



**KZN Agriculture, Environmental Affairs & Rural Development**  
*umNyango: ezoLimo ezeMvelo nokuThuthukiswa  
kweMiphakathi yaseMakhaya*  
**ISIFUNDAZWE SAKWAZULU-NATALI**

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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		
Postal address:	PO Box 1391 Kloof		
Postal code:	3610	Cell:	082 887 4362
Telephone:	031 765 2942		Fax:
E-mail:	jain@enviropro.co.za and josette@enviropro.co.za		086 549 0342

### 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)
Iain Jourdan	BSc (Hons) in Geographical Science	Member of IAIASA	4
Josette Oberholzer	BSc (Hons) MSc	Member of IAIASA EAPSA certified	8
Chevy Smith	BSc (Hons)	-	3

### 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:

The construction of the A1756, A2867 and OLO1937 water course crossings.

### 2. PROJECT DESCRIPTION

Provide a detailed description of the project:

The Department of Transport (Stanger Cost Centre) propose to construct the following:

- 1) **A1756 Crossing** - A low level vented drift at a stream crossing on local road A1756 in Mandeni Local Municipality.
- 2) **A2867 Crossing** - A single portal culvert (900mm x900mm) on a stream crossing on local road A2867 in the Maphumulo Local Municipality.
- 3) **OLO1937 Crossings** – First crossing: Two new 1200mm diameter concrete pipes with concrete bases and masonry head walls. Second crossing: Pipe crossing consisting of 2 x 600mm or 900mm diameter pipes on local road OLO1937 within the Ndwedwe Local Municipality. The local road OLO1937 will also be upgraded as a secondary activity once the crossings are completed.

#### 1) A1756 in the Mandeni Local Municipality.

There is an existing causeway in place on the road identified as the A1756 which will be demolished and a new larger structure with larger diameter portal / box culverts will be constructed in its place. The new causeway structure will consist of a low level vented drift. This is effectively a low level bridge which consists of a deck supported by portal / box culverts which allow water to flow through the structure during normal flow. The portal / box culverts will be arranged in a series of four panels, each panel being made up of 4 X 900mm x 900mm concrete box culverts, each measuring 1,22m in length. The deck itself will be vented on the surface, which means that water can also pass over the structure and pass between the curbs without damaging the structure during peak flow events. The dimensions of the structures footprint will therefore be approximately 2.1m high by 5m wide and 20.5m long. It is likely that the A1756 road will also be widened and re-graveled in a future financial year therefore the structure will be built to accommodate this.

#### 2) A2867 in the Maphumulo Local Municipality

A structure was previously in place however this was washed away in heavy rains. The proposal is to construct a single portal / box culvert across the stream. The structure will consist of a concrete deck supported by a single portal / box culvert (900mm x 900mm) with associated wing walls or gabions on either side of the portal. The deck itself will be vented on the surface, which means that water can also pass over the structure and pass between the curbs without damaging the structure during peak flow events. The dimensions of the structures footprint will therefore be approximately 2.1m high by 5m wide and 8m long. Local Road A2867 will also likely be widened and gravelled in future financial years and the structure will be built to accommodate this.

#### 3) OLO1937 in the Ndwedwe Local Municipality.

There is an existing single large (1200mm) diameter pipe crossing in place to allow ongoing access off the road which was intended as a temporary measure to allow people to cross the river after the original crossing point and road were washed away. The proposal is to place two new 1200mm diameter concrete pipes with concrete bases and masonry head walls at the original crossing point. The dimensions of this structures footprint will therefore be approximately 2m high by 5m wide and 8m long. Further along the same road a smaller pipe crossing will also be required to allow continued access to the community. This will consist of two 600mm or 900mm diameter concrete pipes with brick headwalls. In addition to this, 2kms of road OLO1937 will be upgraded and gravelled and where this occurs within 32m of a water course, the upgrade will be assessed in the BAR. The temporary pipe crossing currently in place will be removed.

### 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:

The proposed location of the causeways and pipe crossings are within watercourses, therefore the following regulations will apply:

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

During construction the existing structures in place on A1756 and OLO1937 will be removed as will the broken concrete from the previous structure on A28678 which will mean the removal of material from the water course. The construction of the causeways and pipe crossings will likely result in the infilling of the water course as erosion protection features including gabion baskets will be constructed.

18. *The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from a watercourse*

### 4. FEASIBLE AND REASONABLE ALTERNATIVES

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

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

Describe alternatives that are considered in this 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 Alternatives

There is only one preferred site alternative for each causeway / crossing as these are on existing roads where a water course crossing is required. In the case of the A1756, an existing structure is being replaced while on the A2867 and OLO1937, the previous structures were destroyed by weather and are being replaced. The new pipe crossing further along on OLO1937 is being put in place to channel water under the road so as to prevent damage to the new surface once completed.

**Technology Alternatives**

**Alternative 1 (Preferred Alternative)**

**1) A1756 in the Mandeni Local Municipality.**

The new causeway structure will consist of a low level vented drift. This is effectively a low level bridge which consists of a deck supported by portal / box culverts which allow water to flow through the structure during normal flow. The portal / box culverts will be arranged in a series of four panels, each panel being made up of 4 X 900mm x 900mm concrete box culverts, each measuring 1,22m in length. The deck itself will be vented on the surface, which means that water can also pass over the structure and pass between the curbs without damaging the structure during peak flow events. The dimensions of the structures footprint will therefore be approximately 2.1m high by 5m wide and 20.5m long. It is likely that the A1756 road will also be widened and re-graveled in a future financial year therefore the structure will be built to accommodate this.

**2) A2867 in the Maphumulo Local Municipality**

The proposal is to construct a single portal / box culvert across the stream. The structure will consist of a concrete deck supported by a single portal / box culvert (900mm x 900mm) with associated wing walls or gabions on either side of the portal. The deck itself will be vented on the surface, which means that water can also pass over the structure and pass between the curbs without damaging the structure during peak flow events. The dimensions of the structures footprint will therefore be approximately 2.1m high by 5m wide and 8m long. Local Road A2867 will also likely be widened and gravelled in future financial years and the structure will be built to accommodate this.

**3) OLO1937 in the Ndwedwe Local Municipality.**

There is an existing single large (1200mm) diameter pipe crossing in place to allow ongoing access off the road which was intended as a temporary measure to allow people to cross the river after the original crossing point and road were washed away. The proposal is to place two new 1200mm diameter concrete pipes with concrete bases and masonry head walls at the original crossing point. The dimensions of this structures footprint will therefore be approximately 2m high by 5m wide and 8m long. Further along the same road a smaller pipe crossing will also be required to allow continued access to the community. This will consist of two 600mm or 900mm diameter concrete pipes with brick headwalls. In addition to this, 2kms of road OLO1937 will be upgraded and graveled and where this occurs within 32m of a water course, the upgrade will be assessed in the BAR. The temporary pipe crossing currently in place will be removed.

