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Final Basic Assessment for the Department of Transport for the Upgrade of Main Road P258 DC24/0027/2011



Prepared by

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Basic Assessment Report



KZN Agriculture, Environmental Affairs & Rural Development

*umNyango: ezoLimo ezeMvelo nokuThuthukiswa
kweMiphakathi yaseMakhaya*

ISIFUNDAZWE SAKWAZULU-NATALI

(For official use only)

File Reference Number:
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Date Received:

DC/
KZN/EIA/

Basic Assessment Report in terms of the **Environmental Impact Assessment Regulations, 2010** promulgated in terms of the **National Environmental Management Act, 1998 (Act No. 107 of 1998)**

Kindly note that:

1. This **basic assessment report** meets the requirements of the EIA Regulations, 2010 and is meant to streamline applications. This report is the format prescribed by the KZN Department of Agriculture, Environmental Affairs and Rural Development. Please make sure that this is the latest version.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with text.
3. Where required, place a cross in the box you select.
4. An incomplete report will be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it will result in the rejection of the application as provided for in the regulations.
6. No faxed or e-mailed reports will be accepted.
7. The report must be compiled by an independent environmental assessment practitioner ("EAP").
8. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
9. The KZN Department of Agriculture, Environmental Affairs and Rural Development may require that for specified types of activities in defined situations only parts of this report need to be completed.
10. The EAP must submit this basic assessment report for comment to all relevant State departments that administer a law relating to a matter affecting the environment. This provision is in accordance with Section 24 O (2) of the National Environmental Management Act 1998 (Act 107 of 1998) and such comments must be submitted within 40 days of such a request.
11. **Please note that this report must be handed in or posted to the District Office of the KZN Department of Agriculture, Environmental Affairs and Rural Development to which the application has been allocated (please refer to the details provided in the letter of acknowledgement for this application).**

SECTION A: DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER AND SPECIALISTS

1. NAME AND CONTACT DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Name and contact details of the EAP who prepared this report:

Business name of EAP:	EnviroPro		
Physical address:	106 Kirtlington Ridge 33 Surprise Ridge Road; Hillcrest 3610		
Postal address:	PO Box 1391 Kloof		
Postal code:	3640	Cell:	082 568 3687 / 082 887 4362
Telephone:	031 765 2942		Fax:
E-mail:	josette@enviropro.co.za iain@enviropro.co.za		

2. NAMES AND EXPERTISE OF REPRESENTATIVES OF THE EAP

Names and details of the expertise of each representative of the EAP involved in the preparation of this report:

Name of representative of the EAP	Education qualifications	Professional affiliations	Experience at environmental assessments (yrs)
Josette Oberholzer	BSc (Hons) MSc	Member of IAIASA	8
Iain Jourdan	BSc (Hons) in Geographical Science	Member of IAIASA	4
Chevy Smith	BSc (Hons)	-	2

3. NAMES AND EXPERTISE OF SPECIALISTS

Names and details of the expertise of each specialist that has contributed to this report:

Name of specialist	Education qualifications	Field of expertise	Section/ s contributed to in this basic assessment report	Title of specialist report/ s as attached in Appendix D
NA				

SECTION B: ACTIVITY INFORMATION

1. PROJECT TITLE

Describe the project title as provided on the application form for environmental authorization:

Upgrade of Main Road P258 within Abaqulusi and Nqutu Local Municipalities.

2. PROJECT DESCRIPTION

Provide a detailed description of the project:

The Kwa-Zulu Natal Department of Transport (KZN DOT) propose to upgrade the entire length of Main Road 258 (P258) from gravel to a blacktop standard (tar).

The upgrade of the existing gravel road will start at the intersection with the P54 and end at the intersection with the P54. The existing gravel road is approximately 8.5 m in width over its length and conforms to the Department of Transport's Type 5 Secondary/Tertiary Gravel Road standard. In general, the route can be described as following "flat terrain". After approximately three kilometres, the upgrade crosses the first of 10 water course crossings. In one location along its route, the road passes within 32m of another water course, which has been designated as a sensitive area. Therefore the upgrade requires environmental authorisation from kilometre 3 and it is the remaining 24.6 kilometres that will be focussed on in this report. All crossings and sensitive areas have been identified and marked on the series of maps in appendix A and are described in this report. It should be noted that from approximately Kilometre 8 until Kilometre 13 (5km portion) the road is already tarred through the settlement of Emondlo. This section of the road does however require rehabilitation and sidewalks will be provided along the route approaching the town¹.

The route to be upgraded will closely follow the existing alignment in what is essentially a semi-circular loop intersecting several district and local access roads. The intersections will be designed to the proper geometric standards for DoT. As mentioned, the P258 has 10 existing watercourse crossings, two of which are considered major crossings (2 bridges) and the other 8 crossings (pipe culverts) are across smaller drainage lines and streams. A portion of the road that runs within 32m of a water course has been designated as a sensitive area. The road upgrade will also involve the implementation of associated storm water infrastructure, bus/taxi bays, pedestrian walkways and crossings.

The cross sectional widths of the larger structures have been deemed as insufficient to accommodate anticipated vehicular and pedestrian traffic, therefore these larger structures will be widened accordingly¹. The smaller crossings will re-designed to ensure the vertical alignment meets the flood frequency standards for new structures located on provincial roads¹. Where necessary pipe culverts will be resized to accommodate greater flow¹.

3. ACTIVITY DESCRIPTION

Describe each listed activity in Listing Notice 1 (GNR 544, 18 June 2010) or Listing Notice 3 (GNR 546, 18 June 2010) which is being applied for as per the project description:

11. The construction of:

(iii) bridges:

(xi) infrastructure or structures covering 50 square meters or more

Where such construction occurs within a water course or within 32 meters of a watercourse,

¹ P258: Ngolokodo to Nqutu Preliminary Basic Planning and Route Location Report, Naidu Consulting 2011.

measures from the edge of a watercourse, excluding where such construction will occur behind the development setback line.

39. The expansion of

(iii) bridge;

(v) bulk storm water outlet structures;

Within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, where such expansion will result in an increased development footprint but excluding where such expansion will occur behind the development setback line.

12. FEASIBLE AND REASONABLE ALTERNATIVES

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

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

Describe alternatives that are considered in this report. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Site Alternative 1

The proposal is to upgrade an existing road (P258), therefore there is only one site alternative. This will include tarring the existing road surface and upgrading the existing stream crossing infrastructure which includes nine water course crossings of which two are existing bridge type structures and the remainder are pipe culverts. The road upgrade will also involve the implementation of associated storm water infrastructure, bus/taxi bays, pedestrian walkways and crossings.

Technology Alternative 1

Re-grade and then **tar** the existing gravel road surface. This will include tarring of taxi and bus lay-bys.

Technology Alternative 2

Re-grade and **re-gravel** the existing gravel road surface.

Sections B 5 – 15 below should be completed for each alternative.

13. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees, minutes and seconds. List alternative sites were applicable.

Alternative:	Latitude (S):	Longitude E:
Alternative S1 ² (preferred site alternative)		
Alternative S2 (if any) NA		

In the case of linear activities:

Alternative:	Latitude (S):	Longitude E:
Alternative S1 (preferred or only route alternative)	27°57'3.42"S	30° 37'1.53"E
Start		
End	28°5'47.69"S	30° 38'13.32"E

RC = River Crossing, SA = Sensitive Area; the number corresponds with the aerial photographs in Appendix A and the Photographs in Appendix B.

River crossing	Latitude (S):	Longitude E:
RC 1	27°57'47.01"S	30°38'42.44"E
RC 2	27°57'49.98"S	30°38'52.51"E
RC 3	27°57'58.65"S	30°39'58.88"E
RC 4	27°57'42.31"S	30°41'12.90"E
RC 5	28°1'34.81"S	30°44'39.43"E
RC 6	28°2'9.88"S	30°44'7.06"E
RC 7	28°3'53.51"S	30°42'57.84"E
RC 8	28°5'21.98"S	30°39'59.27"E
RC 9	28°5'32.11"S	30°39'12.50"E
RC 10	28°5'41.26"S	30°39'2.55"E
SA 1	28°4'7.72"S	30°42'42.05"E

14. PHYSICAL SIZE OF THE ACTIVITY

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

Alternative:	Size of the activity:
Alternative A1 ³ (preferred activity alternative)	m ²
Alternative A2 (if any)	m ²
Alternative A3 (if any)	m ²

or, for linear activities:

Alternative:	Length of the activity:
Alternative A1 (preferred activity alternative-entire road upgrade)	32.6km
Alternative A1 (preferred activity alternative – section requiring environmental authorisation, excludes section of road already tarred)	24.6km

² "Alternative S.." refer to site alternatives.

³ "Alternative A.." refer to activity, process, technology or other alternatives.

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Alternative A2 (if any)	m
Alternative A3 (if any)	m

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

Alternative: NA

Size of the site/servitude:

Alternative A1 (preferred activity alternative)	m ²
Alternative A2 (if any)	m ²
Alternative A3 (if any)	m ²

15. SITE ACCESS

Does ready access to the site exist?

