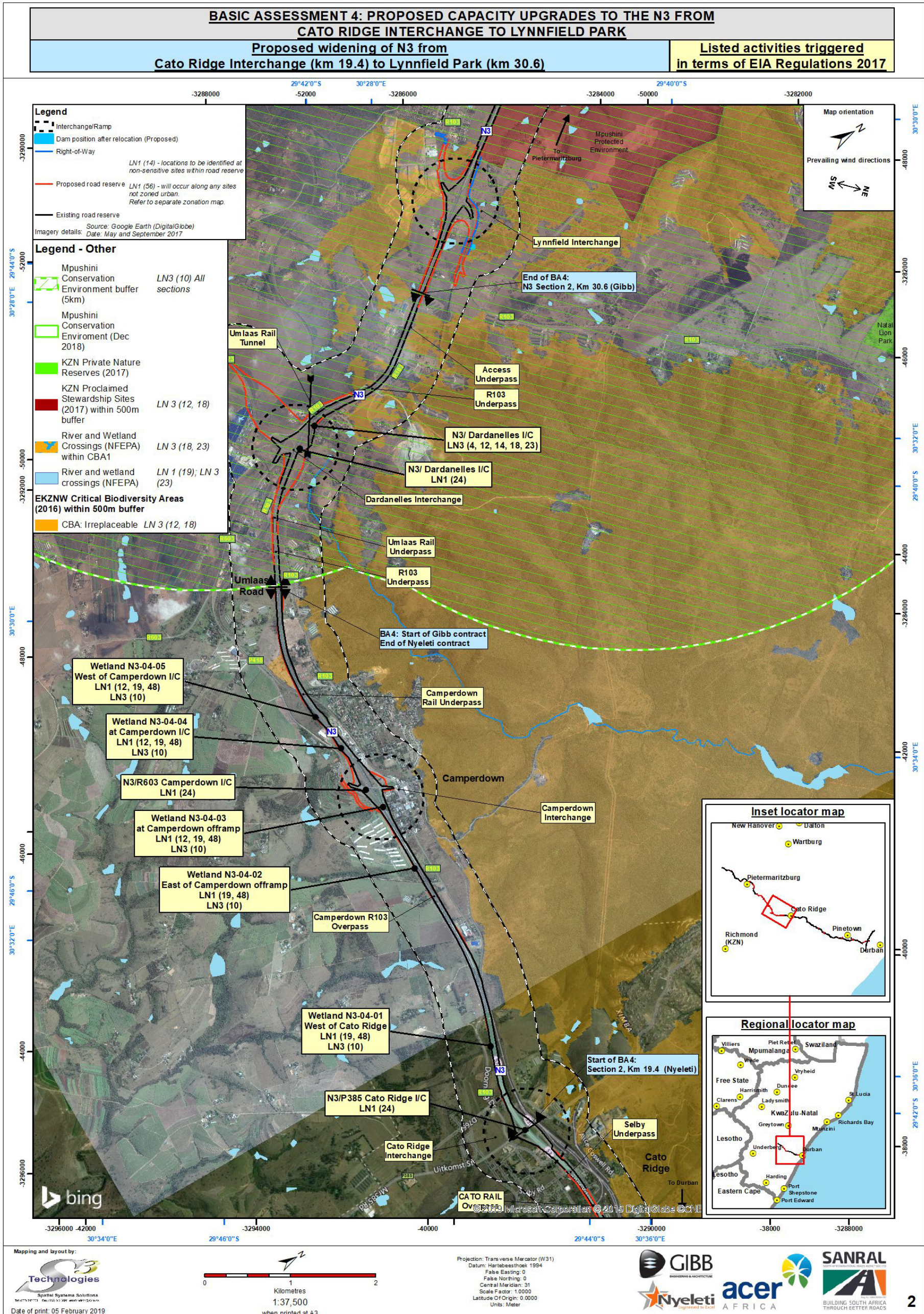


Figure 1 Location of proposed capacity upgrades to the N3 from Cato Ridge Interchange to Lynnfield Park, also showing the locations of listed activities triggered by the project

Road sections to undergo construction are:

- ❑ N3 from the Cato Ridge I/C to south of the Dardanelles I/C.
- ❑ N3 from south of the Dardanelles I/C to south of the Lynnfield Park I/C.

Within these sections, the major interchanges to be upgraded are:

- ❑ Cato Ridge I/C (N3/P385).
- ❑ Camperdown I/C (N3 and Umbumbulu Road) (this interchange will be developed in phases).
- ❑ Dardanelles I/C (N3/R103/R603/R623) (this interchange will be developed in phases).

Associated works include realignment of 0.59 km of Fairview Road (Camperdown); phased upgrades to the approaches of the R103, R603 and R623 at the Dardanelles I/C; relocation/modification of access from the R103 to the One Logix Vehicle Park and Aqua; and possible vertical realignment of sections of Transnet Fuel and Umgeni Water pipelines. Near the Camperdown I/C, sections of the Umgeni Water pipeline will require protection and a section will require relocation, but access to the pipeline will not be compromised.

PROJECT ALTERNATIVES

In line with the EIA Regulations, several alternatives have been considered for the proposed project. Given that this project entails the upgrade of an existing national road, alternatives investigated by SANRAL have revolved mostly around technical engineering issues (road design, materials, etc.). However, it must be understood that the final project proposal for which environmental authorisation is requested presents only **one feasible overall design alternative** which has been selected based on detailed modelling to best meet traffic demands and road safety standards.

The No-Development alternative (not preferred) provides the baseline against which alternatives are assessed and also demonstrates the consequences of not authorising the development proposal.

THE RECEIVING ENVIRONMENT

The N3 section under consideration is part of a major transport and economic corridor. In this area, it passes through a mix of urban and agricultural land, including the towns of Cato Ridge and Camperdown. Land uses include residential, commercial, railway reserve, sugar cane and agri-industrial farming (including commercial chicken farming). Road widening will be restricted mainly to the median and the existing road reserves. However, sections of private and state-owned land will need to be acquired by SANRAL, where widening cannot be accommodated within SANRAL's own properties (Figure 1). No cultural heritage sites have been identified along this section of the N3. The natural terrestrial habitat affected is mainly in the form of open grassland/scrub areas. In these areas, vegetation is largely transformed or very disturbed. The project will require vegetation clearance from narrow areas adjacent to the N3, both within and next to the road reserve, as well as around the upgraded Camperdown I/C and Dardanelles I/C. The road crosses six watercourses, five of which provide wetland habitat (albeit modified). There are a few areas along this section of the N3 that adjoin, but that do not directly impact, land classified as Critical Biodiversity Areas (CBA): Irreplaceable, viz. an area west of the Camperdown I/C and other areas north of the Dardanelles Interchange. A part of the N3 under consideration also falls within the 5 km buffer of the Mpushini Protected Environment, which is situated between Lynnfield Park and Ashburton.

PUBLIC PARTICIPATION PROCESS

The public participation process was designed and implemented to comply with the requirements of the EIA Regulations and NEMA. A detailed description is provided in Chapter 6 of this report.

ASSESSMENT METHODOLOGY

Issues and potential impacts of the project on the environment (and *vice versa*) were identified by way of field investigations, desktop studies and interaction with Interested and Affected Parties (I&APs). Key issues and impacts requiring further investigation were addressed by specialist studies and/or further detailed input from the environmental and technical team. Input from ACER's in-house specialists underwent independent review. Mitigation measures were identified with inputs from I&APs, the specialists, the design engineers and the Environmental Assessment Practitioner (EAP) team. Information was collated, evaluated and integrated, taking into account the specialist findings and recommended mitigation measures. Thereafter, each impact was assessed using the assessment conventions outlined in Table 14 of this report.

SUMMARY OF KEY ISSUES AND POTENTIAL IMPACTS ASSOCIATED WITH THE N2 AND N3 CAPACITY IMPROVEMENTS AND ASSESSMENT OF THE SIGNIFICANCE OF THE IDENTIFIED IMPACTS

The key issues identified and assessed during this Basic Assessment were formulated as eight questions. Associated potential impacts were identified and their significance assessed both before and after mitigation.

What economic and socio-economic benefits will result from the proposed widening/capacity improvements to the N3, at a local, regional and national scale?

- Employment creation, capacity building (+ve).
- Improved road safety (+ve).
- Reduced travel time (reduced traffic congestion and improved road conditions) (+ve).
- Improved transport corridor (+ve).
- Stimulation of the local, regional and national economy (+ve).

With management, these positive impacts are considered to be of medium and high significance.

What effects will the proposed widening/capacity improvements to the N3 have on adjacent properties, infrastructure and services, and vice versa?

- Increased interaction with landowners and entry onto private properties by investigative teams (e.g. geotechnical) (-ve).
- Potential loss and disruption due to expropriation¹ of properties (-ve).
- Resettlement of formal households and loss of privately owned land (-ve).
- Potential change in the values of adjacent properties (+ve or -ve).
- Damage to/disruption of services and infrastructure in and adjacent to the road reserve (-ve).
- Potential disruption of access to businesses (-ve).
- Unintended damages to private property (-ve).
- Increased pressure on adjacent roads and alternative routes during construction (-ve).
- Increased pressure on municipal water supply (quantity) during construction (-ve).

With management, these impacts are considered to be of low and medium significance.

What potential health, safety, security and nuisance impacts may be experienced as a result of the proposed widening/capacity improvements to the N3 during construction?

- Increased spread of disease (-ve).
- Increased likelihood of road traffic accidents (-ve).
- The effect of increased noise on surrounding receivers during construction (-ve).

¹ It is expressly stated that expropriation discussed in this report is expropriation to be undertaken within the context and provisions of the current laws of the country. Expropriation for purposes of capacity improvements to the N2 and N3 is in no way linked to or to be interpreted within the context of the current debate concerning 'land expropriation without compensation'.

- Degraded aesthetics (-ve).
- Disruption to vehicle traffic and access (-ve).
- Increased dust and vehicle emissions (-ve).
- Health and safety risks to those in proximity to construction activities (-ve).
- Increased risk of crime (increased security risk) (-ve).
- Potential protest action (-ve).
- Generation of large amounts of demolition rubble (-ve).

With management, these impacts are considered to be of low and medium significance.

What potential negative impacts will the proposed widening/capacity improvements to the N3 have on the social environment, during operation?

- Increased noise where the distance from the road to receptors is reduced (-ve).
- Increased safety and security risks to nearby properties and occupants during operation of the widened road (-ve).
- Increased effect of vibrations from heavy vehicles, where the distance from the road to buildings is reduced (-ve).
- Risk of stormwater damage to adjacent properties (-ve).
- Increased proximity to vehicle emissions (-ve).

With management, these impacts are considered to be of low and medium significance.

What effects will the proposed widening/capacity improvements to the N3 have on cultural heritage resources?

- According to the Cultural Heritage Resources Impact Assessment specialist report, there are no identified cultural heritage resources that will be impacted upon by this project

What effects will the proposed widening/capacity improvements to the N3 have on the biophysical environment and biodiversity (water, soils, riparian, wetland and terrestrial natural habitat, fauna) during construction, operation and rehabilitation?

- Loss of topsoil (-ve).
- Destabilisation of banks, erosion and sedimentation (-ve).
- Loss/degradation of Disturbed Grassland/Thicket Mosaic (-ve).
- Loss/degradation of hygrophilous grassland (-ve).
- Loss/degradation of wetland areas (-ve).
- Faunal mortalities and negative effect on local faunal populations due to disturbance, loss of habitat and poaching (-ve).
- Potential deterioration of water quality in watercourses during construction (-ve).

With management, the impacts are considered to be of low and medium significance.

What potential cumulative impacts can result from the proposed widening/capacity improvements to the N3?

A cumulative impact is an incremental impact on the environment that results from the impact of a proposed action when added to existing and reasonably foreseeable future actions. Cumulative effects can be both positive and negative. Also, the nature of cumulative impacts can be both temporary (i.e. impacts that are restricted to the construction period) and permanent (i.e. impacts that occur in both the construction and operation phases).

To enhance the positive impacts of the proposed widening/capacity improvements to the N3 and, thus, enhance positive cumulative effects, the project should be implemented efficiently according to best environmental practice. Also, the infrastructure should be well maintained.

To minimise negative impacts of the proposed widening/capacity improvements to the N2 and N3 and, thus, its negative contributions towards cumulative effects on the environment, the project should be implemented with the application of recommended mitigation measures. There will also need to be sound co-ordination between contracts running concurrently.

What are the impacts of the No Development Alternative (not implementing widening/capacity improvements to the N3)?

- ❑ Deferment/avoidance of the negative impacts of construction (social disruption, noise and nuisance, and destruction/disturbance of natural habitat) (+ve).
- ❑ Increased traffic congestion and increased commuter time (-ve).
- ❑ Decreased road safety (-ve).
- ❑ Disadvantages to the local, regional and national economies (-ve).

Apart from the deferment of negative construction impacts, according to the assessment, the predicted impacts of the No Development Alternative are considered to be of high (-ve) significance without mitigation (mitigation would be implementation of the capacity improvements).

ENVIRONMENTAL IMPACT STATEMENT

Effects of the project on the social environment and vice versa

The project constitutes major roadworks (including widening of bridges) to be implemented on a national road carrying high volumes of traffic, including heavy vehicles. As such, during the construction period (the two construction contracts will not start simultaneously so will span 4-5 years) there will be numerous negative impacts on the social environment, which will be experienced by both road users and adjacent property owners/occupiers on the affected sections. These will largely be nuisance impacts related to the disruption of traffic flows, road access, increased noise, increased crime risks and general construction related disturbances. The road restrictions will pose higher road safety risks to motorists, pedestrians and construction workers. Equally, the high traffic volumes and space constraints will make it more difficult for the project team to execute construction efficiently.

Any existing services in the current road reserve will have to be realigned/relocated and related disruptions may ensue. While these impacts will be temporary, it can be anticipated with a high level of certainty that thousands of road users and local residents will be affected on a daily basis at varying intensities over a period of a few years. While the majority of the road widening will be contained within the existing road reserve, expropriation of adjacent land will be required and, thus, some property owners will lose land and, in some cases, potentially entire properties. SANRAL has entered into property acquisition processes with affected property owners and fair compensation will be negotiated in line with legislated procedures.

With efficient and proper project management and implementation by SANRAL, as well as the application of the mitigation measures recommended in this report (carried over into the Environmental Management Programme (EMPr), **the negative social impacts during construction, while onerous, will be of medium and low significance, with no negative social impacts of high significance.**

The positive impacts of the project on the social environment during operation will be of high significance. They can be predicted with a high level of certainty to benefit thousands of road users on a daily basis through improved road travelling conditions, including improved road safety and reduced travel times. Negative impacts during operation, such as increased traffic noise and exhaust emissions are not a result of the project but rather a result of increasing traffic volumes over time,

which will unavoidably affect any occupiers and users of properties adjacent to any national road. In the case of this project, the intensity of impacts will increase where the widened road brings the receivers into closer proximity to traffic. With respect to emissions, the impacts will be variable, depending on the topography and micro-climate of the location. Indeed, some areas where previously there was congestion are likely to improve with respect to emissions, as free flowing traffic is likely to decrease the concentration of exhaust emissions. With respect to operational noise, it is clear that noise levels are already problematic within generally, 250- 280 m from the road and they are predicted eventually (over the next 30 years and in the absence of mitigation) to reach unacceptable levels according to predicted increases in traffic volumes. SANRAL, as the road authority, is tasked with ensuring that the roads can safely and efficiently accommodate traffic growth to facilitate economic development and to do this, has to widen the road. SANRAL has taken into consideration low noise surfacing in the road design and is in the process of appointing an acoustic specialist to investigate further possible and feasible noise control measures over time. Control of the growth of traffic volumes is a broader issue that requires high level interventions such as improved public transport and migration of freight from road to rail. These issues are being addressed but will take time. Ultimately there must also be an adaptation to prevailing conditions, i.e. a change of land use/receptors adjacent to national roads, towards those which are less sensitive to noise. **With mitigation, the negative impacts on the social environment associated with operation of the widened national roads are anticipated to be of a low and medium significance.**

Effect of the project on the economic/socio-economic environment

During the construction period, it is definite that some **positive economic/socio-economic impacts of low significance will accrue to the local and regional community** due to the provision of temporary jobs for semi-skilled and unskilled workers, the increased opportunities for local contractors and SMMEs, and a general increase in spending on a wide range of goods and services in Durban, Pietermaritzburg and KZN. There is also likely to be spending nationally on specialist materials/equipment. The estimated overall cost to upgrade the N3 including interchanges, is R235 million per km (2018 Rand, VAT exclusive) i.e. an estimated cost of R 17.64 billion over 75 km. The interchange upgrades contribute a substantial portion of the N3 upgrading, including the N2/N3 EB Cloete Interchange. The latest Preferential Procurement Policy Framework Act (Act 5 of 2000) (PPPFA) regulations makes it mandatory that thirty percent of the contract value is subcontracted to specific target groups which includes Emerging Micro Enterprises and Qualifying Small Enterprises.

There will also be negative economic/socio-economic impacts during the construction period. Economic losses are likely to be incurred indirectly due to poorer access, poorer road and travelling conditions, an increased likelihood of road traffic accidents, possible damage to infrastructure and services, expropriation of properties, resettlement processes, etc. **With mitigation, the negative economic/socio-economic impacts of the project during construction are anticipated to be of low and medium significance.**

Economic impacts during operation will be positive. The project has SIP2 status (and as such, national priority). The primary motivation for implementing this project is to stimulate economic growth through improved transport infrastructure and an improved logistics/transport corridor between Durban and Gauteng. In conjunction with several other short-, medium- and long-term strategic Government plans and interventions it is, thus, designed to positively impact on the economy of the country. Positive economic benefits will be incurred locally, regionally, provincially and nationally as a result of the improved transport infrastructure. **With good project management and execution, the positive impacts of this particular project on the economy will be of high significance. The project will also contribute cumulatively with other SIP projects to significantly benefit the country's economy.**

Effects of the project on cultural heritage resources and vice versa

Based on the findings of the cultural heritage assessment, no cultural heritage resources have been identified in the project area. Should any be uncovered during the course of construction, Amafa must be notified for guidance on actions required.

Effects of the project on the biophysical environment, biodiversity and vice versa

While construction will inevitably impact negatively on natural habitat, it should be noted that this project is an upgrade of an existing road, it is located primarily within the existing road reserve. The works will, thus, largely affect previously disturbed habitat. Road widening will entail lengthening of existing drainage structures and existing culverts at watercourse crossings. At the expanded Dardanelles I/C, some road sections will affect limited areas outside of SANRALs road reserve. There is one potentially sensitive vegetation community which could be affected by construction activities, the Hygrophilous Grassland at the Cato Ridge offramp. Other key impacts could occur in the disturbed grassland and thicket mosaics and wetland vegetation along the route. Management actions presented in the EMPr will ensure that these impacts are reduced. Once rehabilitation post construction has been completed, the impacts during operation of the road will not be significant. **With mitigation, the negative impacts of construction and operation on the biophysical environment (soils and substrates, terrestrial and riparian habitat, as well as associated fauna) will be of low significance.**

Effects of the No Development Alternative

While the No Development Alternative would defer the negative impacts of construction on the social and biophysical environments, as described above, this would be of short term benefit only. In the longer term, the No Development Alternative will result in increasingly congested, unsafe and inefficient national road infrastructure. The negative consequences of not widening and upgrading the national roads, will be severe and will have far reaching impacts on all South Africans and be contrary to the strategic plans of the South African Government. **The negative impacts of the No Development Alternative have been assessed as being of high significance. For these reasons, this alternative is not recommended.**

RECOMMENDATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

It is the opinion of the EAP that the information contained in this report and the documentation attached hereto is sufficient to make a decision in respect of the activity applied for, viz. the proposed capacity upgrades to the **N3 from Cato Ridge I/C to Lynnfield Park.**

It is recommended that the proposed activity is authorised, based on the findings of the assessment process and conditional on the items listed in Section 11 of this report.

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ACRONYMS AND ABBREVIATIONS

ACER	ACER (Africa) Environmental Consultants
BA	Basic Assessment
BAR	Basic Assessment Report
BID	Background Information Document
CBA	Critical Biodiversity Area
CRCP	Continuously Reinforced Concrete Pavement
CRLHC	Cato Ridge Logistics Hub Consortium
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs (National)
DEAT	Department of Environmental Affairs and Tourism (now DEA)
DEDTEA	Department of Economic Development, Tourism and Environmental Affairs (KwaZulu-Natal)
DM	District Municipality
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EKZNW	Ezemvelo KwaZulu-Natal Wildlife
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
ESA	Ecological Support Area
eThembeni	eThembeni Cultural Heritage Consultants
GN	Government Notice
ha	hectare
I&APs	Interested and Affected Parties
I/C	Interchange
IDP	Integrated Development Plan
kl	Kilolitre
km	Kilometre
KZN	KwaZulu-Natal Province
LM	Local Municipality
LN	Listing Notice
m	Meter
m ³	Cubic Meter
Metamorphosis	Metamorphosis Environmental Consultants
MOSS	Metropolitan Open Space System
Mtons	million tons
N3	National Road 3
NCR	Noise Control Regulations
NEMA	National Environmental Management Act
NEMBA	National Environmental Management Biodiversity Act
NEMPAA	National Environmental Management: Protected Areas Act
PLC	Project Liaison Committees
PPE	Personal Protective Equipment
PPPFA	Preferential Procurement Policy Framework Act
PU	Planning Units
RRM	Routine Road Maintenance
SANRAL	South African National Roads Agency SOC Limited
SANS	South African National Standard
SCA	Systematic Conservation Assessment
SDF	Spatial Development Framework

SIP	Strategic Infrastructure Project
SMME	Small Medium and Micro Enterprise
TOPS	Threatened or Protected Species
UTFC	Ultra-thin friction wearing course

DETAILS AND EXPERTISE OF THE ENVIRONMENTAL IMPACT ASSESSMENT (EAP) AND SPECIALIST TEAM

Details and CVs of specialists are contained in Appendix D. Details and CVs of the EAP are contained in Appendix G.

ADHERANCE TO REGULATORY REQUIREMENTS

Table 1 Required content of Basic Assessment Report according to GNR 326 (7 April 2017)

		Content of Basic Assessment report according to GNR 326 (7 April 2017)	Reference
1		A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application must include	
	A	Details of	
	i	The EAP who prepared the report and	Appendix G
	ii	The expertise of the EAP, including a curriculum vitae	Appendix G
	B	The location of the activity, including	Section 1.3, Figures 1 & 2
	i	The 21-digit Surveyor General code of each cadastral land parcel	Appendix C2 & Appendix H (application)
	ii	Where available, the physical address and farm name	Not available
	iii	Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties	Government Gazette No 40085, Vol. 734, 22 June 2016 details the existing proclaimed road reserve.
	C	A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale, or if it is	
	i	A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken, or	Refer to Tables 4, 5 and 6. In addition, Government Gazette No 40085, Vol. 734, 22 June 2016 details the existing proclaimed road reserve.
	ii	On land where the property has not been defined, the coordinates within which the activity is to be undertaken	N/a
	D	A description of the scope of the proposed activity, including	Section 1.3, Chapter 3
	i	All listed and specified activities triggered and being applied for, and	Section 1.4.1, Table 6
	ii	A description of the activities to be undertaken including associated structures and infrastructure	Section 1.4.1, Table 6; Chapter 3, Appendix A
e	A description of the policy and legislative context within which the development is proposed including	Chapter 2	

		Content of Basic Assessment report according to GNR 326 (7 April 2017)	Reference	
f	i	An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report, and	Chapter 2	
	ii	How the proposed activity complies with and responds to the legislation and policy context, plans guidelines, tools frameworks and instruments	Section 1.2	
	f	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	Section 1.2	
	g	A motivation for the preferred site, activity and technology alternative	Chapter 4	
	h		A full description of the process followed to reach the proposed preferred alternative within the site including	Chapter 4
		i	Details of all the alternatives considered	Chapter 3&4
		ii	Details of the public participation process undertaken in terms of regulation 411 of the Regulations, including copies of the supporting documents and inputs	Chapter 6, Appendix E
		iii	A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.	Section 6.4. Appendix E3
		iv	The environment attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspect.	Chapter 5
		v	The impact and risks identified for each alternative, including the nature significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts	Chapter 8
		aa	Can be reversed	Chapter 9
		bb	May cause irreplaceable loss of resources, and	Chapter 9
		cc	Can be avoided, managed or mitigated	Chapter 8 & 9
		iv	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives,	Chapter 7
		vii	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	Chapter 8
	viii	The possible mitigation measures that could be applied and level of residual risk	Chapter 8	
ix	The outcome of the site selection matrix	N/a		
x	If no alternative locations for the activity were investigated, the motivation for not considering such, and	Chapter 4		
xi	A concluding statement indicating the preferred alternatives, including preferred location of the activity	N/a – in situ upgrade		
i		A full description of the process undertaken to identify assess and rank the impacts the activity will impose on the preferred location through the life of the activity including	Chapter 7	

		Content of Basic Assessment report according to GNR 326 (7 April 2017)	Reference
	ii	A description of all environmental issues and risks that were identified during the environmental impact assessment process, and	Chapter 8
	ii	An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation	Chapter 9
j		An assessment of each identified potentially significant impact and risk, including	Chapter 9
	i	Cumulative impacts	Chapter 9
	ii	The nature, significance and consequences of the impacts and risk	Chapter 9
	iii	The extent and duration of the impact and risk	Chapter 9
	iv	The probability of the impact and risk occurring	Chapter 9
	v	The degree to which the impact and risk can be reversed	Chapter 9
	vi	The degree to which the impact and risk may cause irreplaceable loss of resources and	Chapter 9
	vii	The degree which the impact and risk can be avoided, managed or mitigated	Chapter 9
k		Where applicable, a summary of the findings and impact management measures identified in any specialist's report complying with Appendix 6 to these regulations and an indication as to how these findings and recommendations have been included in the final report	Chapter 8
l		An environmental impact statement which contains	
	i	A summary of the key findings of the environmental impact assessment	Chapter 10
	ii	A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers and	Figure 1. Appendix C. Figures in the Vegetation and Riparian Specialist Reports (Appendix D) and the relevant EMPr Appendices (Appendix F)
	iii	A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives	Executive Summary, Chapter 10, and Chapter 11
m		Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives and the impact management outcomes for the development for the inclusion in the EMPr	Chapter 8, Appendix F
n		Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	Chapter 11
o		A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.	Section 7.2
p		A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any	Chapter 11

		Content of Basic Assessment report according to GNR 326 (7 April 2017)	Reference
		conditions that should be made in respect of that authorisation.	
	q	Where the proposed activity does not include operational aspects, period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised	N/a to national roads
	r	An undertaking under oath or affirmation by the EAP in relation to	
	i	The correctness of the information provided in the reports	Appendix G
	ii	The inclusion of comments and inputs from stakeholders and I&APs	Appendix G
	iii	The inclusion of inputs and recommendations from the specialist reports where relevant, and	Appendix G
	iv	Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties, and	Appendix G
	s	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts	N/a
	t	Any specific information that may be required by the competent authority, and	N/a
	u	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/a

Table 2 Regulatory requirement for public participation in a Basic Assessment Process according to Chapter 6 of GNR 326 (7 April 2017)

		Public Participation Process (Chapter 6 of GNR 326, 7 April 2017)	Undertaken during the Basic Assessment
41(1)		This regulation only applies in instances where adherence to the provisions of these regulations specifically required.	
2		The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by—	
	a	fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of—	
		i the site where the activity to which the application or proposed application relates is or is to be undertaken; and	Appendix E1
		ii any alternative site	Appendix E1
	b	giving written notice, in any of the manners provided for in section 47D of the Act to—	
		i the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken	Section 6.3; Appendix E1, E2 & E4
		ii owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;	Section 6.3; Appendix E1, E2, E4 & E5
		iii the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;	Section 6.3; Appendix E5
		iv the municipality which has jurisdiction in the area	Section 6.3; Appendix E5
		v any organ of state having jurisdiction in respect of any aspect of the activity; and	Section 6.3; Appendix E5
		vi any other party as required by the competent authority;	Section 6.3
	c	placing an advertisement in—	
		i one local newspaper; or	Section 6.3; Appendix E1
		ii any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;	N/a
	d	placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if	Section 6.3; Appendix E1

		Public Participation Process (Chapter 6 of GNR 326, 7 April 2017)	Undertaken during the Basic Assessment
		an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and	
	e	using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to—	
	i	illiteracy;	
	ii	disability; or	
	iii	any other disadvantage.	
3		A notice, notice board or advertisement referred to in subregulations (2) must—	
	a	give details of the application or proposed application which is subjected to public participation; and	Appendix E1
	b	state—	
	i	whether basic assessment or S&EIR procedures are being applied to the application;	Appendix E1
	ii	the nature and location of the activity to which the application relates;	Appendix E1
	iii	where further information on the application or proposed application can be obtained; and	Appendix E1
	iv	the manner in which and the person to whom representations in respect of the application or proposed application may be made	Appendix E1
		A notice board referred to in subregulation (2) must—	Appendix E1
4	a	be of a size of at least 60cm by 42cm; and	Appendix E1
	b	display the required information in lettering and in a format as may be determined by the competent authority.	Appendix E1
		Where public participation is conducted in terms of this regulation for an application or proposed application, subregulation (2)(a), (b), (c) and (d) need not be complied with again during the additional public participation process contemplated in regulations 19(1)(b) or 23(1)(b) or the public participation process contemplated in regulation 21(2)(d), on condition that—	Noted.
5	a	such process has been preceded by a public participation process which included compliance with subregulations (2)(a), (b), (c) and (d); and	N/a
	b	written notice is given to registered interested and affected parties regarding where the—	N/a
	i	revised basic assessment report or, EMPr or closure plan, as contemplated in regulation 19(1)(b);	N/a
	ii	revised environmental impact assessment report or EMPr as contemplated in regulation 23(1)(b); or	N/a
	iii	environmental impact assessment report and EMPr as contemplated in regulation 21(2)(d) may be obtained, the manner in which and the person to whom representations on these reports or plans may be made and the date on which such representations are due.	N/a
6		When complying with this regulation, the person conducting the public participation process must ensure that—	

		Public Participation Process (Chapter 6 of GNR 326, 7 April 2017)	Undertaken during the Basic Assessment
	a	information containing all relevant facts in respect of the application or proposed application is made available to potential interested and affected parties; and	This BAR
	b	participation by potential or registered interested and affected parties is facilitated in such a manner that all potential or registered interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application.	Section 6.3; Appendix E
7		Where an environmental authorisation is required in terms of these Regulations and an authorisation, permit or licence is required in terms of a specific environmental management Act, the public participation process contemplated in this Chapter may be combined with any public participation processes prescribed in terms of a specific environmental management Act, on condition that all relevant authorities agree to such combination of processes.	Noted. The public were given the opportunity in this public review process, to review submissions to Department of Water and Sanitation for registration of water uses under the relevant General Authorisations. No comments were received in this regard.

1. INTRODUCTION

1.1 Background

This report is a Basic Assessment Report (BAR) for part of the South African National Roads Agency SOC Limited's (SANRAL) proposed capacity improvements to existing sections of the N3 national road in KwaZulu-Natal. It has been prepared on behalf of SANRAL by Metamorphosis Environmental Consultants, in collaboration with ACER (Africa) Environmental Consultants (ACER), in terms of the requirements of the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended), published under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The details of the Environmental Assessment Practitioner (EAP) team are provided in Appendix G.

This assessment, referred to as **Basic Assessment 4**, forms part of a suite of six Basic Assessments being undertaken by Metamorphosis and ACER for SANRAL's proposed upgrades². They will all ultimately be submitted to the Department of Environmental Affairs (DEA) as part of the requirements of the application for environmental authorisation³. (Note that two N3 sections are not included below: Key Ridge to Hammarsdale and Gladys Manzi (formerly Murray) Road to New England Road, which are being undertaken by other environmental practitioners).

- ❑ **Basic Assessment 1.** Capacity Upgrades to the N2 (Solomon Mahlangu I/C to south of the Umgeni Road I/C), including expansion of the EB Cloete and Solomon Mahlangu Interchanges, and the N3 (EB Cloete to Paradise Valley) including provision of temporary access for construction below Westville and Paradise Valley Viaducts.
- ❑ **Basic Assessment 2.** Capacity Upgrades to the N3 (Paradise Valley to Key Ridge), including provision of temporary access for construction below the Umhlatuzana Viaduct.
- ❑ **Basic Assessment 3.** Capacity Upgrades to the N3 from Hammarsdale to Cato Ridge.
- ❑ **Basic Assessment 4.** Capacity Upgrades to the N3 from Cato Ridge (Km 19.4) to Lynnfield Park (Km 30.6).
- ❑ **Basic Assessment 5.** Capacity Upgrades to the N3 from Lynnfield Park (Km 30.6) to Gladys Manzi Road (Km 6.0).
- ❑ **Basic Assessment 6.** Capacity Upgrades to the N3 from New England Road I/C (Km 8.8) to Twickenham Road Underpass (Km 16.5).