**Alternative 2**

**1) A1756 in the Mandeni Local Municipality.**

The construction of a causeway across the river comprising of a series of storm water pipes (350mm to 600mm in diameter) through which water from the stream will continue to flow. Supportive concrete slabs will then be placed above and below the pipework.

**2) A2867 in the Maphumulo Local Municipality**

The construction of a causeway across the river comprising of a series of storm water pipes (350mm to 600mm in diameter) through which water from the stream will continue to flow. Supportive concrete slabs will then be placed above and below the pipework.

**3) OLO1937 in the Ndwedwe Local Municipality.**

The construction of a causeway across the river comprising of a series of storm water pipes (350mm to 600mm in diameter) through which water from the stream will continue to flow. Supportive concrete slabs will then be placed above and below the pipework.

**No Go Option**

There will be no construction of the proposed causeways at the various locations within the ILembe District Municipality. Thus, there will be no potential negative impacts related to construction activity. However, there will also be no positive impacts such as the improved

connectivity and access for local residents as the existing infrastructure on the A1756 will not be upgraded and the structures on OLO1937 and A2867 that were destroyed will not be replaced. Community members making use of local road A1756 may still experience access disruptions as this structure can be overtopped by storm water and its capacity needs to be increased. People who need to make use of the A2867 will struggle to cross the water crossing point during high rainfall events such as that which destroyed the first structure. Those using the OLO1937 may also face additional disruptions if the road upgrade near the water course is not permitted as the unmanaged water flowing beneath the road will continue to damage the road surface. The temporary pipe crossing is not permanent structure and has not been fitted with erosion protection features, meaning that it will ultimately be undermined and there will be ongoing erosion damage to the water course at this point.

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

**5. 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.

**1) A1756 in the Mandeni Local Municipality.**

Alternative:	Latitude (S):	Longitude (E):
Alternative S1 <sup>1</sup> (preferred site alternative)	29° 2'14.85"S	31°25'22.46"E

**2) A2867 in the Maphumulo Local Municipality**

Alternative:	Latitude (S):	Longitude (E):
Alternative S1 <sup>2</sup> (preferred site alternative)	29°12'55.68"S	31° 4'27.05"E

**3) OLO1937 in the Ndwedwe Local Municipality.**

Alternative:	Latitude (S):	Longitude (E):
Alternative S1 <sup>3</sup> (preferred site alternative) Causeway	29°25'44.31"S	30°59'16.48"E
Alternative S1 <sup>4</sup> (preferred site alternative) Pipe crossing	29°25'40.56"S	30°59'22.30"E

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

**6. PHYSICAL SIZE OF THE ACTIVITY**

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

**1) A1756 in the Mandeni Local Municipality.**

Alternative: Alternative L1<sup>5</sup> (preferred layout alternative)

Size of the layout:	102m <sup>2</sup>
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**2) A2867 in the Maphumulo Local Municipality**

Alternative: Alternative L1<sup>6</sup> (preferred layout alternative)

Size of the layout:	40m <sup>2</sup>
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<sup>1</sup> "Alternative S.." refer to site alternatives.

<sup>2</sup> "Alternative S.." refer to site alternatives.

<sup>3</sup> "Alternative S.." refer to site alternatives.

<sup>4</sup> "Alternative S.." refer to site alternatives.

<sup>5</sup> "Alternative A.." refer to activity, process, technology or other alternatives.

<sup>6</sup> "Alternative A.." refer to activity, process, technology or other alternatives.

**3) OLO1937 in the Ndwedwe Local Municipality.**

**Alternative: Causeway**  
 Alternative L1<sup>7</sup> (preferred layout alternative)  
**Alternative: Pipe crossing**  
 Alternative L1<sup>8</sup> (preferred layout alternative)

Size of the layout:	40m <sup>2</sup>
Size of the layout:	5m <sup>2</sup>

**7. SITE ACCESS**

The following is applicable to the A1756, A2867 and OLO1937 Causeways and pipe crossings:

Does ready access to the site exist?

YES X	NO
	NAm

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.

**8. 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:

- 8.1. the scale of the plan which must be at least a scale of 1:500;
- 8.2. the property boundaries and numbers/ erf/ farm numbers of all adjoining properties of the site;
- 8.3. the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 8.4. the exact position of each element of the application as well as any other structures on the site;
- 8.5. 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;
- 8.6. walls and fencing including details of the height and construction material;
- 8.7. servitudes indicating the purpose of the servitude;
- 8.8. sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
  - rivers, streams, water courses or wetlands;
  - the 1:100 year flood line (where available or where it is required by DWA);
  - ridges;
  - cultural and historical features;
  - areas with indigenous vegetation including protected plant species (even if it is degraded or infested with alien species);
- 8.9. 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
- 8.10. the positions from where photographs of the site were taken.

Photographs taken at the co-ordinates provided. Please see photographs in Appendix B with descriptions of locations where each photograph was taken.

**9. 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.

<sup>7</sup> "Alternative A.." refer to activity, process, technology or other alternatives.

<sup>8</sup> "Alternative A.." refer to activity, process, technology or other alternatives.

**10. 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.

**11. ACTIVITY MOTIVATION**

**11.1. Socio-economic value of the activity**

What is the expected capital value of the activity on completion?

A1756 – R900 000.00  
A2867 - R450 000.00  
OLO1937 – R600 000.00

What is the expected yearly income that will be generated by or as a result of the activity?

NA

Will the activity contribute to service infrastructure?

<b>YES</b> X	NO
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Is the activity a public amenity?

<b>YES</b> X	NO
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How many new employment opportunities will be created in the development phase of the activity?

10

What is the expected value of the employment opportunities during the development phase?

A1756 – R75 000.00  
A2867 – R45 000.00  
OLO1937 – R60 000.00

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?

NA (Zimbabwe scheme will continue)

What is the expected current value of the employment opportunities during the first 10 years?

NA (Zimbabwe)

What percentage of this will accrue to previously disadvantaged individuals?

100%

**11.2. Need and desirability of the activity**

Please note that the following is applicable to all three causeways and the pipe crossing

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

The three causeway locations are key access points for the surrounding communities. In the case of the A1756, an existing structure is being replaced while on the A2867 and OLO1937 the previous structures were destroyed by weather and are being replaced. The new structure on OLO1937 will allow the community to be able to continue using the existing road and the new pipe crossing that is being proposed will be able to channel water under the road so as to prevent damage to the new surface once completed. The temporary pipe crossing constructed on OLO1937 will be removed. In the case of all three structures as well as the road upgrade near the water course, the issue relates to maintaining the accessibility of the roads so that they can be used by the local community. The three causeways are therefore public amenities, identified by the local communities as key infrastructure projects and requested through their local Rural Transport Forum Member.

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

The creation and upgrading of formal crossing points will enable community members to access these areas at all times of the year and will reduce the risk associated with crossing the rivers during periods of high rainfall. There will also be temporary creation of employment opportunities during the construction period.

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

The creation and upgrading of formal crossing points will enable community members to access these areas at all times of the year and will reduce the risks associated with crossing the rivers during periods of high rainfall. There will also be temporary creation of employment opportunities during the construction period.