YES	NO
x	
m	

If NO, what is the distance over which a new access road will be built
Describe the type of access road planned:

NA

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

16. SITE OR ROUTE PLAN

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

The site or route plans must indicate the following:

- a. the scale of the plan which must be at least a scale of 1:500;
- b. the property boundaries and numbers/ erf/ farm numbers of all adjoining properties of the site;
- c. the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- d. the exact position of each element of the application as well as any other structures on the site;
- e. the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- f. walls and fencing including details of the height and construction material;
- g. servitudes indicating the purpose of the servitude;
- h. sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
 - rivers, streams, drainage lines or wetlands;
 - the 1:100 year flood line (where available or where it is required by DWA);
 - ridges;
 - cultural and historical features;

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- areas with indigenous vegetation including protected plant species (even if it is degraded or infested with alien species);
- i. for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- j. the positions from where photographs of the site were taken.

17. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

18. FACILITY ILLUSTRATION

A detailed illustration of the facility must be provided at a scale of 1:200 and attached to this report as Appendix C. The illustrations must be to scale and must represent a realistic image of the planned activity/ies.

19. ACTIVITY MOTIVATION

a. Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R280 000 000.00
What is the expected yearly income that will be generated by or as a result of the activity?	0
Will the activity contribute to service infrastructure?	YES X NO
Is the activity a public amenity?	YES X NO
How many new employment opportunities will be created in the development phase of the activity?	1 500
What is the expected value of the employment opportunities during the development phase?	4,3 million (over three years of construction)
What percentage of this will accrue to previously disadvantaged individuals?	100%
How many permanent new employment opportunities will be created during the operational phase of the activity?	Employment opportunities will only be during the construction phase.
What is the expected current value of the employment opportunities during the first 10 years?	Employment opportunities will only be during the construction phase.
What percentage of this will accrue to previously disadvantaged individuals?	Employment opportunities will only be during the construction phase.

b. Need and desirability of the activity

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

The route serves a large population and provides access to numerous residential settlements on both sides of the road and is an important feeder route between the towns of Vryheid and Melmoth². The road also services six secondary and five primary schools, one health facility (Siyakhathala Clinic) and one place of worship (viz. churches) as well as a number of small businesses.

The route is heavily used on a daily basis by mini bus taxis, public buses, supply trucks, light delivery vehicles and light motor vehicles. Due to the scattered location of the various schools along the route, a large number of pedestrians also utilize the route without adequate safety facilities such as sidewalks⁴.

It is therefore imperative that the corridor between these communities via the P258 be upgraded to a blacktop standard to support the organic growth and development that will occur in these areas over time⁴.

Indicate any benefits that the activity will have for society in general:

The upgrade will ensure safe and easy access to services located along the P258, including schools, health care facilities etc. It will ensure that the road can cater for expected growth in traffic volumes in the area, facilitating safer and more efficient transport. Ultimately the road upgrade will play an important role in the growth and upliftment of this community.

The road upgrade will facilitate the movement of people from Emondlo to Ngolokodo, Nquthu, Vryheid and Kranskop and to various clinics and hospitals along the P258. It will allow for safe travel for all road users from Ngolokodo to Nquthu. It is expected to encourage economic development within the various communities along the route and will also promote pedestrian safety, especially for school children attending the eleven schools along the road.

Indicate any benefits that the activity will have for the local communities where the activity will be located:

As previously mentioned the upgrade will ensure safe and easy access to services located along the P258, including schools, health care etc. It will ensure that the road can cater for expected growth in traffic volumes in the area, facilitating safer and more efficient transport.

The route between Ngolokodo and Nquthu is currently experiencing high growth. The upgrading of P258 to blacktop standard will accelerate this growth and the additional road capacity will accommodate the anticipated increased traffic volumes which will ensure an efficient transportation network⁴. The upgrading of the P258 is expected to alleviate traffic congestion and enhance accessibility to the towns of Vryheid and Kranskop, via P463 and P199, ensuring the highest level of safety for both vehicular and pedestrian traffic⁴.

Additionally, with the development of Main Road 16-4 between Silutshana and Vryheid, it has become apparent that the P258 will experience similar large growth and consequential corridor development⁴.

The community has previously expressed the need for the road to be upgraded. Additionally, there will also be temporary employment opportunities for local community members during the construction period for tasks that require unskilled labour. Ultimately the road upgrade will play an important role in the growth and upliftment of this community.

⁴ P258: Ngolokodo to Nqutu Preliminary Basic Planning and Route Location Report, Naidu Consulting 2011

20. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline:	Administering authority:	Date:
1. National Environmental Management Act	All government bodies	1998
2. National Water Act	DWAF	1998
3. National Waste Management Act	DEAT	2008
4. Environmental Conservation Act	DEAT	1996

21. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a. Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES	NO
X	

If yes, what estimated quantity will be produced per month?

8 m ³

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

Construction rubble will be collected in a skip and disposed of at a registered landfill site by the appointed construction contractor or by a certified waste contractor.

Where will the construction solid waste be disposed of? (provide details of landfill site)

Should any material require disposal, this will be disposed of at waste collection point in Vryheid town (municipal waste stream), which will then be taken to the Vryheid Land fill site, which is the nearest registered landfill.

Will the activity produce solid waste during its operational phase?

YES	NO
	X

If yes, what estimated quantity will be produced per month?

NA m ³

How will the solid waste be disposed of? (provide details of landfill site)

NA

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

NA

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine the further requirements of the application.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES	NO
	X

If yes, contact the KZN Department of Agriculture, Environmental Affairs and Rural Development to obtain clarity regarding the process requirements for your application.

Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO
	X

If yes, contact the KZN Department of Agriculture, Environmental Affairs and Rural Development to obtain clarity regarding the process requirements for your application.

b. Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO
	X

If yes, what estimated quantity will be produced per month?

NA m ³

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Will the activity produce any effluent that will be treated and/or disposed of on site?

Yes	NO
	X

If yes, contact the KZN Department of Agriculture, Environmental Affairs and Rural Development to obtain clarity regarding the process requirements for your application.

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO
	X

If yes, provide the particulars of the facility:

Facility name:	NA		
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

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

NA

c. Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES	NO
	X

If yes, is it controlled by any legislation of any sphere of government?

YES	NO
	X

If yes, contact the KZN Department of Agriculture, Environmental Affairs and Rural Development to obtain clarity regarding the process requirements for your application.

If no, describe the emissions in terms of type and concentration:

NA

d. Generation of noise

Will the activity generate noise?

YES	NO
X	

If yes, is it controlled by any legislation of any sphere of government?

YES	NO
	X

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

If no, describe the noise in terms of type and level:

The noise generated will be from the construction vehicles used during construction and will thus be a temporary impact.

22. WATER USE

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

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Municipal x	water board	groundwater	river, stream, dam or lake x	other	the activity will not use water
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Water will only be during the construction phase for dust suppression and mixing of cement.

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

+- 100 000 litres	
YES	NO x

Does the activity require a water use permit from the Department of Water Affairs?

If YES, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this report.

Water use will be monitored, should water use exceed 50 000 litres per day (50 cubic meters) then the water use will be registered with DWA.

23. ENERGY EFFICIENCY

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

NA

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

NA

SECTION C: SITE/ AREA/ PROPERTY DESCRIPTION

Important notes:

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

Section C Copy No.
(e.g. A):

- Subsections 1 - 6 below must be completed for each alternative.

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

The following applies to the entire route under assessment from River Crossing 1 to the end of the upgrade. The route covers rolling terrain and the gradient varies throughout.

Alternative S1:

Flat x	1:50 – 1:20 x	1:20 – 1:15 x	1:15 – 1:10 x	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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2. LOCATION IN LANDSCAPE

The following applies to the entire route under assessment from River Crossing 1 to the end of the upgrade. The route covers rolling terrain and the gradient varies throughout.

Indicate the landform(s) that best describes the site (Please cross the appropriate box).

From River Crossing One the road starts to climb a hillside to River Crossing Two, it then remains fairly level until reaching River Crossing Three and River Crossing Four. The road then descends gently through the dense settlement of Emondlo along the section of the road that is already tarred. The road then switches to a gravel surface again and continues to descend until it reaches River Crossing Five a large bridge structure. From this point the road climbs gently before descending to River Crossing Six, which is a single lane concrete bridge across a river. From this point onwards the road climbs to River Crossing Seven which is located on a hillside, it then proceeds to follow a ridgeline where it traverses through Sensitive Area One. The road then traverses undulating terrain for the remainder of the route with River Crossing Eight, Nine and Ten located on hillsides within open valleys.

Alternative S1 (preferred site):

Ridgeline <input checked="" type="checkbox"/>	Plateau	Side slope of hill/mountain <input checked="" type="checkbox"/>	Closed valley	Open valley <input checked="" type="checkbox"/>	Plain	Undulating plain/low hills <input checked="" type="checkbox"/>	Dune	Sea-front
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3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

The following applies to the entire route under assessment from River Crossing 1 to the end of the upgrade.

Has a specialist been consulted for the completion of this section?

YES	NO <input checked="" type="checkbox"/>
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If YES, please complete the following:

Name of the specialist:	
Qualification(s) of the specialist:	
Postal address:	
Postal code:	

Telephone:		Cell:	
E-mail:		Fax:	

Are any further specialist studies recommended by the specialist?

YES	NO <input checked="" type="checkbox"/>
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If YES, specify:

NA

If YES, is such a report(s) attached in Appendix D?

YES	NO <input checked="" type="checkbox"/>
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Signature of specialist: _____ Date: _____

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

The following applies to the entire route under assessment from River Crossing 1 to the end of the upgrade.