This Report deals with Basic Assessment 4 (BA4), which includes the proposed widening of approximately 11.2 km of the N3, improvements to the Cato Ridge I/C and Camperdown I/C, realignment of a 0.59 km section of Fairview Road (near Camperdown I/C) and extensive upgrades of the Camperdown I/C and Dardanelles I/C, the latter involving upgrades to its approaches on R103 (1.2 km), R623 (2.2 km) and R603 (0.8 km) and relocation of access from the R103 to Onelogix and Aqua.

² Please note that Basic Assessment 4 is being undertaken by Metamorphosis Environmental Consultants (albeit that the production of the six BARs has been a collaborative effort between the two companies).

³ DEA, along with their counterparts in the KwaZulu-Natal Department of Economic Development Tourism and Environmental Affairs (DEDTEA) will review the BAR for the purposes of adjudicating the application for environmental authorisation.

BA1 and BA2 shared a public participation process for the project announcement phase⁴ during 2016. Please note that BAs 3-6 commenced together, during early 2018, approximately nine months after the commencement of BAs 1 and 2. BAs 3-6 have shared the project announcement phase of the public participation process but thereafter are being separately circulated for public review.

1.2 Project purpose, need and desirability

SANRAL is responsible for improving, managing and maintaining the network of national roads which act as the “economic arteries” of South Africa. The N2 and N3 carry large volumes of traffic, with a high percentage of heavy vehicles carrying freight to and from the Port of Durban, forming the backbone of South Africa’s freight network. Sections of these national roads are operating at full or near full capacity. Traffic studies commissioned by SANRAL have projected traffic growth figures, which indicate the need to provide additional lanes to alleviate current traffic congestion and to accommodate future growth and improve road safety and efficiency. SANRAL (Eastern Region), therefore, proposes to provide additional lanes along a section of the N2 near the Port of Durban and a section of the N3 from the N2/N3 (E.B Cloete) Interchange (I/C) on to Pietermaritzburg. The proposed capacity improvements, which are divided into sections and covered ultimately by several engineering work packages, will be implemented at different stages according to timing priorities and factors related to funding availability (albeit the reality is that there will be overlapping construction periods between the work packages). The proposed capacity improvements will improve safety, increase mobility and accommodate traffic growth to 2047.

Importantly, the upgrades are planned in line with South Africa’s Strategic Infrastructure Projects (SIPs) as described in the National Development Plan, 2011. Specifically, the proposed capacity improvements form the backbone of the SIP2 project, which focuses on strengthening the Durban-Free State-Gauteng logistics and industrial corridor. In line with SIP2 goals, the capacity improvements will improve access to Durban’s export and import facilities. National roads are essential infrastructure supporting the economy of the country and, therefore, the project will benefit all citizens of South Africa either directly or indirectly. As such, this project has been taken into account by, and is compatible with, national, provincial and municipal development, and planning frameworks, including eThekweni’s Cato Ridge Local Area Plan (Markewicz Redman Partnership, June 2018).

1.3 Location and scope of proposed capacity upgrades (for Basic Assessment 4)

The section of road under assessment in this study falls primarily within the Mkhambathini Local Municipality (LM) within the uMgungundlovu District Municipality (DM). However, the upgrading of the Cato Ridge Interchange and approximately 1.5 km of road upgrades fall within the Outer West planning region of the eThekweni Metropolitan Municipality (eThekweni). Also, a portion of the upgrades to the Dardanelles/Umlaas Road I/C and approximately 2 km of road upgrades will take place within the Msunduzi LM which is also part of the uMgungundlovu DM. The affected wards are shown in Table 3. Road widening falls primarily within the existing road reserve (indicated by the black lines in Figure 1) but additional land will be required (indicated by the red lines in Figure 1).

⁴ The draft BARs for BA1 & 2 initially ran in parallel; however, due to SANRAL’s implementation priorities, BA1 has been completed ahead of BA2 and further processes for these BARs will be run separately.

Table 3 Municipalities and wards affected by the project

Province	KwaZulu-Natal	KwaZulu-Natal	KwaZulu-Natal
District Municipality	eThekweni	uMgungundlovu	uMgungundlovu
Local Municipality	Outer West	Mkhambathini	Msunduzi
Ward Number(s)	1	3	37

The basic scope of the project is outlined below (and shown in Figure 1). GPS co-ordinates of the various components are provided in Tables 4 and 5. A detailed description of proposed improvements and construction activities associated with the two engineering contracts is provided in Section 3.1. Details of affected properties are provided in Section 5.2. Drawings are provided in Appendix A.

Road sections to undergo construction are:

- ❑ N3 from the Cato Ridge I/C to south of the Dardanelles I/C.
- ❑ N3 from south of the Dardanelles I/C to south of the Lynnfield Park I/C.

Within these sections, the major interchanges to be upgraded are:

- ❑ Cato Ridge I/C (N3/P385)⁵.
- ❑ Camperdown I/C (N3/ and Umbumbulu Road) (this interchange will be developed in phases⁶).
- ❑ Dardanelles I/C (N3/R103/R603/R623) (this interchange will be developed in phases).

In addition, this project requires:

- ❑ The realignment of a 0.59 km section of Fairview Road on the south side of the Camperdown I/C.
- ❑ Upgrades to the approaches of the R103, R603 and R623 at the Dardanelles I/C. Three new bridges will be required for three of the proposed new directional ramps. Ramp A and its respective bridge will be constructed during phase 1 while ramps C and D together with their bridges will only be constructed in the following phases (anticipated 2047).
- ❑ Relocation/modification of access from the R103 to the One Logix Vehicle Park and Aqua (new location under discussion).
- ❑ Sections of Transnet Fuel and Umgeni Water pipelines are affected at the Dardanelles I/C. They may need to be lowered from their current horizontal alignment, to accommodate the upgraded interchange. Near the Camperdown I/C, sections of the Umgeni Water pipeline will require protection and a section will require relocation, but access to the pipeline will not be compromised.

⁵ Note that the proposed new CRLH I/C near the D12, when built, will require the closure of the east facing ramps of the Cato Ridge I/C. This does not, however, affect the upgrade design of the existing Cato Ridge I/C to signalised terminals. Ramp closure will be handled under BA3.

⁶ The implementation of the upgrade to the Camperdown I/C is planned as a future phase when warranted (anticipated 2030).

GPS co-ordinates of the linear sections of existing road to be improved and main interchanges are provided in Tables 4a and 4b. Please note that there is only one site (route) alternative as this is an *in situ* upgrade of an existing national road and existing approaches to interchanges.

The existing Transnet fuel pipeline and Umgeni water pipeline which cross the ramps for the proposed new intersection follow the horizontal alignments as shown in Table 5b. It is currently anticipated that these pipelines may only have to be lowered (not relocated).

Table 4a Geographical co-ordinates of the existing and proposed linear road sections affected by the project

	Latitude (S)	Longitude (E)
N3 from south of the Cato Ridge I/C to south of the Dardanelles I/C (approx 7.2 km)		
Starting point of the activity	29°44'4.20"	30°34'59.02"
Middle/Additional point of the activity	29°43'49.49"	30°32'44.82"
End point of the activity	29°43'39.93"	30°30'37.01"
Realignment of a section of Fairview Road (approx 0.59 km)		
Starting point of the activity	29°43'57.77"	30°32'7.54"
Middle/Additional point of the activity	29°43'56.55"	30°32'19.16"
End point of the activity	29°43'52.42"	30°32'26.82"
N3 from south of the Dardanelles I/C to south of the Lynnfield Park I/C (approx 4 km)		
Starting point of the activity	29°43'40.49"S	30°30'37.67"E
Middle/Additional point of the activity	29°42'59.89"S	30°29'47.34"E
End point of the activity	29°41'59.19"S	30°29'22.26"E
Upgrades to approaches of the R103 at the Dardanelles I/C (approx 1.1 km)		
Starting point of the activity	29°42'33.97"S	30°29'45.39"E
Middle/Additional point of the activity	29°42'53.60"S	30°29'42.93"E
End point of the activity	29°43'13.84"S	30°29'49.48"E
Upgrades to approaches of the R603 at the Dardanelles I/C (approx 0.3 km)		
Starting point of the activity	29°43'13.75"S	30°29'49.39"E
Middle/Additional point of the activity	29°43'17.37"S	30°29'52.38"E
End point of the activity	29°43'21.71"S	30°29'54.75"E
Upgrades to approaches of the R623 at the Dardanelles I/C (approx 2.2 km)		
Starting point of the activity	29°43'15.84"S	30°29'43.08"E
Middle/Additional point of the activity	29°43'13.65"S	30°29'9.94"E
End point of the activity	29°43'26.08"S	30°28'20.40"E

Table 4b Geographical co-ordinates of the existing interchanges to undergo improvements

Interchanges	Latitude (S)	Longitude (E)
N3/P385 Cato Ridge I/C	29°44'4.15"	30°34'58.98"
N3/R603(Umbumbulu Road) Camperdown I/C	29°43'49.61"	30°32'16.78"
N3/ Dardanelles I/C	29°43'10.22"S	30°29'52.92"E

Table 5 Horizontal alignment of pipelines

Transnet fuel pipeline location HORIZONTAL ALIGNMENT	
X coordinate	Y coordinate
X = 49104.00	Y = 3289000.0000
X = 49137.5400	Y = 3289126.1300
X = 49269.8900	Y = 3289215.4600
X = 49291.0400	Y = 3289269.4700
Umgeni Water pipeline location HORIZONTAL ALIGNMENT	
X coordinate	Y coordinate
X = 48810.7436	Y = 3289096.2370
X = 48894.3816	Y = 3289201.2998
X = 48920.3884	Y = 3289308.6879
X = 48910.0866	Y = 3289335.7820

1.4 Environmental authorisation requirements and listed activities triggered by the project

1.4.1 Listed activities triggered by the project

Activities from Listing Notice 1 (GN R.327) and Listing Notice 3 (GN. R. 324) are triggered by the project and are detailed in Table 6. The description and co-ordinates of these activities are provided in Table 6 and the locations are shown on Figure 1.

Table 6 Listed activities in terms of which SANRAL is seeking environmental authorisation for the proposed N3 improvements Cato Ridge-Lynnfield Park

	Listed activity as described in GN R. 327, GN R. 325 and GN R.324 (EIA Regulations 2014, as amended)	Description of project activity that may trigger the listed activity	Description/co-ordinates of activity (refer also to Figure 1)
1	<p>Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 12: The development of—</p> <p>(i) ..</p> <p>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>where such development occurs—</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback;</p> <p>or</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; —</p> <p>excluding—</p> <p>(aa) ..</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in</p>	<p>Road widening will occur within a watercourse or within 32 m of a watercourse. Most of this will be in the existing road reserve and is expansion of existing infrastructure. However, at Camperdown I/C, current and future phases of the upgraded I/C may affect watercourses.</p>	<p>LN1(12) wetland N3 04 02 E of Camperdown offramp</p> <p>29 ° 43' 50.5" S 30 ° 32' 56.2" E</p> <p>LN1(12) wetland N3 04 03 at Camperdown offramp</p> <p>29 ° 43' 49.4" S 30 ° 32' 26.2" E</p> <p>LN1(12) wetland N3 04 04 Camperdown I/C</p> <p>29 ° 43' 51.8" S 30 ° 31' 55.3" E</p> <p>LN1(12) wetland N3 04 05 W of Camperdown I/C</p> <p>29 ° 43' 53.8"</p>

	Listed activity as described in GN R. 327, GN R. 325 and GN R.324 (EIA Regulations 2014, as amended)	Description of project activity that may trigger the listed activity	Description/co-ordinates of activity (refer also to Figure 1)
	<p>which case that activity applies;</p> <p>(dd) where such development occurs within an urban area;</p> <p>(ee) where such development occurs within existing roads, road reserves or railway line reserves; or</p> <p>(ff) ..</p>		30 ° 31' 37.8"
2	<p>Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 14:</p> <p>The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.</p>	<p>Contractors may store and use fuel and other hazardous substances at their site camps, in containers that have a combined capacity of 80 cubic metres or more, but not exceeding 500 cubic metres.</p>	<p>These sites will be identified by the contractor and will be sited where possible within the road reserve and away from sensitive sites identified in the BAR.</p>
3	<p>Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 19:</p> <p>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;</p>	<p>Widening of the N3 between Cato Ridge and Lynnfield Park, including upgrades to existing interchanges, will affect five watercourses. The project, therefore, will involve excavation, removal, infilling and/or depositing of material of more than 10 m³, in watercourses.</p>	<p>LN1(19) N3-04-01 wetland W of Cato Ridge</p> <p>29 ° 43' 59.6" S 30 ° 34' 20.5" E</p> <p>LN1(12, 19) wetland N3 04 02 E of Camperdown offramp</p> <p>29 ° 43' 50.5" S 30 ° 32' 56.2" E</p> <p>LN1(12, 19) wetland N3 04 03 at Camperdown offramp</p> <p>29 ° 43' 49.4" S 30 ° 32' 26.2" E</p> <p>LN1(12, 19) wetland N3 04 04 Camperdown I/C</p> <p>29 ° 43' 51.8" S 30 ° 31' 55.3" E</p> <p>LN1(12, 19) wetland N3 04 05 W of Camperdown I/C</p> <p>29 ° 43' 53.8" S 30 ° 31' 37.8" E</p>
4	<p>Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 24:</p> <p>The development of a road—</p> <p>(i) or</p>	<p>This activity is included so as to cover any new ramps of the upgraded interchanges, which may not fall within an urban area.</p>	<p>LN1 (24) N3/P385 Cato Ridge I/C)</p> <p>29°44'4.15" S</p>

	Listed activity as described in GN R. 327, GN R. 325 and GN R.324 (EIA Regulations 2014, as amended)	Description of project activity that may trigger the listed activity	Description/co-ordinates of activity (refer also to Figure 1)
	<p>(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;</p> <p>but excluding a road—</p> <p>(a) which is identified and included in activity 27 in Listing Notice 2 of 2014;</p> <p>(b) where the entire road falls within an urban area; or</p> <p>which is 1 kilometre or shorter.</p>		<p>30°34'58.98"</p> <p>LN1 (24) N3/R603 Camperdown I/C</p> <p>29°43'49.61" S 30°32'16.78" E</p> <p>LN1 (24) N3/ Dardanelles I/C</p> <p>29°43'10.22" S 30°29'52.92" E</p>
5	<p>Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 48:</p> <p>The expansion of—</p> <p>(i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or</p> <p>(ii)</p> <p>where such expansion occurs—</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback; or</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>excluding—</p> <p>(aa)</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such expansion occurs within an urban area; or</p> <p>(ee) where such expansion occurs within existing roads, road reserves or railway line reserves.</p>	<p>This activity is being applied for as some of the infrastructure affecting watercourses may be in areas that are still to be acquired and will be proclaimed as road reserve. Thus, the expansion might encroach into areas that are not currently proclaimed as road reserve. Some of the works at the interchanges will be on the provincial roads outside of SANRAL's road reserve.</p>	<p>LN1(19, 48) N3-04-01 wetland W of Cato Ridge</p> <p>29 ° 43' 59.6" S 30 ° 34' 20.5" E</p> <p>LN1(12, 19, 48) wetland N3 04 02 E of Camperdown offramp</p> <p>29 ° 43' 50.5" S 30 ° 32' 56.2" E</p> <p>LN1(12, 19, 48) wetland N3 04 03 at Camperdown offramp</p> <p>29 ° 43' 49.4" S 30 ° 32' 26.2" E</p> <p>LN1(12, 19, 48) wetland N3 04 04 Camperdown I/C</p> <p>29 ° 43' 51.8" S 30 ° 31' 55.3" E</p> <p>LN1(12, 19, 48) wetland N3 04 05 W of Camperdown I/C</p> <p>29 ° 43' 53.8" S 30 ° 31' 37.8" E</p>
6	<p>Listing Notice 1 (Government Notice, No. R. 327, 7 Apr 2017) Item 56:</p> <p>The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre—</p>	<p>Parts of the N3 to be widened are outside of urban areas and, thus, the widening of these sections would trigger this activity.</p>	<p>Various sections of the N3 between Cato Ridge and Lynnfield Park pass through non-urban areas. Please refer to the zonation map in</p>

	Listed activity as described in GN R. 327, GN R. 325 and GN R.324 (EIA Regulations 2014, as amended)	Description of project activity that may trigger the listed activity	Description/co-ordinates of activity (refer also to Figure 1)
	(i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.		Appendix 6, which indicates areas that are not zoned urban.
7	Listing Notice 3 (Government Notice, No. R. 324, 7 Apr 2017) Item 4 (d) (viii) The development of a road wider than 4 metres with a reserve less than 13,5 metres. <u>(d) In KwaZulu-Natal:</u> xii Outside urban areas: (aa). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve;	The upgrading of the Dardanelles I/C when all phases are complete will entail provision of ramps from the existing approaches (R103, R603 and R623). The Dardanelles I/C falls within 5 km of the Mpushini Protected Area. It is also adjacent to an area around the Dardanelles I/C which is considered by the municipality to be a CBA in their municipal conservation plan, although not identified as such by provincial or district conservation plans nor the uMgungundlovu District Municipality EMF.	LN3 (4) Dardanelles I/C 29°42'59.89"S 30°29'47.34"E
8	Listing Notice 3 (Government Notice, No. R. 324, 7 Apr 2017) Item 10 (d) (iv) (vii) (xi) (xiii aa, cc) (xiv aa) The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. <u>d) In KwaZulu-Natal:</u> iv Biodiversity Stewardship Programme Biodiversity Agreement areas; ix Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans xi Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; xii Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; xiii Outside urban areas: (aa). Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres	Contractors may store fuel and other hazardous substances at their site camps, in containers that have a combined capacity of 30 cubic metres or more, but not exceeding 80 cubic metres. Site camp locations are not known as yet and will be identified by the contractor. Care will be taken to use existing transformed areas for site camps. Nevertheless, these may fall within 100 m from a water course or wetland. They may also be sited within 5 km of the Mpushini Protected Environment. Note that there is an area around the Dardanelles I/C which is considered by the Msunduzi municipality to be a CBA in their municipal conservation plan and EMF, although not identified as such by the uMgungundlovu district EMF as contemplated in chapter 5 of the Act. (storage of fuel at this area however will be	LN1(19, 48); LN3 (10) N3-04-01 wetland W of Cato Ridge 29 ° 43' 59.6" S 30 ° 34' 20.5" E LN1(12, 19, 48); LN3 (10) wetland N3 04 02 E of Camperdown offramp 29 ° 43' 50.5" S 30 ° 32' 56.2" E LN1(12, 19, 48); LN3 (10) wetland N3 04 03 at Camperdown offramp 29 ° 43' 49.4" S 30 ° 32' 26.2" E LN1(12, 19, 48); LN3 (10) wetland N3 04 04 Camperdown I/C 29 ° 43' 51.8" S 30 ° 31' 55.3" E

	Listed activity as described in GN R. 327, GN R. 325 and GN R.324 (EIA Regulations 2014, as amended)	Description of project activity that may trigger the listed activity	Description/co-ordinates of activity (refer also to Figure 1)
	<p>from any terrestrial protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; or (cc) Areas within a watercourse or wetland; or within 100 m from the edge of a watercourse or wetland. Xiv In urban areas: (aa) Areas zoned for use as public open space;</p>	<p>avoided).</p>	<p>LN1(12, 19, 48); LN3 (10) wetland N3 04 05 W of Camperdown I/C 29 ° 43' 53.8" S 30 ° 31' 37.8" E LN3 (10) All sections of the N3 road reserve for this project, which fall within 5 km of the Mpushini Protected Area.</p>
9	<p>Listing Notice 3 (Government Notice, No. R. 324, 7 Apr 2017) Item 12d (v), (xi) & (vii) The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. In KZN: v Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; xi Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose; xii Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p>	<p>Note that there is an area around the Dardanelles I/C which is considered by the Msunduzi municipality to be a CBA in their municipal conservation plan and EMF, although not identified as such by the uMgungundlovu District Municipality conservation plan or EMF as contemplated in chapter 5 of the Act. Vegetation clearance will be required in this area and some blasting is likely to take place.</p>	<p>LN 3 (12) Dardanelles I/C 29°42'59.89"S 30°29'47.34"E</p>
10	<p>Listing Notice 3 (Government Notice, No. R. 324, 7 Apr 2017) Item 14 (xii) d(x)(aa) The development of ii infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— a) within a watercourse; c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; <u>d) In KwaZulu-Natal:</u> x Outside urban areas: aa) Areas within 10 kilometres from national parks or world heritage</p>	<p>It is possible that new ramps on the Dardanelles I/C may fall within 32 m of a watercourse. The activity will occur within 5 km of the Mpushini Protected Environment.</p>	<p>LN 3 (14) Dardanelles I/C 29°42'59.89"S 30°29'47.34"E</p>

	Listed activity as described in GN R. 327, GN R. 325 and GN R.324 (EIA Regulations 2014, as amended)	Description of project activity that may trigger the listed activity	Description/co-ordinates of activity (refer also to Figure 1)
	sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;		
11	<p>Listing Notice 3 (Government Notice, No. R. 324, 7 Apr 2017) Item 18d (xi) and (xii aa) The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. In KZN:</p> <p>Xi Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority</p> <p>xii Outside urban areas: (aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; xiii In urban areas:</p>	<p>The upgrades to the Dardanelles I/C will include widening of the approaches to bridge ramps, by more than 4 meters. The Dardanelles I/C is sited within 5 km of the Mpushini Protected Environment.</p> <p>Note that there is an area around the Dardanelles I/C which is considered by the Msunduzi municipality to be a CBA in their municipal conservation plan and EMF, although not identified as such by the uMgungundlovu District Municipality conservation plan or EMF as contemplated in chapter 5 of the Act. Vegetation clearance may be required in this area.</p>	<p>LN3 (18) Dardanelles I/C</p> <p>29°42'59.89"S 30°29'47.34"E</p>
12	<p>Listing Notice 3 (Government Notice, No. R. 324, 7 Apr 2017) Item 23(ii) a and c: d(x), The expansion of—</p> <p>ii infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs— a) within a watercourse; c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; d In KwaZulu-Natal x Outside urban areas: aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;</p>	<p>It is possible that new ramps on the Dardanelles I/C may fall within 32 m of a watercourse. The activity will occur within 5 km of the Mpushini Protected Environment.</p>	<p>LN3 (18) Dardanelles I/C</p> <p>29°42'59.89"S 30°29'47.34"E</p>

1.4.2 Basic assessment process and requirements

The application for environmental authorisation requires a Basic Assessment to be undertaken in accordance with regulations 19 and 20 of GN No. 326 (07 April 2017) as shown overleaf.

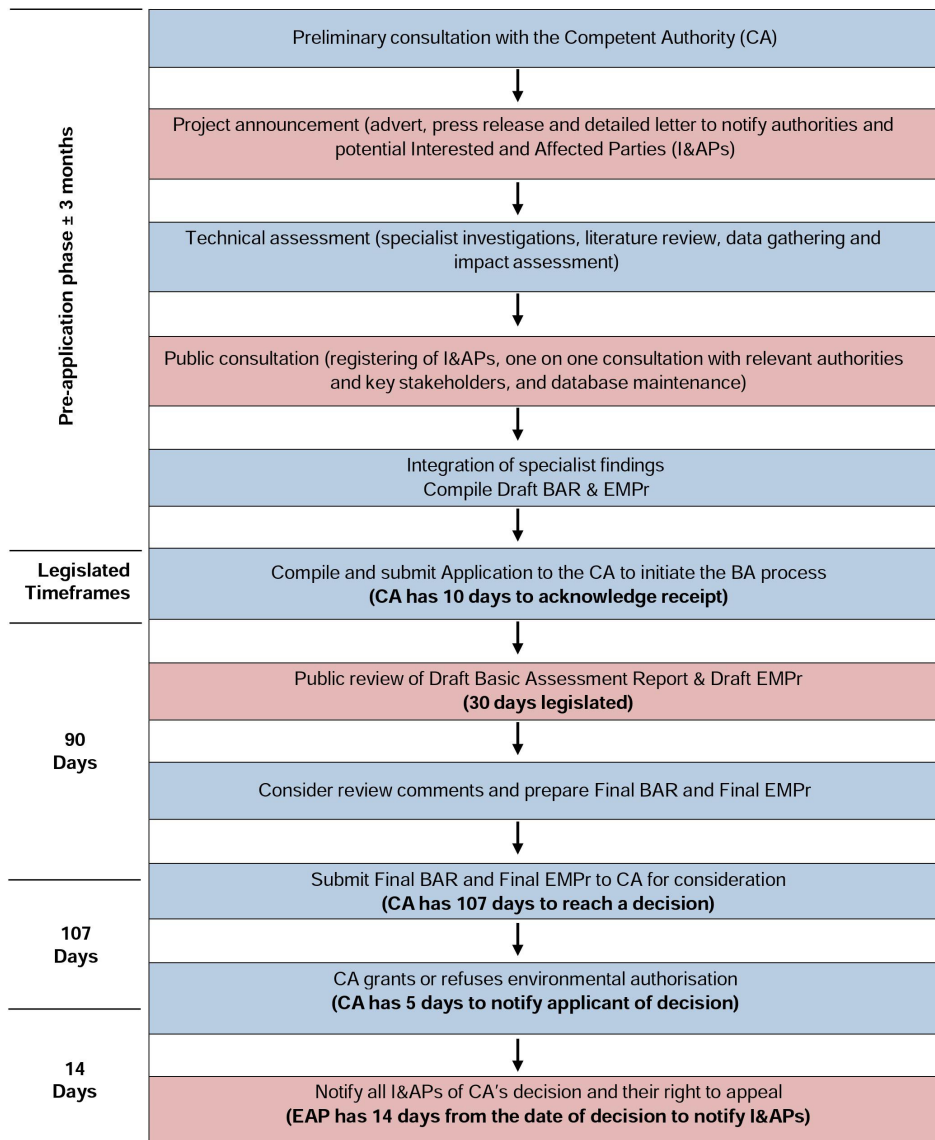
1.4.3 Contents of a Basic Assessment Report (BAR)

A BAR must contain the information set out in Appendix 1 of GN No. 326. Table 1 indicates where in this BAR these various components are covered.

1.4.4 Public participation process during the Basic Assessment

Public participation is to be undertaken in accordance with Chapter 6 of GN No. 326 (refer to Table 2). A detailed description of public participation undertaken for this project is provided in Chapter 6 of this BAR.

BASIC ASSESSMENT PROCESS



2. LEGISLATIVE FRAMEWORK

Further to the regulatory process for environmental authorisation outlined in Section 1.4, the environmental legislation applicable to this project includes but is not limited to that indicated in Table 7. Note that as they are national roads and part of planned SIP2 projects, the proposed capacity improvements to the national roads have been taken into account by, and are in line with national, provincial and municipal development goals and planning frameworks.

Table 7 Applicable legislation, policies and guidelines

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) (as amended)	The Environmental Clause, Access to Information, Fair Administrative Action, Enforcement of Rights and Administrative Review.	Government of South Africa	1996
National Environmental Management Act, 1998 (Act No. 107 of 1998)	Management of activities that may have a significant impact on the environment. Principles include: <ul style="list-style-type: none"> <input type="checkbox"/> The sustainability principle. <input type="checkbox"/> The life-cycle, cradle-to-grave principle. <input type="checkbox"/> The 'polluter pays' principle. <input type="checkbox"/> The precautionary principle. <input type="checkbox"/> The duty of care principle. <input type="checkbox"/> Fair and transparent public consultation. 	Department of Environmental Affairs	1998
National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)	The conservation of natural habitats, fauna and flora. Permits required to remove or relocate protected plant species.	Department of Environmental Affairs	2004
National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)	To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. Permission to construct a road within a protected area will be required by SANRAL from the protected area's management authority.	Department of Environmental Affairs	2003
National Environmental Management: Waste Act, 2008 (Act No.59 of 2008)	Management of activities that generate waste.	KZN Department of Economic Development, Tourism and Environmental Affairs	2008
KwaZulu-Natal Nature Conservation Management Act, 1997 (Act 9 of 1997)	The Act provides for the management of nature conservation within KZN and protected areas. Permits required to remove or relocate protected plant species.	Ezemvelo KZN Wildlife	1997

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
Natal Nature Conservation Ordinance (Act No. 15 of 1974).	For plants designated as 'specially protected' under the Natal Nature Conservation Ordinance (Act No. 15 of 1974), an application must be submitted to EKZNW to clear or translocate these plants.	Ezemvelo KZN Wildlife	1974
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	The conservation of agricultural resources. Protection of soils.	Department of Agriculture, Forestry and Fisheries	1983
National Forests Act, 1998 (Act No. 84 of 1998)	The conservation of natural forests. Permits required to remove or cut protected tree species.	Department of Agriculture, Forestry and Fisheries	1998
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The protection of cultural heritage resources and the management of activities that may have a significant impact on cultural heritage resources.	South African Heritage Resources Agency	1999
KwaZulu-Natal Heritage Act, 2008 (Act No. 4 of 2008)	The protection of cultural heritage resources and the management of activities that may have a significant impact on cultural heritage resources (specifically within KZN).	Amafa aKwaZulu-Natali	1997
Environment Conservation Act, 1989 (Act No 73 of 1989)	National Noise Control Regulations (GN R154 dated 10 January 1992).	Department of Environmental Affairs	1989
National Water Act, 1998 (Act No 36 of 1998)	Legislation regulating and protecting water resources in South Africa which includes non-consumptive water uses such as the impeding or diverting of water in a water course or altering of beds, banks or characteristics of a watercourse. Also regulates abstraction of large volumes of water from natural water bodies.	Department of Water and Sanitation Provincial Office of Water and Sanitation	1998
National Environmental Management: Air Quality Act, 2004 (Act No 39 of 2004)	Measures in respect to air quality.	District Municipalities	2004
The South African National Roads Agency Limited and National Roads Act 7 of 1998	To make provision for a national roads agency for the Republic to manage and control the Republic's national roads system and take charge, amongst others, of the development, maintenance and rehabilitation of national roads within the framework of government policy.	National Department of Transport	1998
Promotion of Access to Information Act, 2000 (Act No 2 of 2000)	All requests for access to information held by the state or private bodies are provided for in the Act under Section 11.	Department of Justice and Constitutional Development	2000
Promotion of Administration Justice Act, 2000 (Act No 3 of 2000)	In terms of Section 3, the Government is required to act lawfully and take procedurally fair, reasonable, and rational decisions. Interested and affected parties have a right to be heard.	Department of Justice and Constitutional Development	2000

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
Infrastructure Development Act, 2014 (Act No. 23 of 2014)	To provide for the facilitation and co-ordination of public infrastructure development which is of significant economic or social importance to the Republic.	Department of Economic Affairs Presidential Infrastructure Coordinating Commission	2014
Public Participation Guideline in Terms of the National Environmental Management Act, 1998 and Environmental Impact Assessment Regulations	The guideline provides information and guidance for proponents or applicants, I&APs, competent authorities and Environmental Assessment Practitioners on the public participation requirements of the Act. It further provides information on the characteristics of a rigorous and inclusive public participation process.	Department of Environmental Affairs	2017
Guideline Series 5: Companion to the Environmental Impact Assessment Regulations of 2010 Guideline Series 7: Public Participation in the Environmental Impact Assessment Process Guideline Series 9: Need and Desirability in terms of the Environmental Impact Assessment Regulations of 2010 (Draft) DEA Alternatives Guideline 5 DEA Guidelines for EMPs	These guidelines provide information and guidance on the requirements of the EIA Regulations and various associated aspects of the environmental impact assessment process.	Department of Environmental Affairs	2010

3. DESCRIPTION OF THE PROPOSED ACTIVITY

3.1 Proposed capacity improvements

BA4 deals with proposed road upgrades covered by two different detail design engineering contracts. A description of the proposed works for each contract is outlined below. Further information/technical drawings are provided in Appendix A.