**12. 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

**13. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT**

Please note that the following sections are applicable to all three causeways and the pipe crossing.

**13.1. Solid waste management**

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

YES X	NO
+-14m <sup>3</sup> per causeway	

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

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 of by a certified waste contractor.

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

Material requiring disposal (rubble, concrete pipes) will be disposed of at either the nearest registered Land fill site or incorporated into the respective municipal waste streams (Mandeni, Maphumulo and Ndwedwe respectively).

Will the activity produce solid waste during its operational phase?

YES	NO X
m <sup>3</sup>	

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

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

**13.2. Liquid effluent**

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

YES	NO X
NA m <sup>3</sup>	
Yes	NO X

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

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

**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

YES	NO X
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another facility? [ ] [ ]

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

### 13.3. Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES X	NO
YES	NO

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

**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:

Vehicle emissions will be released by construction vehicles during the construction phase, however this will only be a temporary impact.

### 13.4. Generation of noise

Will the activity generate noise?

YES X	NO
YES	NO X

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

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

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

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

## 14. WATER USE

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

Municipal	water board	groundwater	river, stream, dam or lake 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:

< 50 000 litres per day	
Does the activity require a water use permit from the Department of Water Affairs?	YES    NO X

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.

## 15. 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.
- Subsections 1 - 6 below must be completed for each alternative.

### 1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Indicate the general gradient of the sites (**Please cross the appropriate box**).

#### 1) A1756 in the Mandeni Local Municipality.

Alternative S1 (preferred site):

Flat X	1:50 – 1:20 X	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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#### 2) A2867 in the Maphumulo Local Municipality

Alternative S1 (preferred site):

Flat X	1:50 – 1:20 X	1:20 – 1:15 X	1:15 – 1:10 X	1:10 – 1:7,5 X	1:7,5 – 1:5 X	Steeper than 1:5
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#### 3) OLO1937 in the Ndwedwe Local Municipality including road and pipe crossing.

Alternative S1 (preferred site):

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

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

#### 1) A1756 in the Mandeni Local Municipality.

Alternative S1:

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley X	Plain X	Undulating plain/low hills	Dune	Sea-front
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#### 2) A2867 in the Maphumulo Local Municipality

Alternative S1:

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley X	Open valley	Plain	Undulating plain/low hills	Dune	Sea-front
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#### 3) OLO1937 in the Ndwedwe Local Municipality including road and pipe crossing.

Alternative S1:

Ridgeline	Plateau	Side slope of hill/mountain	Closed valley	Open valley X	Plain X	Undulating plain/low hills	Dune	Sea-front
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### 3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

YES

NO  
X

If YES, please complete the following: NA

Name of the specialist:

Qualification(s) of the specialist:

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Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

**1) A1756 in the Mandeni Local Municipality.**

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

**Alternative S1  
(preferred site):**

Shallow water table (less than 1.5m deep)	<b>YES</b> X	NO
Dolomite, sinkhole or doline areas	YES	<b>NO</b> X
Seasonally wet soils (often close to water bodies)	<b>YES</b> X	NO
Unstable rocky slopes or steep slopes with loose soil	YES X	<b>NO</b> X
Dispersive soils (soils that dissolve in water)	YES	<b>NO</b> X
Soils with high clay content (clay fraction more than 40%)	YES	<b>NO</b> X
Any other unstable soil or geological feature	YES	<b>NO</b> X
An area sensitive to erosion	YES	<b>NO</b> X

**2) A2867 in the Maphumulo Local Municipality**

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

**Alternative S1  
(preferred site):**

Shallow water table (less than 1.5m deep)	<b>YES</b> X	NO
Dolomite, sinkhole or doline areas	YES	<b>NO</b> X
Seasonally wet soils (often close to water bodies)	<b>YES</b> X	NO
Unstable rocky slopes or steep slopes with loose soil	YES	<b>NO</b> X
Dispersive soils (soils that dissolve in water)	YES	<b>NO</b> X
Soils with high clay content (clay fraction more than 40%)	YES	<b>NO</b> X
Any other unstable soil or geological feature	YES	<b>NO</b> X
An area sensitive to erosion	<b>YES</b> X	NO

**3) OLO1937 in the Ndwedwe Local Municipality including road and pipe crossing.**

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

**Alternative S1  
(preferred site):**

Shallow water table (less than 1.5m deep)	<b>YES</b> X	NO
Dolomite, sinkhole or doline areas	YES	<b>NO</b> X
Seasonally wet soils (often close to water bodies)	<b>YES</b> X	NO
Unstable rocky slopes or steep slopes with loose soil	YES	<b>NO</b> X
Dispersive soils (soils that dissolve in water)	YES	<b>NO</b> X
Soils with high clay content (clay fraction more than 40%)	YES	<b>NO</b> X
Any other unstable soil or geological feature	YES	<b>NO</b> X

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An area sensitive to erosion

YES X	NO
----------	----

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?

YES	NO X
-----	---------

If YES, please complete the following: NA

Name of the specialist:			
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	NO X
-----	---------

If YES, specify and explain: NA

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

YES X	NO
----------	----

If YES, specify and explain: Each of the causeways as well as the pipe crossing and a section of the OLO1937 road upgrade will fall within 32m of a water course.

As per the EIA regulations:  
*“Watercourse” means –*  
 (a) A river or spring;  
 (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;

**1) A1756 in the Mandeni Local Municipality.**

The road crosses the Evutha River via an existing causeway which will be replaced. Vegetation adjacent to the road and existing structure consists of a grassed verge which has been cut or grazed and hygrophilous grasses dominate much of the river channel near the road. Several meters back from the road on the one side of the causeway are some indigenous trees, but these are well back from the causeway structure and won't be affected during construction. On the opposite side, a mixture of indigenous tree species as well as some invasive wattle species can be found lining the river channel. A small area of wetland is located to the south east of the road and stream. As the new structure will be replacing the old structure, there will be little clearing required, even though the new structure will occupy a slightly larger footprint.

**2) A2867 in the Maphumulo Local Municipality.**

The water course that is being crossed is a tributary of the Kwamenshana River. The structure that was previously in place has been washed away and the crossing point has become quite eroded. The road with a grassed verge runs up to the crossing point on the one side while on the opposite bank, the road edges are dominated by *Lantana camara* and some scattered Pampas grass (alien invasive species) was noted to be growing along the banks of the river. Further back from the bank and outside the construction footprint a

single coral tree (indigenous *Erythrina* species) was noted. The proposed location of the structure will not require very much vegetation clearing.

**3) OLO1937 in the Ndwedwe Local Municipality including road and pipe crossing.**

The road and adjacent grassed verges runs through the crossing point which is located on the Kwamanzaduma River, a tributary of the Tongati. A small wetland area vegetated by Papyrus species is located up stream of the crossing, however there is little vegetation in the immediate vicinity of the existing pipe crossing and the old crossing point where the new causeway will be placed, therefore there will be little clearing required. The river and its banks further upstream of the crossing points are vegetated by Papyrus species.