Alternative S1:

Shallow water table (less than 1.5m deep)	YES <input checked="" type="checkbox"/>	NO
Dolomite, sinkhole or doline areas	YES	NO <input checked="" type="checkbox"/>

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Seasonally wet soils (often close to water bodies)	YES X	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO X
Dispersive soils (soils that dissolve in water)	YES	NO X
Soils with high clay content (clay fraction more than 40%)	YES	NO X
Any other unstable soil or geological feature	YES	NO X
An area sensitive to erosion	YES X	NO

The vegetation type along the proposed road upgrade route is predominantly grassland with scattered alien plant species. A few indigenous *Acacia* Tree Species and a few indigenous *Aloe* Species were also noted along the route. In certain sections of adjacent to the road the grassland has been disturbed and this has resulted in the loss of topsoil and the formation of erosion gullies. The areas surrounding RC 1, RC 2, RC 6, RC 7 and SA 1 are susceptible to erosion and appropriate interventions during both construction and operation must be implemented to ensure the proposed project does not exacerbate this situation. These measures will be further discussed within the EMP.

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

4. GROUND COVER

Has a specialist been consulted for the completion of this section?

YES	NO X
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If YES, please complete the following:

Name of the specialist:	NA		
Qualification(s) of the specialist:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Are there any rare or endangered flora or fauna species (including red data species) present on any of the alternative sites?

YES X	NO X
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If YES, specify and explain:

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Are there any special or sensitive habitats or other natural features present on any of the alternative sites?

YES X	NO
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If YES, specify and explain:

<p>There are some indigenous Thorn trees and Aloes (<i>Acacia</i> Species and <i>Aloe</i> Species) in certain locations along the roadside. However, it is not anticipated that any of these trees or plants will be damaged or removed as part of the road upgrade itself. See below for a full description of the vegetation and natural features noted at each water course crossing and sensitive area. The section of the P258 under assessment crosses 10 water courses of varying size.</p> <p>As per the EIA regulations: "Watercourse" means – (a) A river or spring;</p>
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- (b) *A natural depression in which water flows regularly or intermittently;*
- (c) *A wetland, lake or dam into which, or from which water flows; and*
- (d) *Any collection of water which the minister may, by notice in the Gazette, declare to be a watercourse, And a reference to a watercourse includes, where relevant, its bed, and banks;*

For the most part, many of the water courses noted along the P258 could be described as natural depressions in which water flows regularly or intermittently. Many of these crossings were dry at the time of the site visit.

RC1: This crossing is an existing pipe culvert and headwall structure which is surrounded by grassland and scattered *Aloe* Species. At the time of the site visit, there was a small volume of water flowing through the pipe. The watercourse is rocky and the contractor should take care not to disturb the grassland vegetation which could result in the soil erosion.

RC2: Is an existing pipe culvert structure with headwall. At the time of the site visit this water course was dry. The vegetation type surrounding this culvert was predominantly grassland with scattered *Acacia* Tree Species. There is evidence that the area surrounding RC2 has been previously disturbed, the contractor should therefore take care not to exacerbate this situation.

RC3: This small drainage line which was dry at the time of the site crosses under the road at this point, through an existing pipe culvert structure. There is a large Fig Tree (*Ficus* Species) adjacent to the discharge. The presence of Turpentine Grass and Thatching Grass in the surrounding area indicates previous disturbance. On the upstream side of this crossing, illegal dumping has occurred in what is essentially the catch pit for the culvert. The waste that has been left there is predominantly domestic refuse. This illegal activity at this location should therefore not be attributed to the appointed contractor at a later stage although it is recommended that this waste be removed and disposed of at a permitted site during the upgrade.

RC4: Is a small drainage line that was not flowing at the time of the site visit. The surrounding area is dominated by grassland and woody species adjacent to the water course.

RC5: Is an existing raised concrete bridge structure that has sufficient width to accommodate two vehicles. This bridge crosses a wide (20m) slow moving body of water. There is wetland upstream of the structure although the predominantly grassy vegetation in the wetland has been partially disturbed and there is evidence that livestock regularly frequent the area. Approximately 30m below the bridge is a raised pipe crossing structure. The railing on the eastern edge of the bridge has been damaged and requires maintenance.

RC6: Is an existing large single lane concrete bridge structure across the Mvunyane River. The surrounding area is predominantly grassland. It should be noted that the soil type in this area consists of a very sandy type of material that is susceptible to erosion. Appropriate interventions will be required to prevent construction activity contributing to this situation. Upstream of the bridge location there is existing sand mining activity on the banks of the river.

RC7: Two existing pipe culverts drain an area where the existing road alignment cuts across a water course near the start of the drainage line. Water pools upstream of the road and once sufficient volume has been reached this water drains through the pipe culverts into the water course below the road. The surrounding vegetation is predominantly grassland and hygrophilous species were noted in the area upstream of the road. The water course below the road is highly eroded and sufficient erosion protection will be

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required at the discharge points below the road.

SA1: A portion of the road passes through an area that is within 32m of the start of a drainage line. This area is highly eroded and appropriate measures must be put in place to ensure that the proposed project does not contribute to this situation.

RC8: Is an existing pipe culvert structure running beneath the road. At the time of the site visit there was water flowing through the structure. The drainage line itself is relatively undisturbed with the dominant vegetation type being grassland.

RC9: Is a small drainage line that was flowing at the time of the site visit. There is an existing pipe culvert structure with large stone headwalls on either side of the road. A few scattered indigenous *Acacia* Tree Species were noted in and around the water course and the surrounding grassland has been disturbed by grazing.

RC10: Is a small drainage line that was flowing at the time of the site visit. There is an existing pipe culvert structure with headwalls. The surrounding area is dominated by grassland disturbed by grazing.

Are any further specialist studies recommended by the specialist?	YES	NO X
If YES, specify:	NA	
If YES, is such a report(s) attached in <u>Appendix D</u> ?	YES	NO

Signature of specialist: _____ Date: _____

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

The following applies to the entire route under assessment from River Crossing 1 to the end of the upgrade.

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

The groundcover in the areas surrounding River Crossings One to Ten have been expanded upon in the previous section of the report. In reference to the the buildings or other structures, this refers to the existing bridges and drainage structures that are currently in place at the various river crossing locations. The majority of bare soil on site refers to the existing gravel road to be upgraded, there are however a few areas where soil has been exposed by frequent pedestrian or vehicle traffic such as the footpaths/ driveways that lead to the surrounding residential homesteads. The cultivated land refers to the subsistence agriculture that occurs along the route and the gardens refer to the kept yards within the densely populated areas typically along the existing tar section of the road.

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

5. LAND USE CHARACTER OF SURROUNDING AREA

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

The following applies to the entire route under assessment from River Crossing 1 to the end of the upgrade.

Land use character			Description
Natural area	YES	NO	The road runs through natural areas which consist of a mix of indigenous and scattered alien invasive vegetation. The road also crosses nine water courses including the Mvunyane River. The potential impacts during construction and operation will however be restricted to the construction footprint along the existing road alignment and immediate vicinity of the bridges and drainage structures. Thus there will be little change to the natural area and surrounds.
Low density residential	YES	NO	The road runs past residential areas. The majority of residential homesteads appear to be out of the road reserve and there should be little or no requirement for the relocation of fences etc. However, should any relocations be required the contractor will negotiate with the landowners to move fences and make necessary adjustments. Ultimately, residents will have improved vehicle access as a result of the proposed road upgrade.
Medium density residential	YES	NO	From approximately kilometer 8 to kilometer 13, the road passes through an area with medium density residential homesteads. This portion of the road is already tarred and construction along this portion of the road would be limited to maintenance and upgrading of the pavements, drainage structures and intersections. There would be temporary disruption to traffic flow, this however would only be during the construction phase.
High density residential	YES	NO	
Informal residential	YES	NO	
Retail commercial & warehousing	YES	NO	There are a number of small retail outlets (trading stores/ taverns and spaza shops), these stores will however not be negatively affected by the proposed road upgrade as they are not within the road reserve. Ultimately, the improved vehicle access as a result of the proposed road upgrade, could lead to additional traffic along the route resulting in increased sales.
Light industrial	YES	NO	

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Medium industrial	YES	NO	
Heavy industrial	YES	NO	
Power station	YES	NO	
Office/consulting room	YES	NO	
Military or police base/station/compound	YES	NO	
Spoil heap or slimes dam	YES	NO	
Quarry, sand or borrow pit	YES	NO	
Dam or reservoir	YES	NO	There are a number of reservoirs/ dams adjacent to the road in the vicinity of RC 5 and again near RC 9, these appear to be part of the water treatment works and possibly small scale irrigation schemes. All services are to be identified prior to the commencement of the road upgrade and there should therefore be no negative impact on these facilities.
Hospital/medical centre	YES	NO	The road does run past a number of clinics. Care should be taken to reduce potential nuisance impacts during construction.
School/ creche	YES	NO	The road does run past several schools. Care should be taken to reduce potential nuisance impacts during construction.
Tertiary education facility	YES	NO	
Church	YES	NO	The road does run past some churches (places of worship). Care should be taken to reduce potential nuisance impacts during construction.
Old age home	YES	NO	
Sewage treatment plant	YES	NO	Within the vicinity of RC 5, there appears to be a water treatment works. The facility appeared to be in state of disrepair and it was not obvious whether it was functioning or not. All services are to be identified prior to the commencement of the road upgrade and there should therefore be no negative impact on this facility.
Train station or shunting yard	YES	NO	
Railway line	YES	NO	
Major road (4 lanes or more)	YES	NO	
Airport	YES	NO	
Harbour	YES	NO	
Sport facilities	YES	NO	Within the denser settlement of Emadrisini and Kwa-Mabona (Emondlo), there was a community sports facility and a number of the schools had open field areas used for recreational purposes and sports matches. Care should be taken to reduce potential nuisance impacts during construction.
Golf course	YES	NO	
Polo fields	YES	NO	
Filling station	YES	NO	
Landfill or waste treatment site	YES	NO	
Plantation	YES	NO	