3.1.1 Upgrade of the N3 from Cato Ridge (km 19.4) to Dardanelles (km 26.6)

- ❑ This contract deals with a 7.2 km section of the N3 between the Cato Ridge I/C (N3 Section 2 km 19.4) to south of the Dardanelles I/C (N3 Section 2 km 26.6)
- ❑ The existing Cato Ridge I/C will retain the same layout but will be upgraded to include signalised ramp terminals and the Cato Ridge Bridge (Uitkomst Street) will be resurfaced and re-marked to accommodate the new road cross section. The on and off ramps will have one lane each.
 - ❑ The Camperdown I/C will be reconfigured and upgraded to a new Partial Clover I/C layout. The on and off ramps will have one lane in each direction. The implementation of the upgrade to the Camperdown I/C is planned as a future phase when warranted (anticipated 2030).
- ❑ A 0.59 km section of Fairview Road will be realigned to accommodate the new interchange (Figure 2).
- ❑ There are two sections of cut faces that will be retained by retaining walls. Cut retaining walls will consist of reinforced concrete. A concrete (“New Jersey-type”) barrier will be constructed at the base of each wall. Fill retaining walls will be mechanically stabilised earth walls (“reinforced earth type walls”) on problematic high fill sections.
- ❑ All sections of the N3 and interchange ramps within the project area will be provided with overhead street lighting.
- ❑ All road signage will be replaced with new signs to accommodate the additional lanes. All signs will be mounted on overhead sign gantries.
- ❑ All cut and fill retaining walls will have New Jersey-type (concrete) barriers at the base of the cut and the top of the retaining walls respectively.
- ❑ Sidewalks will be provided on all bridge crossings and a formal pedestrian crossing will be provided on all interchange and intersections to allow safe crossing movement.
- ❑ The following work will be carried out on the crossroads and bridges:
 - **Uitkomst Street (Cato Ridge Interchange):** the existing bridge will require rehabilitation and minor modifications. Typical work will involve milling and replacing surfaces, guardrail repairs/replacement, repair and re-instatement of embankment protection works, etc.
 - **R103 Road Camperdown South overpass:** the existing overpass bridge will require rehabilitation.
 - **Umbumbulu Road (R603) Camperdown Interchange:** the existing interchange will be reconfigured and a new longer bridge will be constructed parallel to and immediately east of the existing bridge. Once the crossroad has been diverted onto the new bridge, the existing bridge will be demolished. This is planned for a future phase (estimated 2030).
 - **Camperdown Rail Underpass (km 25.190):** this will be extended to accommodate new N3 lane requirements. Extensions are to be done on the southern end with a slight adjustment to the horizontal alignment of the N3. The extension of the northern end will be problematic due to vertical clearance requirements of the railway.

- **Fairview Road:** with the proposed upgrading of the Camperdown interchange planned in phase 2, approximately 590 m of the existing Fairview road needs to be relocated further south. The impact of this realignment will be limited to farmland, some of which is previously cultivated land.

The estimated construction period for this section of the N3 is 4-5 years and phase one is anticipated to commence in November 2019.

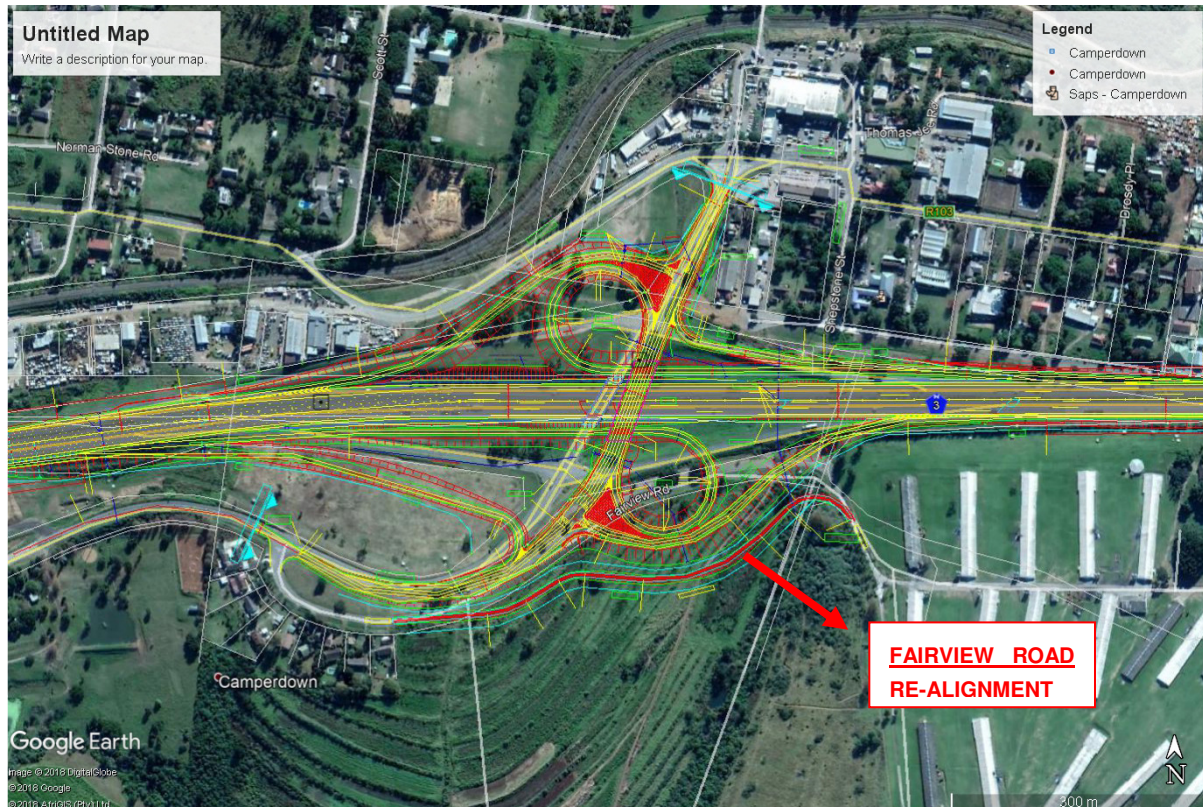


Figure 2 Planned realignment of Fairview Road near the Camperdown I/C

3.1.2 Upgrade of the N3 from Dardanelles (km 26.6) to Lynnfield Park (km 30.6)

- ❑ This contract deals with a 4 km section of the N3 between south of the Dardanelles I/C (N3 Section 2 km 26.6) to south of the Lynnfield Park I/C (N3 section 2, km 30.6).
- ❑ The N3 will have 4 lanes in each direction. A climbing lane (a 5th lane) will be added to the southbound carriageway from km 28.24 to km 30.6 during phase 1.
- ❑ The proposed interchange upgrade does not conform to any one strict type of interchange but rather a combination of elements from the various types of interchanges. There are portions of a Parclo interchange, directional interchange and three legged directional interchange. The reason for the unconventional type of interchange is mainly due to the railway line, tunnel and the location of the R103 and R603 situated directly adjacent to the N3 with limited space available to develop a conventional interchange. The existing Dardanelles I/C will be extensively upgraded as shown in the layout plan (Appendix A). Ramps B, C1, C2 and D will have 2 lanes each while ramps A, E, F, G and H will be constructed as a single lane ramp. The two lane configuration will be implemented where Ramp C1 and Ramp A converge. The single lane ramp will have 2 m wide surfaced shoulders and a 4 m roadway while the two lane ramps shall have 2 m wide shoulders and two 3.7 m wide carriageways. The project will be implemented over

three phases, phase one will include the upgrade of the N3 and existing ramp C2. The construction of ramps A, B, E, G and H will also be completed in phase one. The interchange layout has been selected to provide free-flow for all directions of traffic movements. However, the intersection where ramps E, H, D and C1 converge will be converted into a signalized intersection in future and will remain until such time as the level of service decreases to such extent as to warrant the construction of the new ramp C. This will trigger phase two which will consist of constructing ramp C2. The final phase will consist of constructing ramps F and D. Inherently, the parclo type elements will be controlled by either traffic lights or traffic signs in order to facilitate the required traffic movements.

- ❑ Currently, the R103 consists of a single carriageway and crosses the N3 in two locations. The R103 is generally located on the right hand side of the N3 except for this portion where it is predominantly on the left hand side. The existing road has a total width of approximately 7.5 m and consists of two 3.75m wide lanes with no surfaced shoulders and almost no gravel shoulders. The new road profile will provide a minimum lane width of 3.7 m with 2 m surfaced shoulders and 800 mm gravel shoulders.
- ❑ The start of the R603 interacts with the R103 in such a manner that there is a portion of the R603 intermingled with the R103. The R603 is single carriageway, generally located on the left hand side of the N3 with a road profile consisting of a 3.7 m wide lane and a 3 m wide surfaced shoulder. The total width is approximately 13 m and no gravel shoulders are evident as they are completely overgrown. The new road profile will have a similar profile; however, 800 mm gravel shoulders will be provided.
- ❑ The R623 is a low order road which connects to the R56 at Thornville and has a width of approximately 7.6 m. The single carriageway road has two 3.5 m wide lanes and 300 mm surfaced shoulder. Only the last portion of the road will be widened to accommodate the new ramps. The existing alignment will be re-worked in order to form part of one of the directional Parclo type ramps required for the new interchange
- ❑ There is currently an access affected to the One Logix vehicle complex which may have to be reinstated. The owners of the complex will, however, have to advise on their specific requirements (this item has not been resolved yet).
- ❑ Nearly all cuts and fills will be restrained by retaining walls. Cut retaining walls will consist of soil nails and reinforced gunite with a precast concrete cladding. Fill retaining walls will be either mechanically stabilised earth walls (“reinforced earth type walls”) or conventional reinforced concrete walls. All walls will be topped with a concrete parapet.
- ❑ All sections of the N3 and interchange ramps within the project area will be provided with overhead street lighting (masts in the median).
- ❑ All road signage will be replaced with new signs to accommodate the additional lanes. All signs will be mounted on overhead sign gantries.
- ❑ Nearly all fills will have concrete parapets on the top of the fill retaining walls. Armco barriers will, however, be used where circumstances dictate and where concrete walls/parapets are not already provided.
- ❑ No provision has been allowed for pedestrian facilities as no requirements have been identified during the various investigations.

The estimated construction period for this section of the N3 is three and half years and is anticipated to commence in January 2020. The project will be implemented over three phases; however, a significant amount of time will pass before phase 2 will be required. It is currently anticipated that phase 2 will only be required in 2047.

3.2 Construction phase activities

3.2.1 Access to construction sites

All access for construction will be via existing roads, including lanes of the N3. No additional haul roads will be built.

3.2.2 Relocation of services

Various services in the existing road reserve will need to be relocated, protected and/or have ducts lengthened in order to accommodate the road widening. Co-ordination between the affected service providers and SANRAL's appointed engineers and contractors is undertaken to effect this, with detailed services investigation and preparation of relocation of services plans. Services that are affected by the proposed upgrade include those belonging to:

- Eskom.
- eThekweni electrical services.
- eThekweni water services (Western Aquaduct).
- uMgeni Water.
- Transnet Fuel Pipelines.
- Liquid Telecom (formally Neotel).
- Dark Fibre Africa.
- Telkom.

3.2.3 Contractors' site offices and stockpile areas

Contractors' site offices and stockpile areas will be located either within the road reserve or on nearby properties as negotiated and agreed with property owners. The exact sites will be identified by the contractors who are awarded the contract for the work. Siting and establishment will be guided by specifications in the Environmental Management Programme (EMPr). No staff (except security) will be accommodated overnight at site offices/stockpile sites, although the facilities may be used during possible night work.

3.2.4 Waste management

Solid waste

Solid waste will be produced during construction. However, there will be no waste management activities requiring a permit in terms of the Waste Regulations under the National Environmental Management: Waste Act. Wherever possible, inert waste will be re-used in construction.

The project will generate demolition rubble consisting of reinforced concrete, when bridges, parapets, concrete pavement and concrete-lined side drains are demolished. The removal, where necessary, of concrete islands, concrete barriers, signage, etc. will also result in large volumes of rubble. The inert material will be re-used as fill, re-used in pavement layers; excess sold to outside contractors (for similar purposes) and/or disposed at licensed landfill sites. Monthly quantities are unknown at present. However, over the duration of the project (2 contracts) an estimated 26,000 m³ (Cato Ridge to Dardanelles) and 10,000 m³ (Dardanelles to Lynnfield) of rubble will be produced on this portion of the N3 from demolition of structures.

Asphalt and possibly tar from the older sections of the original roadway resulting from removal of pavements will be generated as well as other general waste such as cement bags, packaging, plastic and used metal canisters. It is intended that general waste, including any excess inert waste, will be disposed at the nearest licensed municipal landfill site. However, it is

proposed that the milled off asphalt be stockpiled for use in new asphalt on other sections of the N3.

The project (both contracts) will also generate a large amount of surplus cut material from earthworks, estimated at approximately 280,000 m³ (roughly 410,000 tons). However, this will not be waste as it is SANRAL's intention to use this on other sections of the N3, which are part of the broader project (between Durban and Pietermaritzburg). It will be stockpiled on SANRAL's own land, recently acquired at Camperdown and in an area just east of Lynnfield Park.

Layerworks material from the existing roadworks will be temporarily stockpiled off site. Where practical, however, it will be transported from one section directly to another.

Liquid effluent/waste water

The project will not produce effluent other than normal sewage. Rented portable chemical toilets will be used for staff at the site of works, to be serviced regularly by the contractor's appointed service provider.

There will be no waste water generated by the project that can be recycled. Batching plants will not be on site (unless authorised in a separate application). It is envisaged that concrete as well as asphalt will be obtained from commercial sources; however, should the contractor establish on site, a separate approval will be required.

Emissions

There will be no emissions other than exhaust and dust emissions. Dust will be controlled during construction. However, if Contractors elect to erect mobile asphalt batching plants on site, that have emissions, they will be applied for under a separate licensing process.

3.2.5 Borrow pits and quarries

Materials will be sourced from commercial sources and/or existing SANRAL borrow pits/quarries as well as from within the road reserve. Should new borrow pits or quarries need to be established, these will be applied for under a separate licensing process.

3.2.6 Batching plants

There is an existing concrete plant and an asphalt batch plant at the Sterkspruit Quarry. If Contractors elect to erect mobile asphalt batching plants on site, they will be applied for under a separate licensing process.

3.2.7 Water use

The estimated average volume of water required during construction for the two contracts involved in this section is a maximum of 30 kl (m³) and 75 kl per day, respectively. Water will be obtained from a municipal supply as there are no suitable river crossings on this section of the N3 road from which to abstract. Should the Contractor wish to abstract from a watercourse elsewhere, the Contractor will be required to ensure that this is done in accordance with the National Water Act and any applicable General Authorisation or requirement for a water use license from the Department of Water and Sanitation (DWS).

3.2.8 Energy use

During construction, conventional sources of energy will be used (e.g. municipal electrical supply, generators, and conventional fuels and oils). Alternative energy sources will not apply, unless the contractor chooses to make use of them.

The re-use of asphalt milled off the existing road may contribute towards energy saving (as compared with no recycling of asphalt).

3.2.9 Demolition

The N3 will be closed temporarily during the initial stages of demolition, if required. Demolition will take place at the following sites:

- Minor demolition at the Camperdown rail underpass (does not require closure).
- Existing Camperdown I/C (future phase).
- R103 underpasses.
- Umlaas rail bridge.
- Existing Dardanelles bridge.
- Agricultural underpass for the D806.

The production and handling of demolition rubble is discussed in section 3.2.4. Demolition sites will be restored to a safe and neat condition.

3.2.10 Generation of noise

During construction, construction activities will elevate existing noise levels over and above those already generated by traffic on the N3, by 2-10 dB (A). According to the noise specialist report (Appendix D), construction noise may be problematic to receivers within 200 m to 310 m of the work areas. The area of effect will fluctuate according to the activities at any given time. Although construction noise will be temporary and confined mostly to daylight hours, there will, however, be some need to work at night, due to the heavy traffic volumes and to reduce the duration of the project.

If blasting occurs, this will generate temporary and short lived loud noises. Blasting will be undertaken in accordance with relevant legislation and with prior notice to affected neighbours. (Note that the contractors will inspect and record the condition of structures and buildings within the blast area before and after blasting).

3.2.11 Accommodation of traffic during construction

Traffic will be managed according to a Traffic Management Plan approved by SANRAL for each contract, ensuring that co-ordination between adjacent contracts (on the N3 as well as provincial and municipal roads) is undertaken as relevant. The contractors will be required to submit the final Traffic Management Plans for approval by the engineers prior to implementation.

3.2.12 General construction activities

The main construction activities for the N3 capacity upgrades are presented hereunder.

Site preparation

- Establishment of site camps and stockpile areas.
- Provision for on-site waste management – sewage, waste water, solid waste, general waste, etc.
- Provision for storage/handling/disposal of hazardous substances (e.g. cement, asphalt, fuels and oils). A bunded area will be provided for storage. Storage volumes may exceed 50 m³.
- Clearance of vegetation.
- Removal and stockpiling of topsoil and subsoil.

Road and bridge widening

- Accommodation of traffic according to an approved final Traffic Management Plan.
- Demolition.
- Blasting is not envisaged on the Cato Ridge – Lynnfield section of the N3, except at the Dardanelles I/C at the start of the contract.
- Excavation with heavy plant.
- Stockpiling of spoil for building and levelling on site or other parts of the proposed N3 upgrades.
- Stockpiling of demolition rubble for building and levelling on site or other parts of the proposed N3 upgrades, as well as for use in the new road layers.
- Disposal of excess spoil/rubble to licensed landfill sites and/or use on adjacent contracts, where feasible.
- Provision of drainage structures where crossing drainage lines and watercourses.
- Haulage and placement of materials with heavy plant.
- Water abstraction from local streams, if feasible.
- Water spraying.
- Rolling and compaction with heavy plant.
- Construction, jacking, lengthening and/or repair of bridges
- Retaining walls/other stabilisation/erosion control structures (as required).
- Erection of lighting, guardrails, barriers, road signs, and/or road lane markings.
- Relocation of existing traffic management infrastructure (cameras, etc).

Re-instatement and rehabilitation

- Reinstatement of slopes.
- Reinstatement of topsoil.
- Revegetation.
- Erosion control.
- Alien plant control.

3.2.13 Employment opportunities

Contractors, with their skilled labour, will be appointed in accordance with the procurement policies of SANRAL. Unskilled labour will be sourced by the contractors involved in the work. At present, it is unclear exactly how many jobs will be created as a result of the proposed project. However, based on previous projects it is anticipated that over both contracts, up to 550 people may be employed on site at any one time. A portion of these will be semi-skilled and unskilled labour. It is anticipated that contractors may use their own skilled personal and, thus, direct employment opportunities for people from the surrounding communities may be predominantly

for unskilled and semi-skilled jobs. The number of job opportunities will, however, vary on a month to month basis and will be dependent on the stage in the construction process.

3.2.14 Communication with land owners and stakeholders

This is a linear development with several affected land owners over and above the applicant themselves (SANRAL). Consultation with directly affected property owners will be initiated by the land acquisition team as part of the land acquisition process. The design engineers have notified service owners with respect to the relocation of services and utilities in the road reserve. All key stakeholders including as many as possible of the adjacent property owners have been notified and given an opportunity to consult with the project team as part of the public participation process conducted for this application for environmental authorisation. During construction, SANRAL and its appointed contractor(s) will be responsible for keeping road users and adjacent landowners informed of relevant planned construction activities (e.g. road closures, deviations, etc).

3.3 Operation phase activities

3.3.1 Vehicle traffic

The main activity of the N3 during operation is obviously the carrying of the nation's vehicle traffic, which comes with noise related impacts and safety hazards. These are largely controlled by road design (including the road reserve which acts as a buffer between the road and surrounding land), speed restrictions, signage, monitoring by camera, traffic policing and emergency services, as needed.

3.3.2 Road maintenance

During operation, SANRAL conducts routine maintenance activities which include:

- Maintenance of vegetation in the road reserve, e.g. trimming of grass and shrubs, weed removal and control of alien invasive plants.
- Erosion control in the road reserve.
- Clean-up of litter from the carriageway and road reserve.
- Keeping drains and culverts free of vegetation and litter.
- Checking and repairing/resurfacing of the road surface, as required.
- Checking and repair of road related infrastructure as required (barriers, guard rails, signage, etc).
- Operation of speed cameras, variable messaging system, etc.

SANRAL appoints a Routine Road Maintenance (RRM) Engineer for each section of road to advise on the physical maintenance that is required on the travelled road surface, so that tenders and contracts for the work can be set up as required. Contracts for road reserve maintenance (mowing, etc) are longer term. All maintenance activities will remain in place during construction.

3.3.3 Waste generation

During operation, the national roads *per se* will not generate solid waste. However, road users do throw out litter from their vehicles and this accumulates on the roadsides. The road reserves are also maintained and this produces grass cuttings and other 'waste' vegetation. This waste is collected on a regular basis by SANRAL's RRM contractors and disposed at the closest licensed municipal landfill sites.

3.3.4 Energy use

Lighting of the interchanges and road sections is provided by a conventional electrical connection. A performance based approach is used for the procurement of the luminaires (street lighting) on the N3 corridor. This means that as technology evolves after the procurement phase, the latest technology will be made available to this project. LED street lights with high efficiency and low energy consumption are being specified. In addition to the luminaires, a Lighting Management System will also be implemented which allows the dimming of the lights as required, thus, extending the life spans of the luminaires and reducing energy consumption.

Generally, the capacity upgrades should facilitate smooth traffic flow and, thus, better energy efficiency. Where the Parclo configuration is used for interchanges, it allows for free movement of traffic, which is more fuel efficient for vehicles.

3.3.5 Generation of noise

During operation, noise will continue to be generated from the traffic using the N3, as is already the case. Currently, noise levels are above local and international standards. According to the Noise Specialist Report (Appendix D), for the Cato Ridge –Lynnfield section of the N3, the Noise Control Regulations Standard of 65 dB(A) is exceeded within a distance of 250 m - 280 m from the edge of the N3.

With increasing growth in traffic volumes, noise levels will continue to increase. It must be noted that an increase in traffic volumes will occur, regardless of whether the proposed upgrade proceeds. Thus, the project itself will not result in more noise; it is the increase in traffic volumes which will result in increased noise. However, where road widening encroaches closer to receivers, the source of the noise will be closer to recipient residences, businesses and other community facilities.

4. PROJECT ALTERNATIVES

Given that this project entails the upgrade of an existing national road, alternatives investigated by SANRAL have revolved mostly around technical engineering issues (road design, materials, etc.). Alternatives that have been considered during the course of SANRAL's planning are discussed below. It must, however, be understood that the final project proposal put forward for consideration by DEA consists only of one feasible alternative.

No additional feasible alternatives have been put forward by SANRAL as the final design selected has been based on detailed modelling to best meet traffic demands and road safety standards.

4.1 Macro alternatives: use of road versus rail

The South African Government recognises the need to introduce an efficient rail freight service to reduce truck traffic long term, ease traffic burden on road networks and, at the same time, enhance the longevity and quality of roads. A migration from road to rail will improve road safety and decrease road maintenance costs. However, given the major role that road plays in South Africa, being able to migrate from road to rail is a long term venture and dependency on road transport will still continue even after required rail upgrades take place. Thus, the use of rail cannot be considered as an alternative to the proposed project; rather, road and rail are complementary alternatives, both required to meet demand.

Of the 643 million tons (Mtons) of freight moving through South Africa annually, only 22.5% is moved by rail and the rest by road. Within the Gauteng to Durban corridor, general freight moved by road is 46 Mtons and a mere 6.4 Mtons via rail⁷. Of the 2.7 million containers moving over Durban's wharf per annum, 70% are spread around Durban and only 30% are sent to Gauteng. There is a high dependence on the movement of freight in rural corridors via road (255 Mtons) versus rail (39 Mtons), with a similar trend for metro corridors⁸. This highlights a need for road freight movement through these corridors and a particular need for freight movement via road for short, local hauls and rail for longer hauls. Given the high density of rural and metro areas in South Africa, freight movement via road is essential. However, there is a requirement for the migration of more freight from road to rail and rail upgrades are needed to enable this⁹.

SIP 2 included the Durban–Free State-Gauteng logistics corridor, which is expected to create 135,000 jobs, strengthen the movement of freight and transport corridors between major industrial hubs in the country, improve access to the port and increase efficiency. The programme includes the construction of a new railway line between Gauteng and Durban. The Durban to Gauteng corridor is one of the most important corridors in the country and is expecting massive increases in freight volumes (Havenga *et al.*, undated). With freight forecasts considered, it is expected that during the next 25 to 30 years, containers moved from the Port of Durban to Gauteng will grow almost eightfold. This cannot be done without a new rail line, as the expected increases in freight will result in a heavy increase in freight trucks travelling within this corridor. The existing rail lines need upgrades to be dedicated to carry freight. However, in the absence of rail line upgrades and new line construction, the need for road upgrades is essential and regarded as of high importance. Without a present back up for freight movement, it is essential that road upgrades are made to manage the increase in freight movement, particularly between the Durban to Gauteng corridor.

⁷ https://www.environment.gov.za/sites/default/files/docs/publications/freightshift_roadtorail.pdf

⁸ <https://roadtransportnews.co.za/wp-content/uploads/2017/01/Havenga.pdf>

⁹ http://www.transport.gov.za/documents/11623/39906/7_FreightTransport2017.pdf/a3f7cb55-8d77-4eea-b665-4c896c95a0d8

4.2 Property/location/route alternatives

Early in the planning process, SANRAL's decision was to make use of the national road median to contain the extra lanes as far as possible within SANRAL's existing road reserve, rather than having to expand on the outer edges of the road, which may require the acquisition of much more additional adjacent land. Similarly, through road design, acquisition of adjacent properties has been minimised.

As this is an upgrade of an existing national road and existing interchanges, route alternatives were not considered.

4.3 Design/layout alternatives

This project has undergone a preliminary engineering design phase followed by detailed design. It has taken several years and numerous reviews of different options and iterations to arrive at acceptable design proposals that meet cost, safety and technical requirements. The design proposals were based on numerous engineering factors and models, taking into account the results of Traffic Analyses, forecasts of future traffic loads based on predicted developments and land use changes, the existing and required road standards, road gradients, geological conditions and other factors. Based on this information, the optimal number of lanes and lane configurations, and corresponding interchange layouts were proposed.

This project has involved a technical and iterative design process which has entailed modelling and testing of various alternative layouts to arrive at financially feasible designs that meet the required safety standards and traffic carrying capacity to 2047. It is beyond the scope of this environmental report to provide a detailed engineering motivation for each iteration that has played out during the design process, nor to assess these alternatives. However, it can be said that the various interchanges have been designed (within the individual confines and restrictions of the surrounding physical environment) for optimal traffic flow of forecast traffic on approach and exit lanes, and to accommodate the number of additional lanes on the main carriageway. The feasibility of phased upgrades has also been considered, i.e. to design for maximum carrying capacity but to construct initially to provide an intermediate carrying capacity (the design would allow for provision of additional ramps at a later stage, should development in the area call for maximum carrying capacity).

In considering the design for the existing Cato Ridge I/C, the findings of the traffic study showed that traffic growth (generated over 30 years with generic growth) can satisfactorily be accommodated with only minor upgrades. Thus, the decision was made to optimise existing terminals to include signalised ramp intersections and to rehabilitate the Cato Ridge Bridge (Uitkomst Street).

The findings of the traffic study regarding the existing Camperdown I/C showed that the present northern ramp terminal of the existing Camperdown diamond interchange would not be able to satisfactorily accommodate¹⁰ a right turn movement of a projected 1,200 vehicle per hour, from the northbound carriageway of Umbumbulu Road to the N3 eastbound on-ramp. Some of the conflicting right turn movements at the existing ramp terminals need to be removed and this would be best accomplished by providing on-ramp loops in the northwest and southeast quadrants of the interchange. Engineering solutions involve transforming the existing diamond interchange configuration into a semi-parclo interchange configuration. The upgrade of the Camperdown I/C is planned as a future phase (estimated to be 2030).

¹⁰ If the planned spatial development is fully realised in the future.

In the design of the Dardanelles I/C, the current and estimated future traffic demand was considered. The type and layout of the ultimate I/C is restricted by the proximity of the Transnet rail tunnel, provincial roads and services (such as Eskom high voltage powerlines and pylons, Transnet pipes and Umgeni water services) within the I/C footprint. Various alternative layouts were considered during the Preliminary Design and a phased approach to the upgrading of the I/C was adopted, with only one new ramp structure required to be provided in the first phase and the continued utilisation of the existing I/C structure during this phase.

Taking into consideration the above, it must be noted that SANRAL has put forward one final recommended layout proposal for environmental authorisation. For a project of this scale and nature, which constitutes an *in situ* upgrade, it would be impractical to assess additional alternatives for authorisation, that are not recommended by SANRAL and which they cannot implement.

4.4 Technology alternatives

Aspects such as pavement structure, retaining structures, lighting, signage, barriers, etc. have also been subjected to a process whereby various design proposals have been investigated and the optimal design selected based on technical engineering, road safety and cost criteria.

A key operational aspect taken into account has been noise management/reduction. SANRAL has considered the use of ultra-thin friction course or semi-open graded surfacing. This type of asphalt surfacing has been proven to be quieter than conventional asphalt and concrete surfacing and can also be used to overlay the sections of the N3 where SANRAL is proposing to construct a concrete pavement. As an alternative, diamond grinding of the concrete surface, which reduces tyre noise, has also been considered. Diamond grinding creates grooves of uniform depth and spacing unlike conventional grooving techniques. The consistent grooves within the road pavement reduce the noise of the vehicle tyres over the pavement. SANRAL's design team will use different surfacing types according to the requirements of the different sections of road, taking into account the proximity of noise sensitive receptors.

It should be noted that SANRAL has commenced the process of sourcing an acoustic specialist to investigate further feasible and cost effective noise mitigation measures which can be considered for implementation to reduce noise levels adjacent to the N3.

4.5 The no-go alternative

The No-Go (no-development) alternative implies that the *status quo* remains and no widening of the national road and upgrading of interchanges occur. If no widening occurs, no listed activities will be triggered, for example, the clearance of indigenous vegetation or construction within or near wetlands and riparian channels. The resultant impacts of construction on vegetation, riparian areas and wetlands along the N3 sections of interest will, thus, be avoided. The nuisance impacts and disruption to traffic which will result from road widening construction activities will also be avoided.

However, the fact that this proposed project is one of South Africa's Strategic Infrastructure Projects (SIP2 status) is an indication of its importance and priority. The project will assist in strengthening the logistics and transport corridor between South Africa's main industrial hubs, improve access to Durban's export and import facilities, and raise efficiency along the corridor. Currently, the N3 carries between 40,000 and 120,000 vehicles per day and in excess of 75 million tons of freight per annum. The sections of N3 under consideration are operating at near full capacity with ongoing safety related incidents with the mix of heavy and light vehicles, topography and limited capacity. The failure to widen and upgrade these sections will lead to increasing congestion as traffic volumes continue to increase with substantial costs to the economy in lost time. This, in turn, will lead to increased safety risks and accidents. It will also

result in more road maintenance requirements, causing further congestion during maintenance and much road user frustration and dissatisfaction. The ongoing decrease in the efficiency of transport of people and goods, due to increasing traffic congestion, will result in widespread negative effects on the social and economic environment. **The No-Go Alternative is, therefore, not considered to be a feasible alternative.**

While the no-development option is not preferred, it forms the baseline against which all other options are assessed.

5 DESCRIPTION OF THE RECEIVING ENVIRONMENT

5.1 Current land use and zoning

The section of road under assessment falls primarily within the Mkhambathini Local Municipality that forms part of the uMgungundlovu District Municipality. However, the upgrading of the Cato Ridge interchange and approximately 1.5 km of road upgrades will take place within the Outer West planning region of the eThekweni Metropolitan Municipality. Also, a portion of the upgrades to the Dardanelles/Umlaas Road Interchange and approximately 2 km of road upgrades will take place within the Msunduzi Local Municipality which is also part of the uMgungundlovu District Municipality.

Land use zonation is shown in Appendices C1a and C1b. In the vicinity of the Cato Ridge Interchange there are various land use zones including *General Commercial*, *Special Residential*, *Service Industry*, *Agriculture 1*, *Agriculture 3* and *Railway* and *Amenity Reserve* all of which are within the eThekweni Metropolitan Municipality. The Cato Ridge Local Area Plan (Markewicz Redman Partnership, June 2018) outlines future development plans for this area as a major economic centre and logistics hub. Within the Mkhambathini Local Municipality, land zonation adjacent to the N3 includes *Urban Agriculture*, *Future Commercial/Mixed Use*, *Existing Commercial*, *Existing* and *Future Residential*, *Existing* and *Future Industrial* and *Agriculture/Limited Tourism*. The main agricultural activities along the N3 corridor between Cato Ridge and Lynnfield Park include the production of battery chickens and eggs¹¹ and the farming of sugar cane and livestock. Within the Msunduzi Local Municipality, in terms of the Municipal Spatial Development Framework, the land immediately adjacent to the N3 includes *Existing* and *Future Formal Residential* (albeit that currently settlement in the area is of low density in nature). It needs to be noted that in the event of the areas zoned *Future Formal Residential* being developed, the noise levels generated by the N3 will need to be taken into consideration as existing noise levels adjacent to the N3 are already high. Land use zonation is shown in Appendices C1a and C1b.