Are any further specialist studies recommended by the specialist?	YES	NO
If YES, specify: <b>NA</b>		
If YES, is such a report(s) attached? <b>NA</b>	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).

**1) A1756 in the Mandeni Local Municipality.**

**Alternative S1:**

Natural veld - good condition <sup>E</sup>	Natural veld with scattered aliens <sup>E</sup> <b>X</b>	Natural veld with heavy alien infestation <sup>E</sup>	Veld dominated by alien species <sup>E</sup>	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure <b>X</b> (existing causeway)	Bare soil <b>X</b>

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.

**2) A2867 in the Maphumulo Local Municipality**

**Alternative S1:**

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

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.

**3) OLO1937 in the Ndwedwe Local Municipality including road and pipe crossing.**

**Alternative S1:**

Natural veld - good condition <sup>E</sup>	Natural veld with scattered aliens <sup>E</sup> <b>X</b>	Natural veld with heavy alien infestation <sup>E</sup>	Veld dominated by alien species <sup>E</sup>	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure <b>X</b> (existing pipe)	Bare soil <b>X</b>

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:

**1) A1756 in the Mandeni Local Municipality.**

Land use character			Description
Natural area	YES	NO	The proposed causeway structure will replace an existing structure that is located within a water course (Natural area). The potential impacts during construction and operation will however be restricted to the construction footprint and immediate vicinity of the structure. Thus there will be little change to the natural area and surrounds.
Low density residential	YES	NO	Residents will have improved vehicle and pedestrian access as a result of the proposed causeway construction.
Medium density residential	YES	NO	
High density residential	YES	NO	
Informal residential	YES	NO	As above
Retail commercial & warehousing	YES	NO	
Light industrial	YES	NO	
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	
Hospital/medical centre	YES	NO	
School/ crèche	YES	NO	
Tertiary education facility	YES	NO	
Church	YES	NO	St Cyprian's Mission is located 400m away and will likely also benefit from the improved access that the upgraded structure will bring.
Old age home	YES	NO	
Sewage treatment plant	YES	NO	
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	
Golf course	YES	NO	
Polo fields	YES	NO	
Filling station	YES	NO	
Landfill or waste treatment site	YES	NO	
Plantation	YES	NO	There are several plantations in the general area however these will not be

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			negatively impacted and may even benefit from improved access.
Agriculture	YES	NO	Small scale subsistence farming occurs in the area. No expected impact on local farmers other than improved access.
River, stream or wetland	YES	NO	The proposed causeway structure will replace an existing structure located within a water course. Construction of the causeway will be carefully managed through provisions within the Environmental Management Program (EMPr) and monitored by an independent Environmental Control Officer. The new causeway will be a larger structure, with greater pipe diameters, thus while the aquifauna in this portion of the water course will be subject to temporary construction disturbance. Once complete the large pipe diameters will allow for increased mobility of these species. Furthermore, given that the majority of aquifauna are mobile species they have the ability to move when disturbed and then return and repopulate the area once the project is complete. There is a wet area to the south east of the proposed causeway location. This wet area must be demarcated as a 'no-go' zone and potential disturbance to it will thereby be prevented. The new structure will be designed to minimise the alteration of flow dynamics within the river. This will ensure that during periods of peak river flow, the structure will not create significant drag that could result in it becoming damaged leading to unnecessary maintenance costs. Thus, the potential impacts during both construction and operation will essentially be restricted to the construction footprint and immediate vicinity of the structure.
Nature conservation area	YES	NO	
Mountain, hill or ridge	YES	NO	There are hills and ridges within 500m of the causeway but these will not be impacted on.
Museum	YES	NO	
Historical building	YES	NO	
Protected Area	YES	NO	
Graveyard	YES	NO	
Archaeological site	YES	NO	
Other land uses (describe)	YES	NO	

**2) A2867 in the Maphumulo Local Municipality**

Land use character			Description
Natural area	YES	NO	The proposed causeway structure will
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			be located within a water course (Natural area) however the potential impacts during construction and operation will be restricted to the construction footprint and immediate vicinity of the structure. Thus there will be little change to the natural area and surrounds.
Low density residential	YES	NO	Residents will have improved vehicle and pedestrian access as a result of the proposed causeway construction.
Medium density residential	YES	NO	
High density residential	YES	NO	
Informal residential	YES	NO	As above
Retail commercial & warehousing	YES	NO	
Light industrial	YES	NO	
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	
Hospital/medical centre	YES	NO	
School/ crèche	YES	NO	
Tertiary education facility	YES	NO	
Church	YES	NO	
Old age home	YES	NO	
Sewage treatment plant	YES	NO	
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	
Golf course	YES	NO	
Polo fields	YES	NO	
Filling station	YES	NO	
Landfill or waste treatment site	YES	NO	
Plantation	YES	NO	
Agriculture	YES	NO	Small scale subsistence farming occurs in the area. No expected impact on local farmers.
River, stream or wetland	YES	NO	The proposed causeway structure will be located within a watercourse. Construction of the causeway will be carefully managed through provisions within the Environmental Management Program (EMPr) and monitored by an independent Environmental Control Officer. The structure will be designed to minimise the alteration of flow dynamics and ensure mobility of aquifauna within the water course.

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			During peak flows, the structure must not create drag as this could result in its being damaged and resulting in unnecessary maintenance costs. Thus, the potential impacts during both construction and operation will essentially be restricted to the construction footprint and immediate vicinity of the structure.
Nature conservation area	YES	NO	
Mountain, hill or ridge	YES	NO	
Museum	YES	NO	
Historical building	YES	NO	
Protected Area	YES	NO	
Graveyard	YES	NO	
Archaeological site	YES	NO	
Other land uses (describe)	YES	NO	

**3) OLO1937 in the Ndwedwe Local Municipality including road and pipe crossing.**

Land use character			Description
Natural area	YES	NO	The proposed causeway structure will be located within a water course (Natural area) however the potential impacts during construction and operation will be restricted to the construction footprint and immediate vicinity of the structure. Thus there will be little change to the natural area and surrounds.
Low density residential	YES	NO	Residents will have improved vehicle and pedestrian access as a result of the proposed causeway construction. The intention of the infrastructure upgrade is to facilitate the return of residents to an area previously inhabited.
Medium density residential	YES	NO	
High density residential	YES	NO	
Informal residential	YES	NO	As above
Retail commercial & warehousing	YES	NO	
Light industrial	YES	NO	
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	
Hospital/medical centre	YES	NO	
School/ crèche	YES	NO	
Tertiary education facility	YES	NO	
Church	YES	NO	
Old age home	YES	NO	
Sewage treatment plant	YES	NO	
Train station or shunting yard	YES	NO	