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Agriculture	YES	NO	There is subsistence agriculture occurring in the area. A variety of livestock was also noted along the entire route during the site visit. These will however not be negatively affected by the road upgrade. Construction staff must be made aware of the dangers of working in areas where livestock are free to roam, as they may wander into the construction areas.
River, stream or wetland	YES	NO	The road being upgraded crosses nine water courses including the Mvunyane River. The majority of the watercourses are seasonal drainage lines that range from average to degraded, especially where previous disturbance has allowed soil erosion to occur. Primary impacts will occur during construction but can be mitigated by adhering to the EMPr.
Nature conservation area	YES	NO	
Mountain, hill or ridge	YES	NO	In places along its route the road runs along a ridgeline and hillside, however there should be no negative impacts as a result of the upgrade.
Museum	YES	NO	
Historical building	YES	NO	
Protected Area	YES	NO	
Graveyard	YES	NO	There are two areas approximately 20-30m from the edge of the road where grave sites were noted. These areas are sufficiently far enough away from the road edge and it not anticipated that they will be impacted upon during construction. The engineer must ensure these areas are designated as no-go zones to prevent potential impact on these areas as a result of the construction activity.
Archaeological site	YES	NO	
Other land uses (describe)	YES	NO	

6. CULTURAL/ HISTORICAL FEATURES

The upgrade of the existing road does not require submission to AMAFA heritage as the proposal is to upgrade an existing road. There will be limited re-alignment of the route and therefore limited potential to impact on the surrounding culturally significant elements therefore no submission to AMAFA heritage is required.

Two grave yards were noted approximately 20-30m from the road edge (Co-ordinates 28°4'39.35"S; 30°41'4.83"E and 28°5'16.84"S; 30°40'6.46"E). these sites are sufficiently far from the road and will not be disturbed however their locations have been noted and it will be ensured that these areas are not damaged in any way.

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or within 20m of the site?

YES	NO X
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If YES, contact a specialist recommended by AMAFA to conduct a heritage impact assessment. The heritage impact assessment must be attached as an appendix to this report.

Briefly explain the recommendations of the specialist:

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Will any building or structure older than 60 years be affected in any way?

YES	NO X
YES	NO X

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

If YES, please submit the necessary application to AMAFA and attach proof thereof to this report.

SECTION D: PUBLIC PARTICIPATION

The entire road upgrade is located within a predominantly rural area with strong traditional ties, and the public participation method used had to ensure that existing channels of communication were used in order to notify surrounding stakeholders so as to avoid creating confusion and offense. Surrounding stakeholders rely on direct means of communication through elected officials such as the Ward Councillors, the Indunas and Amakhosi. It is important to note that any communication that takes place with community members without working through these elected officials is seen as disrespectful and to a point irrelevant as these community leaders are in place to facilitate such communications. Notification was therefore conducted through the respective ward councilors, Indunas and Amakhosi. In addition to this, a Community Liaison Officer (CLO), will be selected to operate as a direct liaison in addition to these community groups. An introductory meeting was held with the relevant traditional authorities, who as the land owners, needed to be notified and consulted with regarding the project (Appendix E) in order to submit the application form.

The following steps were followed during the public participation process.

- An initial meeting to notify the landowners was held with the traditional authorities represented by the Amakhosi, as well as with the ward councilors (Appendix E).
- Signboards notifying the community of the proposal were placed along the route (Appendix E).
- Adverts were placed in the Ilanga and Vryheid Herald notifying people of the proposal (Appendix E).
- Notices of the meeting and project were distributed to the community leaders (Appendix E).
- A complete copy of the Basic Assessment report has been made available to Ward Councillors and Amakhosi for dissemination to the community members.
- With regards to authority communications, all relevant authorities have been notified of the application and have been provided with copies of this BAR.

1. ADVERTISEMENT

The person conducting a public participation process must take into account any 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 the application which is subjected to public participation by—

- (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—

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- (i) the site where the activity to which the application relates is or is to be undertaken; and
- (ii) any alternative site mentioned in the application;
- (b) giving written notice to—
 - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
 - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (v) the local and district municipality which has jurisdiction in the area;
 - (vi) any organ of state having jurisdiction in respect of any aspect of the activity (as identified in the application form for the environmental authorization of this project); and
 - (vii) any other party as required by the competent authority;
- (c) placing an advertisement in—
 - (i) one local newspaper; or
 - (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;
- (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 an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and
- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
 - (i) illiteracy;
 - (ii) disability; or
 - (iii) any other disadvantage.

2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

- (a) indicate the details of the application which is subjected to public participation; and
- (b) state—
 - (i) that an application for environmental authorization has been submitted to the KZN Department of Agriculture, Environmental Affairs and Rural Development in terms of the EIA Regulations, 2010;(ii)
 - (iii) a brief project description that includes the nature and location of the activity to which the application relates;
 - (iv) where further information on the application can be obtained; and
 - (iv) the manner in which and the person to whom representations in respect of the application may be made.

3. PLACEMENT OF ADVERTISEMENTS AND NOTICES

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

4. DETERMINATION OF APPROPRIATE PROCESS

The EAP must ensure that the public participation process is according to that prescribed in regulation 54 of the EIA Regulations, 2010, but may deviate from the requirements of subregulation 54(2) in the manner agreed by the KZN Department of Agriculture, Environmental Affairs and Rural Development as appropriate for this application. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate.

Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before this application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations (regulation 57 in the EIA Regulations, 2010) and be attached as Appendix E to this report.

6. PARTICIPATION BY DISTRICT, LOCAL AND TRADITIONAL AUTHORITIES

District, local and traditional authorities (where applicable) are all key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of this application and provided with an opportunity to comment.

Has any comment been received from the district municipality?

YES	NO X
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If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

The report has been provided to Umzinyathi and Zululand District Municipalities for comment. All comments and responses received to date have been included in the comments and response table in Appendix E.

Has any comment been received from the local municipality?

YES	NO X
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If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

The report has been provided to the Abaqulusi and Nqutu Local Municipalities for comment. All comments and responses received to date have been included in the comments and response table in Appendix E.

Has any comment been received from a traditional authority?

YES	NO
X	

If "YES", briefly describe the feedback below (also attach any correspondence to and from this authority with regard to this application):

A meeting was held with traditional authorities and comments from the meeting have been recorded in the meeting minutes from this meeting. All comments and responses received to date have been included in the comments and response table in Appendix E.

7. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES	NO
X	

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

A meeting was held with stakeholders and comments from the meeting have been recorded in the meeting minutes from this meeting. All comments and responses received to date have been included in the comments and response table in Appendix E.

SECTION E: IMPACT ASSESSMENT

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

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

See Comments and Response Table in Appendix E.

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

See Comments and Response Table in Appendix E.

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

2.1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN PHASE

There are no impacts associated with the design and planning phase as this is an existing road and all design and planning was done through desktop studies.

2.2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION PHASE

- a. Site alternatives
- b. Process, technology, layout or other alternatives

2.3. IMPACTS THAT MAY RESULT FROM THE OPERATIONAL PHASE

- a. Site alternatives
- b. Process, technology, layout or other alternatives

**SITE ALTERNATIVES
CONSTRUCTION PHASE**

All the following construction impacts are applicable to all ten water crossings and the identified sensitive areas. Where an impact is specific to one of the crossings, this has been indicated.