There is also reported to be an application for a mining permit lodged for the property Portion 405 of the farm Vaalkop & Dadelfontein No 885, located near the Dardanelles I/C. SANRAL's land acquisition team are investigating further, as part of this land will be required for construction of the upgraded interchange.

5.2 Land ownership and affected properties

5.2.1 Land ownership

This is a linear development located primarily within the proclaimed N3 road reserve belonging to SANRAL, as use will be made of the median and existing road reserve to accommodate widening. However, additional property will need to be acquired adjacent to the N3 in certain areas where expansion beyond the existing road reserve is required. These areas are indicated by the red lines in Figure 1 and include private and institutionally owned properties. SANRAL undertakes a land acquisition process whereby negotiations are entered into with property owners to purchase the land at market based values and to take into consideration other financial impacts. In the rare circumstances where agreement cannot be reached, SANRAL is compelled to embark on legal proceedings to expropriate¹² the land. The newly acquired land will be proclaimed as road reserve.

¹¹ Although RCL foods has sold several of its properties adjacent to the N3, to SANRAL.

¹² It is expressly stated that acquisition and/or expropriation discussed in this report is acquisition and/or expropriation to be undertaken within the context and provisions of the current laws of the country.

5.2.2 Property names and numbers

This approximately 6.8 km linear project involves numerous property subdivisions, mostly within SANRAL's proclaimed road reserve. The property diagrams and property numbers in the proclaimed N3 road reserve are published in Government Gazette No 40085, Vol. 734, 22 June 2016. Due to the size of the document it is not appended to this BAR. The gazettes can be downloaded from the government website:

http://www.gov.za/sites/www.gov.za/files/40085_gon733.pdf

The property numbers of all properties within 50 m of the national road sections to be widened are included in the copy of the Application to DEA, which is in Appendix H of this BAR. The properties to be acquired for extensions to the road reserve are listed in Appendix C2.

5.3 The social/socio-economic environment

While the road upgrades will take place in three municipalities (the majority within Mkhambathini Local Municipality – refer to Section 5.1), the socio-economic conditions and land-use patterns of the receiving environment can be considered similar throughout the study area and are best represented by the conditions prevailing within Ward 3 of the Mkhambathini Local Municipality, the municipal ward through which the N3 passes. A summary of the socio-economic character of the receiving environment is provided below. More detailed information is provided in the Social Impact Assessment Specialist Report (Appendix D).

5.3.1 Demographics

The Mkhambathini Local Municipality covers an area of approximately 917 km² with a total population of approximately 63,142 people. This equates to a population density of 69 people/km², lower than the provincial average of 109 people/km² (Mkhambathini IDP, 2016). The population is characterised by a high proportion of people under the age of 35, with 70% of the population aged between 0 and 34 years (31% under 15 and 39% between 15 and 34) (StatsSA, 2012).

The municipal ward where the proposed upgrades will take place (Ward 3) is also characterised by a young population, with 63% of the population in the ward below the age of 35 (StatsSA, 2011). The high proportion of the population being classified as young is indicative of a 'developing population' characterised by high birth rates and relatively short life expectancy.

Large portions of the local municipality are covered by traditional authority areas, thus, accounting for the large portion of households (43%) reported to be living in traditional dwellings, significantly higher than the average for the district municipality of 21% and provincial average of 19% (StatsSA, 2011). However, within Ward 3, 76% of households are reported to reside in formal dwellings, 15% in informal dwellings and 9% in traditional dwellings (StatsSA, 2011). The higher than average percentage of households in the ward reported to reside in formal dwellings can be attributed to the urban centre of Camperdown being located within the ward. The higher than average percentage of the population residing in informal dwellings can also be attributed to this, with informal settlements often being located on the urban periphery.

Residents within Ward 3, on average, report better access to basic services (water, sanitation, electricity and refuse removal) and education than the municipal population as a whole. However, access to education and basic services within the local municipality is, on average, worse than the averages for the district municipality and the province.

5.3.2 Economic profile

Unemployment in the municipality is reported to be 12%, well below unemployment levels for KZN, which is reported to be 33%, and the District Municipality, reported to be 16% (Stats SA, 2011). While these figures appear relatively good, Mkhambathini has a high portion of the population of working age (51%) classified as 'not economically active' or 'discouraged work seekers' which implies that despite a low level of unemployment, a high number of the potentially economically active population are not economically active and are, thus, dependant on a small base of employed people (Mkhambathini IDP, 2016).

Unemployment levels within Ward 3 are, on average, lower than the municipal and provincial average, with 8% of the potentially economic active population reported to be unemployed (StatsSA, 2011). Importantly, significantly less people (32%) are classified as "not economically active" or "discouraged work seekers" (StatsSA, 2011). The lower levels of unemployment in the ward are the likely result of Camperdown, the main economic hub in the municipality, being located in this ward.

The majority of households within the Mkhambathini LM are reported to be living on less than R 22,728 per annum which, in accordance with the 'Minimum Household Living Level' developed by the South African Bureau for Market Research, places these households below the poverty datum line (Mkhambathini IDP, 2016). Comparatively, within Ward 3, there is a high percentage of middle income and upper income households, again the likely result of the economic hub of the municipality (Camperdown) being located within Ward 3.

5.3.3 Noise receptors adjacent to the N3

The noise receptors likely to be most sensitive to noise are existing residences and schools adjacent to the N3 road reserve, those close to the interchanges in the Cato Ridge and Camperdown precincts, residents near the Dardanelles I/C and any remaining operating¹³ commercial chicken farms directly adjacent to the N3 in the Camperdown/Umlaas Road areas. However, it must be noted that most affected properties close to the interchanges have been acquired by SANRAL.

National Chicks has two broiler breeding laying farms in proximity to the N3, viz. Brenton Farm and Willows Farm, with the closest laying houses appearing to be located approximately 110 m from the N3. In the general area, SANRAL has purchased most of RCL Food's properties directly adjacent to the N3. However, RCL Foods still retains two hatcheries which are both closer than 100 m from the edge of the N3. It is noted that these facilities are situated within a high noise zone.

According to the specialist report, construction noise may be problematic to receptors within 200 m to 310 m of the work areas. The area of effect will fluctuate according to the activities at the time. Receptors within 250 m - 430 m from the edge of the road may experience operational noise which exceeds the SANS and/or NCR standards.

5.4 Cultural heritage resources

eThembeni Cultural Heritage Consultants (eThembeni) were appointed to assess potential impacts of the project on heritage resources within the study area.

¹³ Note that a large number of RCL chicken farms adjacent to the N3 have closed down and the properties have been purchased by SANRAL.

The N3 national route in KwaZulu-Natal has been constructed over the past approximately forty years. Accordingly, no infrastructure associated with the road, such as bridges, is older than sixty years and, therefore, generally protected in terms of the KwaZulu-Natal Heritage Act or the National Heritage Resources Act.

Findings by eThembeni (Appendix D) indicate that there are no cultural heritage resources in the project area that will be affected by the proposed widening/capacity improvements to the N3. The heritage resources types assessed are provided in Table 8.

Table 8 Cultural Heritage Resources on site (BA4)

Heritage resource type	Observation
Places, buildings, structures and equipment	No infrastructure associated with the road, such as bridges, is older than sixty years and, therefore, generally protected in terms of the KZNHA.
Places associated with oral traditions or living heritage	None were identified within the proposed development area.
Landscapes	None were identified within the proposed development area.
Natural features	None were identified within the proposed development area.
Traditional burial places	None identified.
Ecofacts	None were identified within the proposed development area.
Geological sites of scientific or cultural importance	None were identified within the proposed development area.
Archaeological sites	None were identified within the proposed development area.
Historical settlements and townscapes	None were identified within the proposed development area.
Public monuments and memorials	None were identified within the proposed development area.
Battlefields	None were identified within the proposed development area.

5.5 The biophysical environment

5.5.1 Site gradient

The site lies at an approximate altitude of 760 meters above sea level in between Dardanelles (to the west) and Cato Ridge (to the east). The surrounding area in this section of the N3 is characterized with irregular plains, dissected by drainage lines, ridges and hills. The section of the route is typically described as possessing "rolling hills". The vertical alignment of the roadway gradually transitions from moderately sized cuttings to moderately sized fills, apart from a few large fills with vertical dimensions in the order of 20 m. There are many successive vertical curves along the route and the gradient is in the range of 0.67% to 4.5%.

The section between Dardanelles and Lynnfield Park lies at a maximum altitude of approximately 830 m above sea level (the start at km 26.6 with an altitude of 794 m and the end at km 30.6 with an altitude of approximately 773 m above sea level). The topography may be described as rolling with gradients of 1:20 (5%) along the N3 route. The access ramps for the Dardanelles Interchange have grades of up 1:12.5 (8%) in order to provide the minimum required vertical clearance of 5.2 m. Steep embankments are encountered along the route and retaining walls will be constructed in order to minimize the effect on the properties adjacent to the road reserve.

5.5.2 Geological conditions along the route

The geotechnical information in this section has been provided from preliminary geotechnical reports for the different engineering contracts and can be made available on request.

The geology along the existing N3 comprises mainly tillites of the Dwyka Group. Two dolerite intrusions occur between Cato Ridge and Dardanelles but these are expected to have a minimal influence as regards geotechnical issues. Small areas of Pietermaritzburg formation also occur in two sections of the route (Table 9).

The tillite generally comprises, when fresh or unweathered, a bluish to olive grey rock with sandstone, granite and chert inclusions. The tillite is frequently encountered in various stages of weathering, ranging from the blue (or unweathered) rock through to first and second brown stages. Where encountered in cuttings, the weathered tillite will generally require blasting for excavation except if it is relatively highly weathered when it can be removed by excavator.

A feature of the tillite is the tendency to form hard rock boulders or large corestones and pinnacles which occur erratically within the more weathered bedrock and sometimes the soil matrix, sometimes requiring blasting.

The soil mantle overlying the tillite bedrock is generally very thinly developed, on average around 1.5 metres thick. The transported soil component of the soil mantle generally comprises silty clayey sand to sandy clay and is suitable as a general fill material. Residual tillite soils are very thinly developed in this area and do not provide sufficient volumes of material for use in construction.

Soil erosion has not been identified as a major risk; however, soils will need careful management at the river and wetland crossings. The route has been investigated by the geotechnical team to inform engineering design and specific recommendations have been made.

Table 9 Summary of geological conditions along the route

Lithology	Comment
Tillite	Majority of the route
Dolerite intrusions	Occur in two places between Cato Ridge and Dardanelles
Pietermaritzburg Formation	Two small areas along the route

The weathered tillite and shale can achieve hard status at shallow depth, requiring large excavators or even blasting to remove.

5.5.3 Rivers and wetlands

The information below is referenced from the specialist riparian assessment report (Appendix D).

The study area falls within the uMgeni and uMlazi River catchments and the N3 crosses or passes within 50 m of several tributaries of these rivers in this section of the upgrade.

The major rivers all drain in a predominantly easterly direction, eventually discharging into the South Indian Ocean off the east coast, first passing through the eThekweni Municipality.

The uMngeni River catchment forms the main water catchment for the water supply dams of the Pietermaritzburg-Durban development node, the second most important economic complex in South Africa (after Gauteng), supplying water to over 5 million people. Due to the strategic importance of the uMngeni catchment water resource, and the high level of impacts and demands on the river systems within the eThekweni Municipality, it is essential that river and wetland integrity is maintained and improved during all developments within the uMngeni River catchment.

The uMlazi catchment feeds Baynesfield and Mapstone dams in the upper catchment. The uMlazi River passes mainly through agricultural, forestry and rural areas until it crosses the R603; thereafter, the river is severely impacted by urban and peri-urban settlements, including Mpumalanga, Chatsworth and Umlazi township.

Most of the watercourses within 500 m of the N3 have been heavily impacted by the road and associated drainage structures, canalisation and urban development. Vegetation is largely degraded and heavily invaded by alien species. Five of the six crossings (Figure 3) have been identified as providing wetland habitat (the remaining comprises artificial ponds and have, therefore, not been assessed). It must be noted that because four of the crossings are existing road crossings, the wetlands are already modified at these points. The re-alignment of the Camperdown offramp will, however, result in a crossing point which is not at the same point as the existing crossing.

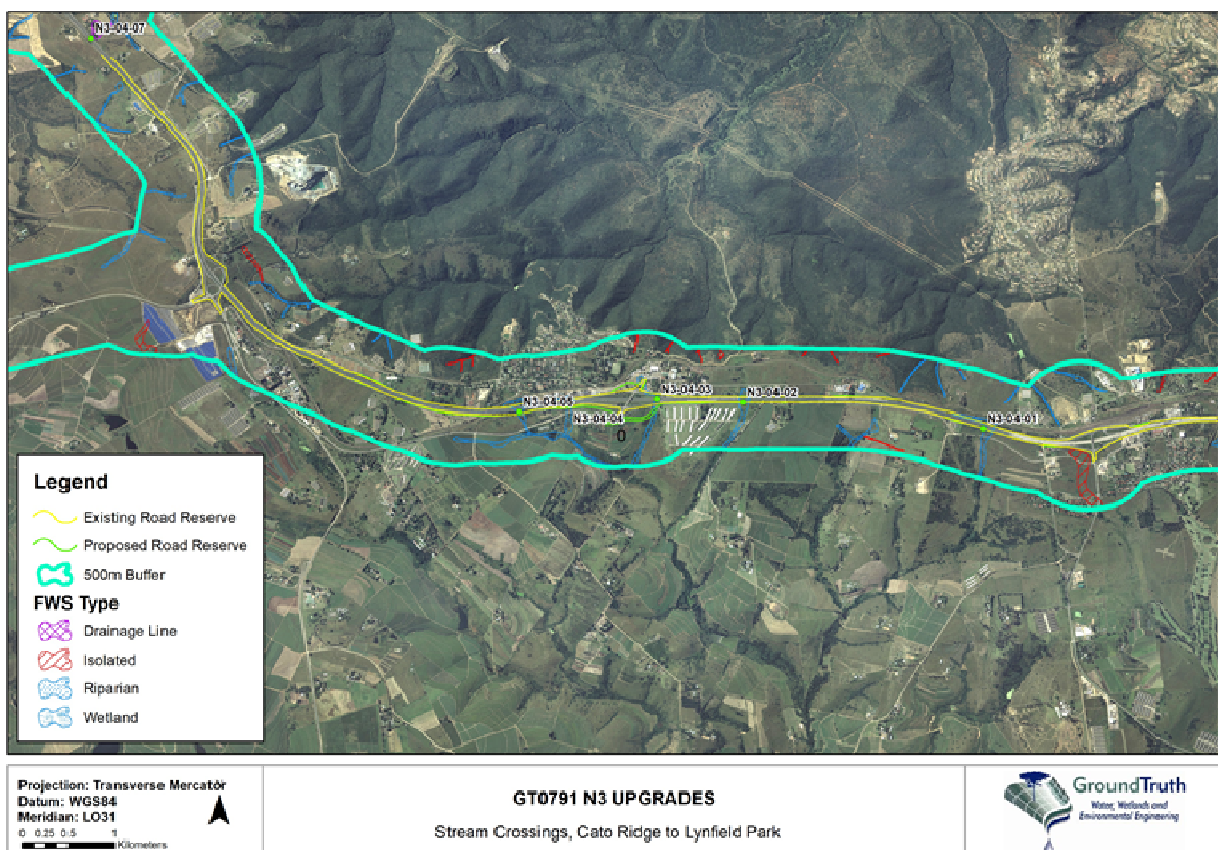


Figure 3 Watercourses crossed in the study area

The crossings include:

- ❑ N3-04-01. This is a valley bottom wetland without a channel. It has a health score of 'poor' due to alterations in flow regime, erosion, sedimentation, pollution, compaction, wetland habitat disturbance and high levels of alien vegetation.
- ❑ N3-04-02. This is a valley bottom wetland without a channel, close to the Camperdown offramp. It has a health score of 'poor' due to alterations in flow regime, erosion, sedimentation, pollution, compaction, wetland habitat disturbance and high levels of alien vegetation.
- ❑ N3-04-03. This is a valley bottom wetland without a channel, at the Camperdown offramp. It has a health score of 'poor' due to alterations in flow regime, erosion, sedimentation, pollution, compaction, wetland habitat disturbance and high levels of alien vegetation.
- ❑ N3-04-04. Valley bottom wetland without a channel. The health score for the wetland is 'Critically modified' as a result of alterations in flow regime, erosion, sedimentation, pollution, compaction, wetland habitat disturbance and alien plant invasion.
- ❑ N3-04-05. Valley bottom wetland without a channel. The health score for the wetland is 'Seriously modified' as a result of alterations in flow regime, erosion, sedimentation, pollution, compaction, wetland habitat disturbance and alien plant invasion.
- ❑ N3-04-07. Drainage line. No assessment was undertaken as this crossing comprises artificial ponds.

Water Use Licence Requirements

An assessment by GroundTruth (Appendix D) indicated that all the above sites are in a largely to critically modified state, indicating little to no provision of ecosystem goods or services. None of the sites indicates any sensitivity, quality or ecological importance that would require additional licensing requirements outside of SANRAL's generally authorized activities (Government Notice 509 of 2016, Appendix D2). Risks were assessed as low for all sites. The location of the wetlands close to other infrastructure and existing impacts negate opportunities for rehabilitation.

Further detailed information is provided in the attached riparian specialist report (Appendix D).

5.5.4 Natural habitat affected by the project

Land use within the study area is mixed and comprises agriculture (sugarcane and some dryland and irrigated crops), agri-industrial (RCL Foods), suburban/residential and commercial areas associated with the small towns of Cato Ridge and Camperdown, national and provincial roads, rural dwellings and open grassland/scrub areas. In these areas, vegetation is largely transformed or very disturbed. Approximately 27% of the study area is untransformed. Most of the riparian zones and wetlands are similarly disturbed and modified due to development and land use impacts. For the section of the N3 investigated in this study, the highway does not bisect any protected areas, stewardship sites or municipal reserves.

Table 10 provides a general indication of the habitat condition and levels of transformation on site. Disturbed grassland/thicket is the most widespread community within the direct footprint of the existing and proposed extensions of the road reserve and comprises a patchy mosaic of degraded and secondary grassland dominated by ruderal, weedy and alien invasive species. Any resemblances of the natural vegetation to Hinterland Grassland/Ngongoni Veld by a few indicator species tends to be limited and degraded, often isolated at interchanges and along the tops of road embankments or road cuttings. Essentially, much of the Hinterland Grassland/Ngongoni Veld present has experienced some form of historical disturbance (the greater the levels of disturbance, the lower the biodiversity present). A range of species

specially protected under the Natal Nature Conservation Ordinance (Act no. 15 of 1974) were found, as well as one bulb listed as Declining in the South African National Biodiversity Institute's (SANBI's) National Red List of South African Plants.

Please refer to the specialist vegetation report in Appendix D for detailed information and mapping.

Table 10 Summary of habitat condition on site

Vegetation/Habitat Condition	Percentage (%) of Vegetation/Habitat Condition Class	Description and Additional Comments and Observations
Natural (includes areas with a high proportion (>75%) of indicator plant species that characterise the vegetation that originally occurred in the area)	0.0%	There is no Dry Coast Hinterland Grassland (or Ngongoni Veld) or KwaZulu-Natal Hinterland Thornveld along this section on the N3 that is considered to be in a natural/pristine condition.
Near Natural (includes areas with low to moderate level of alien invasive plants, with a moderate proportion (25 to 75%) of indicator plant species that characterise the vegetation that originally occurred in the area)	7.0%	A relatively small proportion of the remaining untransformed areas along this section on the N3 comprises vegetation that is considered to be in a near natural state, with a reasonable diversity of indigenous plant species (including some species that are indicative of Dry Coast Hinterland Grassland (or Ngongoni Veld) or KwaZulu-Natal Hinterland Thornveld, as well as hygrophilous grassland that is associated with wetland habitats (notably the wetland located at Site 1, south west of the Cato Ridge Interchange; see Figure 4). Patches of near natural vegetation are largely located along the N3 between Camperdown and Lynnfield Park.
Degraded (includes areas heavily invaded by alien plants, secondary vegetation, with a low proportion (<25%) of indicator plant species that characterise the vegetation that originally occurred in the area)	16.4%	A significant proportion of the remaining untransformed areas along this section of the N3 comprises vegetation that is degraded as a result of a long history of disturbance and edge effects associated with the land transformation and land use activities that typically have occurred along the N3 (e.g. road construction, earthworks, footpaths, illegal dumping, borrow pits, mowing/burning, residential/industrial/commercial development, etc.). The vegetation is, thus, largely a patchy/fragmented mosaic of secondary grassland (particularly in and around interchanges), grassland in poor condition, and degraded thicket. Indigenous plant diversity is generally low, and made up of mostly ruderal/weedy species, as well as a number of invasive alien plant species.
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	76.6%	Most of the areas along this section on the N3 are already transformed by the existing N3 national road, interchanges, bridges and other roads, as well as by cultivated lands.

5.5.5 Vegetation types

The original, reference vegetation according to the provincial mapping and classification of Scott-Shaw and Escott (2011) that defines the study area includes two dominant vegetation types, viz. Dry Coast Hinterland Grassland and KwaZulu-Natal Hinterland Thornveld. Within this grassland/savanna mosaic are aquatic ecosystems containing wetland vegetation (e.g. Temperate Alluvial Wetland and Eastern Temperate Wetland Vegetation).

Dry Coast Hinterland Grassland is a subclass of Ngongoni Veld, that once occupied most of the areas (around 85%) along this section of N3. It is classified as a Vulnerable vegetation type by Rutherford *et al.* (2006), as well as the more recent and regionally appropriate assessment (of Dry Coast Hinterland Grassland) by Scott-Shaw and Escott (2011).

The South African National Botanical Institute (SANBI) and the Department of Environmental Affairs and Tourism (DEAT, 2009), in accordance with Section 52 of the National Environmental Management: Biodiversity Act (NEMBA) (Act 10 of 2004), also regard Hinterland Grassland/Ngongoni Veld as a Threatened Ecosystem, listed as Vulnerable (Government Gazette, 2011). This is on the basis that 61% of the original extent (approximately 10,000 km²) remains, with less than 1% under formal protection – it is more likely that the remaining extent is less than 61% as was estimated ten years ago by SANBI and DEAT (2009).

At lower altitudes, where the Hinterland Grassland/Ngongoni Veld transitions into KwaZulu-Natal Hinterland Thornveld, there tend to be higher occurrences of woody vegetation.

KwaZulu-Natal Hinterland Thornveld falls within the Savannah Biome and is described by Rutherford *et al.* (2006) as open “thornveld” dominated by *Acacia* trees on undulating plains found on upper margins of river valleys. Compared to Dry Coast Hinterland Grassland, the more savanna-like KwaZulu-Natal Hinterland Thornveld generally supports a greater floristic richness of trees, shrubs, climbers, herbs and grasses. This vegetation type is classified as Vulnerable by Rutherford *et al.* (2006), however, according to the more recent and regionally appropriate assessments by Scott-Shaw and Escott (2011) it is Least Threatened. Only a small portion of the study area is defined by KwaZulu-Natal Hinterland Thornveld (see Appendix D for more detail).

5.5.6 Provincial conservation planning

EKZNW's Systematic Conservation Assessment (SCA, also referred to as systematic conservation planning) highlights areas that vary in terms of conservation importance as identified and mapped under the KZN biodiversity spatial planning terms and processes (EKZNW, 2016). This includes areas that are proclaimed as conservation areas or formally protected areas (e.g. provincial reserves, private reserves and stewardship sites), as well as unprotected areas that are considered a priority in terms of containing important biodiversity features. In terms of the latter, areas within KZN are subdivided into Planning Units (PUs) of varying spatial scales each supporting/potentially supporting biodiversity features (e.g. conservation important species, vegetation types/ecosystem, etc). The SCA broadly classifies areas of biodiversity value/importance using two categories, viz. Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). CBAs comprise two subcategories, CBA: Irreplaceable and CBA: Optimal. (See Appendix D for more detail).

There are a few areas along this section of the N3 that adjoin, but that do not directly impact, land classified as CBA: Irreplaceable, viz an area west of the Camperdown I/C and other areas north of the Dardanelles Interchange (Figure 4). (Note that the Msunduzi Local Municipal C-Plan (and EMF) highlight an area adjacent to the northwest of the Dardanelles I/C, which is categorised as “Totally Irreplaceable”. However, this **area is not identified as sensitive in the Provincial C-Plan (2016) and as low biodiversity constraint in the uMgungundlovu EMF(2017).**

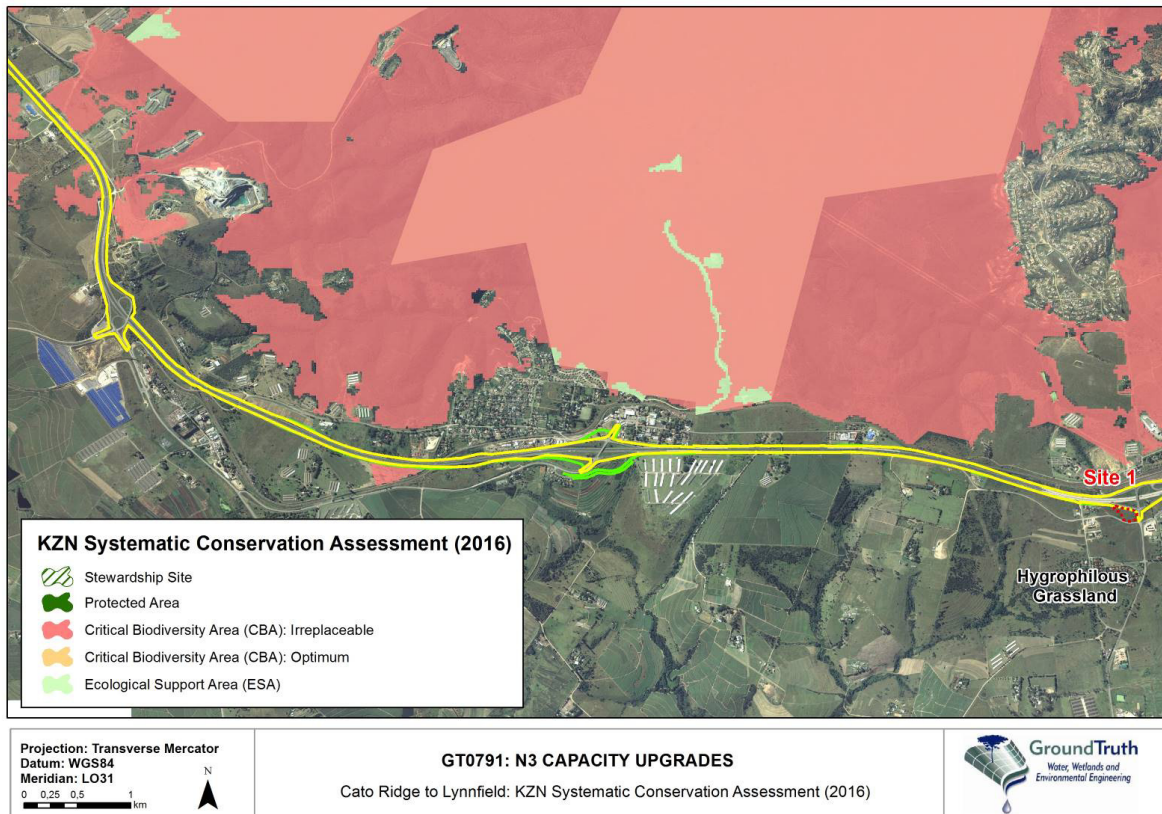


Figure 4 Overview of important conservation areas between Cato Ridge and Lynnfield Park and sensitive areas identified along the route

5.5.7 Environmental Management Framework (EMF) Sensitive Areas

The 2010 Environmental Management Framework (EMF) Regulations (General Notice R547 of Government Gazette 33306, 18 June 2010) require that any EMF, as gazetted under NEMA (Act No 107 of 1998), is considered in applications for environmental authorisation, by taking into account sensitive areas as identified in the EMF. For this section of the N3, this includes sensitive areas for biodiversity as identified in the Draft 2017 EMF developed for the Umgungundlovu District Municipality. The EMF highlights areas of varying development constraint based on biodiversity sensitivity (i.e. low, medium, high, very high). For this section of the N3, these are largely areas of low constraint/sensitivity, with a few areas of very high constraint/sensitivity that are not directly impacted, but which may be affected indirectly by the proposed N3 upgrades.

As discussed in Section 5.5.6, an area northwest of the Dardanelles I/C which is regarded as “Totally Irreplaceable” in the municipal (Msunduzi) EMF (2015) is indicated as a low biodiversity

constraint in the Umgungundlovu EMF (2017). This area shall however be safeguarded as far as possible through implementation of appropriate mitigation measures as presented in Section 8 of this report, and treated in a similar manner as CBAs.

5.5.8 MOSS (Metropolitan Open Space) and protected areas

This section of the N3 does not pass through any provincial or municipal reserves. However, the eastern parts of this section of the N3 run adjacent to green open spaces of eThekweni, which form part of the Durban Metropolitan Open Space System (D'MOSS). These areas do not include any formal reserves but comprise rural landscapes and riverine corridors. No specific areas of concern were highlighted during communication with the eThekweni Biodiversity Planning Unit for this project. (See Specialist Report Figure 4 in Appendix D4).

The SDF shows an area identified as MOSS in terms of the Msunduzi Municipal Open Space System, just to the north and west of the Dardanelles Interchange. It is not directly affected, but care will have to be taken to ensure that there are no secondary impacts in this area due to its proximity to the upgrade activities.

5.5.9 Plants of Conservation Importance

A number of biogeographically important and endemic taxa are associated with natural occurrences of Hinterland Grassland/Ngongoni Veld and Hinterland Thornveld. In addition, there are several conservation important plant species (i.e. Red Listed, rare and endemics, and protected species) that may occur within the study area based on known species distribution ranges (Raimondo *et al.*, 2009; SANBI, 2017). A number of these are listed as Threatened species (See Appendix D for more detail).

Modelled and recorded data from EKZNW's MINSET data highlights one species:

- *Acalypha angustata*, which has a conservation status of Least Concern (Pillay, 2004), and its typical habitat is Hinterland Grassland/Ngongoni Veld.

The distribution of known protected plants in this section of the upgrade is shown in Appendix B of the Specialist Vegetation Report.

5.5.10 Vegetation on site

The vegetation on site is described below, with an emphasis on sensitive aspects. Detailed species lists are provided in the specialist report (Appendix D). Alien species are denoted with an asterisk (*).

Disturbed grassland/thicket mosaic

This is the most widespread community within the study area and comprises a patchy mosaic of degraded and secondary grassland, approximately 1-1.5 m tall, shrubland between 4 and 5 m tall and thicket between 3 and 8 m tall, together with taller stands of *Eucalyptus**, *Pinus** and *Acacia mearnsii** trees, up to 15 m tall. The original natural vegetation has become degraded through urban and agricultural activities (including mowed grass verges). A range of generalist, ruderal and alien invasive species are common. A few patchy/isolated occurrences of the original natural grassland cover are present, including protected species and other geophytes such as *Eulophia sp.*, *Hypoxis hemerocallidea* and *H. colchicifolia*.

Notable species found include:

- *Aloe arborescens*, *A. Maculate*, *A. ferox* and *Eulophia sp.*, which are all designated as specially protected under the Natal Nature Conservation Ordinance (Act No. 15 of 1974).

- The geophyte, *Hypoxis hemerocallidea*, which has a status of Declining in the National Red List of South African Plants (Williams *et al.*, 2016).

Riparian and Wetland Vegetation

Many of the waterways and wetlands present have been variably impacted by the road and associated drainage structures, and by urban and agricultural development. Livestock impacts such as grazing, trampling and siltation are common. Natural environmental gradients are often obscured and vegetation is largely degraded or disturbed.