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Railway line	YES	NO	
Major road (4 lanes or more)	YES	NO	
Airport	YES	NO	
Harbour	YES	NO	
Sport facilities	YES	NO	
Golf course	YES	NO	
Polo fields	YES	NO	
Filling station	YES	NO	
Landfill or waste treatment site	YES	NO	
Plantation	YES	NO	There is a plantation nearby but this is unlikely to be impacted on by the causeway construction.
Agriculture	YES	NO	There is small scale subsistence farming occurring in the area but these farmers will most likely benefit from the improved access that will be offered by the new causeway.
River, stream or wetland	YES	NO	The proposed causeway structure will be located within a water course. Construction of the structure will be carefully managed through provisions within the Environmental Management Program (EMPr) and monitored by an independent Environmental Control Officer. The structure will be designed to minimise the alteration of flow dynamics within the river and ensure the mobility of aquifauna is not compromised. It is important that the structure not create drag during peak flows as this will only result in its being damaged and requiring unnecessary maintenance costs. Furthermore, given that the majority of aquifauna are mobile species they have the ability to move when disturbed and then return and repopulate the area once the project is complete. Thus, the potential impacts during both construction and operation will essentially be restricted to the construction footprint and immediate vicinity of the structure.
Nature conservation area	YES	NO	
Mountain, hill or ridge	YES	NO	
Museum	YES	NO	
Historical building	YES	NO	
Protected Area	YES	NO	
Graveyard	YES	NO	
Archaeological site	YES	NO	
Other land uses (describe)	YES	NO	

## 6. CULTURAL/ HISTORICAL FEATURES

The following applies to all three causeways and the pipe crossing. As all the causeways will be shorter than 50m in length no submission to AMAFA heritage is required. The road being upgraded is an existing road therefore this does not require approval from AMAFA either.

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:

NA

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

YES	NO X
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Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

YES	NO X
-----	---------

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

## SECTION D: PUBLIC PARTICIPATION

**The following applies to all three causeways and the pipe crossing:**

The projects are located within rural areas with strong traditional ties, therefore the public participation method used had to ensure that existing channels of communication were used in order to notify surrounding stakeholders in a manner that did not create any offense. Surrounding stakeholders rely on direct means of communication through an elected official which in all these cases were the Rural Roads Transport Forum Members, Ward Councillors and their ward committees. 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 the RRTF member and ward councillor have been elected to facilitate such communications. Separate meetings for each causeway were held with these respective community leaders as well as other community members who were available. The community leaders agreed to pass on the information to the remainder of the community. As the causeways selected for construction were identified and requested by the community, the primary purpose behind the notification was to ensure that the community was made aware of the commencement of the environmental assessment.

The following steps were followed during the public participation process.

- Separate meetings were held for each causeway with the relevant RRTF member, ward councillor, Inkhosi, Induna and community elders where the project details for the specific causeway under discussion were presented.
- In each case the relevant Ward Councillor and RRTF member indicated a willingness to engage with the community, agreeing that this was the best procedure for notification.
- Signboards detailing each proposal were erected at each site.
- The respective Ward Councillors and RRTF members were provided with pamphlets for distribution.
- The Ward Councillors and RRTF members will be given opportunity to review complete copies of the Basic Assessment report so that they may relay information back to the community.
- With regards to authority communications, all relevant authorities have been notified of these applications 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—
  - (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	<b>NO</b> <b>X</b>
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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 ILembe District Municipality for comment. All comments and responses received will be included in the comments and response table in Appendix E.

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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 Mandini, Maphumulo and Ndwedwe Local Municipalities. All comments and responses received will be included in the comments and response table in Appendix E.

Has any comment been received from a traditional authority?

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 relevant RRTF members for each area for dissemination to the relevant traditional authority and community. 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 X	NO
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If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

Please see 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

#### 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**

**1) A1756 in the Mandeni Local Municipality.**

**CONSTRUCTION PHASE**

<p><b>Impacts</b> The following lists the potential impacts associated with the construction phase and is applicable to the proposed site.</p>	<p><b>Mitigations</b> The following lists mitigation measures that may eliminate or reduce the potential impacts listed:</p>
<p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>1. Damage to surrounding infrastructure and services by irresponsible contractors.</li> <li>2. Temporary disturbance for pedestrian and vehicle traffic.</li> <li>3. Generation of emissions from construction vehicles.</li> <li>4. Dusty conditions generated by construction vehicles travelling over exposed soil.</li> <li>5. Erosion of exposed soil (specifically existing access roads) prior to the rehabilitation of the construction area.</li> <li>6. Temporary river diversions may be required when constructing the foundation slab within the riverbed.</li> <li>7. Deposition of eroded material into the water course.</li> <li>8. Damage to stream, stream banks, riparian zone and wet area south east of the proposed causeway location as a result of construction vehicles, cranes and heavy equipment moving within these areas.</li> <li>9. Removal and disposal of existing structure causing damage to the stream and resulting in improper disposal of construction rubble i.e. illegal burying or dumping of rubble around the causeway preventing rehabilitation.</li> <li>10. Damage to surrounding vegetation.</li> <li>11. Temporary increase in waste and litter due to the construction process.</li> <li>12. Contamination of the receiving environment due to inappropriate storage and usage of hazardous materials and substances (cement, fuel etc.)</li> <li>13. Improper disposal of construction rubble i.e. illegal burying or dumping of rubble around the causeway preventing rehabilitation.</li> <li>14. Insufficient number of toilet facilities resulting in unsanitary conditions on site.</li> <li>15. Inappropriate disposal of toilet waste resulting in the contamination of the environment.</li> <li>16. Generation of noise.</li> <li>17. Contaminated run off polluting the water course.</li> <li>18. Encroachment of alien vegetation into areas disturbed during construction.</li> <li>19. Speeding construction vehicles creating unsafe working conditions.</li> </ol> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>20. Unsustainable sourcing of raw materials such as gravel, sand, water etc. which could</li> </ol>	<p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>1. As standard construction practice the engineer and contractor will identify all existing services that may be affected prior to construction.</li> <li>2. Pedestrians and vehicles 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.</li> <li>3. 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.</li> <li>4. A water cart will be used to dampen dusty surfaces and suppress dust.</li> <li>5. Exposed areas will be rehabilitated and re-vegetated as soon as possible during construction.</li> <li>6. Temporary flow diversions may be required as the foundation slab is to run the entire length of the structure and a dry surface is required for the concrete foundation slab to set. However, any diversions may only divert a portion of the river at a time and only a portion of the flow may be blocked at a time, allowing for flow to continue around the diversion. Any temporary structures or channels are to be removed once construction is complete.</li> <li>7. 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.</li> <li>8. No ad hoc roads may be created. The contractor must mark out the crossing point and the minimum required construction area on the watercourse and vehicle access must be restricted to this area only. A 15m buffer should then be imposed on the rest of the river with no traffic or vehicles or storage permitted within this buffer</li> </ol>