Impacts The following lists the potential impacts associated with the construction phase and is applicable to the proposed site.	Mitigations The following lists mitigation measures that may eliminate or reduce the potential impacts listed:
<p>Direct impacts:</p> <ol style="list-style-type: none"> 1. On RC1, RC2, RC3, RC6, RC9 and RC10 the level of the water course is significantly lower than that of the road, creating high, steep banks on either side of the water course thereby increasing risk of damage during construction. 2. Deposition of eroded material into nearby water bodies due to erosion. Specific areas of concern are RC1, RC2, RC6, RC7 and SA1 where there is already erosion damage. 3. Damage to water courses caused by heavy vehicle traffic and careless operation. 4. Damage to heritage resources, along the proposed route. 5. Contaminated run off polluting the water courses and possibly the river (RC6). 6. Contamination of the receiving environment and ultimately the water courses, due to inappropriate storage and usage of hazardous materials and substances (cement, fuel etc.) 7. Damage to indigenous vegetation, specifically the indigenous tree species, namely <i>Acacia</i> species and <i>Aloe Species</i> noted along the route. 8. Damage to surrounding infrastructure and services by irresponsible contractors. 9. Risk to Pedestrians, specifically school children during construction 10. Damage to property, fences or cultivated land during construction. 11. Temporary disturbance for pedestrian and livestock traffic. 12. Generation of emissions from construction vehicles. 13. Dusty conditions generated by construction vehicles travelling over exposed soil. 14. Erosion of exposed soil prior to the rehabilitation of the construction area. 	<p>Direct impacts:</p> <ol style="list-style-type: none"> 1. Contractors need to be aware of the height of the banks and risk of mechanical damage to the water course should these banks be destabilized. Measures to stabilize these banks must be put in place prior to construction. Should the banks collapse, immediate reparation must be made to ensure sediment does not block the water course. 2. Areas exposed to erosion will be protected through the use of sand bags, berms and efficient construction processes i.e.: limiting the extent (footprint) and duration period that areas are exposed. No excavated material or fill material may be stored within the water courses or within 15m of the water courses. 3. Only the area directly in the path of construction may be cleared and excavated. Therefore there should be little to no construction required within the water courses themselves at these points as these are existing crossings that are being upgraded. The remainder of the water courses must be demarcated as no-go areas. Heavy vehicles should avoid working near the water courses as much as possible. The EMPr will address management of these areas. 4. Two grave yards were noted approximately 20-30m from the road. It is unlikely that these areas will be affected as they are far enough away from the road that they won't be

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<p>15. Improper disposal of construction rubble i.e. illegal burying or dumping of rubble around the roads preventing rehabilitation.</p> <p>16. Temporary increase in waste and litter due to the construction process.</p> <p>17. Insufficient number of toilet facilities resulting in unsanitary conditions on site.</p> <p>18. Inappropriate disposal of toilet waste resulting in the contamination of the environment.</p> <p>19. Encroachment of alien vegetation into areas disturbed during construction.</p> <p>20. Generation of noise.</p> <p>21. Speeding construction vehicles creating unsafe working conditions.</p> <p>Indirect impacts:</p> <p>22. Unsustainable sourcing of raw materials such as gravel, sand, water etc. which could result in the promotion of illegal mining operations which can cause significant damage to the environment.</p> <p>Cumulative impacts:</p> <p>23. General increase of waste to landfill.</p>	<p>directly affected. However their locations have been noted and care must be taken to avoid damaging these sites. Attention is drawn to the South African Heritage Resources Act, 1999 (Act No. 25 of 1999) and the KwaZulu-Natal Heritage Act (Act no 4 of 2008) which, requires that operations that expose archaeological or historical remains should cease immediately, pending evaluation by the provincial heritage agency.</p> <p>5. The engineer must ensure that only clean storm water runoff enters the environment. Any contaminated runoff must be collected and disposed of.</p> <p>6. All hazardous materials and substances will be stored within a secured area in the construction camp. No storage of material is to occur within 15m of the water courses. The storage area will be a hard surfaced, bunded and covered area. Cement mixing must be done on a hard surface that is protected from storm water runoff.</p> <p>7. It is not expected that the trees or Aloes will be impacted on directly by the upgrade and controls will be included in the EMP. Contractors should avoid damaging or removing these trees. Should there be a need to remove these trees, the ECO must be consulted.</p> <p>8. As standard construction practice the engineer and contractor will identify all existing services that may be affected prior to construction.</p> <p>9. This will be managed by the EMP. Appropriate signage and barriers must be used to cordon off construction areas. Schools specifically must be notified prior to commencement. Points men must be in attendance to direct traffic.</p> <p>10. Surrounding land owners and stakeholders will be notified prior to disruptive activities during construction. The contractor will work with the local representatives and CLO to ensure that land owners are aware of where their fence lines encroach into the road reserve. It is suggested that any structures that need to be removed, should be replaced and any damage repaired. Construction activities will be monitored and controlled through the implementation of the Environmental Management</p>
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	<p>Program (EMPr).</p> <ol style="list-style-type: none"> 11. Pedestrians and livestock will need to find alternate routes around the construction areas during construction; however this will only be temporary. Surrounding stakeholders will be notified prior to disruptive activities during construction. The contractor must take into consideration the potential movements of surrounding stakeholders and must ensure safe access is provided at all times. 12. All construction vehicles will be fitted with the appropriate silencers and exhausts. Emissions generated from these vehicles will be negligible and are not expected to significantly affect surrounding communities. 13. A water cart will be used to dampen dusty surfaces and suppress dust. 14. Exposed areas will be rehabilitated and re-vegetated as soon as possible during construction. 15. Contractors will be required to dispose of construction rubble at an appropriate landfill site. Delivery notes and safe disposal certificates to prove appropriate disposal will be required during the construction audits conducted by an independent environmental consultant. 16. Littering will not be permitted on site. Waste management will be controlled through the implementation of the EMPr. 17. Appropriate and sufficient toilet facilities will be provided by the contractor and will be controlled through the EMPr. 18. Toilet facilities must be provided by a registered company and all sewage must be disposed of at an appropriate facility. Safe disposal certificates will be kept on record. Any spills must be immediately contained and the spilled material disposed of appropriately. Toilets may not be located within 15m of the water courses. 19. The construction EMPr will specify that alien vegetation will not be allowed to encroach onto the site and must be continually removed. 20. All construction vehicles will be fitted with standard silencers. The noise generated will be a temporary impact during construction. 21. Speed limits must be obeyed and enforced. 	
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	<p>Indirect impacts:</p> <p>22. The implementation of the EMPr will manage these issues. Contractors must provide proof of sustainable sourcing of materials i.e. permits for quarries and sand winning operations from which stone and sand have been obtained.</p> <p>Cumulative impacts:</p> <p>23. Waste generated during the upgrade will consist of broken concrete pipes and construction materials and general litter and will only be temporarily generated during the construction period.</p>
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OPERATIONAL PHASE

All the following operational impacts are applicable to all ten water crossings and the sensitive area. Where an impact is specific to one of the crossings, this has been indicated.

Impacts The following lists the potential impacts associated with the operational phase and is applicable to the proposed site.	Mitigations The following lists mitigation measures that may eliminate or reduce the potential impacts listed:
<ol style="list-style-type: none"> 1. Impact on flow of water under the roads due to pipe blockages, leading to pooling, flooding and erosion. 2. Increased traffic on the roads within 32m of the water courses and at the crossing points may lead to entry of eroded material into the water courses and destabilization of the stream banks. Of specific concern are RC1, RC2, RC3, RC6, RC7, RC9, RC10 and SA1 where high steep banks increase risk of long term instability leading to erosion and collapse of the banks. 3. An increase in hardened surfaces may increase stormwater runoff resulting in increased erosion of nearby areas and impacting on nearby streams. 4. Improved roads may lead to increased traffic and increased traffic speeds, potentially increasing risk for pedestrians and livestock. 5. Blockages impeding flow of water courses, resulting in flooding or drying out of water courses and interruption in flow. 6. Improved access for vehicles including emergency response and improved connectivity for the community. <p>Indirect impacts:</p> <ol style="list-style-type: none"> 7. Emergency vehicles and pedestrian vehicles will be able to easily access the area, thereby improving quality of life for local communities. The road will allow for improved access to the various schools and clinics in the area. <p>Cumulative impacts:</p> <ol style="list-style-type: none"> 8. Improved access to the area allowing for growth and improvement in service delivery for surrounding communities. The road will 	<ol style="list-style-type: none"> 1. In most cases, existing pipework/culverts will be upgraded or replaced to ensure that it meets minimum requirements. All pipework will have a minimum diameter of 600mm, thereby ensuring a large enough pipe size to allow ease of flow and reduce risk of blockages. 2. The proposal is to upgrade the road to tar and construct/ upgrade all necessary stabilization and drainage infrastructure. This will reduce likelihood of material being destabilized and entering these water courses. Specific attention should be paid to ensuring long term stability of the high steep banks on RC1, RC2, RC3, RC6, RC7, RC9, RC10 and SA1 to ensure that these banks do not erode and collapse, resulting in entry of sediment into the water courses. 3. Stormwater infrastructure will be put in place to ensure proper management of stormwater generated as a result of the road construction. Stormwater infrastructure will need to direct flow so as to prevent pooling and channeling that could cause erosion. Erosion protection measures will need to be instituted to prevent channeling of water into the water courses which may result in sediment deposition. Where pipework directs and channels flow from drainage lines underneath the roads, erosion protection measures to slow the velocity of the flow and prevent erosion should be instituted.

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<p>assist in improving connectivity to other developed areas thereby allowing development in the area itself.</p>	<p>4. This cannot be completely avoided as the intention of the proposal is to improve accessibility and drivability due to an anticipated traffic increase as the area becomes more developed. However there will be standard traffic calming measures in place as well as signage to ensure that safe crossing points are provided. Pedestrian walkways will be provided along certain sections providing safe walking areas and barriers will be provided along certain sections of the road. There will also be taxi and bus laybys. This will provide these vehicles with safe places to load and unload passengers without having to stop in the road.</p> <p>5. The pipes and structures that are upgraded on the water courses must promote the free flow of water and must not create blockages that would result in sedimentation of the water course. This can be achieved by using a minimum of 600mm diameter pipes, which are less likely to become blocked. In addition to this, the section of the existing pipe culverts that are located within the bed of the water course must be in sympathy with the bed of the water course. The structures must not sit higher or lower than the bed of the water course which could result in the flooding or drying out of the water course above or below these structures.</p> <p>6. This is a positive impact.</p> <p><i>Indirect impacts:</i></p> <p>7. This is a positive impact.</p> <p><i>Cumulative impacts:</i></p> <p>8. This is a positive impact.</p>
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TECHNOLOGY ALTERNATIVES CONSTRUCTION

All the following construction impacts are applicable to all ten water crossings and sensitive area. Where an impact is specific to one of the crossings, this has been indicated.