In temporarily to seasonally wet areas, disturbed hygrophilous grassland is common between 0.5 and 1.5 m tall, and typically contains a range of grasses, sedges and forbs. Where more permanently wet conditions prevail, *Typha capensis* reedbeds occur up to about 2 m tall. There are a variety of indigenous species that tend to increase in abundance in response to disturbance events and it is likely that nutrient pollution and grazing impacts have contributed to the dominance of *Typha capensis* in these situations.

Hygrophilous Grassland

There is a section of hygrophilous grassland immediately south west of the Cato Ridge Interchange which is considered noteworthy (Site 1 - Figure 4). This will be largely avoided by the planned upgrades but may be indirectly influenced by continued edge effects and stormwater runoff from the existing road reserve. The species composition indicates that the majority of this wetland experiences temporary to seasonally wet conditions, which may be largely influenced by stormwater runoff from the N3 and other roads that surround this hygrophilous grassland patch. The sward is approximately 1.5 m tall and parts have been visibly disturbed through adjacent road works and spoiling of material. The diversity of forbs is relatively low, and it appears that there has been a history of disturbance across the whole wetland (e.g. the area is often mowed).

5.5.11 Fauna and avifauna

Due to the transformation of natural habitat along the N3, animal biodiversity and populations are limited in the immediate study area. However, a high diversity of naturally occurring species may be found in the broader region within protected areas, nature reserves and less disturbed areas in proximity to the road (e.g. Msunduzi and eThekweni MOSS areas). These areas provide habitat for a large variety of amphibians, reptiles, mammals, birds and invertebrates. Mammals include various small antelopes, jackal, bush pig, porcupine, genet, caracal, mongeese, dassies and vervet monkeys as well as a variety of rodents.

There are likely to be breeding and foraging areas located in less disturbed habitats along the route and these will need to be examined prior to disturbance to ensure that faunal impacts are minimised. Specific information will be sourced from the eThekweni and Mkhambathini Municipalities by the Environmental Control Officer prior to commencement of construction. Rescue and relocation will be undertaken if required.

Management recommendations pertaining to the reduction on impacts on fauna (such as prohibiting hunting, etc) are included in the EMPr.

5.5.12 Site sensitivity mapping

Figure 5 and Appendix C of the specialist vegetation assessment, provide maps of environmental sensitivities.

6 PUBLIC PARTICIPATION PROCESS

6.1 Objectives

The public participation process for the proposed project was designed to comply with the requirements of the EIA Regulations and NEMA (Table 2). The objectives of public participation are to provide sufficient and accessible information to I&APs in an objective manner to assist them to:

- Identify issues of concern, and provide suggestions for enhanced benefits and alternatives.
- Contribute local knowledge and experience.
- Verify that their issues have been considered.
- Comment on the findings of the assessment, including the measures that have been proposed to enhance positive impacts and reduce or avoid negative ones.

6.2 Stakeholder/I&AP profile

Table 11 lists the stakeholder profile registered on the database (Appendix E2) and Table 12 lists the organs of state that have been identified as key stakeholders. Note that as the public participation processes were run for BAs 3, 4, 5 and 6 simultaneously, the database contains individuals and groups associated with the N3 sections from all projects (including all municipalities affected).

Table 11 Sectors of society represented by I&APs on the direct mailing list

Government (National, Provincial and Local)
State owned companies (e.g. Telkom, Transnet, Eskom)
Utility providers with services in road reserve
Transport sector (taxis, buses)
Non-Governmental Organisations/Community Based Organisations
Private and institutional adjacent landowners
Local residents and businesses
Conservation authorities
Business and industry

Table 12 Authorities and organs of state identified as key stakeholders

Authority/Organ of State	Contact person	Tel No	Fax No	e-mail	Postal address
South African National Roads Agency Limited (SANRAL)	Mr R Ronny	033 392 8100	033 386 3365	ronnyr@nra.co.za	58 Van Eck Place, Mkondeni, Pietermaritzburg, KwaZulu-Natal
Department of Water and Sanitation (Licensing Dept)	Ms Zama Hadebe	031 336 2737 082 895 8445		hadebez@dws.gov.za	P O Box 1018 Durban, 4000
Department of Water and Sanitation	Ms Manisha Maharaj	031 336 2750 082 808 1191		thakurdinm@dws.gov.za	P O Box 1018 Pietermaritzburg, 3200
KZN Department of Transport	Mrs Judy Reddy	033 355 8600	033 342 3962	Judy.Reddy@kzntransport.gov.za	224 Prince Alfred Street Private Bag X9043 Pietermaritzburg, 3200
KZN Department of Economic Development, Tourism and Environmental Affairs	Reka Kalicharan	033 347 1820	033 347 1826	Reka.Kalicharan@kznedtea.gov.za	Private Bag X07, Cascades, 3202, Pietermaritzburg, KwaZulu-Natal
DAFF- KZN Forestry Regulations & Support	Miss Karen Moodley	033 392 7741	033 342 8783	KarenM@daff.gov.za	Private Bag X9029 Pietermaritzburg, 3200
AMAFA Heritage KwaZulu-Natal	Ms Bernadette Pawandiwa	033 394 6543	033 394 6552	bernadetp@amafapmb.co.za	P.O. Box 2685 Pietermaritzburg 3201
Ezemvelo KZN Wildlife	Ms Dineshree Thambu	033 845 1999	033 845 1499	thambud@kznwildlife.com	P O Box 13053, Pietermaritzburg, 3232
Dept. of Transport, Community Safety & Liaison	Mr Sibusiso Gumbi	033 355 8808	033 355 8021	sbusiso.gumbi@kzntransport.gov.za	Private Bag X9043, Pietermaritzburg, 3200
eThekweni Metropolitan Municipality (Engages with all Municipality Departments)	Mrs Diane van Rensburg	031 311 7136	031 311 7859	Diane.VanRensburg@durban.gov.za	PO Box 680, Durban, 4000

Authority/Organ of State	Contact person	Tel No	Fax No	e-mail	Postal address
Transnet Ltd	Mr Willy Joubert	035 906 7487		willie.joubert@transnet.net	
Transnet Pipelines	Mrs Khosi Zondi	031 361 1347	031 361 1346	khosi.zondi@transnet.net	PO Box 3113, Durban, 4001
uMgeni Water and Environmental Services	Ms Asha Ramjatan	033 341 1335	033 341 1349	asha.ramjatan@umgeni.co.za	310 Burger Street, Pietermaritzburg, 3201
Dept Co-operative Governance & Traditional Affairs	Ms Hlengiwe Phewa	033 355 6472	033 355 6424	hlengiwe.phewa@kzncogta.gov.za	Private Bag X9123, Pietermaritzburg, 3200
Department of Public Works	Mr T.L. Mchunu	033 897 1421/1422	033 897 1399	PA.RegionalManager@kznworks.gov.za / Thobiyisi.mchunu@kznworks.gov.za	10 Prince Alfred Street, Pietermaritzburg, 3201
Department of Rural Development and Land Reform	Ms Thembeka Ndlovu	033 355 4388		Thembeka.Ndlovu@drdlr.gov.za	200 Church St, Pietermaritzburg, 3201
Department of Human Settlements KZN	Mr Lindani Khoza	031 336 5316		Lindani.khoza@kzndhs.gov.za or Sli.zwane@kzndhs.gov.za	Legal Wise building, 199 Pietermaritzburg St, Pietermaritzburg, 3201
Department of Mineral Resources	Mr. Sandile Njapha	031 335 9604		sandile.njapha@dmr.gov.za	333 Anton Lembede St, Durban Central, Durban, 4001
Mkhambathini Local Municipality (Environmental)	Ms Elaine Donaldson	031 785 9341		DonaldsonE@mkhambathini.gov.za	Private Bag X04, Camperdown, 3720
Msunduzi Local Municipality (Environmental)	Ms Esmeralda Ramburran	033 392 2470		esmeralda.ramburran@msunduzi.gov.za	P.O. Box 321, Pietermaritzburg, 3200
Msunduzi Local Municipality (Planning)	Mr Atkins Khoali	033 392 2135	033 392 2576	nyakane.khoali@msunduzi.gov.za	Private Bag X321, Pietermaritzburg, 3200
Umgungundlovu District Municipality (Planning)	Ms Mandisa Khomo	033 897 6811		Mandisa.Khomo@umdm.gov.za	P O Box 3235, Pietermaritzburg, 3200

6.3 Project notification and invitation to participate

Notification of the project and the opportunity to participate in the Basic Assessment process was announced during May 2018. Notifications to I&APs were made available in two local languages, English and isiZulu. The process undertaken is described below and summarised in Table 13. All relevant documentation associated with the public participation is contained in Appendix E.

- Direct personal notification of **directly affected property owners** (where they have been contactable) has been undertaken to date by the responsible engineers along the relevant sections of roads. This refers to the owners of properties which SANRAL needs to acquire, where expansion to the existing road reserve is necessary and where the owner will be required to sell a portion of land to SANRAL. Wherever these property owners were contactable, these property owners were also sent information regarding the Basic Assessment process (see further below and Appendices E1 & E2 & E3). Please note that contact details for some property owners have not been available and the search for property owner details is ongoing.
- **Landowners adjacent to the site** – a deeds search was done to identify owners of several hundreds of properties adjacent to the affected sections of the N3, and all reasonable attempts were made to obtain current contact details. Many property owners own multiple properties and are in the form of Companies or Trusts, and several properties belong to the State or Municipality. Some are individuals. A letter, Background Information Document (BID) and comment sheet were posted to the identified addresses of owners and in the letter, the I&APs were requested to update their details for the database. Where addresses were not available or invalid (returned to sender) an sms was sent to the property owner (where cell numbers were available) (Appendix E4 provides proof of postage/bulk sms).
- Compilation of a **database of I&APs** (Appendix E2) identified as being potentially interested and/or affected, including authorities, municipalities, organs of state, ward councillors, conservation bodies, non-government organisations, landowners, local residents, etc. The registered I&APs from databases used for other recent projects (e.g. upgrade of the N3 Hammarsdale I/C and Proposed N3 Capacity Upgrades BA1 and BA2) were also included in the database, as relevant.
- **Personalised letters and electronic mail, including a Background Information Document** (Appendix E1) containing relevant details of the project and environmental application process were sent to all I&APs on the database. A comment sheet was provided for I&APs to update their contact details, register themselves on the database, to record issues and to send back by fax or email. Contact telephone numbers of the project public participation office were provided to enable direct telephonic liaison with the project team, if required.
- **Advertisements** (Appendix E1) were placed during 9-11 May 2018 in local, provincial and national newspapers (Table 13) providing project details and contact details of where to register and obtain further information:
 - The Maritzburg Fever (English).
 - The Citizen (English).
 - Ilanga (Zulu).
 - The Witness (English).
 - Intshonalanga Eyethu (Zulu).

- ❑ **Public notices** (A3 posters) (Appendix E1) were posted at the nearest public facilities such as public libraries and municipal offices and larger site notices were placed in selected areas adjacent to the N3. SANRAL does not allow notices to be placed directly along the side of their national roads as they can cause a safety hazard (distraction to motorists), thus, it was not possible to place notices directly on the site. This limitation was raised and discussed with DEA during the pre-application meeting.
- ❑ A **project website** containing relevant documentation was set up on www.acerafrica.co.za.
- ❑ SANRAL was provided with relevant information to place on the **SANRAL website and Facebook page**.
- ❑ During the project announcement phase between May and August 2018, one on one meetings were held with certain **key authorities** such as municipal environmental and planning departments, and the regional Department of Water and Sanitation (Appendix E6). The technical engineering teams have held direct meetings with the KZN Department of Transport and municipal transport departments as indeed the capacity upgrades constitute a joint planning exercise between all three road authorities.
- ❑ Three **Public Open Days** were held: Cato Ridge Golf Club, Vine Church at Lynnfield Park and Maritzburg Golf Club on 28, 29 and 30 May 2018, respectively. The dates of the Open Days were advertised in the media and invitation reminders circulated to all I&APs on the database.
- ❑ Receipt of comments from I&APs and acknowledgement of comments has been ongoing since project announcement in May 2018. Responses to these comments are in the **Comments and Responses Report** (Appendix E3).

Table 13 Summary of adverts and project notifications to the public and key stakeholders

Publication/event	Type	Placement date 2016
Maritzburg Fever	English Advert	9 May 2018
Citizen	English Advert	9 May 2018
Ilanga	Zulu Advert	10 May 2018
The Witness	English Advert	11 May 2018
Intshonalanga Eyethu	Zulu Advert	11 May 2018
A2 On Site Notices	6 (English) and 5 (Zulu)	11 May and 14 May 2018
A3 posters	20 English and 15 Zulu	11 May and 14 May 2018
Email and post to database	Letter (English and Zulu), Background Information Document (English) and comment sheet (English and Zulu)	Posted and Emailed 11 May 2018
ACER Project Website	BID, Comment Sheet and Letter including invitation to Open Days	11 May 2018 to date
Bulk SMS	Bulk SMS to send to remind the I&APs about the Public Open Days	24 May 2018
Public Open Days	Cato Ridge Golf Club Rhema Vine Ministries Maritzburg Golf Club	28 May 2018 29 May 2018 30 May 2018
Bulk SMS	Bulk SMS to send to remind the I&APs about the Public Open Days	24 May 2018

6.4 Summary of Issues Raised by I&APs

Table 14 provides a summary of issues raised by I&APs and the responses provided by the EAP. A full Comments and Responses Report is provided in Appendix E3.

Table 14 Summary of issues raised by interested and affected parties

Summary of main issues raised by I&APs	Summary of response from EAP
Increased noise during construction	<p>Construction activities will involve the use of heavy plant and equipment, which will generate noise, adding to the operational noise already generated by the N3. Construction noise will vary in intensity depending on the equipment being used at any given time. According to the noise specialist report for the Cato Ridge –Lynnfield Park section of the N3 (Appendix D), the Noise Control Regulations Standard of 65 db (A) is exceeded within 250 m – 280 m from the N3. According to the specialist report (Appendix D), construction noise (considered together with operational noise) will present an environmental noise problem to residences and schools around Cato Ridge and Camperdown, within 350-470 m of the work area at the time. Along the other sections of the N3, the area of concern varies but is up to 270 m from the road.</p> <p>Construction noise cannot be avoided and will negatively affect people situated close to the source. Also, the works will on occasions require construction during night time hours and on weekends, which will be a further disturbance on close receptors. In mitigation, construction noise will be managed by the contractors, with the aim of keeping noise nuisance to the best attainable minimum. Specifications are provided in a Noise Management Plan appended to the EMPr and include several control measures including liaison with affected parties, possibly limiting work hours, managing vehicles/equipment and noise monitoring.</p>
Increased noise during operation	<p>There will be increased noise during operations due to an increased number of vehicles using the N3. Noise generated by traffic on national roads is already high and over time, with the projected increase in traffic volumes, noise levels will increase. Noise levels will differ according to the topographical position of the receiver relative to the road (whether above or below the road), weather conditions and depending on whether any physical barriers to sound are located between the road and receiver (walls, other houses, vegetation, banks, etc). Steep sections of road may generate more noise due to heavy vehicles having to engage lower gears and/or air brakes. According to the specialist report, for the N3 between Cato Ridge and Lynnfield Park, the 65 dB Noise Control Regulations standard is exceeded within 250-280 m from the N3.</p> <p>It is not possible to eliminate noise next to a national road and owners who have chosen to purchase properties adjacent to the N3 have done so being aware of the road, existing noise and the potential for noise levels to increase over time (due to growth in traffic volumes and decreased distance from properties when necessary expansion of roads is undertaken to accommodate traffic growth). However, there are several measures that can be implemented to reduce noise. These</p>

Summary of main issues raised by I&APs	Summary of response from EAP
	<p>include using low noise road surface and the construction of barriers.</p> <p>The road surfacing will include either asphalt or concrete on different packages. SANRAL is considering ultra-thin wearing surfaces which are low-noise surfaces. They are also investigating other noise limiting surfaces and will apply the one best suited to the area. For barriers (walls, earth berms, etc), their effectiveness is dependent on the location, height and distance between the noise source and the receiver. Noise barriers are effective in reducing the level of noise received on severely impacted locations close to the road provided the barrier screens the receivers' (ground floor and upper floors) windows from the noise source. Their effectiveness is good near the source and decreases with distance. The design engineers, in conjunction with an acoustic specialist, are investigating the feasibility of barriers in areas where noise is anticipated to be particularly problematic.</p> <p>Home and business owners may be able to reduce noise levels on their properties by erecting walls around their properties and using double glazing on windows. An evaluation of the noise source should be undertaken first so that optimum measures can be put in place. According to the noise specialist, the use of hedges and vegetation generally provides little noise reduction.</p>
<p>Effect on property values</p>	<p>The effect on property values will differ according to each individual circumstance and can be influenced by multiple factors. Generally, properties increase in value over time but the rate at which they increase will be influenced by the nature of the area and trend in surrounding land uses. Where an owner has purchased property adjacent to an existing national road, this is presumably done in awareness of noise as well as the current and future disadvantages of such a location (such as increase in noise levels and encroachment due to road widening). Properties adjacent to national roads are, for these reasons, generally lower in value and less expensive to purchase. However, depending on the nature of the property and its use, and proximity and access to the national road, the location may be advantageous and a widened national road may not devalue the property. For example, easy access to a national road often adds value to business and institutional premises.</p> <p>Where land is to be acquired, SANRAL will negotiate with each land owner as part of land acquisition. The valuator takes into account individual circumstances and potential financial losses caused by acquisition. SANRAL will compensate land owners at fair market value for the land they purchase and may compensate for financial losses in line with applicable legislation, viz. The Constitution, Section 25 (3) and Expropriation Act (Act 63 of 1975).</p> <p>In terms of the Expropriation Act, compensation is not payable for the perceived or real devaluation of properties.</p>

Summary of main issues raised by I&APs	Summary of response from EAP
Numerous individual queries from property owners as to whether the road widening will affect their properties and businesses adjacent to the upgrades	The EAP has responded to all individual queries with information to indicate the footprint of construction in relation to individual properties. Where requested, further information has been provided by the engineers involved.
Various questions relating to specific interchanges, roads and accesses were raised by individuals	The EAP has responded to all individual queries in the Comments and Responses Report.
Increased dust during construction	The contractor will implement dust control measures during construction, in accordance with the specifications of the EMPr.
Refer to Environmental Management Frameworks in the assessment	The Msunduzi EMF and uMgungundlovu draft EMF have been taken into consideration in the biodiversity assessments.
Linkages to the Cato Ridge Logistics Hub	This proposed development is subject to separate investigations and licensing processes by the Cato Ridge Logistics Hub Consortium (CRLHC). All queries relating to this development have been forwarded to the CRLHC. However, it should be noted that if the proposed new interchange near the D12 is constructed, it will affect the existing Cato Ridge I/C in that the east facing ramps will need to be closed. This issue will be further investigated and reported on in BA3 (N3 Hammarsdale-Cato Ridge).
Loss of trees on boundaries	Existing tree barriers would need to be replaced or alternative barriers established.
Employment of local labour and use of local contractors	SANRAL's procurement policies require the optimisation of the use of local labour. The sourcing of labour will be done by contractors within the provisions of these policies. In terms of SANRAL's 14 point plan, a structure will be established, including municipal representation for employment, labour, small contractors and suppliers.
Impact of project on boundary walls, fences and banks of adjacent properties	Existing fences (and boundary walls) between the N3 and neighbouring properties will be protected. Where land is being acquired due to expansion of the road reserve and existing fences and boundary walls need to be removed, SANRAL will provide a new fence/wall to the minimum standard of the current fence/wall, as part of the works contract. This will be at SANRAL's cost. Any affected banks in the road reserve will be stabilised to the required standard.
Damage/cracks to buildings	Where it can be proven that construction activities have resulted in cracks or damages, SANRAL, through the appointed contractors, will be liable for compensation or repairs. Prior to any potentially damaging construction activities, e.g. blasting, the contractors will undertake asset condition surveys to establish the baseline condition of potentially affected infrastructure. Any reported damages will be evaluated in terms of this baseline.
Damage to windows and structures as a result of blasting	If blasting is required, all potentially affected parties will be informed prior to any blasting taking place. Improved blasting techniques allow for more controlled blasts, with impacts being confined to small targeted areas. Controlled blasting will be done in accordance with

Summary of main issues raised by I&APs	Summary of response from EAP
	relevant legislation and due regard for the proximity of structures that may be vulnerable to vibrations from the blast. Photo reports pre- and post-blasting can be requested for infrastructure in very close proximity to the blast area to support any damage claims.
Vibrations on windows and doors from heavy vehicles passing, during operation	The widening of the road may result in the source of vibrations passing closer to residences. However, the improved road surface may well reduce vibrations as it is usually a rough or uneven road surface which can cause vibration. Regular maintenance and ensuring that uneven surfaces are repaired will help reduce vibrations.
Increased security risks/crime during construction including at properties located near site camps	It is possible that security risks will increase during construction, due to an influx of workers and a potential increased opportunity for criminals. Crime is more likely to occur where properties are located in proximity to construction activities and where existing fencing is required to be removed and replaced in closer proximity to residences or business premises. During construction, measures will be put in place by the contractor to help minimise security risks. This will include strict control of staff, identification of staff and maintenance of boundary fencing (including provision of temporary fencing if required). No staff (except security) will be accommodated overnight at site offices/stockpile sites. These measures are stipulated in the EMPr.
Increased health and safety risks during construction, where there is proximity of construction to houses and properties	Property boundary fences will remain in place during construction to provide a barrier between properties and construction activities. Where boundary fences have to be moved, they will be reinstated prior to the commencement of construction. Health and safety risks during construction will be managed by the contractor and will include various measures required in terms of the Construction Regulations under the Occupational Health and Safety Act, 1993 (Act 85 of 1993) as well as relevant specifications in the EMPr. An important component of safety during construction will be the management of traffic according to an approved Traffic Management Plan.
Safety risks to properties and houses due to proximity to freeway during operation (from vehicle accidents)	Boundary fences will be retained between the road reserve and neighbouring properties. Where there are currently no walls and the need for such is indicated for safety reasons, these will be erected as part of the works for the construction of the N3. Similarly, where the need is indicated, guardrails, screens, etc, will be constructed for purposes of enhancing safety of road users and those living adjacent to the N3. The proposed upgrade of the N3, by providing additional lanes and improving road safety through design, will contribute to a safer national road which should assist in reducing the risk of accidents. However, driver error cannot be controlled and accidents do occur. Where these cause damages to third parties, police investigations will inform courts of law as to who is the liable party. Insurances (private, company, third party and/or the road accident fund) are in place for monetary compensation.
Land acquisition process and compensation	Where land is to be acquired to accommodate widening, SANRAL negotiates with each land owner as part of land acquisition and takes into account their individual circumstances and potential financial losses caused by expropriation. SANRAL will compensate land owners at fair market value for the land they purchase and may compensate for financial losses in line with applicable legislation, viz. The Constitution, Section 25 (3) and the Expropriation Act.

Summary of main issues raised by I&APs	Summary of response from EAP
Compensation values used for land purchase	All SANRAL's land acquisition is undertaken within the provisions of the applicable laws at the time. The land values are based on market value in the area at the time of negotiations. Several factors are taken into account by professional valuers and final rates negotiated with affected property owners on an individual basis. Should either party feel aggrieved, the matter can be referred to a court of law for a decision.
Control of stormwater	<p>Control of stormwater during operation forms a key part of the road design. According to the design engineers, the total catchment areas feeding all the cross-drainage structures will not increase. The runoff, however, will increase by a very small margin due to the relatively high runoff on the additional road surface width. In comparison to the total stormwater runoff, this is minimal and the culverts crossing the road will be operating at very similar runoffs as in the past. All the stormwater which runs off the road surface is accommodated in lined stormwater channels adjacent to the road surface. The concentration of stormwater from the concrete side drains is mitigated by the construction of energy dissipaters which ease the flow of water into the natural streams.</p> <p>Stormwater management plans will be in place for each construction contract. A generic stormwater management plan is appended to the EMPr but specific stormwater management specifications are provided by the engineers for each contract and must be approved by SANRAL.</p>
Use of rail to alleviate congestion, high accident risk and high maintenance costs caused by heavy vehicles on national roads	The South African government recognises the need to introduce an efficient rail freight service to reduce truck traffic long term, ease the traffic burden on road networks and at the same time enhance the longevity and quality of roads. A migration from road to rail will improve road safety and decrease road maintenance costs. Currently, 22% of freight is moved by rail and government intends to double this. However, given the major role that roads play in South Africa, being able to migrate from road to rail is a long term venture and dependency on road transport will still continue even after required rail upgrades take place. Also, it is to be noted that freight will travel on the best mode of transport for convenience and cost effectiveness, which road based transport currently offers.
Lighting along the N3	Internationally, it has been shown that lighting does reduce the number of accidents on freeways dependant on the volumes of traffic. Due to the substantial volumes of vehicles between Durban and Pietermaritzburg (between 45,000 – 110,000 vehicles per day) including a high percentage of heavy vehicles, lighting will reduce the number of light vehicle accidents during night conditions. Light efficient luminaries, e.g. LEDs are being investigated.
Traffic management during construction	Traffic management plans will be in place for all sections of the N3 under construction which provide for continuity of access, minimising disruption of traffic and safety risks, including maintaining access for emergency vehicles. A minimum of two lanes shall be open to traffic in each direction at all times. A generic Traffic Management Plan is appended to the EMPr but actual plans will be site-specific along and within the different sections of the N3 under construction. Final plans

Summary of main issues raised by I&APs	Summary of response from EAP
	will be submitted by the contractors to the Engineers, for approval prior to construction.
Impact on schools	Various schools in the Pietermaritzburg area will be impacted due to road widening requiring all or parts of the property, affecting access and/or leading to increased noise levels as well as nuisance impacts during construction. SANRAL is negotiating directly with the schools to find solutions for alternate land, access, etc. Issues affecting close neighbours to the N3 such as increased noise, dust, etc are discussed elsewhere in this table. Refer also to the Comments and Responses Report, Appendix E3, where more detail is provided.
Air emissions and health	The increase in vehicle emissions results from an increase in traffic volumes over time and is not a direct impact of the widening of the N3. When the road is widened, the source of vehicle emissions (carbon dioxide and nitrous oxide) will encroach closer to residences than previously and will cumulatively contribute to existing air pollution levels. However, the concentrations/dilution of emissions and other air pollutants at different positions along the N3 will vary depending on topography, prevailing winds and weather conditions. Where congestion is eased and traffic flows freely, vehicle emissions should decrease in areas where there was previously congestion.
Loss of privacy	People choose to live adjacent to or near national roads and, when doing so, must be aware of the consequences, including the possible widening of the road. It is the responsibility of individual land owners to secure their own privacy. Nevertheless, where the need is indicated for safety purposes, SANRAL will build walls (or similar structures) between the N3 and private properties.
Maintenance of the Road Reserve	SANRAL has a Routine Road Maintenance team in place which maintains the road reserve. Areas of concern should be reported to SANRAL, Eastern Region, RRM Division, responsible maintenance engineer (033 392 8100).
Location of site camps and stockpile areas	These will be decided by contractors and, as far as possible, will be located within the road reserve. Environmental guidelines for the siting of contractors' infrastructure and services are provided in the EMPr.
Traffic studies	The capacity improvements to the N3 are underpinned by a comprehensive traffic assessment undertaken during detailed design. As soon as the detailed design reports have been completed, they may be requested from SANRAL.
Interruption of services/utilities	Where services need to be relocated out of the road reserve, this will be done in full consultation with the service provider/owner. Service relocations will be done in accordance with the relevant requirements and conditions as agreed between SANRAL and the service providers/owners. The service provider/owner will notify customers of scheduled interruptions when disconnections and connections occur.
Increase in traffic on local roads	Traffic studies have taken into consideration pressure on local roads and where necessary, these will be upgraded to accommodate the additional traffic attraction and some of the smaller local access streets will be reconfigured to restrict access to residents only.

Summary of main issues raised by I&APs	Summary of response from EAP
Impacts on biodiversity	Specialist assessments have been undertaken to identify impacts on vegetation and riparian/wetland areas. While the N3 is an existing corridor with adjacent road reserve having been previously disturbed, the N3 runs through various areas considered to be Critical Biodiversity Areas in terms of conservation planning. It also crosses various rivers, streams and wetlands. These areas provide important habitat for fauna and flora, including protected species. SANRAL's design seeks to minimise the amount of additional land required for widening, therefore, limiting vegetation clearance from adjacent areas. Indeed, the majority of land needed for widening will come from the median and the existing road reserve. Prior to vegetation clearance ahead of construction, there will be a plant rescue and relocation exercise undertaken to conserve notable species. Where possible, fauna will be relocated. Maintenance of natural drainage patterns and erosion protection measures are taken into account in the design to limit impacts on aquatic and terrestrial habitat. Several mitigation measures have been identified to limit impacts on biodiversity and natural habitat during construction. These are specified in the EMPr.
Impacts on cultural heritage	Specialist assessments have been undertaken to identify impacts on cultural heritage along the N3 corridor to be widened. No heritage resources have been identified along this section of the N3. Should any cultural heritage artefacts or graves be encountered during construction, works in the affected area will be stopped and Amafa will be notified.
Realignment of water and fuel pipelines	Realignment of short sections of pipelines is required along some sections of the N3 between Hammarisdale and Pietermaritzburg to accommodate the capacity upgrades. This will be planned, coordinated and implemented in conjunction with the service provider. SANRAL will comply with all legislative and regulatory requirements.
Notification of the public regarding construction activities, prior to and during construction	The public will be notified of construction activities by the contractor. During construction, contract boards are posted at either end of the road section under construction. They list the details of the project, the start and end dates as well as the relevant contact numbers for the Traffic Safety Officer. Should there be specific closures, demolition, blasting or other activities, these will be communicated via media advertisements as well as additional construction information boards.

6.5 Circulation of draft BAR for public review

- ❑ Stakeholders on the project database (registered stakeholders) were notified of the availability of the draft BAR & EMPr for comment, for a period of 30 days (all I&APs including authorities). Notification was done by post, email and sms.
- ❑ The documents were made available on ACER's website www.acerafrica.co.za.
- ❑ Hard copies of the draft BAR and EMPr were made available at the following public libraries: Cato Ridge Public Library, Camperdown Public Library and Ashburton Public Library.
- ❑ Hard copies and/or CDs of the draft BAR & EMPr were provided to key municipalities and organs of state which include: eThekweni Metropolitan Municipality, eThekweni Transport Authority, Mkhambathini Local Municipality (Planning), Msunduzi Local Municipality (Planning and Environmental Units), Umgungundlovu District Municipality (Planning), Amafa, KwaZulu-Natal, Department of Economic Development, Tourism and Environmental Affairs, KZN Department of Transport, Department of Agriculture, Fisheries and Forestry (Forestry Department), Department of Water and Sanitation, Department of Minerals and Energy and the National Department of Environmental Affairs.
- ❑ CDs were made available to key stakeholders affected by the project.

6.6 Public and authority review comments incorporated into the final BAR (BA4)

- ❑ Comments submitted on the draft BAR will be recorded and responded to in the DBAR Comments and Responses Report, and matters raised will be addressed in the Final BAR, where appropriate.

7 ASSESSMENT METHODOLOGY

7.1 Identification and assessment of significance of key issues and impacts

Issues and potential impacts of the project on the environment (and *vice versa*) were identified by way of field investigations, desktop studies and interaction with I&APs. Key issues and impacts requiring further investigation were addressed by specialist studies (Appendix D) and/or further detailed input from the environmental and technical teams. Specialist studies were guided by Terms of Reference ¹⁴(Appendix D) to ensure that issues and associated impacts were correctly identified, understood and addressed, thereby enabling an integrated assessment of the development proposal. Mitigation measures were identified with inputs from I&APs, the specialists, the design engineers and the EAP team. Information was collated, evaluated and integrated. Thereafter, the significance of each impact was assessed using the assessment conventions outlined in Table 15 (in line with the requirements of the EIA Regulations). It should be noted that the significance of an impact is a function of all the attributes outlined in Table 15, and the relationships between them. The assessment conventions are applied qualitatively by the EAP, based on an understanding of the receiving environment, the proposed project components and activities, and the information gathered from different sources, including specialists and the public.

7.2 Assumptions, limitations and gaps in knowledge

7.2.1 General assumptions, limitations and gaps in knowledge

- ❑ It is assumed that technical data supplied by the applicant and its appointed engineers are correct and valid at the time of compilation of the BAR. It must be noted that all designs were not necessarily final.
- ❑ It is assumed that data supplied by external institutions were correct and valid at the time of compilation of the specialist reports and the BAR.
- ❑ While every effort was made to directly contact all affected landowners and adjacent landowners, there were cases where current contact details could not be obtained. However, it is assumed that the widespread advertising, public notices and delivery of flyers to numerous households adjacent to the N3, would serve to notify the public at large.