<p>result in the promotion of illegal mining operations which can cause significant damage to the environment.</p> <p><b>Cumulative impacts:</b></p> <p>21. General increase of waste to landfill</p>	<p>zone. This will reduce the area affected. Vehicles may not cross the river at any other point than where construction is to occur. Where possible, heavy vehicle access to the stream and stream banks must be restricted. Non-essential equipment and vehicles are to remain at least 15m from the stream banks at all times, except where this falls within the road. Materials may not be stored within 15m of the stream bank. The wetland area must also be demarcated and no vehicles may drive this area at all. No storage or activity may take place in the wetland area at all and where feasible, a 15m buffer should be retained on the wetland, except where this falls within the road.</p> <p>9. The existing low level bridge must be removed with care to avoid damage to the stream channel and banks. The concrete may be re-used for gabion baskets or fill when constructing the new structure but may not be disposed of in the stream or surrounding grassland. If this material is not used, it must be disposed of at a permitted landfill site that accepts builders rubble. Delivery notes and safe disposal certificates to prove appropriate disposal will be required during the construction audits conducted by an independent environmental consultant.</p> <p>10. There will be little need for any clearing as the new structure will replace an existing causeway, although it will have a slightly bigger footprint. There is a mixture of indigenous and invasive vegetation in the surrounding area which for the most part should remain untouched. However should clearing be required, it should not result in loss of irreplaceable species.</p> <p>11. Littering will not be permitted on site. Waste management will be controlled through the implementation of the EMPr.</p> <p>12. 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 river or wetland, even if this falls within the road. The storage area will be hard surfaced, bunded and covered. Cement mixing must be done on a hard surface that is</p>
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	<p>protected from storm water runoff.</p> <ol style="list-style-type: none"> <li>13. 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.</li> <li>14. Appropriate and sufficient toilet facilities will be provided by the contractor and will be controlled through the implementation of the EMPr.</li> <li>15. 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 river or the wetland.</li> <li>16. All construction vehicles will be fitted with standard silencers. The noise generated will be a temporary impact during construction.</li> <li>17. The engineer must ensure that only clean storm water runoff enters the surrounding environment. Any contaminated run off must be collected and disposed of.</li> <li>18. The construction EMPr will specify that alien vegetation will not be allowed to encroach onto the site and must be continually removed.</li> <li>19. Speed limits must be obeyed and enforced.</li> </ol> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>20. 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.</li> </ol> <p><b>Cumulative impacts:</b></p> <ol style="list-style-type: none"> <li>21. Waste generated during the upgrade will consist of building rubble and construction materials and general litter will only be temporarily generated during the construction period.</li> </ol>
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**OPERATIONAL PHASE**

<p><b>Impacts</b> The following lists the potential impacts associated with the operational phase and is applicable to the proposed site.</p>	<p><b>Mitigations</b> The following lists mitigation measures that may eliminate or reduce the potential impacts listed:</p>
<p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>1. Flood events overtopping the structure,</li> </ol>	<p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>1. The new structure to be built will be</li> </ol>

<p>damaging the causeway and making the way impassable for vehicles.</p> <ol style="list-style-type: none"> <li>The pipes which allow the flow of water may become blocked resulting in flooding and erosion.</li> <li>Potential erosion of the surrounding area especially at the ends of the structure, destabilizing it and resulting in material loss which will enter the waterway.</li> </ol> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>Potential alteration of flow dynamics due to poor placement of the structure.</li> <li>Access to the adjacent residential homesteads will be improved and maintained, having a direct positive impact on motorists and pedestrians.</li> </ol> <p><b>Cumulative impacts:</b></p> <ol style="list-style-type: none"> <li>Improved access to the area allowing for growth and improvement in service delivery for surrounding communities.</li> </ol>	<p>larger than the existing causeway and will therefore only be overtopped during large rainfall events. As such any inconvenience related to overtopping would be minimal.</p> <ol style="list-style-type: none"> <li>The pipe diameter will be of sufficient size to allow water to flow unobstructed. The pipes will allow passage of sediment and debris without becoming obstructed.</li> <li>Erosion protection features will be installed i.e. gabion baskets on either side of the structure ensuring that storm water does not erode the foundations and wing walls of the new structure.</li> </ol> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>The structure has been designed to ensure that the natural flow of the water course is not interrupted and that the areas upstream and downstream are not starved or flooded with water.</li> <li>This is a positive impact.</li> </ol> <p><b>Cumulative impacts:</b></p> <ol style="list-style-type: none"> <li>This is a positive impact.</li> </ol>
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**2) A2867 in the Maphumulo Local Municipality**

**CONSTRUCTION PHASE**

<p><b>Impacts</b> The following lists the potential impacts associated with the construction phase and is applicable to the proposed site.</p>	<p><b>Mitigations</b> The following lists mitigation measures that may eliminate or reduce the potential impacts listed:</p>
<p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>Damage to surrounding infrastructure and services by irresponsible contractors.</li> <li>Temporary disturbance for pedestrian and vehicle traffic.</li> <li>Generation of emissions from construction vehicles.</li> <li>Dusty conditions generated by construction vehicles travelling over exposed soil.</li> <li>Erosion of exposed soil (specifically existing access roads) prior to the rehabilitation of the construction area.</li> <li>Temporary river diversions may be required when constructing the foundation slab within the riverbed.</li> <li>Deposition of eroded material into the water course.</li> <li>Ongoing introduction of rubble into stream as a result of material left over from previously damaged structure.</li> <li>Damage to stream, stream banks and riparian zone due to construction vehicles, cranes and heavy equipment moving within these areas.</li> <li>Damage to surrounding vegetation.</li> <li>Temporary increase in waste and litter due</li> </ol>	<p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>As standard construction practice the engineer and contractor will identify all existing services that may be affected prior to construction.</li> <li>Pedestrians and vehicles 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.</li> <li>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.</li> <li>A water cart will be used to dampen dusty surfaces and suppress dust.</li> <li>Exposed areas will be rehabilitated and re-vegetated as soon as possible during construction.</li> </ol>