ALTERNATIVE A1: TAR (PREFERRED)	
Impacts The following lists the potential impacts associated with the construction phase and is applicable to the proposed technology alternatives.	Mitigations The following lists mitigation measures that may eliminate or reduce the potential impacts listed:
<ol style="list-style-type: none"> 1. Risk of spillage of hazardous materials such as bitumen which may impact on the receiving environment, specifically the water courses and river. 2. Additional construction time due to longer process required to tar the roads. 	<ol style="list-style-type: none"> 1. Bitumen itself is not environmentally hazardous and once it has cooled it can be disposed of as general waste, however in a liquid state it is hot and can cause burns or react with water causing it to splash. Hazardous store

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<p>3. Release of emissions during the tarring process as heated bitumen is poured on to the roadway.</p> <p>4. Use of heavy machinery during tarring process resulting in generation of additional noise during construction.</p> <p>5. Creation of additional rubble due to additional materials being used i.e. sand, stone and bitumen.</p> <p>Indirect impacts:</p> <p>6. Increased resource use as tarring process requires a longer construction period and more machinery is required.</p> <p>Cumulative impacts:</p> <p>7. General increase of waste to the local landfill site.</p> <p>8. Costs for constructing tarred roads are significantly higher than for gravel roads.</p>	<p>areas must be designated. Hazardous materials should be stored within a hard surfaced bunded area, preferably under cover. Liquid bitumen must be stored on hard surfaced bunded areas. Caution must be taken with working with these materials to prevent spillage in areas other than the on the road surface. Adequate spill equipment must be kept on site to manage any spills that occur and all staff must be trained to handle any spills that occur. Any spills to a water course must be reported to the ECO.</p> <p>2. This cannot be mitigated against although the initial construction period is longer, the road will require less maintenance in the long term.</p> <p>3. The release of emissions during tarring is unavoidable however this is a relatively minor emission and is only released during construction.</p> <p>4. All machinery must be fitted with standard silencers and be well maintained to reduce noise as far as is possible. Construction should be kept to working hours (07h00 to 17h00). Construction after hours or on weekends should be avoided.</p> <p>5. Where possible materials will be recycled and re-used. Any rubble for disposal must be disposed of at an approved site and safe disposal certificates obtained.</p> <p>Indirect impacts:</p> <p>6. Although more resource intensive during construction, the road will require less resources and less maintenance in the long term.</p> <p>Cumulative impacts:</p> <p>7. Where possible material will be re-used and recycled to reduce waste.</p> <p>8. With construction costs being higher than for gravel roads, tarred roads are more suited for high volume traffic areas where they need to be more robust to cope with higher traffic volumes.</p>
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ALTERNATIVE A2:RE - GRAVELLING

Impacts The following lists the potential impacts associated with the construction phase and is applicable to the proposed technology alternatives.

1. In order to ensure a smooth surface, the larger gravel pieces need to be broken down once they have been laid by using a padfoot

Mitigations The following lists mitigation measures that may eliminate or reduce the potential impacts listed:

1. Use of noisy machinery must be restricted to working hours (07h00-17h00) and use of such machinery

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<p>roller to compact the gravel. This creates vibrations which can cause a nuisance for nearby neighbors. Creation of a gravel road may require that this machinery operates for a longer period of time than when used in the tarring process.</p> <ol style="list-style-type: none"> 2. More dust during construction as gravel remains uncovered. <p>Indirect impacts:</p> <ol style="list-style-type: none"> 3. Unsustainable sourcing of raw materials such as gravel, sand, water etc. which could result in the promotion of illegal mining operations which can cause significant damage to the environment. <p>Cumulative impacts:</p> <ol style="list-style-type: none"> 4. General increase of waste to the local landfill site. 5. Costs to construct gravel roads are much lower than for tarred roads. 	<p>after hours and on weekends must be avoided.</p> <ol style="list-style-type: none"> 2. This will be managed by the EMPr. Water carts should be used during construction to manage dust release. <p>Indirect impacts:</p> <ol style="list-style-type: none"> 3. Contractors must provide proof of sustainable sourcing of materials i.e. permits for quarries and sand winning operations where stone and sand has been obtained from. <p>Cumulative impacts:</p> <ol style="list-style-type: none"> 4. Where possible material will be re-used and recycled to reduce waste. 5. Gravel roads are more feasible from a construction cost perspective for rural areas where there will be less wear and tear and traffic is infrequent. However where higher traffic volumes are anticipated, tarred roads are better wearing and more cost effective in the long term.
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OPERATIONAL PHASE

All the following operational impacts are applicable to all ten water crossings and sensitive area. Where an impact is specific to one of the crossings, this has been indicated.

ALTERNATIVE A1: TAR (PREFERRED)	
Impacts The following lists the potential impacts associated with the operational phase and is applicable to the proposed technology alternatives.	Mitigations The following lists mitigation measures that may eliminate or reduce the potential impacts listed:
<ol style="list-style-type: none"> 1. An increase in hardened surfaces as a result of the road surface being tarred instead of graveled may increase stormwater runoff resulting in increased erosion of nearby areas and impacting on nearby streams. Improved roads surfaces leading to increased traffic, vehicles travelling at higher speeds and increased risk for pedestrians. 2. Less material from the roads entering drainage channels and the river. 3. Reduction in dust from road surface. 4. Improved stormwater drainage and control. 5. Improved vehicle safety (better braking ability, improved traction in wet conditions, well defined and marked road edges and road markings, improved signage, speed bumps etc.). 6. Increased traffic and traffic speeds increasing safety risk for pedestrians and livestock. <p>Indirect impacts:</p> <ol style="list-style-type: none"> 7. Prolonged lifespan of the roads. 8. In the long term the ongoing maintenance and repair of tarred roads is more labour 	<ol style="list-style-type: none"> 1. Stormwater infrastructure will be put in place to ensure proper management of runoff generated as a result of the road construction. Stormwater infrastructure will need to direct flow so as to prevent pooling and channeling that could cause erosion. Erosion protection measures will need to be instituted to prevent channeling of water into the water courses which may result in sediment deposition. Where pipework directs and channels flow from drainage lines underneath the roads, erosion protection measures to slow the velocity of the flow and prevent erosion should be instituted. 2. A tarred road loses less material than a gravel road, therefore there will be less material entering water bodies, reducing sedimentation. 3. Positive impact. 4. The tarred road will be properly cambered to allow stormwater run off

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<p>intensive providing employment to local communities⁵.</p> <p>Cumulative impacts:</p> <ol style="list-style-type: none"> 9. Improved access allowing for growth of the surrounding area. 10. A tarred road requires less regular maintenance in the long run⁵. 	<p>and prevent stormwater pooling on the road surface. Storm water will then enter the formal drainage system where it will be slowed and released in a controlled manner.</p> <ol style="list-style-type: none"> 5. A positive impact. 6. A tarred road would allow for substantially increased speeds and would require that traffic calming measures (i.e. Road signs, pedestrian crossing areas and speed bumps) be implemented to control vehicle speeds, especially near busy pedestrian areas and schools. The traffic increase in already anticipated as the area undergoes development. <p>Indirect impacts:</p> <ol style="list-style-type: none"> 7. Tarred roads are designed for heavier traffic loads and are more appropriate for use in high volume traffic areas than dirt or gravel roads as they are harder wearing. 8. The tarred roads will require less maintenance in the long run when compared to dirt or graveled roads. <p>Cumulative impacts:</p> <ol style="list-style-type: none"> 9. Positive impact. 10. A tarred road requires less frequent maintenance than a gravel road but repair work can be carried out by local contractors and is labour intensive thereby creating more local employment opportunities⁵.
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ALTERNATIVE A2:RE - GRAVELLING	
Impacts	Mitigations
<p>The following lists the potential impacts associated with the operational phase and is applicable to the proposed technology alternatives.</p> <ol style="list-style-type: none"> 1. Ongoing loss of material from the gravel roads as increased traffic lead to higher volumes of material loss. This material will ultimately enter the water courses increasing sediment loads. 2. Dust released from gravel roads affects neighbouring properties and may potentially affect health of community members⁵. <p>Indirect impacts:</p> <ol style="list-style-type: none"> 3. Vehicle traffic and stormwater will result in material loss which will enter stormwater systems and waterways⁵. 4. In the long term the ongoing maintenance and repair of gravel roads is less labour intensive and more machine intensive⁵. 	<p>The following lists mitigation measures that may eliminate or reduce the potential impacts listed:</p> <ol style="list-style-type: none"> 1. Correct construction techniques will ensure that this risk is reduced, however ultimately, a gravel road is not designed for heavy traffic volumes and material loss is inevitable. 2. There is more dust released from a gravel road surface than a tarred surface; this is more problematic under heavy traffic conditions. 3. This is unavoidable; and becomes more problematic under heavy traffic conditions which increases material loss. 4. Maintenance of gravel roads requires mechanical equipment such as motor graders and tipper trucks and offers

⁵ Advancing the Public Interest; A case for surfacing gravel roads; SABITA Information Series 2

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<p>Cumulative impacts:</p> <ol style="list-style-type: none"> 5. More regular maintenance required for gravel roads. 	<p>limited opportunities for employment during repair work⁵.</p> <ol style="list-style-type: none"> 5. A graveled road surface will require more regular maintenance due to loss of materials through traffic and erosion.
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No-go alternative (compulsory)

These impacts are applicable to all ten water crossings and the sensitive area. Where an impact is specific to one of the crossings, this has been indicated.