7.2.2 Specialist assumptions, limitations and gaps in knowledge

The assumptions, limitations and gaps in knowledge stated in the specialist reports are listed below.

Social Impact Assessment

Assumptions

- ❑ All information, including maps, provided by SANRAL is accurate.
- ❑ It is not the purpose of this SIA report to quantify resettlement impacts. If necessary, this will take place immediately following the receipt of Environmental Authorisation and the completion of detailed design.
- ❑ The project will not undergo decommissioning and, as such, social impacts during decommissioning have not been considered.
- ❑ The information provided herein will be adequate for effective decision-making in the EIA process.

¹⁴ Terms of Reference for each specialist are contained in their relevant reports. Terms of reference for updating each of these studies are provided in Appendix D7.

Table 15 Conventions applied to the impact assessment

Criteria	Rating Scales	Definition
Nature	Positive	This is an evaluation of the overall impact of the construction, operation and management that the proposed N2/N3 upgrades would have on the affected environment (social, biophysical and economic)
	Negative	
	Neutral	
Spatial extent	Low	Site-specific, affects only the development footprint
	Medium	Local (< 2 km from site)
	High	Regional (within 30 km of site) to national
Duration	Very low	Temporary (less than 1 year)
	Low	Short term (1-4 years, i.e. duration of construction phase)
	Medium	Medium term (5-10 years)
	High	Long term (impact will only cease after the operational life of the activity) to permanent
Intensity	Low	Negligible alteration of natural systems, patterns or processes
	Medium	Noticeable alteration of natural systems, patterns or processes
	High	Severe alteration of natural systems, patterns or processes
Irreplaceability of resource caused by impacts	Low	No irreplaceable resources will be impacted (the affected resource is easy to replace/rehabilitate)
	Medium	Resources that will be impacted can be replaced, with effort
	High	Project will destroy unique resources that cannot be replaced
Reversibility of impacts	Low	Low reversibility to non-reversible
	Medium	Moderate reversibility of impacts
	High	High reversibility of impacts
Consequence (a combination of spatial extent, duration, intensity and irreplaceability of impact on resources).	Low	A combination of any of the following: - Intensity, duration, extent and impact on irreplaceable resources are all rated low - Intensity is low and up to two of the other criteria are rated medium - Intensity is medium and all three other criteria are rated low
	Medium	Intensity is medium and at least two of the other criteria are rated medium
	High	Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration Intensity is rated high, with all of the other criteria being rated medium or high
Probability (the likelihood of the impact occurring)	Low	It is highly unlikely or there is a less than 50% chance that an impact will occur
	Medium	It is between 50 and 75% certain that the impact will occur
	High	It is more than 75% certain that the impact will occur or it is definite that the impact will occur
Significance (all impacts including potential cumulative impacts)	Low	Low consequence and low probability Low consequence and medium probability Low consequence and high probability
	Medium	Medium consequence and low probability Medium consequence and medium probability Medium consequence and high probability High consequence and low probability
	High	High consequence and medium probability High consequence and high probability

- ❑ The impact assessment conventions (Table 15) are more applicable to the biophysical environment. Therefore, for social/socio-economic impacts, the SIA practitioner has applied professional judgement to the conventions to arrive at the assessment of impact significance.

Limitations

- ❑ As statistical data can only be obtained at a ward level, they do not necessarily represent the socio-economic conditions occurring within the project footprint.

Gaps in knowledge

- ❑ The engineering designs are yet to be finalised and, thus, some alterations are to be expected.
- ❑ The exact number of jobs and the breakdown of skilled, semi-skilled and unskilled is not available.
- ❑ Future plans by Transnet, regarding the development of rail infrastructure for the transportation of freight to reduce pressure on road infrastructure, are unknown.

Cultural Heritage Resources Impact Assessment

Assumptions

- ❑ The description of the proposed project provided by the client is accurate.
- ❑ The public consultation process undertaken as part of the Environmental Impact Assessment is sufficient and adequate and does not require repetition as part of the heritage impact assessment.

Limitations

- ❑ Soil surface visibility varied from good to non-existent. Heritage resources might be present below the surface or in areas of dense vegetation and we remind the client that the NHRA requires that a developer cease all work immediately and observe the protocol in Section 9 of this report (the specialist study report) should any heritage resources, as defined in the Act, be discovered during the course of development activities.
- ❑ No subsurface investigation (including excavations or sampling) were undertaken, since a permit from Amafa is required to disturb a heritage resource.
- ❑ Stopping or parking of vehicles and walking are not allowed on the N3 and the minimum speed allowed on the N3 is 60 kilometres per hour.
- ❑ A key concept in the management of heritage resources is that of non-renewability: damage to or destruction of most resources, including that caused by bona fide research endeavours, cannot be reversed or undone. Accordingly, management recommendations for heritage resources in the context of development are as conservative as possible.
- ❑ Human sciences are necessarily both subjective and objective in nature. eThembeni staff members strive to manage heritage resources to the highest standards in accordance with national and international best practice but recognise that their opinions might differ from those of other heritage practitioners.
- ❑ Staff members involved in this project have no vested interest in it; are qualified to undertake the tasks as described in the terms of reference; and comply at all times with the Codes of Ethics and Conduct of the Association of Southern African Professional Archaeologists and the Association of Professional Heritage Practitioners (SA).
- ❑ eThembeni staff members take no personal or professional responsibility for the misuse of the information contained in this report, although they will take all reasonable precautions against such misuse.

Vegetation Ecology Impact Assessment

Assumptions

The following assumptions have been made regarding affected areas and associated impacts on vegetation, and assumes a worst-case scenario:

- ❑ All vegetation within the existing road reserve will be cleared during construction.
- ❑ All areas within proposed extensions to the road reserve will be completely destroyed during construction.
- ❑ Habitat degradation is likely to occur directly adjacent to cleared areas, due to edge effects that will manifest over time once construction activities have commenced.

Limitations

It is important to note that the original field survey was undertaken in late summer (i.e. February 2012), and the true botanical diversity present is under-represented by this study, particularly amongst the herbaceous plants. However, all effort was made to identify Red Data, specially protected and other important species, and surrounding land use and condition of natural vegetation were surveyed to identify levels of disturbance and potential biodiversity issues. A second field survey was undertaken in May 2018 to assess additional areas for the proposed N3 extension – timing from a botanical perspective was, therefore, suboptimal in terms of identifying and locating sensitive species. In some cases, for example, where grass cover was tall and dense, detection of plants was limited, in comparison to other areas where grass cover has been reduced through fire and grazing. This said, edge effects caused by the existing road reserve have no doubt compromised the plant species composition over all the years to the extent that natural vegetation within and adjacent to the existing road reserve is generally degraded, supporting few and/or isolated occurrences of conservation important plant species.

Wetland and Riparian Impact Assessment

Assumptions

Studies relating to natural ecosystems and understanding historical conditions rely on various assumptions, with the following assumptions being made during the assessment of these particular wetland and riparian systems:

- ❑ The reference benchmark vegetation of the wetlands and riparian areas within 500 m of the road reserve are considered to consist of Dry Coast Hinterland Grassland (Gs 19), KwaZulu-Natal Hinterland Thornveld (SVs 3), Eastern Valley Bushveld (SVs 6), Southern Mistbelt Forest (FOz 3), Eastern Temperate Freshwater Wetlands (AZf 3) and Highland Alluvial Vegetation (Aza 5), within the Sub-Escarpment Savanna (SVs)
- ❑ The final development layout would remain within the indicated proposed development footprint.
- ❑ The development foot print provided was accurate.
- ❑ The pre-upgrade condition of all sites was already impacted by the current N3 operation.

Limitations

- ❑ Due to time and budgetary constraints, wetland and riparian areas were delineated at a desktop level and were verified infield.
- ❑ The original assessments were done in Summer of 2012, and the 2018 update assessments were done at the beginning of Autumn following a period of good rains and riparian vegetation was in a moderately good condition for identification.
- ❑ Riparian and wetland areas were only assessed within the 50 m buffer of the footprint area as per the original TOR.
- ❑ The determination of risk was confined by the choices available within the risk assessment matrix as per appendix A of Government Notice 509 of 2016.

Noise Assessment

- This assessment evaluated the noise levels over specific periods. These results are based on the road traffic at times of assessment and also on the activity. In most instances normal road operations occurred.
- This assessment updated the findings and compared the results to those provided in a previous assessment and the road noise level predictions.
- Data provided by the client were used. Where no data could be provided, the assessment used normal or project or potential from other recognised sources.

8 INTEGRATED DESCRIPTION OF ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

The key issues identified and assessed during this Basic Assessment were formulated as eight questions:

- ❑ What economic and socio-economic benefits will result from the proposed widening/capacity improvements to the N3, at a local, regional and national scale?
- ❑ What effects will the proposed widening/capacity improvements to the N3 have on adjacent properties, infrastructure and services, and *vice versa*?
- ❑ What potential health, safety, security and other nuisance impacts may be experienced as a result of the proposed widening/capacity improvements to the N3 during construction?
- ❑ What potential negative impacts will the proposed widening/capacity improvements to the N3 have on the social environment during operation?
- ❑ What effects will the proposed widening/capacity improvements to the N3 have on cultural heritage resources?
- ❑ What effects will the proposed widening/capacity improvements to the N3 have on the biophysical environment and biodiversity (water, soils, riparian, wetland and terrestrial natural habitat, fauna) during construction, operation and rehabilitation?
- ❑ What potential cumulative impacts can result from the proposed widening/capacity improvements to the N3?
- ❑ What are the impacts of the No Development Alternative (not implementing widening/capacity improvements to the N3)?

Potentially significant impacts associated with each of the above issues (including cumulative impacts) are discussed in the sections below. The assignment of significance ratings to impacts (where applicable), according to the assessment conventions (Table 15), is provided in Chapter 9 (Tables 16 - 22).

8.1 What economic and socio-economic benefits will result from the proposed widening/capacity improvements to the N3, at a local, regional and national scale?

A summary of impacts (incorporating a summary of specialist findings as applicable) is provided below, including recommended measures for management/mitigation of impacts. For further detail, please refer to the Social Impact Assessment specialist report (Appendix D). According to the assessment, the various positive impacts during construction are considered to be of a low significance and the positive impacts during operation, of medium significance, without management. With management, the impacts during construction and operation are likely to be of medium and high significance, respectively (Table 16 in Chapter 9).

8.1.1 Employment creation

During the planning, design and construction phases, economic and socio-economic benefits will accrue locally, regionally and nationally through project spend, with the entire N3 upgrade estimated to be in the region of R 17.64 billion (2018 Rand, excluding VAT). Of this, the targeted local labour component will be 8%, equating to an estimate of R 1.41 billion and small contractor involvement of 30%, equating to R 5.29 billion. There will be increased opportunities for temporary employment (albeit largely unskilled and semi-skilled positions) and capacity building for individuals, local contractors, SMMEs and service providers. In addition, opportunities will be created for informal traders, which will have positive economic impacts.

8.1.2 Improved road network, stimulation of the economy and achieving SIP 2 goals

An efficient and effective road network is critical to sustain economic growth and development. As such, to accommodate increasing traffic volumes, upgrading of roads as well as regular maintenance are essential. There are numerous positive and wide reaching social and socio-economic effects that provision of a high quality and safe road network have on the economy and the daily lives of people in general. As indicated in Section 1.2 of this report, this project forms part of national infrastructure (National Infrastructure Plan - Strategic Infrastructure Project 2¹⁵) to strengthen the logistics and transport corridor between SA's main industrial hubs and improve access to Durban's export and import facilities. The successful implementation of the project will, therefore, have numerous cumulative wide-ranging economic and socio-economic benefits as a result of *inter alia*:

- ❑ Improved road safety.
- ❑ Reduced travel time (reduced traffic congestion and improved road).
- ❑ Improved transport network and corridor.

8.1.3 Potential positive economic and socio-economic impacts and recommended measures for management (enhancement)

Pre-construction and construction

- ❑ Increased employment creation/opportunities for local contractors and SMMEs and informal traders (all project phases):
 - Ensure that, wherever possible, labour is sourced locally.
 - Sub-contractors, SMMEs and service providers should be sourced locally where the requisite skills exist.
 - Conduct procurement in accordance with the Preferential Procurement Policy Framework Act, specifically Section 10, pre-qualification criteria for preferential procurement, which stipulates that a required value of the contract must go to Exempted Micro Enterprises and Qualifying Small Business Enterprises which, as a minimum, are Black owned. These criteria are likely to enhance the potential positive impacts for local contractors and SMMEs. This will be addressed via the Contract Participation Goals in the contract documents which assist the Targeted Enterprises.

Operation

- ❑ Improved transport corridor and road conditions:
 - Provide budget to beautify the road reserve with appropriate (aesthetic but low maintenance) indigenous plant species (noting that the aloes currently on the existing reserve should be relocated to the remaining or new road reserve, as far as possible).
 - In conjunction with the relevant Municipalities, develop a database of all locally based service providers.
 - Ensure budget is provided for regular road and road reserve maintenance, and that this is implemented timeously in a cost effective manner.

¹⁵

SIP 2: Durban-Free State-Gauteng Logistics and Industrial Corridor

Strengthen the logistics and transport corridor between SA's main industrial hubs; improve access to Durban's export and import facilities; integrate Free State Industrial Strategy activities into the corridor; new port in Durban; Aerotropolis around OR Tambo International Airport.

8.2 What effects will the proposed widening/capacity improvements to the N3 have on adjacent properties, infrastructure and services and *vice versa*?

A summary of impacts (incorporating a summary of specialist findings as applicable) is provided below, including recommended measures for management/mitigation of impacts. For further detail, please refer to the Social Impact Assessment specialist report (Appendix D). According to the assessment, the impacts on adjacent properties, infrastructure and services are of low, medium and high significance, without management. With management, the impacts are considered to be of low significance (Table 17 in Chapter 9).

8.2.1 Increased interaction with owners and residents of adjacent properties

During the planning phase, adjacent landowners (depending on the location of their properties) may be contacted and required to interact with engineers, land acquisition teams and/or other investigative teams (e.g. geotechnical) who may require access to properties. Where adjacent properties are required by SANRAL for road widening, SANRAL's land acquisition team will enter into negotiations with landowners.

8.2.2 Property loss, compensation, resettlement, effect on property values and businesses

SANRAL's design seeks to minimise the amount of land that must be acquired. However, to meet the required technical and safety standards, some land acquisition will be unavoidable. The project will result in the permanent loss of portions of some adjacent, privately owned properties, and encroachment of a busy national road closer to existing residences, which may affect property values. The effect on property values will differ according to each individual circumstance and can be influenced by multiple factors. Generally, properties increase in value over time but the rate at which they increase will be influenced by the nature of the area and trend in surrounding land uses. Where an owner has purchased property adjacent to an existing national road, this is presumably done in awareness of noise as well as the current and future disadvantages of such a location (such as increase in noise levels and encroachment due to road widening). Properties adjacent to national roads are, for these reasons, generally lower in value and less expensive to purchase. However, depending on the nature of the property and its use, and proximity and access to the national road, the location may be advantageous and a widened national road may not devalue the property. For example, easy access to a national road often adds value to business and institutional premises. Where land is to be acquired, SANRAL will negotiate with each land owner as part of land acquisition. The valuator takes into account individual circumstances and potential financial losses caused by acquisition. SANRAL will compensate land owners at fair market value for the land they purchase and may compensate for financial losses in line with applicable legislation, viz. The Constitution, Section 25 (3) and the Expropriation Act (Act 63 of 1975).

In terms of the Expropriation Act, compensation is not payable for the perceived or real devaluation of properties.

Some residents or businesses may be required to move if SANRAL needs to procure a large proportion of the property. Where SANRAL needs to acquire the entire property, property owners will be bought out and will need to relocate. Where formal property owners have unlawfully encroached into the road reserve, either with buildings or fences, they may lose these structures without compensation.

The densely packed row of businesses located adjacent to the north-eastern side of the N3, just west of the Camperdown I/C, will not be directly affected by land acquisition. In this area, acquisition of land will take place on the opposite side of the N3.

8.2.3 Disruption of access to businesses

Businesses (and residents) that rely on access from the N3 will be affected during the construction period, insofar as roadworks will slow down travel times, which will need to be factored into their day to day planning, as relevant. Access to properties will be maintained at all times during construction. Should road closures occur, alternative access will be provided. Should it be necessary to work directly across a driveway to a property, the occupants will be notified in advance so that inconvenience will be minimised.

Access to RCL Foods Hatchery No 3 is via an existing access underpass under the N3, north of Umlaas Road, which has a restricted bridge height (lower than 4 m). Access has been raised by RCL Foods as a concern with SANRAL engineers, both in terms of possible closure of this access during the construction period and a request to consider the possible lowering of the existing access road to raise the height of this underpass in the future (operation phase). This matter is receiving attention from SANRAL and will require input from the KZN Department of Transport to find suitable solutions, with further consultation also required with RCL Foods.

8.2.4 Damage to/disruption of services and infrastructure in and adjacent to the road reserve

During construction, there is the potential for incurring damage to boundary fences/walls and banks of adjacent properties. Where adjacent roads are affected by construction works (or gaining access to construction works), damage may be incurred. Existing services and infrastructure below and on the surface of the road reserve may need to be excavated/removed disconnected and relocated, which may cause temporary disruptions to services (e.g. water/electricity/telecommunications). This will be dealt with by SANRAL's appointed engineers and the relevant authorities/service providers; landowners will be kept informed.

8.2.5 Increased pressure/disruptions on adjacent roads and alternative routes

As a result of construction activities, construction vehicles may be required to use provincial or municipal side roads for access. Traffic may need to be deviated onto provincial and municipal roads during roadworks involving blasting or demolition. These alternative roads/routes may deteriorate and will have to be repaired and maintained on a more regular basis, by the contractor. SANRAL is currently in discussions with the KZN Dept of Transport in terms of critical sections of the R103 that need to be repaired¹⁶ before the N3 construction can commence. This will create extra nuisance for residents/business owners who use these roads daily. In addition, the alternate roads are also likely to become increasingly congested due to people attempting to avoid the construction activities, thereby further exacerbating the pressure on these routes.

8.2.6 Impact on Fairview Road

The eastern end of Fairview Road is to be realigned (Figure 3). However, Fairview road will only require realignment in Phase 2 when the Camperdown I/C is upgraded (approx 2030). This end of the road does not directly impinge on adjacent residences and the realignment will affect sugar cane land. However, the last (east most) house will be located in close proximity to the works. Fairview Road residents will be affected by construction vehicles travelling along Fairview Road to reach the site and are likely to experience some of the nuisance impacts discussed in Section 8.3. Management of these impacts will be required, as discussed in Section 8.3.

¹⁶ Realignment of sections of the R103 may be required, which will be dealt with in a separate process.

8.2.7 Water use impacts (quantity and quality)

Water is scarce in the Umgeni catchment and Contractors will have to ensure upfront that sufficient water will be available from municipal sources, where potable water is required. Contractors should also consider using recycled water where possible. While applications for abstraction from watercourses can be submitted to DWS, Contractors must be aware that water in sufficient quantity and quality may not be available from watercourses at the time of construction, depending on rainfall and other factors at the time.

8.2.8 Potential impacts to adjacent properties, infrastructure and services, and recommended measures for mitigation/management

Planning and design

- Increased interaction with landowners and entry onto private property.
 - Maintain good communication with affected landowners throughout the project lifecycle.
 - Ensure that any investigative activities on private properties are undertaken with due consideration and respect for people and property.
 - Conduct land acquisition negotiations timeously and professionally.
- Geotechnical investigations.
 - Geotechnical team to comply with relevant industry standards.
- Resettlement/relocation of formal households and/or loss of privately owned land.
 - Design to minimise expropriation of land.
 - Engage with affected parties on a case by case basis.
 - Ensure that it is clear that all valuations are conducted by an independent person.
 - Fair and equitable compensation should be paid in line with SANRAL's policies and according to the legal framework of the country (The Constitution Section 25 (3) and the Expropriation Act (Act 63 of 1975)).
- Risks associated with illegal infrastructure in road reserve.
 - SANRAL has dedicated route managers on its routes to identify immediately when illegal occupants/infrastructure occupy the road reserve¹⁷.
- Increased need for repairs and maintenance to associated roads.
 - This must be budgeted for in the contract.
- Potential interference with access to businesses including access to RCL Foods via the access underpass.
 - The issue of access to RCL Foods via the access underpass requires resolution, in consultation with SANRAL, RCL Foods and the KZN Department of Transport.
 - SANRAL must ensure in the planning phase that it is possible to maintain current access/provide alternative access to all properties, during the construction period.

Pre-construction and construction

- Risks to property fencing/walls.
 - Existing fences/walls between the N3 and neighbouring properties will be protected. In cases where land is being acquired due to expansion of the road reserve, requiring existing fences to be removed, SANRAL will provide a new fence/wall to the standard of the current fence/wall, as part of the works contract, at SANRAL's cost.
 - In the event of security being compromised as a result of unintended damages, SANRAL is to ensure that suitable security is provided until such time as repairs have been made.

¹⁷ This is made more difficult where fences demarcating the road reserve are stolen.

- ❑ Relocation of services.
 - The design engineers must ensure that all encroachment consents are identified and the service providers timeously notified so that services can be relocated timeously and preceded by proper forward planning.
 - The relocation costs will be borne by the Service Owners should there be a need to relocate services in the current road reserve. However, where services are required to be relocated outside the current road reserve, then SANRAL will pay for such relocations. Importantly, however, SANRAL requires proof from service owners that their services are legally in the road reserve (covered by existing encroachment consents/wayleaves).
- ❑ Illegal structures in the road reserve.
 - It will be necessary to remove existing unlawful structures in the road reserve where widening is to take place. Property owners will not be compensated for the loss of unlawful building or structures in the road reserve. The owner will be responsible for the cost of demolition or removal of these structures. It is recommended that adjacent property owners finding themselves in this situation contact Mr I Ramklown (033 392 8100) at SANRAL Eastern Region offices as soon as possible.
- ❑ Access to businesses and residences.
 - Access to properties must be provided at all times during the construction period.
- ❑ Increased need for repairs and maintenance to associated roads.
 - Contractors are to maintain roads/repair damages caused by construction vehicles. This must be budgeted for in the contract.
- ❑ Impacts on Fairview Road.
 - Contractor to plan works so disturbance of residents along the access to the site is minimised. Relevant mitigation measures above will also apply.
- ❑ Water quantity and quality.
 - Contractors must liaise with the municipality prior to construction to ensure sufficient potable water will be available when construction commences.
 - Prior to construction, Contractors must check and monitor water quantity and quality at any abstraction points that have been authorised by the Department of Water and Sanitation, in case alternatives need to be found.

8.3 What potential health, safety, security and nuisance impacts may be experienced as a result of the proposed widening/capacity improvements to the N3 during construction?

A summary of impacts (incorporating a summary of specialist findings as applicable is provided below, including recommended measures for management/mitigation of impacts. For further detail, please refer to the Social Impact Assessment specialist report (Appendix D). According to the assessment, the impacts on adjacent health, safety, security and other nuisance impacts are of low, medium and high significance, without management. With management, the impacts are considered to be of low and medium significance (Table 18 in Chapter 9).

8.3.1 Influx of construction workers/job seekers and increased spread of disease and criminal activity

As a result of the proposed project, it is likely that there will be an influx of people to, and through, the project area, inclusive of construction workers, jobs seekers, informal traders and criminal opportunists. The movement of people into or through the project area may lead to people spreading disease, in particular HIV and AIDS, or alternatively contracting the disease within the project area and spreading it elsewhere. In addition, the increase in human traffic makes the movement of criminal opportunists easier. The potential of compromised boundary fences exacerbates the potential for increased criminal activities.

8.3.2 Increased likelihood of road traffic accidents and disruption to vehicle traffic

Increased congestion in and around where upgrades are taking place, increased travel time leading to driver fatigue and the potential for increased aggressive driving as a result of delays will result in an increased likelihood of road traffic accidents. The presence of slow moving construction vehicles and construction personnel adjacent to the N3 (left and right hand sides) is also likely to increase the potential for road traffic accidents.

8.3.3 Protest action

It is becoming increasingly common for large construction projects to be delayed as a result of protest action, often concerning the lack of employment opportunities provided for members of local communities. In addition, protests by disaffected contractors (usually smaller and emerging contractors) is an eventuality arising from mistrust in procurement processes. Such delays may have significant financial implications for the project, while also increasing the risk of damage to infrastructure, road closures and ultimately injuries and/or fatalities. The potential for protest action, and how it may affect construction contracts is an issue which needs to be considered carefully in SANRAL's planning.

8.3.4 Increased noise and dust

Households and businesses located close to where construction activities will be taking place are likely to be affected by an increase in noise and dust.

Ambient noise within 250-280 m from the N3 exceeds the Noise Control Regulations Standard of 65 dB(A). According to the specialist report (Appendix D), construction noise (considered together with operational noise) will present an environmental noise problem to residences and schools around Cato Ridge and Camperdown, within 350-470 m of the work area at the time. Along the other sections of the N3, the area of concern varies but is up to 270 m from the road. The requirement for night work will be minimised, however, will potentially be a source of disturbance at night. Blasting would generate short lived loud noises (blasting is only anticipated at the Dardanelles I/C). Although noise from construction will be a variable and temporary impact, construction will occur over many months and will negatively impact at variable times on receptors.

Sudden strange noises and vibrations can cause stress to battery chickens, as the birds are extremely sensitive to any unusual (sudden and loud) noise and disturbance, which can lead to trampling and death.¹⁸ The current commercial chicken farms are already exposed to a high level of noise from the N3. Construction noise however will add to the noise levels and it is sudden noises that would be more problematic than the constant noise of traffic.

Areas of exposed soil and stockpiles, as well as the movement of construction vehicles on dirt access roads, will result in increased dust in the area. During periods of strong winds, this is likely to affect adjacent households and businesses unless it is well controlled by dust suppression techniques.

8.3.5 Disposal of large amounts of demolition rubble and management of inert material

Over the duration of the project, a large amount of rubble (refer to Section 3.2.4) will be produced from the demolition of structures. It is intended that as much as possible of this will be crushed and re-used for road building. The project will also generate a large surplus of cut

¹⁸ The birds rush away from the noise, trampling each other and then suffocating at one end of the house.

material from earthworks (refer to Section 3.2.4). It is SANRAL's intention to use this on other sections of the N3, which are part of the broader project, and to stockpile on SANRAL's own land. The balancing of material requirements for each project will be done in line with what is best/economically feasible to SANRAL. A separate professional team has been appointed to manage the materials utilisation between the various projects for the N3 upgrading. Two dedicated stockpiles areas adjacent to the N3 have been identified on land recently acquired by SANRAL for this specific purpose.

Surplus volumes on this particular stretch of the N3 (Cato Ridge – Lynnfield) will not be as great as on other sections and the majority will be used during construction. Nevertheless, good forward planning as to disposal and stockpiling procedures will be required so that large volumes do not accumulate in unwanted stockpiles and/or are not accepted by authorised landfill sites.

8.3.6 Potential nuisance impacts and impacts to health, safety and security and recommended measures for mitigation/ management

Planning and Design

- ❑ Management of demolition rubble and other inert waste.
 - SANRAL must ensure that the construction contracts that go out to tender are clear about re-use and/or disposal of material. Should the material need to be stored prior to use on other sections of the road, sites must be identified upfront and any necessary authorisations/permits obtained, should they be required.
 - Landfill sites should be contacted prior to construction, to ensure that anticipated volumes can be accepted.
- ❑ Potential protest action.
 - Conduct open and transparent procurement processes.
 - Optimise use of local labour.
 - Set up Project Liaison Committees (PLCs) to engage with communities and local businesses.
 - Brief security team on site and the South African Police Services on steps to respond to protest action.

Pre-construction and construction

- ❑ Increased spread of disease.
 - An HIV/AIDS awareness/education component should be included in the induction programme for all personnel working on the proposed road upgrades.
 - Ensure there is easy access to HIV/AIDS related information and condoms for all workers involved with the proposed road upgrades.
- ❑ Increased likelihood of road traffic accidents.
 - Develop a Traffic Management Plan.
 - Ensure that all staff members and people on site undergo road safety training.
 - Ensure that all staff members and people on site have suitable Personal Protective Equipment (PPE).
 - Ensure there is suitable signage informing road users of construction activities.
 - Implement measures to reduce traffic speed, including rumble strips, speed cameras and digital signage showing approaching drivers their vehicle speed.
 - Ensure measures are put in place to prevent unauthorised people from accessing the areas where upgrades are taking place.
- ❑ Increased crime.
 - Construction teams should be clearly identified by wearing uniforms and/or identification cards that should be exhibited in a visible place on their body.

- Instant dismissal and prosecution of any staff caught in criminal activities of any kind.
- Inform local law enforcement agencies of the possibilities of increased criminal activity in the area.
- In the event of boundary fences being temporarily compromised, alternative security measures should be put in place.
- Increased dust.
 - Dust caused by strong winds on exposed soils should be controlled by means of water spraying.
 - Ensure all stockpiles are wet or covered.
 - Minimise the amount of exposed soils by removing vegetation for construction only when required.
 - Ensure good 'housekeeping' is practiced on the construction site.
 - Strict speed limits should be applied on any gravel roads so as to reduce dust levels.
- Increased noise.
 - In areas where construction will be taking place in proximity to residential and/or business properties, and commercial chicken farms, make use of noise reduction techniques as applicable and as indicated in a Noise Management Plan.
 - Avoid undertaking construction activities after daylight hours. In instances when this is not possible, ensure that potentially affected parties are communicated with and kept informed on a regular basis.
 - If blasting is required, ensure that potentially affected parties are informed prior to any blasting taking place.

8.4 What potential negative impacts will the proposed widening/capacity improvements to the N3 have on the social environment during operation?

A summary of impacts (incorporating a summary of specialist findings as applicable) is provided below, including recommended measures for management/mitigation of impacts. For further detail, please refer to the Social Impact Assessment specialist report (Appendix D). According to the assessment, the potential negative impacts on the social and socio-economic environment during operation are of medium significance, without management. With management, the impacts are considered to be of low and medium significance (see Table 19 in Chapter 9).

8.4.1 Increased safety and security risks due to closer proximity of the widened road to adjacent properties

Residents are concerned about safety risks during operation. Where houses and structures have been brought into closer proximity to the widened road, they may be at increased risk of damage due to vehicle collisions, spillages, fires, etc. Guardrails/concrete parapets will be constructed as protection where required adjacent to banks.

There are instances where sections of road reserve are overgrown with vegetation near residential areas and these areas are used by criminals to hide to aid them in their criminal activities. Where houses and structures have been brought into closer proximity to the widened road, the security risks could increase if the road reserve is not kept clear of thick vegetation. However, where the road reserve has substantially narrowed, it is likely there will be less space for thick vegetation and less opportunity for criminals to hide.

8.4.2 Increased noise during operation of the widened road

The predicted increase in traffic over time will be accompanied by an increase in noise levels adjacent to the national road. In addition, due to the widening of the N3, the edge of the road will be closer to residential and business properties. The noise generated by traffic on the national roads is already high. Noise levels will differ according to the topographical position of the receiver (whether above or below the road) and depending on whether any physical barriers to sound are located between the road and receiver (walls, other houses, vegetation, banks, etc). Steep sections of road may generate more noise than flatter sections, due to heavy vehicles having to engage lower gears and/or air brakes.

According to the specialist report for the Cato Ridge-Lynnfield section, current (2018) noise levels measured between 78.7 – 87.6 dB(A), which exceed the levels recommended internationally and in SA (NCR 65 dB(A)). For the operational phase, the predicted noise increase from year 2012 to year 2047, due to traffic growth, will initially be small and not noticeable by the receiver but over time will present a problem to receivers near the N3. On average, an increase of 3-4 dB (A) is predicted for areas within 350 m of the N3, which along certain sections includes residences, schools, churches and medical facilities. In simplified terms, to the receiver, this increase could be generally equated to the noise being twice as loud.

Unfortunately, it is not possible to eliminate noise next to a national road. Owners who have chosen to purchase properties adjacent to the N3 have done so being aware of the existing noise levels and the potential for these noise levels to increase over time (due to growth in traffic volumes and decreased distance from properties when necessary expansion of roads is undertaken to accommodate this growth). However, there are various measures that can be implemented to help reduce noise levels. These include using low noise road surfacing and, potentially, the construction of barrier walls.