<p>to the construction process.</p> <ol style="list-style-type: none"> <li>12. Contamination of the receiving environment due to inappropriate storage and usage of hazardous materials and substances (cement, fuel etc.)</li> <li>13. Improper disposal of construction rubble i.e. illegal burying or dumping of rubble around the causeway preventing rehabilitation.</li> <li>14. Insufficient number of toilet facilities resulting in unsanitary conditions on site.</li> <li>15. Inappropriate disposal of toilet waste resulting in the contamination of the environment.</li> <li>16. Generation of noise.</li> <li>17. Contaminated run off polluting the water course.</li> <li>18. Encroachment of alien vegetation into areas disturbed during construction.</li> <li>19. Speeding construction vehicles creating unsafe working conditions.</li> </ol> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>20. 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.</li> </ol> <p><b>Cumulative impacts:</b></p> <ol style="list-style-type: none"> <li>21. General increase of waste to landfill</li> </ol>	<ol style="list-style-type: none"> <li>6. Temporary flow diversions may be required as the foundation slab is to run the entire length of the structure and a dry surface is required for the concrete foundation slab to set. However, any diversions may only divert a portion of the river at a time and only a portion of the flow may be blocked at a time, allowing for flow to continue around the diversion. Any temporary structures or channels are to be removed once construction is complete.</li> <li>7. 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.</li> <li>8. The rubble left over from the previous structure must be removed from the river bed, taking care not to damage the banks of the river in the process. The rubble must then be disposed of at a permitted landfill and safe disposal certificates for the disposed waste must be retained.</li> <li>9. No ad hoc roads may be created. The contractor must mark out the crossing point and minimum required construction area on the river and vehicle access must be restricted to this area only. A 15m buffer should then be imposed on the rest of the stream with no traffic or vehicles or storage permitted within this buffer zone. This will reduce the area affected. Vehicles may not cross the river at any other point than where construction is to occur. Where possible, heavy vehicle access to the stream and stream banks must be restricted. Non-essential equipment and vehicles are to remain at least 15m from the stream banks at all times. Materials may not be stored within 15m of the stream bank.</li> <li>10. There will be little need for any clearing as the new structure will be constructed upon an existing road where a previous structure used to be located. The surrounding vegetation is predominantly invasive (<i>Lantana camara</i>) although there are some scattered indigenous trees located outside the construction footprint. Should clearing be required, it should not result in loss of irreplaceable species.</li> </ol>
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	<ol style="list-style-type: none"> <li>11. Littering will not be permitted on site. Waste management will be controlled through the implementation of the EMPr.</li> <li>12. 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 stream. The storage area will be hard surfaced, bunded and covered. Cement mixing must be done on a hard surface that is protected from storm water runoff.</li> <li>13. Contractors will be required to dispose of construction rubble at an appropriate and permitted 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.</li> <li>14. Appropriate and sufficient toilet facilities will be provided by the contractor and will be controlled through the implementation of the EMPr.</li> <li>15. 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 drainage line.</li> <li>16. All construction vehicles will be fitted with standard silencers. The noise generated will be a temporary impact during construction.</li> <li>17. The engineer must ensure that only clean storm water runoff enters the surrounding environment. Any contaminated run off must be collected and disposed of.</li> <li>18. The construction EMPr will specify that alien vegetation will not be allowed to encroach onto the site and must be continually removed.</li> <li>19. Speed limits must be obeyed and enforced.</li> </ol> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>20. 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.</li> </ol>
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	<p><b>Cumulative impacts:</b></p> <p>21. Waste generated during the upgrade will consist of building rubble and construction materials and general litter and will only be temporarily generated during the construction period.</p>
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**OPERATIONAL PHASE**

<p><b>Impacts</b> The following lists the potential impacts associated with the operational phase and is applicable to the proposed site.</p> <p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>1. Flood events damaging the causeway and making the way impassable for vehicles.</li> <li>2. The pipes which allow the flow of water may become blocked resulting in flooding and erosion.</li> <li>3. Potential erosion of the surrounding area especially at the ends of the structure, destabilizing it and resulting in material loss which will enter the waterway.</li> </ol> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>4. Potential alteration of flow dynamics due to poor placement of the structure.</li> <li>5. Access to the residential homesteads will be improved and maintained, having a direct positive impact on motorists and pedestrians.</li> </ol> <p><b>Cumulative impacts:</b></p> <ol style="list-style-type: none"> <li>6. Improved access to the area allowing for growth and improvement in service delivery for surrounding communities.</li> </ol>	<p><b>Mitigations</b> The following lists mitigation measures that may eliminate or reduce the potential impacts listed:</p> <p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>1. The new causeway will be raised so that water only overtops it during high flow events and installation of larger diameter pipes will allow better flow of water, thereby preventing this new structure from being destroyed as with the previous one.</li> <li>2. The pipe diameter will be of sufficient size to allow water to flow unobstructed. The pipes will allow passage of sediment and debris without becoming obstructed.</li> <li>3. Erosion protection features will be installed i.e. gabion baskets on either side of the structure ensuring that storm water does not erode the foundations and wing walls of the new structure.</li> </ol> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>4. The structure has been designed to ensure that the natural flow of the water course is not interrupted and that the areas upstream and downstream are not starved or flooded with water.</li> <li>5. This is a positive impact.</li> </ol> <p><b>Cumulative impacts:</b></p> <ol style="list-style-type: none"> <li>6. This is a positive impact.</li> </ol>
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**3) OLO1937 in the Ndwedwe Local Municipality including road and pipe crossing.**