Direct impacts:

1. The road will continue to degrade.
2. Road remains in its current graveled state. As traffic increases, the roads will degrade more quickly, costing more in maintenance in the long term.
3. There will be ongoing dust release from the road surface coating neighbouring properties, damaging vehicles etc.
4. With increased traffic and no traffic calming measures or pedestrian walkways implemented, pedestrians and livestock will continue to be exposed to greater risk.
5. The dirt roads will continue to result in costs to motorists as a result of wear and tear on the vehicles.
6. Lack of stormwater infrastructure allowing for continued uncontrolled stormwater flow off dirt roads resulting in erosion and damage to roads and surrounding environment and deposition of materials into nearby water bodies.

Indirect impacts:

7. Entry of sediment into nearby water courses due to uncontrolled stormwater flow.
8. Continued cost to motorists using the road due to poor condition of the road surface.

Cumulative impacts:

9. Could ultimately impact on future growth of the area as the road will not promote the easy through flow of traffic that a tar road will allow.

2.4. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING OR CLOSURE PHASE

- a. Site alternatives
- b. Process, technology, layout or other alternatives

This is an existing road that will be upgraded and therefore it is unlikely that decommissioning will apply, however this section has been completed in the event that stormwater infrastructure needs to be removed and disposed of.

All the following decommissioning impacts are applicable to all ten water crossings. Where an impact is specific to one of the crossings, this has been indicated.

Alternative S1 (preferred alternative)

Direct impacts:

1. Potential for alien vegetation encroachment into the disturbed area where roads and pipes were located.
2. Potential contamination of the surrounding environment with construction rubble and waste.
3. Potential erosion around the areas where the causeways have been removed.
4. Potential generation of noise and dust.

Indirect impacts:

5. Impact on residents and disruption to traffic during decommissioning.

Cumulative impacts:

6. Increase in the amount of waste sent to the landfill site.

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No-go alternative (compulsory)

These impacts would be as per the operational impacts for roads.

Indicate mitigation measures that may eliminate or reduce the potential impacts listed above:

Alternative S1

1. Alien species would need to be removed and replaced with indigenous species suitable to the area.
2. All construction rubble and waste would need to be disposed of appropriately at an appropriate land fill site.
3. Exposed areas would need to be rehabilitated and re-vegetated as soon as possible after decommissioning.
4. The noise and dust generated would be a temporary impact during decommissioning only and would be negligible. Significant dust would be controlled through the use of a water cart.
5. Traffic would be minimal considering the scale of the roads; a flagman will be used to control traffic.
6. The only material sent to the landfill would be broken concrete pipes and possible bricks from the causeways, which would be a negligible amount of waste.

2.5. PROPOSED MONITORING AND AUDITING

For each phase of the project and for each alternative, please indicate how identified impacts and mitigation will be monitored and/or audited.

Alternative S1 (preferred site)

Alternative S2 NA

<p>Construction phase: It is suggested that monitoring be done through monthly construction audits to ensure compliance with the Environmental Management Program (EMPr).</p>	
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Alternative A1 (preferred alternative)

Alternative A2

<p>Construction phase: It is suggested that monitoring be done through monthly construction audits to ensure compliance with the Environmental Management Program (EMPr).</p>	<p>Construction phase: It is suggested that monitoring be done through monthly construction audits to ensure compliance with the Environmental Management Program (EMPr).</p>
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3. ENVIRONMENTAL IMPACT STATEMENT

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

Alternative S1 (preferred alternative)

It is the opinion of the EAP that all potential impacts that could potentially occur during the construction and operational phase of the P258 road upgrade have been identified and key impacts and their mitigation measures are summarized below.

Key Construction Impacts

Deposition of eroded material into nearby water bodies as a result of erosion: There is always a risk of erosion when working near water bodies and caution needs to be exercised when working near all the water crossings on this road upgrade. However, specific attention should be paid to RC1, RC2, RC6, RC7 and SA1 where there is already erosion damage. This impact is rated as medium.

Damage to water courses: Specific concerns would be careless operation and use of heavy vehicles in close proximity to the water courses causing stream banks to erode and collapse, resulting in sedimentation of these water bodies and ultimately the Mvunyane River. Storage of materials and soil within or near the water courses could also result in the deposition of these materials into the waterways leading to contamination of the entire river system. Heavy vehicles should be kept at least 15m away from the water courses except where needed for road construction. As per the EMPr, no materials may be stored within 15m of the water ways. No dumping is to be permitted within these areas. The above impacts are temporary in nature and can be mitigated but will require absolute compliance with the construction EMPr. This impact is rated as medium.

Risk of mechanical damage and collapse of high steep banks noted at RC1, RC2, RC3 RC6, RC9 and RC10: At these locations, the level of the water course is significantly lower than that of the road, creating high, steep banks on the water course thereby increasing risk of damage during construction. Contractors need to be aware of the height of the banks and risk of mechanical damage to the water course should these banks be destabilized. Measures to stabilize these banks must be put in place prior to construction. Should the banks collapse, immediate reparation must be made to ensure sediment does not block the water course. This impact is deemed to be preventable and thus rated as low.

Damage to Surrounding properties, services and businesses: The upgrade will take place near existing residences and therefore there is potential for disruption to existing services, properties and accesses. These impacts can be effectively mitigated by ensuring that all services are identified prior to construction, by notifying surrounding stakeholders prior to road closures, potential traffic congestion and any potential road closures. It is imperative that contractors are cognizant of the stakeholders movements and where possible, disruptive activities should be scheduled outside of peak traffic hours. All these impacts can be successfully mitigated by following the recommendations in this report and EMPr. Surrounding land owners and stakeholders will be notified prior to disruptive activities during construction. Where fences or structures may have encroached into the road reserve, property owners will be notified and these may need to be removed. This will however be negotiated before any activity occurs. The contractor will work with the local representatives and CLO to ensure that land owners are aware of where their fence lines encroach into the road reserve. It is suggested that should any structures need to be removed, they should be replaced and any damage repaired. Construction activities will be monitored and controlled through the implementation of the Environmental Management Program (EMPr). These impacts are seen to be temporary impacts during construction only. This impact is thus rated as low.

Risk to Pedestrians, specifically school children during construction: There are a number of schools located near the proposed road upgrade. Where there are schools, special precautions need to be taken with respect to pointsman and traffic control, hazardous areas must be demarcated and monitored to ensure that risk to children is minimized. These impacts are seen to be temporary impacts during construction only and can be managed through responsible operation. This impact is thus rated as low.

Key Operational Impacts

Improved access and connectivity: The road upgrade and construction will improve access into the area for vehicles and emergency services. This will help to handle and facilitate development in the area. The proposed upgrade will therefore allow the road to handle the potential traffic increase. This is a positive impact.

Increased traffic within 32m of water course increasing erosion and destabilization of banks: The increase in traffic within 32m of water courses may destabilize banks, increasing erosion and leading to deposition of eroded material into the water courses. The proposed upgrade will include construction of all necessary stabilization and drainage infrastructure. This will reduce the likelihood of material being destabilized and entering these water courses. Specific attention should therefore be paid to ensuring long term stability of the high steep banks on RC1, RC2, RC3, RC6, RC9 and RC10 to ensure that these banks do not erode and collapse, resulting in entry of sediment into the water courses. These impacts can be mitigated against and are therefore rated as low.

Increase in traffic volume and travelling speeds increasing risks to pedestrians and livestock: The tarring of the road surface and expected traffic increase will increase risk to pedestrians and livestock from speeding vehicles. The increased risk to pedestrians and livestock as a result of road improvements cannot be completely avoided as the intention of the proposal is to cater for an expected increase in traffic and to improve accessibility and drivability. However, the road has been designed to mitigate these potential impacts by including road calming measures as well as formalized pedestrian crossings and where necessary, pedestrian walkways. There will also be allowance for taxi and bus laybys so that vehicles are able to pull off the road to load and unload passengers, without obstructing traffic. These impacts can be mitigated against and are therefore rated as low.

Blockages impeding or altering flow of water courses, resulting in flooding or drying out of water courses and interruption in flow:

The engineer must ensure that the level of the crossings, specifically the pipe culverts does not result in the flooding or drying out of the wet area above or below the causeway. The pipes and structures that are upgraded on the water courses must promote the free flow of water and must not create blockages that would result in sedimentation of the water course. This can be achieved by using a minimum of 600mm diameter pipes or box culverts, which are less likely to become blocked. The structures must not sit higher or lower than the bed of the water course which could result in the flooding or drying out of the water course above or below these structures. Existing structures that contain sediment within the pipes must be maintained and improved to meet the desired outcome of preventing the impedance to flow. These impacts can be mitigated against and are therefore rated as low.