SANRAL will apply low noise surfacing to all sections of roads that pass residential areas. Barrier walls, however, need to be location specific and may have very limited effect, depending on the location of the receptor in relation to the road. Barrier walls are generally extremely costly and come with their own set of negative impacts, particularly negative visual impacts. The noise they deflect from one receptor may potentially become a problem for another receptor. SANRAL will commission an acoustic design specialist to investigate if there are feasible and affordable options that may be incorporated into the design, or implemented over time, post construction, for particular noise hotspots in urban areas. These would then need to be assessed for *in situ* impacts.

Ultimately, however, it should be understood that it is the increase in traffic that causes an increase in noise and not road widening. SANRAL, as the road authority, is tasked with ensuring that the roads can safely and efficiently accommodate traffic volumes, to facilitate economic development. This is especially important for the N3, being the busiest road freight corridor in South Africa. Control of the growth of traffic volumes is a broader planning exercise that would include interventions from various government departments, such as better public transport and increased movement of freight by rail. Ultimately, there must also be an adaptation to prevailing conditions, i.e. a change of land use/receptors adjacent to national roads, towards those which are less sensitive to noise.

8.4.3 Possible stormwater damage to neighbouring properties during operation of the widened road

SANRAL has received a few complaints regarding the damaging effect of stormwater on adjacent properties being attributed to runoff from the national road. The risk of stormwater damage should be low if drainage is properly designed and is well maintained.

8.4.4 Damage to adjacent properties as a result of increased vibrations from traffic

Some residents living adjacent to the national road complain of vibrations when heavy vehicles go past. The vibrations rattle windows and are a source of disturbance and/or may cause damage to adjacent structures such as boundary walls. As a result of the proposed expansion, the N3 will be closer to various properties in a number of locations and, thus, may increase the likelihood of vibrations. However, the proposed expansions will result in an improved road surface which is likely to reduce vibrations as the generation of vibrations is usually the result of a rough or uneven surface.

8.4.5 Increased exposure to air emissions during operation of the widened road

When the road is widened, the source of vehicle emissions (carbon dioxide and nitrous oxide) will encroach closer to residences than previously and will cumulatively contribute to existing air pollution levels. It is possible that areas where congestion decreases as a result of the upgrades, will improve with respect to emissions, as free flowing traffic is likely to decrease the concentration of exhaust emissions. However, the concentrations/dilution of emissions and other air pollutants at different positions along the N3 will vary depending on topography, prevailing winds and weather conditions.

8.4.6 Potential negative social impacts during operation and recommended measures for mitigation/management

Planning and design

- ❑ Safety risks to adjacent properties.
 - Retain boundary fences between the road reserve and neighbouring properties (note SANRAL will always provide a boundary fence along its road reserve, providing some form of safety).
 - Construct guardrails/concrete parapets as protection, where required.
- ❑ Risk of damage from stormwater runoff.
 - Ensure drainage design prevents damaging stormwater runoff on adjacent properties.
- ❑ Increased noise.
 - Ultra-thin friction wearing course (UTFC) in the form of bitumen rubber having an open grading will be used, which is a low noise surface. For surfacing on concrete, the option of UTFC using bitumen rubber is under consideration. Surfacing is to be regularly maintained.
 - The engineers responsible for detailed design must investigate, in conjunction with acoustic design specialists, the feasibility of constructing barrier walls to mitigate noise in particular problem areas. The effectiveness of walls is, however, very dependent on the location, height and distance between the noise source and the receiver. Noise barriers are effective in reducing the level of noise received on severely impacted locations close to the road provided the barrier screens the receivers' (ground floor and upper floors) windows from the noise source. Their effectiveness is good near the source and decreases with increasing distance.

Operation and maintenance

- Increased noise.
 - Home and business owners may be able to reduce noise levels on their own properties by erecting walls around their properties and using double glazing on windows. An evaluation of the noise source should be undertaken first, however, so that optimum measures can be put in place. According to the noise specialist, the use of hedges and vegetation generally provides little noise reduction.
 - Ensure regular maintenance of the noise reducing road surfacing.
- Stormwater damage.
 - Maintain drainage structures in good condition for optimal functioning during operations.
- Increased vibrations.
 - Maintain the road surface regularly and ensure uneven surfaces are repaired.
- Increased security/crime risks.
 - Ensure the road reserve is kept clear of overgrown vegetation that can harbour/provide refuge for criminals.

8.5 What effects will the proposed widening/capacity improvements to the N3 have on cultural heritage?

According to the Cultural Heritage Resources Impact Assessment specialist report (Appendix D), there are no identified cultural heritage resources that will be impacted upon by this project (Table 20). Should any cultural heritage resources be encountered during the course of construction, the process specified below must be followed.

8.5.1 Potential impacts on cultural heritage and recommended mitigation/management actions*Construction*

- General protection of cultural heritage.
 - Should any cultural heritage resources be encountered during the course of construction, work in the affected area must be immediately be halted, the area cordoned off and the heritage authority contacted for advice on further action.
 - Amafa should undertake an inspection of the surveyed road reserve prior to construction and periodic inspections during construction to ensure that heritage resources are not damaged.
 - Any extension of the project beyond its current footprint involving vegetation and/or earth clearance should be subject to prior assessment by a qualified heritage practitioner, taking into account all information gathered during the initial heritage impact assessment.

8.6 What effects will the proposed widening/capacity improvements to the N3 have on the biophysical environment and biodiversity (water, soils, riparian, wetland and terrestrial natural habitat, fauna) during construction, operation and rehabilitation?

A summary of impacts (incorporating a summary of specialist findings) is provided below, including recommended measures for management/mitigation of impacts¹⁹. For further detail, please refer to the Riparian/Wetland and Vegetation specialist reports in Appendix D. According to the assessment, the potential negative impacts on the biophysical environment, biodiversity and natural habitat during construction, operation and rehabilitation are of high and medium

¹⁹ Note that mitigation measures also apply to rivers and streams, although along this section of the N3, rivers and streams are not directly crossed.

significance, without management. With management, the impacts are considered to be of low significance (see Table 21 in Chapter 9).

8.6.1 Loss/degradation of soils and substrates

The project will entail significant excavation work with heavy machinery, including cuts and fills. These activities will potentially result in increased soil erosion, increased loss of topsoil, increased safety risk due to unstable banks or rockfall, destabilisation of banks and may also result in high sediment loads entering drains and nearby water courses.

8.6.1.1 Potential impacts on soils and substrates and recommended measures for mitigation/management

Preconstruction and construction

- Increased soil erosion and increased slope instability.
 - Topsoil is to be removed separately to subsoil and be safely stockpiled for use in rehabilitation.
 - Exposed soils and cut and filled surfaces are to be adequately safeguarded as per recommendations of the engineer's geotechnical reports and other applicable mitigation measures provided in the EMPr (Appendix F).
 - Specialist geotechnical advice must be followed to ensure all new fill embankments are constructed to rule out the potential for large-scale instability and the associated negative environmental implications.
 - Soil erosion on site must be controlled in accordance with the relevant specifications in the EMPr (Appendix F).
 - Large sediment loads must be prevented from entering drains and watercourses.
 - Controlled blasting is to be undertaken in accordance with legal requirements and best practice (albeit that blasting is not anticipated on this section of the N3).
 - The impacts on soils and substrates must be monitored during the construction phase as part of environmental management of the contract.

8.6.2 Loss/degradation of terrestrial vegetation and natural habitat

- Clearance of vegetation cover.

The clearing of vegetation for widening of the road reserve, stockpiling of materials, vehicular access during construction and operation, and the establishment of construction camps will lead to the direct loss of vegetation cover, but only within the road reserve. Based on the existing road reserve and proposed extensions, up to 35 ha of mostly degraded/secondary grassland and thicket, possibly with some relic elements of Hinterland Grassland/Ngongoni Veld, may be affected. Any direct impact to natural vegetation would result in the loss of indigenous plant species, largely common/widespread species, but potentially also a number of notable and/or protected species.
- Edge effects.

The clearing of vegetation during construction will result in an increase in disturbed edge habitat immediately adjacent to developed areas. Edge habitat is characterised by a predominance of generalist and alien species because these areas experience higher levels of stress and more frequent disturbance (in both time and space), for example, higher light conditions, lower soil moisture conditions and higher exposure to wind (and fire for closed woody communities). Edge habitat is characterised by highly competitive species which can invade areas of established vegetation, resulting in a loss of sedentary species of mature habitats which are normally considered sensitive. Within the area of

interest, edge effects will be lowest where natural vegetation is already disturbed (i.e. disturbed grassland/thicket) and highest where vegetation is more intact (i.e. Hinterland Grassland/Ngongoni Veld in good condition). Shade cast on habitat under bridges may have a small effect on the composition of plant communities.

❑ Habitat fragmentation.

Given the N3 route is already in existence, it is expected that widening will increase the distance between natural areas bisected by the highway, although this effect is likely to be small relative to the current width of the highway.

Clearing of vegetation for temporary vehicle access and stream crossings through riparian and/or wetland vegetation will, however, result in further habitat fragmentation and the consequent loss of habitat connectivity. Rehabilitation would be important to reinstate (and potentially improve) habitat connectivity in the long-term.

❑ Alien invasive plants.

The clearing of vegetation during construction and operation, and the operation of machinery and stockpile/lay down areas during construction will result in increased levels of disturbance. Alien invasive plants often outcompete indigenous plants and are likely to become established in disturbed areas, thereby reducing habitat quality and contributing to the loss of indigenous species/biodiversity. Some alien plants exacerbate soil erosion while others contribute to a reduction of natural streamflow.

❑ Soil erosion and siltation.

The clearing of vegetation for vehicular access during construction, stockpiling of materials, establishment of construction camps and operation of machinery will result in the removal of protective plant cover and compaction of soils, exposing soils to erosion by water and wind. Habitat quality will be degraded by soil erosion and siltation of down slope areas. This will increase the disturbance experienced in surrounding areas of natural vegetation and increase the footprint of the development. It is likely that the ecology of wetland and/or riparian systems will also be adversely impacted. Similarly, temporary crossings over riparian zones and/or wetlands can have negative impacts on natural habitats downstream. Negative ecological impacts can operate long after construction is complete if soil erosion and siltation remain uncontrolled.

❑ Harvesting of indigenous plants.

Increased access for labour during construction and operation could result in the increased collection of medicinal plants, firewood, building wood, and other plant material. This could impact negatively on biodiversity, as well as result in the general degradation of habitat quality.

There is one potentially sensitive vegetation community which could be affected by construction activities, the Hygrophilous Grassland at the Cato Ridge offramp. Other key impacts could occur in the disturbed grassland and thicket mosaics and wetland vegetation along the route.

8.6.2.1 Potential impacts on terrestrial vegetation and natural habitat and recommended measures for mitigation/management

Planning and design

❑ Loss/degradation of habitat and loss of biodiversity.

- Ensure during project planning and tender processes that sufficient budget is allowed for plant rescue prior to vegetation clearance and rehabilitation post construction.

- Ensure sufficient funding will be available for an effective alien plant control programme.

Pre-construction and construction

- Loss/degradation of habitat and loss of biodiversity.
 - Where construction occurs close to any sensitive areas of natural vegetation or areas supporting any plants of conservation concern (i.e. listed Red Data, TOPS, protected and rare plant species), as specified in Appendix A of the specialist vegetation assessment attached in Appendix D of this BAR, these areas must be clearly/visibly demarcated and cordoned off by an Environmental Control Officer (ECO) prior to, and during construction. Should these areas be unavoidable, then permits and authorisations will need to be obtained from EKZNW and DAFF, followed by a plant rescue programme as far as is appropriate.
 - A plant 'rescue' operation must be undertaken under the direction of an ecologist/botanist prior to construction, where plants of high conservation value will be impacted by any part of the development (construction or operation phase). The contractor is to conduct plant rescue according to the specifications for plant rescue provided in the Appendices to the EMPr.
 - It will be particularly important to ensure that construction contractors are made aware of the CBAs and important EMF areas that are proximal to the N3 as discussed in Section 5.5, with due guidance and monitoring by an ECO prior to, and during construction to ensure that the construction footprint is kept to a minimum, with no works occurring outside of the negotiated servitude/working area. The working area/s must also be clearly demarcated. Ancillary infrastructure (e.g. construction camps, lay down areas, stockpiles, etc) should be positioned away from any CBAs.
 - The construction footprint is to be kept to a minimum. No works are to occur outside of the negotiated servitude/working area and the working area is to be clearly demarcated.
 - Clearance and cutting back of natural vegetation is to be kept to a minimum. The contractor is to conduct vegetation clearance according to the relevant specifications in the EMPr, including the relevant Appendices to the EMPr that deal with specific sensitive areas.
 - Stockpile and lay down areas are to be kept away from areas of sensitive natural vegetation.
 - Where good quality Hinterland Grassland/Ngongoni Veld are to be affected by construction activities, the following, mitigation measures need to be carefully considered to avoid or reduce impacts:
 - The construction footprint is kept to an absolute minimum.
 - A plant 'search and rescue' operation must be undertaken prior to construction.
 - Once all plants of conservation value/concern have been rescued, impacted sections of Hinterland Grassland/Ngongoni Veld affected by construction should be carefully removed and transplanted at nearby disturbed sites²⁰ within the same vegetation type and with similar habitat characteristics. This can be done by carefully removing strips of grassland along with the first 250 mm of topsoil using a front-end loader (or by hand). The removed grassland strips/swards should then be transported to the new site where they are to be placed on the ground in sections side-by-side. Gaps between sections should then be filled with sand and the grass must be given a good

²⁰ Care should be taken to select sites which are not subject to on-going disturbance that would destroy translocated sections of grassland and to ensure that compacted soils on receiving areas are ripped before grassland is translocated.

watering. Depending on the time of year and natural rainfall patterns, watering should continue approximately once a week for six to eight weeks until the grassland has become established.

- Alien invasive plants around any excavated areas/work areas and within the road reserve must be kept under control during both construction and operation in accordance with SANRAL's existing protocol. Additional effort (follow ups) will be required in sensitive areas and additional funding will need to be made available.
- Where construction may impact on plants designated as 'specially protected' under the Natal Nature Conservation Ordinance (Act No. 15 of 1974), an application must be submitted to EKZNW to clear or translocate these plants as part of the plant rescue operation.
- Where construction requires tree species that are protected in terms of the National Forests Act (Act No 84 of 1998) to be cut, disturbed, damaged or destroyed, an application must be submitted to DAFF.
- Where construction may impact on MOSS areas, then the relevant municipality will need to be engaged to authorise and consent to the clearing of vegetation within these areas.
- Where construction may impact on plants listed as Threatened or Protected Species (TOPS) under the National Environmental Management Act: Biodiversity Act, 2004 (10 of 2004), an application must be submitted to EKZNW to translocate these plants as part of the plant rescue operation.
- Relevant general specifications in the EMPr are to be followed. These include specifications relating to:
 - Vegetation clearance.
 - Plant rescue.
 - Control of soil erosion.
 - Site access and working areas.
 - Pollution and waste management.
 - Siting of construction camps.
 - Rules for construction teams.
 - Control of alien invasive plants.
 - Site rehabilitation.
 - Dealing with demolition rubble.
- Specific management must be employed regarding site access to viaducts and/or culverts:
 - The number of access tracks is kept to a minimum. Adequate drainage (mitre drains) should be constructed at regular intervals in accordance with the local topography to minimise soil erosion potential. Alien plant control should also be undertaken along these access tracks.
 - As far as possible, work takes place during the winter low flow period.
 - Existing crossings are used as far as possible for vehicle access.
 - The width of the crossings is kept to the absolute minimum required for access. Construction of new and/or temporary crossings must be suitably designed and constructed to limit interference of hydrological flows and connectivity. Crossing designs must be accompanied by stormwater management plans.
 - Soil compaction should be minimised by keeping access and parking areas for vehicle and construction plant to a minimum and making use of existing compacted/hardened surfaces wherever possible.
 - Where new tracks are required, sensitive areas of vegetation, wetlands and riparian zones are to be avoided. Wherever feasible, shaping new tracks with a grader is to be avoided, and new vehicle tracks are to be created by simply driving over the grass cover without removing grass cover/topsoil.

- The same track is to be used to access a site and widening and creating alternative or parallel tracks must not be allowed. Likewise, the same vehicle turning areas are to be used (for both construction and maintenance).
- Where new access tracks are required, as far as possible, these must follow the contour on steep slopes, rather than being aligned directly down steep slopes. Stormwater runoff must be such to limit concentration of runoff, and consequently erosion of soils.
- Where watercourse and drainage line crossings are unavoidable, drains and culverts must be designed in conjunction with relevant experts to the correct invert levels to prevent damming of flows or draining of wet areas. Culverts should be designed to prevent concentration of flows, and to maintain natural flows as free flowing as possible. Levels and elevations must also be set and aligned according to the natural flow of water to limit headcuts and channel incision developing.
- If water for construction is to be sourced from local water bodies, then this must occur at existing disturbed sites due to potential for damage by temporary access roads and water tankers.
- Temporary access tracks are rehabilitated as quickly as possible after construction ceases by removing excess imported material, ripping compacted soils, reinstating natural ground levels, implementing soil erosion controls and re-establishing a dense cover of indigenous vegetation appropriate to the plant community in which the road/track is located.
- Where dewatering of silt laden water is required at excavations, it is recommended that this water is not pumped directly into watercourses (i.e. wetlands and rivers), and that separate collection areas/sumps should be created in existing disturbed areas where suspended sediments can be settled out.

Operation

- Spread of alien invasive plants.
 - Alien invasive plants around any excavated areas/work areas and within the road reserve must be kept under control during operation. Additional effort (follow ups) will be required in sensitive areas for which additional funding will need to be made available.

8.6.3 Degradation of wetland and riparian areas

The road widening will require the extension (lengthening) of the existing drainage infrastructure. Where needed, inlets and outlets will be improved/enlarged and erosion protection provided up and/or downstream. There are 6 wetlands (See Figure 3) within 500 m of the N3 between Cato Ridge and Lynnfield Park.

The works will result in the destruction of small sections of wetland habitat where existing crossings are widened from construction activities and possible contamination with construction materials.

All of the wetland habitats assessed are dominated by alien plants, with construction activity, therefore, having limited impact on indigenous species and providing an opportunity for localised removal of aliens and rehabilitation with indigenous wetland species.

Given that the majority of the systems are already highly modified, the construction phase impacts can largely be controlled, mitigated and rehabilitated through an appropriate and comprehensive EMPr and mitigation measures, followed by prompt and appropriate rehabilitation. Key areas of focus would be habitat destruction, erosion, successful and rapid re-

vegetation, the maintenance of wetland vegetation and pollution prevention. If the correct measures are implemented during the construction phase, longer term impacts of the construction phase on water quality can be managed. The higher risk is rendering wetland biophysical habitat unstable as a result of modification, particularly when coupled with vegetation clearing and earthworks.

Risks related specifically to construction associated with the wetland areas may include the following:

- ❑ The introduction of foreign and hazardous materials to the habitat which may result in deterioration of water quality from pollutants, such as fuel, cement and other building materials.
- ❑ Erosion and the sedimentation of watercourses and aquatic habitat.
- ❑ Removal of indigenous vegetation.
- ❑ Loss of sections of wetland.
- ❑ Compaction of wetland soils by construction vehicles.
- ❑ Modifications to the wetlands a result of earthworks, excavations and sloping.
- ❑ Erosion and the diversion of subsurface flow if artificial preferential flow paths are created as a result of earthworks.
- ❑ Risk of erosion forming if infilling is not adequately compacted or the longitudinal slope of the wetland system is not maintained.
- ❑ Vegetation disturbance leading to increased encroachment by alien invasive or ruderal plant species.
- ❑ The production of a large amount of inert waste (reinforced concrete rubble) which could be dumped in a manner that degrades watercourses.

8.6.3.1 *Potential impacts on wetland and riparian areas and recommended measures for mitigation/management*

General guidelines applicable to both wetlands and riparian crossings are provided below, although it is noted that there are no river crossings along this specific section of the route (Cato Ridge-Lynnfield Park).

Planning and design

- ❑ Increased erosion and instability due to earthworks and crossings.
 - The crossings should be designed to ensure that flow patterns along the stream/river channel are not altered or diverted potentially resulting in stream bed and bank erosion and instability.
 - Culverts should be placed in a manner that allows for the free movement of water and sediment.
 - Culverts should be placed at the same level as the base of the channel.
 - Culverts need to allow for the natural flows of water across the freshwater ecosystems and not confine flows.
 - Culverts should have sufficient grade to be self-scouring or self-cleaning and not be prone to sedimentation build up within the culverts. However, the culverts must be equipped with energy breakers at their outlets to ensure the downstream freshwater ecosystems do not scour or erode as a result of the culvert grade.
 - Construction of the causeway should ensure that the banks of the stream channels are stabilised so as not to erode at the edges.
 - The crossing support infrastructure should be constructed at right angles to the freshwater habitat wherever possible (new crossings as existing angles will remain).

- Potential problems due to generation of large volumes of demolition rubble and rock material.
 - SANRAL must ensure that the construction contracts that go out to tender are clear about re-use and/or disposal of material. Should the material need to be stored prior to use on other sections of the road, sites must be identified up front and any necessary authorisations /permits obtained, should they be required.

Pre-construction, construction

- Increased soil erosion, sedimentation and instability due to earthworks and crossings.
 - Earthworks associated with river crossings should take place in the winter months as this is the driest period for this region. It is acknowledged that this is not always practically achievable but should be accommodated as far as possible in construction scheduling. In addition, it should be noted that working in river channels during summer can be dangerous due to sudden flooding following thunder storms upstream in the catchment. Construction personnel need to be aware of this risk.
 - The crossings should be designed to ensure that flow patterns along the stream/river channel are not altered or diverted potentially resulting in stream bed and bank erosion and instability.
 - On steep slopes draining towards the identified freshwater ecosystems, small-scale diversion berms should be constructed, to reduce the risk of the earthworks becoming a preferred surface flow path leading to erosion. Where space is insufficient, suitable road fill embankment protection must be designed.
 - “Trench-breakers”, which are in-trench barriers, should be installed within any trench excavations to minimise the interception and accumulation of surface runoff water from upslope areas.
 - During earthworks, the top 50 cm of the wetland/riparian topsoil must be removed and stockpiled, to be replaced once activities have been completed. This is to maintain the existing seed bed and soil profiles as best as possible.
 - Excavated soils should be placed on the upslope side, to allow the excavated area to intercept any water thereby minimizing the risk of erosion and excess sediment and minimizing the risk of the loose soils entering the freshwater ecosystems.
 - The construction footprint across the systems must be as narrow as practically possible, i.e. machinery must utilise the same route through the systems at all times so as to avoid unnecessary disturbance.
- Increased soil compaction due to access and working areas.
 - Each construction working area must be clearly demarcated. Vehicle and personnel traffic must be minimised and must be restricted to within designated working areas.
 - Vehicle access routes must not pass through watercourses, wetlands and any areas of sensitive vegetation. Where access routes have to cross wetland communities these must be single track entry and exit routes. The ECO must be notified of any spills or leakages in these sections. These spills/leaks should be treated with hydrocarbon degrading bacteria (products such as or similar to biogX or Oil Spill Gobbler™).
 - Existing roads, tracks and pathways should be used wherever possible, and multiple pathways must not be allowed to develop.
 - Disturbance to steep slopes must be kept to an absolute minimum.
 - The activity must cover as small a working area as is feasible, to minimise the areas disturbed on site at any one time. If applicable to non-working areas, buffers must be established around open water, aquatic habitats, riparian and wetland vegetation and riparian banks.

- Degradation of riparian and wetland vegetation, and faunal habitat.
 - The activity must cover as small a working area as is feasible to minimise the area disturbed at any one time.
 - Strict buffers must be established around all open water, aquatic habitats, riparian and wetland vegetation and riparian banks, outside of necessary access routes and designated work areas. It is recommended that a 32 m buffer be maintained from the edge of wetlands and a 50 m buffer from the edge of riparian zones. These limits are subject to review by the authorities.
 - The buffers outside of access routes and designated working areas become strict no-go areas where habitats must not be disturbed, and personnel and machinery are not permitted entry unless directed by the ECO during rehabilitation.
 - The removal, damage or disturbance of any flora outside the working areas is not permitted. Fishing must be strictly prohibited in and around the working areas.
 - Clearing or pruning of indigenous vegetation at the site of activity must be kept to an absolute minimum. This must be done under the supervision of an appropriately qualified specialist. Any trimming or clearing of any threatened or protected species (TOPS) will require a permit from Ezemvelo KZN Wildlife.
 - Where protected or otherwise important fauna and flora are encountered and require removal, the ECO should be consulted and the individuals transferred to a nearby 'safe', similar habitat.
 - Where clearing is required outside of earthwork/construction areas, vegetation should be brush-cut rather than cleared to speed re-establishment following site closure.
 - No herbicides may be used on indigenous vegetation, particularly within proximity to wetland and riparian areas.
 - No project workers are permitted to catch, trap, poison, kill or disturb any animals present in the project areas.
 - No disturbance of nesting or feeding sites and fauna habitat is allowed. Advice from the ECO should be sought if such sites are encountered.
- Increased risk of damage due to erosion and stormwater runoff.
 - Where construction activity takes place within floodlines of watercourses, temporary berms need to be formed to ensure the construction site and disturbed soils are protected from flooding, storm flows and erosion. This is particularly important when construction activities are taking place outside of the dry season.
 - Erosion that takes place during rainfall events must be rehabilitated immediately. A stock of suitable materials (e.g. sub- and top soil stock piles from excavated areas) for this purpose must be kept in a secure facility.
 - Stormwater control measures must be implemented with all stormwater generated within disturbed earthwork areas channelled to temporarily constructed settling ponds which allow the water to naturally filter back to the watercourse after settling.
 - Storm water retention and other constructed settling ponds must be suitably sited or protected so that river channel high flows will not cause flooding of the ponds. Siting of such ponds must be undertaken by a suitably qualified specialist (e.g. agricultural/wetland engineer) who must also provide advice as to the size and maintenance of the ponds.
- Increased risk of pollution/deterioration of water quality.
 - Fuel and hazardous material storage, handling and refuelling areas must not fall within the 1:100 year flood line of riparian/wetland habitat and buffer zones. Such storage areas must be located far (100 m (horizontal distance)) from riparian zones and any other sensitive environments.

- All spills of foreign or hazardous materials or fluids must be cleaned up immediately, with all spills larger than 20 litres being reported to the ECO immediately.
- A record must be kept of all spills and the corrective action taken.
- Vehicles should not be parked in or near sensitive areas, such as watercourses or drainage areas.
- Drip trays are to be provided under all standing vehicles to minimise hydrocarbon spills.
- No eating or cooking and cleaning of persons, utensils or equipment may take place near rivers, streams or watercourses.
- Appropriate provision must be made for ablutions during construction. If chemical toilets are used, they must be well serviced, and must be placed on level surfaces well away from any water courses, drainage lines or seeps, and any areas which may be subject to flooding. No spillage must occur during servicing and contents must be correctly removed from site.
- Where appropriate, water quality is to be monitored. The ECO must identify where this is appropriate, based on planned construction activities, and compile a water quality monitoring plan as part of the environmental monitoring program.
- Increased risk from demolition rubble and rock material.
 - No rubble or rock/soil from earthworks may be temporarily stockpiled or dumped within 32 m of the river channels and wetlands.

Construction and post construction

- Site rehabilitation following construction (construction and post construction).
 - In riparian areas, backfilling should occur as soon as possible, with soil compaction undertaken and shaping to original levels.
 - All disturbed areas are to be rehabilitated, with the wetland and riparian habitat at the crossing points and areas where disturbance has resulted from excavation being restored to near-natural conditions. This must be implemented immediately following completion of construction activities at each localised crossing.
 - The crossings should be rehabilitated to ensure that no barriers exist within the stream and that in-stream habitat is comparable to the natural or, at a minimum, preconstruction state.
 - Re-vegetation and rehabilitation must take place at worked sections immediately following completion so that vegetation can re-establish as quickly as possible.
 - Within, and in proximity to riparian and wetland areas, successful re-vegetation is crucial to stabilise soils and limit infestation by invasive alien plant species and dominance by ruderal species.
 - Simple re-vegetation with terrestrial species will not be suitable. Correct species for riparian and wetland habitats of the region must be re-established in consultation with an appropriately qualified specialist (e.g. botanist/vegetation ecologist).
 - Progress of vegetation establishment must be monitored regularly, with slow recovery requiring intervention to ensure site recovery and integrity, as well as physical stability.
 - Vehicle access tracks, footpaths and other areas of soil compaction and vegetation denudation as a result of the construction activities must be appropriately contoured, scarified and re-vegetated where required.
 - Any soil stockpile sites and sites of excavation must also be rehabilitated in the same fashion. Rehabilitation of such sites must be monitored and the results reported to the ECO.
 - All excess soil stockpile not taken off site or used to fix erosion problems must be spread evenly over the disturbed areas, and capped with topsoil, prior to rehabilitation and re-vegetation.

- Construction areas must be rehabilitated to a land surface which integrates with the surrounding slope morphology and river channel form so as not to create areas of soil instability, or flow paths which incorrectly direct stormflows and floods, thereby causing scour, erosion and damage to adjacent habitats and infrastructure.
- Areas subject to concentrated water flows during rainfall or high flow events must receive particular attention during rehabilitation and re-vegetation. Where possible, these must be identified prior to commencement of construction activities. Where required, erosion protection structures may need to be designed and installed.
- Artificial embankments, depressions and holes created by the construction activity must be contoured/rehabilitated to minimise risk to, and death of, all fauna types, from large mammals to small invertebrates.
- Upon site closure, all infrastructure, foreign materials, waste, litter and contaminated water, rock or soil must be removed from site and disposed in accordance with the legal requirements for particular waste streams.

8.6.4 Faunal mortalities and negative effects on local faunal populations due to disturbance, loss of habitat and poaching

All disturbance to natural habitat (whether degraded or not) will impact negatively on the fauna that uses this habitat. Various types of fauna including reptiles, rodents, spiders and various other invertebrates will be disturbed and exposed during the works. Some may be injured and/or killed due to physical impact from machinery. Those that are exposed and displaced will be vulnerable to harm from other predators and from human beings. The project will result in a loss of habitat (albeit disturbed) when the road reserve is paved for the widened road.

8.6.4.1 Potential impacts on fauna and recommended measures for mitigation/management

Construction

- Increased animal mortalities (including poaching).
 - Mortalities of various types of animals are inevitable due to the earthworks and movement of heavy machinery. This should be minimised by keeping the construction footprint to a minimum and by using existing access roads and disturbed areas for vehicle access and for stockpiling.
 - If snakes are encountered, they are not to be killed. There are several snake experts who can be contacted to remove and relocate snakes (e.g. Zane Barnard: Pmb and surrounds, cell: 082 850 7713).
 - Where possible, exposed vulnerable animals should be removed from the work area along with some of the soil/substrate they were found in (if applicable) and placed carefully in similar but safe habitat adjacent to/up or downstream of the works. The ECO must be notified and consulted in this regard.
 - Fishing must be strictly prohibited in and around the working areas.
 - No project workers are permitted to catch, trap, poison, kill or disturb any animals present in the project areas.
 - No disturbance of nesting or feeding sites and fauna habitat is allowed. Advice from the ECO should be sought if such sites are encountered in the work areas.
 - All drivers must obey the speed limits and be on the lookout for animals particularly in the vicinity of any sensitive areas, so that collisions with animals can be avoided.
 - Monitoring of impacts on fauna must be included in environmental compliance monitoring.

8.7 What potential cumulative impacts can result from the proposed widening/capacity improvements to the N3?

A cumulative impact is an incremental impact on the environment that results from the impact of a proposed action when added to existing and reasonably foreseeable future actions. Cumulative effects can be both positive and negative. Also, the nature of cumulative impacts can be both temporary in nature (i.e. impacts that are restricted to the construction phase) and permanent (i.e. impacts that occur in both the construction and operation phases).

To enhance the positive impacts of the proposed widening/capacity improvements to the N3 and, thus, enhance positive cumulative effects, the project should be implemented efficiently according to best environmental practise and the infrastructure should be well maintained.

To minimise negative impacts of the proposed widening/capacity improvements to the N3 and, thus, its negative contributions towards cumulative effects on the environment, the project should be implemented with the recommended mitigation measures.

Potential cumulative impacts from the proposed widening/capacity improvements to the N3 on the environment, as related to the key identified issues and impacts, are described below. Where relevant and applicable, significance ratings are assigned to impacts, according to the assessment conventions (Table 15) in the relevant impact tables (Chapter 9).