Increase in stormwater run-off and associated risk of channeling, pooling and erosion:

An increase in hardened surfaces may also increase stormwater run-off, further increasing erosion and impacts on nearby water bodies. However, the road upgrade will formalize the surface and modify the stormwater infrastructure which will in turn improve stormwater management and control run off. Stormwater infrastructure will therefore need to direct flow in such a manner so as to prevent pooling and channeling that could cause erosion. Appropriate erosion control measures and stormwater flow must be managed carefully at RC7 and SA1 as these areas are deemed to be highly sensitive to erosion. The road upgrade will ensure that road surfaces are properly cambered to DOT standards to ensure proper stormwater flow and management. It is also imperative that the outfall of the storm water infrastructure must not cause damage to neighboring properties. These impacts can be mitigated against and are therefore rated as low.

Further to the above mitigation methods, an EMPr (Appendix F) has been developed to manage and control potential impacts. The EMPr should be implemented through monthly construction audits during which time recommendations within the EMPr should be enforced. If the EMPr is implemented correctly and the mitigation measures listed in this report are adhered to then the potential impacts associated with the road construction can be rated as low.

It is thus the opinion of the EAP that there are no significant environmental impacts associated with the proposal which cannot be mitigated.

Alternative A1 (preferred alternative) Tarring of existing dirt road (P258)

Technology alternative A1 which involves the tarring of the existing dirt roads will have a slightly larger footprint compared to alternative A2 from a construction perspective. However

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alternative A1 will increase the carrying capacity of the roads and improve long term sustainability of the road system.

Long term maintenance: Although initially more costly to construct as well as more resource intensive, tarred roads are more sustainable in the long term requiring less regular maintenance. Tarred roads also have a longer lifespan than graveled roads. Maintenance when it is required will employ more people as it is more labour intensive than gravel roads. In the long term, there are fewer impacts associated with operation of a well constructed tarred road.

Spillage of tar: Care must be exercised when working with tar to avoid spillages into the environment and stormwater drains. Adequate spill kits must be provided on site and staff must be trained to handle spills that may occur. This impact can be mitigated and is rated as low.

Dust and run off: During operation, there will be minimal to no loss of material due to run off and vehicle traffic and there will be no dust generated. Although stormwater run-off from a tarred surface will increase, the improved stormwater drainage system will ensure that stormwater run-off is controlled and does not create puddles on the road surface or on neighboring properties. In the long term, there are fewer impacts associated with operation of a well constructed tarred road.

Increased traffic and traffic speeds: Tarring of the roads will make the roads more usable for vehicle traffic and may increase vehicle travelling speeds which could increase the risk to pedestrian traffic. However, tarred roads will improve vehicle safety by offering improved braking ability compared to dirt or gravel and improved traction in wet conditions. Tarring of the roads will therefore improve road safety in the long term.

It is thus the opinion of the EAP that there are no significant environmental impacts that cannot be mitigated against and that the preferred alternative A1 be authorized.

Alternative A2 **Gravelling of existing dirt roads.**

Technology alternative A2 which involves the gravelling of existing dirt roads will have a slightly smaller footprint compared to alternative A1 from a construction perspective only.

Long term maintenance: Although initially less costly to construct, graveled roads do require more regular maintenance in the long term and this maintenance is less labour and more machine intensive. This is a cost impact for the applicant which is determined by budget availability.

Dust and run off: During operation, there will be on going loss of material from the road surface which will enter the stormwater system. Vehicle traffic will raise dust from the surface which will affect nearby properties and people. This impact is rated as medium.

Although there are no significant impacts associate with the gravelling of the roads, if the initial tarring costs can be borne by the applicant, tarring is the better long term option.

No-go alternative (compulsory)

The P258 road in the area will continue to degrade. There will be ongoing dust generated off the road surface coating neighbouring properties, causing potential health problems and damaging vehicles etc. The dirt road will continue to result in costs to motorists as a result of wear and tear on the vehicles. The continued lack of development of the dirt road will continue to negatively impact property values and on road development.

SECTION F. RECOMMENDATION OF EAP

Is the information contained in this report and the documentation attached hereto in the view of the EAPr sufficient to make a decision in respect of this report?

YES x	NO
NA	

If "NO", please contact the KZN Department of Agriculture, Environmental Affairs and Rural Development regarding the further requirements for your report.

If "YES", please attach the draft EMPr as Appendix F to this report and list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

The following are specific recommendations for mitigating impacts during construction and operation. However, all construction activities must be monitored and controlled through the implementation of the construction Environmental Management Program (EMPr) which provides more specific details on each issue identified in the BAR.

Stakeholders, Properties & Services

1. Surrounding land owners and stakeholders should be notified prior to disruptive activities during construction. The contractor must liaise with the CLO and designated community leaders.
2. As standard construction practice the engineer and contractor should identify all existing services that may be affected prior to construction.
3. Where fences or structures have encroached into the road reserve, property owners will be notified and these may need to be removed. This will however be negotiated before any activity occurs. The contractor will work with the local representatives and CLO to ensure that land owners are aware of where their fence lines encroach into the road reserve.
4. It is suggested that any structures that need to be removed, should be replaced and any damage repaired.

Traffic & Construction Vehicles

5. Traffic congestion should be controlled by flagmen manning major intersections. The contractor must take into consideration the potential movements of surrounding stakeholders and must ensure access is maintained at all times.
6. Appropriate signage and barriers must be used to cordon off construction areas. Schools specifically must be notified prior to commencement. Points men must be in attendance to direct traffic.
7. Speed limits must be obeyed.
8. All construction vehicles should be fitted with the appropriate silencers and exhausts.

Housekeeping, waste management, storage and materials handling

9. Littering must not be permitted on site.
10. All hazardous materials and substances should be stored within a secured area in the construction camp. The storage area should be a hard surfaced, bunded and covered area.
11. Cement mixing must be done on a hard surface that is protected from storm water runoff.
12. Toilet facilities must be provided by a registered company and all sewage must be disposed of at an appropriate facility. Safe disposal certificates must be kept on record.
13. Appropriate and sufficient toilet facilities must be provided by the contractor.
14. Contractors should be required to dispose of construction rubble at an appropriate landfill site. Delivery notes and safe disposal certificates to prove appropriate disposal should be available.

Dust and erosion control

15. A water cart should be used to dampen dusty surfaces and suppress dust.
16. Areas exposed to erosion must be protected through the use of sand bags, berms and efficient construction processes i.e.: limiting the extent (footprint) and duration period that areas are exposed. The contractor must ensure that any blockages created during construction are resolved.
17. Exposed areas should be rehabilitated and re-vegetated as soon as possible during construction.

Stormwater management and protection of water courses and indigenous trees

18. The engineer/contractor must ensure that only clean storm water runoff enters stormwater drains and the environment. Any contaminated run off must be collected and disposed of.
19. Only the area directly in the path of construction may be cleared and excavated. The remainder of the water courses must be demarcated as no-go areas.
20. No excavated material or fill material may be stored within the water courses or within 15m of the water courses.
21. Indigenous trees and/or Aloes should not be removed from along the route without consulting the ECO.
22. Heavy vehicles should avoid working near the water courses as much as possible.
23. Areas deemed specifically sensitive to erosion as a result of existing erosion problems are RC1, RC2, RC6, RC7 and SA1 where there is already erosion damage.
24. On RC1, RC2, RC3, RC6, RC9 and RC10 the level of the water course is significantly lower than that of the road, creating high, steep banks on the water course thereby increasing risk of damage during construction. Contractors need to be aware of the height of the banks and risk of mechanical damage to the water course should these banks be destabilized. Measures to stabilize these banks must be put in place prior to construction. Should the banks collapse, immediate reparation must be made to ensure sediment does not block the water course.

Protection of Heritage Resources

25. The grave sites noted within 20-30m of the road must be protected and may not be damaged during construction. Attention is drawn to the South African Heritage Resources Act, 1999 (Act No. 25 of 1999) and the KwaZulu-Natal Heritage Act (Act no 4 of 2008) which, requires that operations that expose archaeological or historical remains should cease immediately, pending evaluation by the provincial heritage agency.

SECTION G: APPENDICES

The following appendices must be attached as appropriate:

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix E: Public Participation

- Comments & Response report & Comments
- Proof of Notification of I A&Ps:
 - Notice boards
 - Adverts
 - Notification and communications with I &APS
 - Meetings with Community Representatives (Meeting Minutes, Attendance Registers, Signed Agreement to Notify Community)
 - Registered I&APS

Appendix F: Draft Environmental Management Programme (EMPr)

Appendix G: Other information

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix E: Public Participation

Comments & Response Report & Comments Received

Proof of Notification of I A&Ps

Notice boards

2. The person conducting a public participation process must take into account any 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 the application which is subjected to public participation by—
3. (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
4. (i) the site where the activity to which the application relates is or is to be undertaken; and
5. (ii) any alternative site mentioned in the application;

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Adverts

- (c) placing an advertisement in—
 - (i) one local newspaper; or
 - (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;
- (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 an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and
- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
 - (i) illiteracy;
 - (ii) disability; or
 - (iii) any other disadvantage.

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Notification and communications with I &APS

- (b) giving written notice to—
- (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
 - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
 - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (v) the local and district municipality which has jurisdiction in the area;
 - (vi) any organ of state having jurisdiction in respect of any aspect of the activity (as identified in the application form for the environmental authorization of this project); and
 - (vii) any other party as required by the competent authority;

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**Meetings with Community Representatives (Meeting Minutes, Attendance Registers,
Signed Agreement to Notify Community)**

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Registered I & APs

Appendix F: Draft Environmental Management Programme (EMPr)

Appendix G: Other information