8.7.1 Cumulative national, regional and local economic and social benefits arising from an improved transport corridor between the Port of Durban and Pietermaritzburg

This project, along with other planned upgrades to other sections of the N3 as well as to other linking roads and interchanges will cumulatively contribute to improved road and transportation conditions, which will allow for more efficient and better functioning of most aspects of day to day business and the provision of services which rely on transport. The project's contribution towards SIP2 goals along with other SIP2 projects will contribute to social and economic development and growth and allow for increased income generation opportunities. The cumulative contribution of the project to the local, regional and national economy in South Africa is considered to be of high (+) significance (see Table 16 in Chapter 9).

8.7.2 Cumulative health, safety, security and nuisance impacts during construction

All or most of the health, safety, security and nuisance impacts discussed in Section 8.3 have the potential to be compounded if other developments in proximity occur simultaneously in the area. Activities that place additional pressure on traffic flow could be particularly problematic. Possible cumulative impacts may include increased traffic congestion on alternate routes, damage to alternate routes as a result of increased traffic, and public dissatisfaction. These potential cumulative impacts are considered to be of high (-) significance without mitigation and of medium (-) significance with mitigation (see Table 18 in Chapter 9).

8.7.3 Cumulative impacts on the social and socio-economic environment during operation

The national road is generally a conduit for commerce. Increasingly, business premises are being constructed on properties close to national roads. As widening decreases the distance between the national road and adjacent residences, living on these properties will become less attractive due to the disturbance and noise from the road. However, better access and exposure to the public can be beneficial to commercial properties.

Over time, road widening could, therefore, contribute cumulatively to a change of land use/zonation from residential to business, along sections adjacent to national roads. The significance of this impact would vary, depending on the precise locality, properties and individuals that it affects.

When the road is widened, the source of vehicle emissions (carbon dioxide and nitrous oxide) will encroach closer to residences than previously and will cumulatively contribute to other sources of air pollution. The significance of this impact would vary, as the concentrations/dilution of emissions and other air pollutants at different positions along the N3 will vary depending on time of day, traffic volumes, topography, prevailing winds, weather conditions and whatever other emissions are being released at the time. Areas where traffic flows more freely are likely to have less traffic emissions than previously congested areas. Serious concerns regarding persistent high levels of air pollution in a particular area should be reported to the relevant authority for further investigation and monitoring.

8.7.4 Cumulative impacts on natural habitat

Human development needs continually place pressure on land and result in increasing levels of vegetation removal for both domestic and commercial needs. Along with general development taking place, the proposed project will contribute cumulatively to the loss of natural habitat and biodiversity in the study area and may accelerate degradation of adjacent areas through soil erosion, edge effects, spread of alien invasive plants, decrease in water quality, etc. The cumulative impact of the project on natural habitat is considered to be of medium (-) significance without mitigation and of low (-) significance with mitigation (see Table 21 in Chapter 9).

8.8 What are the impacts of the No Development Alternative (not implementing widening/capacity improvements to the N3)?

The No Development Alternative would imply that the proposed widening of the N3 sections of interest, and the upgrading of the associated interchanges, will not occur. This would avoid or, at least defer till a later date, the negative impacts of construction that have been described in this report. However, even with other potential interventions (such as rail) to reduce the future predicted traffic volumes, widening will still eventually be required, because these sections of road have reached full capacity and cannot accommodate further growth in traffic. The failure to upgrade will, thus, lead to increasing congestion as traffic volumes increase over time. Interchanges will come under increasing pressure. Road safety risks will increase and there will likely be an increase in accidents. Commuter time will increase along with road user frustration. Heavy volumes of traffic will increase the need for maintenance. Without additional lanes, maintenance activities will exacerbate traffic congestion and associated negative impacts. Accordingly, the road users will suffer economic losses. The No Development Alternative will, thus, have widespread negative effects on the social and economic environment. The No Development Alternative is likely to have significant negative indirect impacts on the national, local and regional economy as freight haulers, commuters and businesses would have to move, alter their routes or otherwise adapt to a poorly functioning road network, more difficult access and increased safety risks. The No Development Alternative is not consistent with the strategic infrastructure planning of Government and will fail to assist in achieving SIP2 goals.

According to the assessment, the predicted impacts of the No Development Alternative are considered to be of high (-) significance without mitigation. Mitigation measures are not applicable in this case (see Table 22 in Chapter 9).

For the above reasons, the No Development Alternative is not recommended.

9 ASSESSMENT OF THE SIGNIFICANCE OF POTENTIAL IMPACTS

9.1 Assessment

This Chapter deals with the assessment of the significance of the potential impacts, both with and without management measures (mitigation). Impact tables, **where applicable** to the key issues discussed in this report, are provided in Tables 16-22.

Table 16	What economic and socio-economic benefits will result from the proposed widening/capacity improvements to the N3, at a local, regional and national scale?
Table 17	What effects will the proposed widening/capacity improvements to the N3 have on adjacent properties, infrastructure and services, and <i>vice versa</i> ?
Table 18	What potential health, safety, security and other nuisance impacts may be experienced as a result of the proposed widening/capacity improvements to the N3 during construction?
Table 19	What potential negative impacts will the proposed widening/capacity improvements to the N3 have on the social environment during operation?
Table 20	What effects will the proposed widening/capacity improvements to the N3 have on cultural heritage resources?
Table 21	What effects will the proposed widening/capacity improvements to the N3 have on the biophysical environment and biodiversity (water, soils, riparian, wetland and terrestrial natural habitat, fauna) during construction, operation and rehabilitation?
Table 22	What are the impacts of the No Development Alternative (not implementing widening/capacity improvements to the N3)?

Table 16 Assessment of potential beneficial economic and socio-economic impacts resulting from the proposed widening/capacity improvements to the N3, at a local, regional and national scale, during planning, construction, operation and rehabilitation (with and without mitigation)

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
Employment creation	Unmitigated	Positive	High	Low	Low	N/A	Low	Low	High	Low
	Mitigated	Positive	High	Low	Medium	N/A	Low	Medium	High	Medium
Opportunities for local contractors and SMMEs	Unmitigated	Positive	Medium	Low	Low	N/A	Low	Low	Low	Low
	Mitigated	Positive	Medium	Low	Medium	N/A	Low	Medium	Medium	Medium
Opportunities for informal traders	Unmitigated	Positive	Medium	Low	Low	N/A	Low	Low	Low	Low
	Mitigated	Positive	Medium	Low	Low	N/A	Low	Low	Medium	Low
Improved transport network (improving road safety)	Unmitigated	Positive	High	Medium	Medium	N/A	Low	Medium	Medium	Medium
	Mitigated	Positive	High	High	High	N/A	Low	High	High	High
Reduced travel time	Unmitigated	Positive	High	Medium	Medium	N/A	Low	Medium	Medium	Medium
	Mitigated	Positive	High	High	High	N/A	Low	High	High	High
Stimulation of the local, regional and national economy	Unmitigated	Positive	High	Medium	Medium	N/A	Low	Medium	High	Medium
	Mitigated	Positive	High	High	High	N/A	Low	High	High	High
Cumulative benefits to the country's economy	Unmitigated	Positive	High	Medium	Medium	N/A	Low	Medium	High	Medium
	Mitigated	Positive	High	High	High	N/A	Low	High	High	High

Table 17 Assessment of potential impacts of the proposed widening/capacity improvements to the N3 on adjacent properties, infrastructure and services, and *vice versa*, during planning, construction, operation and rehabilitation (with and without mitigation)

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
Increased interaction with landowners and entry onto private properties by investigative teams (e.g. geotechnical)	Unmitigated	Neutral	Low	Low	Medium	N/A	High	Low	High	Low
	Mitigated	Neutral	Low	Low	Low	N/A	High	Low	High	Low
Property loss, compensation, resettlement, effect on property values and businesses	Unmitigated	Negative	Low	High	High	N/A	Low	High	High	High
	Mitigated	Negative	Low	High	Low	N/A	Low	Low	Low	Low
Disruption of access to businesses	Unmitigated	Negative	Low	Low-High	High	N/A	Low	High	Low	Medium
	Mitigated	Negative	Low	Low	Low to Medium	N/A	Medium-High	Medium	Low	Medium
Damage to/disruption of services and infrastructure in and adjacent to the road reserve	Unmitigated	Negative	Low	Low	Medium	N/A	High	Low	Medium	Low
	Mitigated	Negative	Low	Very Low	Low-Medium	N/A	High	Low	Low	Low
Increased pressure/disruptions on adjacent roads and alternative	Unmitigated	Negative	Low	Low	Medium	N/A	Medium	Low	Medium	Low
	Mitigated	Negative	Low	Low	Low	N/A	Medium	Low	Medium	Low

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
routes										
Impact on Fairview Road	Unmitigated	Negative	Low	Low	Medium	N/A	Medium	Low	Medium	Low
	Mitigated	Negative	Low	Very Low	Low	N/A	Medium	Low	Medium	Low
Impacts on water quantity (increased demand)	Unmitigated	Negative	Low	Low	High	Low	High	Medium	High	Medium
	Mitigated	Negative	Low	Low	Medium	Low	High	Medium	Medium	Medium
Cumulative impacts on adjacent properties, services and infrastructure	Unmitigated	Negative	Medium	Low	Medium	N/A	High	Medium	Medium	Medium
	Mitigated	Negative	Medium	Low	Medium	N/A	High	Medium	Medium	Medium

Table 18 Assessment of potential health, safety, security and nuisance impacts resulting during construction of the proposed widening/capacity improvements to the N3 (with and without mitigation)

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
Increased spread of disease	Unmitigated	Negative	High	Low	Medium	N/A	Low	Medium	High	Medium
	Mitigated	Negative	High	Low	Low	N/A	Low	Low	Medium	Low
Increased likelihood of road traffic accidents	Unmitigated	Negative	Medium	Low	Medium	N/A	High	Medium	High	Medium
	Mitigated	Negative	Low	Low	Low	N/A	High	Low	Medium	Low
Increased noise (during construction)	Unmitigated	Negative	Medium	Low	Medium	N/A	Low	Medium	High	Medium
	Mitigated	Negative	Low	Low	Medium-Low	N/A	Low	Low	High	Medium
Aesthetic impacts	Unmitigated	Negative	Low	Low	Low	N/A	Low	Low	High	Low
	Mitigated	Negative	Low	Low	Low	N/A	Low	Low	Low	Low
Increased dust and vehicle emissions	Unmitigated	Negative	Medium	Low	Medium	N/A	Medium	Medium	High	Medium
	Mitigated	Negative	Low	Low	Low	N/A	High	Low	Medium	Low
Health and safety risks to those in proximity to construction activities	Unmitigated	Negative	Low	Medium	Medium	Low	High	Medium	Medium	Medium
	Mitigated	Negative	Low	Medium	Low	Low	High	Low	Low	Low
Increased crime/security risk	Unmitigated	Negative	Medium	Low	Medium	N/A	High	Medium	Medium	Medium
	Mitigated	Negative	Medium	Low	Low	N/A	High	Low	Low	Low
Potential protest	Unmitigated	Negative	Medium	Low	High	N/A	Low	Medium	High	Medium

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
action by informal settlements, business forums and/or disgruntled sub-contractors.	Mitigated	Negative	Medium	Low	Low	N/A	Low	Low	Medium	Low
Generation of large volumes of rubble and inert material	Unmitigated	Negative	Medium	Low	Medium	N/A	Medium	Medium	High	Medium
	Mitigated	Negative	Medium	Low	Low	N/A	High	Low	High	Low
Cumulative health, safety, security and nuisance impacts	Unmitigated	Negative	Medium	Low	High	N/A	Medium	High	High	High
	Mitigated	Negative	Medium	Low	Medium	N/A	High	Medium	High	Medium

Table 19 Assessment of potential negative impacts of the proposed widening/capacity improvements to the N3 on the social and socio-economic environment during operation (with and without mitigation)

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
Increased noise where the distance from the road to receptors is reduced	Unmitigated	Negative	Medium	High	High	N/A	Low	High	High	High
	Mitigated	Negative	Low	High	Medium	N/A	Low	Low	High	Medium
Safety risks to nearby properties and occupants during operation of the widened road	Unmitigated	Negative	Low	High	Medium	N/A	Medium	Medium	Medium	Medium
	Mitigated	Negative	Low	High	Low	N/A	Medium	Low	Low	Low
Increased effect of vibrations from heavy vehicles as a result of passing closer to buildings and residences	Unmitigated	Negative	Low	High	Medium	N/A	Low	Medium	High	Medium
	Mitigated	Negative	Low	High	Low	N/A	Medium	Low	Medium	Low
Damage to adjacent properties due to poorly designed stormwater drainage	Unmitigated	Negative	Low	Medium	Medium	N/A	Medium	Medium	Low	Medium
	Mitigated	Negative	Low	Low	Low	N/A	High	Low	Low	Low

Table 20 Assessment of potential impacts of the widening/capacity improvements to the N3 on cultural heritage resources during construction, operation and rehabilitation (with and without mitigation)

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
No impacts identified	Unmitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 21 Assessment of potential impacts of the proposed widening/capacity improvements to the N3 on the biophysical environment and biodiversity (water, soils, riparian, wetland, terrestrial natural habitat and fauna) during construction, operation and rehabilitation (with and without mitigation)

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
Loss of topsoil	Unmitigated	Negative	Medium	High	High	Medium	Low	High	High	High
	Mitigated	Negative	Low	Low	Low	Medium	Low	Low	Low	Low
Destabilisation of banks, erosion, sedimentation	Unmitigated	Negative	Medium	Low	Medium	Low	Medium	Medium	High	Medium
	Mitigated	Negative	Low	Low	Low	Low	High	Low	Low	Low
Loss/ degradation of disturbed grassland/ thicket mosaic	Unmitigated	Negative	Medium	High	Medium	Low	Medium	Medium	High	Medium
	Mitigated	Negative	Low	High	Low	Low	High	Low	High	Low
Loss/ degradation of Hygrophilous grassland	Unmitigated	Negative	Medium	High	Medium	Medium	Medium	Medium	Medium	Medium
	Mitigated	Negative	Low	High	Low	Low	High	Low	High	Low
Loss/ degradation of wetland areas ²¹	Unmitigated	Negative	Medium	High	Medium	Low	Medium	Medium	High	Medium
	Mitigated	Negative	Low	High	Low	Low	High	Low	High	Low
Faunal	Unmitigated	Negative	Medium	Medium	Medium	Low	Medium	Medium	High	Medium

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
mortalities and negative effect on local faunal populations due to disturbance, loss of habitat and poaching	Mitigated	Negative	Medium	Medium	Low	Low	High	Medium	Medium -Low	Low
Deterioration of water quality from pollutants, sediment, etc during construction	Unmitigated	Negative	Low	Low	Medium	Low	High	Medium	High	Medium
	Mitigated	Negative	Low	Low	Low	Low	High	Low	Medium	Low
Cumulative impacts on natural habitat	Unmitigated	Negative	Medium	High	Medium	Medium	Medium	Medium	High	Medium
	Mitigated	Negative	Medium-Low	High	Low	Low	High	Low	High	Low

Table 22 Assessment of potential impacts of the No Development Alternative

Description and Nature of Impact	Mitigation	Nature (Positive, Negative, Neutral)	Spatial Extent (Low, Medium, High)	Duration (Very Low, Low, Medium, High)	Intensity (Low, Medium, High)	Irreplaceable Loss of Resources (Low, Medium, High)	Reversibility of Impacts (Low, Medium, High)	Consequence (Low, Medium, High)	Probability (Low, Medium, High)	Significance (Low, Medium, High)
Deferment/avoidance of the negative impacts of construction (social disruption, noise and nuisance, and destruction/disturbance of natural habitat)	Unmitigated	Positive	High	N/A	N/A	N/A	N/A	N/A	High	Low-Medium
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Increased traffic congestion and increased commuter time	Unmitigated	Negative	Medium	High	High	High	Low	High	High	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Decreased road safety	Unmitigated	Negative	Medium	High	High	High	Low	High	High	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Disadvantages to the local, regional and national economy	Unmitigated	Negative	High	High	High	High	Low	Medium	High	High
	Mitigated	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

10 ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, a summary of the environmental impacts of the proposed activity (after mitigation) is provided below.

Effects of the project on the social environment and *vice versa*

This project is located primarily within the Mkhambathini LM, however there is a small section each which fall within the eThekweni Metropolitan Municipality and the Msunduzi LM Municipality. The nature of the surrounding area varies from agricultural land to light industrial and limited residential areas in the vicinity of the Camperdown Interchange. The project constitutes major roadworks (including widening of bridges) to be implemented on a national road carrying high volumes of traffic, including heavy vehicles. As such, during the construction period (approximately 4-5 years for the two contracts) there will be numerous negative impacts on the social environment, which will be experienced by both road users and adjacent property owners/occupiers on the affected sections. These will largely be nuisance impacts related to the disruption of traffic flows, road access, increased noise, increased crime risks and general construction related disturbances. The road restrictions will pose higher road safety risks to motorists, pedestrians and construction workers. Equally, the high traffic volumes and space constraints will make it more difficult for the project team to execute construction efficiently.

Any existing services in the current road reserve will have to be realigned/relocated and related disruptions may ensue. While all of these impacts will be temporary, it can be anticipated with a high level of certainty that thousands of road users and local residents will be affected on a daily basis at varying intensities over a period of a few years. While the majority of the road widening will be contained within the existing road reserve, expropriation of adjacent land will be required and, thus, some property owners will lose land and, in some cases, potentially entire properties. SANRAL has entered into property acquisition processes with affected property owners and fair compensation will be negotiated in line with legislated procedures. With efficient and proper project management and implementation by SANRAL, as well as the application of the mitigation measures recommended in this report (carried over into the EMP), **the negative social impacts during construction, while onerous, will be of medium and low significance, with no negative social impacts of high significance.**

The positive impacts of the project on the social environment during operation will be of a medium and high significance. They can be predicted with a high level of certainty to benefit thousands of road users on a daily basis through improved road travelling conditions, including improved road safety and reduced travel times.

Negative impacts during operation such as increased traffic noise and potentially, increased exhaust emissions, are not a result of the project but rather a result of increasing traffic volumes over time, which will unavoidably affect any occupiers and users of properties adjacent to any national road. In the case of this project, the intensity of impacts will increase where the widened road brings the receivers into closer proximity to the traffic. With respect to emissions, the impacts will be variable, depending on the topography and micro-climate of the location. Indeed, some areas where previously there was congestion are likely to improve with respect to emissions, as free flowing traffic is likely to decrease the concentration of exhaust emissions. With respect to operational noise, it is clear that noise levels are already problematic within generally 250-280 m from the road and they are predicted eventually (over the next 30 years and in the absence of mitigation) to reach unacceptable levels according to predicted increases in traffic volumes. SANRAL, as the road authority, is tasked with ensuring that the roads can safely and efficiently accommodate traffic growth to facilitate economic development and to do this, has to widen the road. SANRAL has taken into consideration low noise surfacing in the road design and is in the process of appointing an acoustic specialist to investigate further

possible, economically feasible noise control measures over time. Control of the growth of traffic volumes is a broader issue that requires high level interventions such as improved public transport and migration of freight from road to rail. These issues are being addressed but will take time. Ultimately, there must also be an adaptation to prevailing conditions i.e. a change of land use/receptors adjacent to national roads, towards those which are less sensitive to noise. **With mitigation, the negative impacts on the social environment associated with operation of the widened national roads are anticipated to be of a low and medium significance.**

Effect of the project on the economic/socio-economic environment

During the construction period, it is definite that some **positive economic/socio-economic impacts of low significance will accrue to the local and regional community** due to the provision of temporary jobs for semi-skilled and unskilled workers, the increased opportunities for local contractors and SMMEs, and a general increase in spending on a wide range of goods and services in Durban, Pietermaritzburg and KZN. There is also likely to be spending nationally on specialist materials/equipment. The estimated cost for the N3 upgrades between Durban and Pietermaritzburg, including interchanges, is R 235 million per km (2018 Rand, VAT exclusive) i.e. an estimated cost of R 17.64 billion over 75 km. The interchange upgrades contribute a substantial portion of the N3 upgrading, including the N2/N3 EB Cloete Interchange. The latest Preferential Procurement Policy Framework Act (Act 5 of 2000) (PPPFA) regulations makes it mandatory that thirty percent of the contract value is subcontracting to specific target groups which includes Emerging Micro Enterprises and Qualifying Small Enterprises.

There will also be negative economic/socio-economic impacts during construction. Economic losses are likely to be incurred indirectly due to poorer access, poorer road and travelling conditions, an increased likelihood of road traffic accidents, possible damage to infrastructure and services, expropriation of properties, resettlement processes, etc. **With mitigation, the negative economic/socio-economic impacts of the project during construction are anticipated to be of low and medium significance.**

Economic impacts during operation will be positive. The project has SIP2 status (and as such, is a national priority). The primary motivation for implementing this project is to stimulate economic growth through improved transport infrastructure and an improved logistics/transport corridor between Durban and Gauteng. In conjunction with a number of other short-, medium- and long-term strategic Government plans and interventions it is, thus, designed to positively impact on the economy of the country. Positive economic benefits will be incurred locally, regionally, provincially and nationally as a result of the improved transport infrastructure. **With good project management and execution, the positive impacts of this particular project on the economy will be of high significance. The project will also contribute cumulatively with other SIP projects to significantly benefit the country's economy.**

Effects of the project on cultural heritage resources and *vice versa*

Based on the findings of the cultural heritage assessment, no cultural heritage resources have been identified in the project area. Should any be uncovered during the course of construction, Amafa must be notified for guidance on actions required.

Effects of the project on the biophysical environment, biodiversity and *vice versa*

While construction will inevitably impact negatively on natural habitat, it should be noted that this project is an upgrade of an existing road and it is located primarily within the existing road reserve. The works will, thus, largely affect previously disturbed habitat. Road widening will entail lengthening of existing drainage structures and existing culverts at watercourse crossings. The expanded Dardanelles I/C will require some road sections which will affect

limited areas outside of SANRAL's road reserve. There is one potentially sensitive vegetation community which could be affected by construction activities, the Hygrophilous Grassland at the Cato Ridge offramp. Other key impacts could occur in the disturbed grassland and thicket mosaics, and wetland vegetation along the route. Management actions presented in the EMPr will ensure that these impacts are reduced. Once rehabilitation post construction is undertaken, the impacts during operation of the road will not be significant. **With mitigation, the negative impacts of construction and operation on the biophysical environment (soils and substrates, terrestrial and riparian habitat, as well as associated fauna) will be of low significance.**

Effects of the No Development Alternative

While the No Development Alternative would defer the negative impacts of construction on the social and biophysical environment, as described above, this would be of short term benefit only. In the longer term, the No Development Alternative will result in increasingly congested, unsafe and inefficient national road infrastructure. The negative consequences of not widening and upgrading the national roads, will be severe and will have far reaching impacts on all South Africans and be contrary to the strategic plans of the South African Government. **The negative impacts of the No Development Alternative have been assessed as being of high significance. For these reasons, this alternative is not recommended.**

11 RECOMMENDATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

It is the opinion of the EAP that the information contained in this report and the documentation attached hereto is sufficient to make a decision in respect of the activity applied for, viz the proposed capacity upgrades to the **N3 from Cato Ridge I/C to Lynnfield Park**.

It is the opinion of the EAP that the proposed activity can be authorised, based on the findings of the assessment process and conditional on the following:

- ❑ Compliance with the SANRAL Generic EMP and project specific EMPr.
- ❑ Financial provision must be made for environmental management of the contract in accordance with the specifications of the Environmental Management Programme and associated subsidiary plans. This includes provision for:
 - Alien plant control.
 - Plant rescue and rehabilitation of specified sensitive areas.
 - Public liaison to ensure timeous notification to the public and affected landowners, particularly regarding requirements in the Noise Management Plan.
 - Noise mitigation. SANRAL must engage acoustic engineering specialists to better understand noise abatement measures. Should such measures prove beneficial and provided they are affordable, specific noise hot spots in urban areas along this section of the N3 should be mitigated during the projected lifespan of the upgraded road.
 - Water quality monitoring.
- ❑ SANRAL is to compile a detailed plan for the re-use and/or disposal of demolition rubble and excess inert material, and the relevant specifications are to be included in the contract documents.
- ❑ Crime is rife and the costs of crime to the victims and to the municipality and province are far reaching. During construction, the integrity of boundary fences of adjacent properties is to be maintained and/or other contingency measures put in place to ensure that security is not compromised due to construction activities. This must be priced by contractors as part of their tenders.
- ❑ SANRAL is to ensure that close liaison is maintained with the provincial and municipal Road Transport Authorities to ensure that the relevant authorities and public are kept informed of road closures and deviations that affect provincial and municipal roads.

12 CONCLUDING REMARKS

This draft BAR has been submitted to the competent authority, DEA, along with an application for environmental authorisation. This BAR has been made available for public review and will be finalised after consideration of comments submitted. Thereafter, the final report will be submitted to DEA. Registered I&APs will be kept informed of all further submissions and DEA's decision making with respect to the issuing of an Environmental Authorisation, as well as the appeal procedure which should be followed should a member of the public or the applicant wish to appeal the EA.

VICKI KING

NAME OF EAP:



SIGNATURE OF EAP

27 February 2019
DATE

13 REFERENCES

(note most references cited in this BAR are from the specialist reports in Appendix D)

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Williams, V.L., Raimondo, D., Crouch, N.R., Cunningham, A.B., Scott-Shaw, C.R., Lötter, M. and Ngwenya, A.M. 2016. *Hypoxis hemerocallidea* Fisch., C.A. Mey. and Avé-Lall. National Assessment: Red List of South African Plants version 2017.1. Accessed on 2018/05/24.

Websites referenced (where not cited directly in text)

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APPENDIX A: FACILITY ILLUSTRATIONS

- ❑ A1 N3 BA4 Cato Ridge I/C
- ❑ A2 N3 BA4 Camperdown I/C
- ❑ A3 N3 BA4 Dardanelles I/C

APPENDIX B: SITE PHOTOGRAPHS

- B1 N3 BA4 Photo Report

APPENDIX C: ZONATION, PROPERTIES AND ENVIRONMENTAL SENSITIVITY MAPS

- ❑ C1a BAs 3-6 Land Use and Zonation Map Legend
- ❑ C1b BA4 Land Use and Zonation Map
- ❑ C2a BAs 3-6 Properties within 50 m of Site
- ❑ C2b BA4 list of acquisition properties
- ❑ C3 BAs 3-6 General Environmental Sensitivities

APPENDIX D: SPECIALIST STUDIES

- D1 BA4 Social Impact Assessment
- D1a BA4 Specialist Declaration (Social)
- D1b CV Social Specialist
- D2 BA4 Heritage Impact Assessment Phase 1
- D2a BA4 Specialist Declaration (Heritage)
- D2b CV Heritage Specialist
- D3 BA4 Riparian & Wetland Assessment
- D3a BA4 Riparian & Wetland Assessment Appendix A
- D3b BA4 Riparian & Wetland Assessment Appendix D
- D3c BA4 Specialist Declaration (Riparian & Wetland)
- D3d CV Riparian & Wetland Specialist
- D3e CV Riparian & Wetland Specialist
- D4 BA4 Vegetation Assessment.
- D4 BA4 Specialist Declaration (Vegetation)
- D4b CV Vegetation Specialist
- D5 BA4 Noise Assessment Report
- D5a BA4 Noise Assessment Report Appendix 4
- D5b BA4 Noise Assessment Report Appendix 5
- D5c BA4 Noise Assessment Report Appendix 6
- D5d BA4 Specialist Declaration (Noise)
- D5e CV Noise Specialist
- D6 Specialist Terms of Reference for Report Updates.

APPENDIX E: PUBLIC PARTICIPATION DOCUMENTATION & CORRESPONDENCE

- ❑ E1 Adverts, BID & Notices.
 - E1 BA3-6 Site Notices Placed.
 - E1a BA3-6 Advert Citizen (09.05.18).
 - E1b BA3-6 Advert Maritzburg Fever (09.05.18).
 - E1c BA3-6 Advert Ilanga (10.05.18).
 - E1d BA3-6 Advert Witness (11.05.18).
 - E1e BA3-6 Advert Intshonalanga Eyethu (11.05.18).
 - E1f BA3-6 Infrastructure News N3 Corridors Mega Makeover (29 03 18)
 - E1g L2B News- N3 Corridor Upgrades (15 06 18)
 - E1h BA3-6 Background Information Document.
 - E1i BA3-6 Cover Letter Announce with BID
 - E1j BA3-6 Comment Sheet sent with BID
- ❑ E2 List of Registered I&APs.
 - E2a BA3-6 Database (Company).
 - E2a BA3-6 Database (Surname).
- ❑ E3 Comments and Responses Report.
 - E3a N3 BA3-6 CRR Project Announce 06 02 19
- ❑ E4 Proof of Key Stakeholder Notification.
 - E4a BA3-6 Proof of Postage, Cover Letter and BID (11.05.18).
 - E4b BA3-6 Proof of Sent Emails, Cover Letter and BID (11.05.18).
 - E4c BA3-6 Proof of Bulk SMS Log for N3 POD (24 05 18)
- ❑ E5 Proof of Written Notification to Authorities.
 - E5a BA3-6 Proof of Postage, Cover Letter and BID (11.05.18).
 - E5b BA3-6 Proof of Sent Emails, Cover Letter and BID (11.05.18).
- ❑ E6 Stakeholder Correspondence & Meetings.
 - E6a BA3-6 Msunduzi Environmental Dept Meeting notes (30 05 18)
 - E6b BA1-6 Mins Meeting eThekweni Env Planning 12.03.15(Rev 0)
 - E6b BA3-6 meeting G Mullins ECPPD 06 06 18
 - E6c BA1-6 Agenda Co-ordn meeting with DWS (25 07 18).
 - E6c BA1-6 Minutes Co-ordn meeting with DWS (25 07 18).
 - E6d BA3-6 Public Open Day Cato Ridge Club 28 05 18 att reg
 - E6e BA3-6 Public Open Day Vine Lynnfield Park 20 05 18 att reg
 - E6f Ba3-6 Public Open Day PMB Golf Club 30 05 18 att reg
 - E6g (23.05.18) K.Van Heerden KZNDEDTEA Comment
 - E6h (14.05.18) AMAFA comment
 - E6i (3.07.18) Ezemvelo KZN Wildlife formal Comment
 - E6j (12.07.18) eThekweni Co-ordinated Comment
 - E6k (23.07.18) Msunduzi EMU (Cato Ridge to Lynnfield Park)
 - E6l (23.07.18) Msunduzi EMU (Lynnfield Park to Gladys Manzi)
 - E6m (23.07.18) Msunduzi EMU (New England to Twickenham)
 - E6n (06.08.18) Sandile Dladla (eThekweni Fire)
 - E6o (30.08.18) KZN DoT Comment
 - E6p (18 05 18) DAFF
 - E6q (30 05 18) K Moodley DAFF
 - E6r (17.08.18) K Moodley DAFF
 - E6s (20 09 18) iNgonyama Trust
 - E6t (30 09 18) Transnet
- ❑ E7 I&AP Correspondence

APPENDIX F: ENVIRONMENTAL MANAGEMENT PROGRAMME (DRAFT)

- BAs 1-6 SANRAL Overarching EMP (Construction)
- BA5 Site Specific Environmental Management Programme (Construction)
- Appendices to Site Specific Environmental Management Programme (Construction)
 - BA5 Appendix A: Sensitive Vegetation Rehabilitation Plan with plant rescue and translocation guidelines
 - BA5 Appendix B: Wetland and Riparian Areas Rehabilitation Plan
 - BAs 3-6 Appendix C: Erosion and Soil Management Plan
 - BAs 3-6 Appendix D: Storm Water Management Plan
 - BAs 1-6 Appendix E: Noise Management Plan
 - BAs 1-6 Appendix F: Traffic Management Plan

APPENDIX G: DETAILS AND CV OF EAP

- ❑ G : N3 BA5 EAP Declaration of Interest
- ❑ G1: N3 BAs 1-6 Details of EAPs
- ❑ G2: N3 BAs 1-6 CV A McKenzie
- ❑ G3: N3 BAs 1-6 CV V King
- ❑ G4: N3 BAs 1-6 CV RD Heinsohn
- ❑ G5: N3 BAs 1-6 CV M Straeuli

APPENDIX H DEA CORRESPONDENCE & MEETINGS

- H1 Pre-Application
 - H1a BA3-6 DEA Pre-Application Meeting 23 04 18 notes
 - H1b BA3-6 DEA Pre-Application Meeting 23 04 18 attendance register
- H2 Application
 - H2a BA5 Application DEA (Rev 1) 05 10 18