**CONSTRUCTION PHASE**

<p><b>Impacts</b> The following lists the potential impacts associated with the construction phase and is applicable to the proposed site.</p> <p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>1. Damage to surrounding infrastructure and services by irresponsible contractors.</li> <li>2. Generation of emissions from construction vehicles.</li> <li>3. Dusty conditions generated by construction vehicles travelling over exposed soil.</li> <li>4. Erosion of exposed soil (specifically along the 2kms of road to be re-graveled) prior to the rehabilitation of the construction area.</li> <li>5. Deposition of eroded material into water course.</li> <li>6. Temporary river diversions may be required</li> </ol>	<p><b>Mitigations</b> The following lists mitigation measures that may eliminate or reduce the potential impacts listed:</p> <p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>1. As standard construction practice the engineer and contractor will identify all existing services that may be affected prior to construction.</li> <li>2. 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.</li> <li>3. A water cart will be used to dampen dusty surfaces and suppress dust.</li> </ol>
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<p>when constructing the foundation slab within the riverbed.</p> <ol style="list-style-type: none"> <li>7. Damage to river, river banks, riparian zone and wetland due to construction vehicles, cranes and heavy equipment moving within these areas.</li> <li>8. Material pushed into the river during the grading of the road during the road upgrade.</li> <li>9. Damage to surrounding vegetation.</li> <li>10. Removal and disposal of temporary pipe crossing causing damage to the stream and resulting in improper disposal of construction rubble i.e. illegal burying or dumping of rubble around the causeway preventing rehabilitation.</li> <li>11. Temporary increase in waste and litter due to the construction process.</li> <li>12. Contamination of the receiving environment due to inappropriate storage and usage of hazardous materials and substances (cement, fuel etc.)</li> <li>13. Improper disposal of construction rubble i.e. illegal burying or dumping of rubble around the causeway preventing rehabilitation.</li> <li>14. Insufficient number of toilet facilities resulting in unsanitary conditions on site.</li> <li>15. Inappropriate disposal of toilet waste resulting in the contamination of the environment.</li> <li>16. Generation of noise.</li> <li>17. Contaminated run off polluting the water course.</li> <li>18. Encroachment of alien vegetation into areas disturbed during construction.</li> <li>19. Speeding construction vehicles creating unsafe working conditions.</li> </ol> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>20. 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.</li> </ol> <p><b>Cumulative impacts:</b></p> <ol style="list-style-type: none"> <li>21. General increase of waste to landfill</li> </ol>	<ol style="list-style-type: none"> <li>4. Exposed areas will be rehabilitated and re-vegetated as soon as possible during construction. The soil type in this area is susceptible to erosion, thus it is imperative that re-vegetation is prioritized during the project.</li> <li>5. 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.</li> <li>6. Temporary flow diversions may be required as the foundation slab is to run the entire length of the structure and a dry surface is required for the concrete foundation slab to set. However, any diversions may only divert a portion of the river at a time and only a portion of the flow may be blocked at a time, allowing for flow to continue around the diversion. Any temporary structures or channels are to be removed once construction is complete.</li> <li>7. No ad hoc roads may be created. The contractor must mark out the crossing point and minimum required construction area on the stream and vehicle access must be restricted to this area only. A 15m buffer should then be imposed on the rest of the river with no traffic or vehicles or storage permitted within this buffer zone. This will reduce the area affected. Vehicles may not cross the river at any other point than where construction is to occur. Where possible, heavy vehicle access to the stream and stream banks must be restricted. Non-essential equipment and vehicles are to remain at least 15m from the stream banks at all times. Materials may not be stored within 15m of the stream bank.</li> <li>8. Caution must be exercised when grading the road to ensure that graded material is not pushed into the water course. Any material that is pushed to the road edge and falls within 15m of the river must be removed as soon as possible and may not be stockpiled where it might be washed into the river.</li> <li>9. No clearing will be required for the road upgrade or for the pipe crossing as this is an established road which will be re-graveled and upgraded. The new structure will replace the existing</li> </ol>
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	<p>pipe therefore there should be minimal clearing required. There is a mixture of indigenous grassland and invasive vegetation in the surrounding area with some riverine species noted further upstream; however this should not be impacted by the construction. Should any clearing be required, this should not result in the loss of irreplaceable species.</p> <ol style="list-style-type: none"> <li>10. The temporary pipe crossing must be removed with care to avoid damage to the stream channel and banks. The concrete may be re-used for gabion baskets or fill when constructing the new structure but may not be disposed of in the stream or surrounding grassland. If this material is not used, it must be disposed of at a permitted landfill site that accepts builder's rubble. Delivery notes and safe disposal certificates to prove appropriate disposal will be required during the construction audits conducted by an independent environmental consultant.</li> <li>11. Littering will not be permitted on site. Waste management will be controlled through the implementation of the EMPr.</li> <li>12. 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 stream. The storage area will be a hard surfaced, bunded and covered. Cement mixing must be done on a hard surface that is protected from storm water runoff.</li> <li>13. 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.</li> <li>14. Appropriate and sufficient toilet facilities will be provided by the contractor and will be controlled through the implementation of the EMPr.</li> <li>15. 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.</li> </ol>
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	<p>Toilets may not be located within 15m of the drainage line.</p> <p>16. All construction vehicles will be fitted with standard silencers. The noise generated will be a temporary impact during construction.</p> <p>17. The engineer must ensure that only clean storm water runoff enters the surrounding environment. Any contaminated run off must be collected and disposed of.</p> <p>18. The construction EMPr will specify that alien vegetation will not be allowed to encroach onto the site and must be continually removed.</p> <p>19. Speed limits must be obeyed and enforced.</p> <p><b>Indirect impacts:</b></p> <p>20. 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><b>Cumulative impacts:</b></p> <p>21. Waste generated during the upgrade will consist of building rubble and construction materials and general litter and will only be temporarily generated during the construction period.</p>
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**OPERATIONAL PHASE**

<p><b>Impacts</b> The following lists the potential impacts associated with the operational phase and is applicable to the proposed site.</p>	<p><b>Mitigations</b> The following lists mitigation measures that may eliminate or reduce the potential impacts listed:</p>
<p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>1. Flood events overtopping the structure, damaging the causeway and making the way impassable for vehicles.</li> <li>2. The pipes which allow the flow of water may become blocked resulting in flooding and erosion.</li> <li>3. Potential erosion of the surrounding area especially at the ends of the structure, destabilizing it and resulting in material loss which will enter the waterway.</li> </ol> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>4. Potential alteration of flow dynamics due to poor placement of the structure.</li> <li>5. Access to the adjacent school and residential homesteads will be improved and maintained, having a direct positive impact on motorists and pedestrians.</li> </ol> <p><b>Cumulative impacts:</b></p> <ol style="list-style-type: none"> <li>6. Improved access to the area allowing for growth and improvement in service delivery</li> </ol>	<p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>1. The placement of the causeway within the floodplain of the Tongati River means that it will likely be inundated; therefore it needs to be built to allow it to be overtopped without being damaged. It should also be raised so that water only overtops it during high flow events. The installation of larger diameter pipes will also allow better flow of water during normal flow periods.</li> <li>2. The pipe diameter will be of sufficient size to allow water to flow unobstructed. The pipes will allow passage of sediment and debris without becoming obstructed.</li> <li>3. Erosion protection features will be installed i.e. gabion baskets on either side of the structure ensuring that storm water does not erode the foundations and wing walls of the</li> </ol>

<p>for surrounding communities.</p>	<p>new structure.</p> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>The structure has been designed to ensure that the natural flow of the water course is not interrupted and that the areas upstream and downstream are not starved or flooded with water.</li> <li>This is a positive impact.</li> </ol> <p><b>Cumulative impacts:</b></p> <ol style="list-style-type: none"> <li>This is a positive impact.</li> </ol>
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**TECHNOLOGY ALTERNATIVES**

The following Technology Alternatives are applicable to all three causeways and the pipe crossing.

**CONSTRUCTION**

<p><b>ALTERNATIVE A1:</b> Portal culverts and causeway pipes varying in size from 900mm to 1200mm in diameter will be used.</p>	
<p><b>Impacts</b> The following lists the potential impacts associated with the construction phase and is applicable to the proposed technology alternatives.</p>	<p><b>Mitigations</b> The following lists mitigation measures that may eliminate or reduce the potential impacts listed:</p>
<ol style="list-style-type: none"> <li>Construction impacts will be the same as those described and assessed in section (a) above.</li> <li>The construction footprint will be larger than that of the smaller diameter pipes.</li> </ol>	<ol style="list-style-type: none"> <li>Mitigation measures will be as described above in section (a)</li> <li>The larger diameter culverts and pipes will have a larger construction footprint as they will physically occupy a larger area, however this should still not have a significant impact in terms of vegetation clearing or construction activities required.</li> </ol>
<p><b>ALTERNATIVE A2:</b> Portal culverts and causeway pipes varying in size from 350mm to 600mm in diameter will be used.</p>	
<p><b>Impacts</b> The following lists the potential impacts associated with the construction phase and is applicable to the proposed technology alternatives.</p>	<p><b>Mitigations</b> The following lists mitigation measures that may eliminate or reduce the potential impacts listed:</p>
<ol style="list-style-type: none"> <li>Construction impacts will be the same as those described and assessed in section (a) above.</li> <li>The construction footprint will be smaller than that of the larger diameter pipes.</li> </ol>	<ol style="list-style-type: none"> <li>Mitigation measures will be as described above in section (a)</li> <li>The smaller diameter pipes will have a smaller construction footprint as they will physically occupy a smaller area.</li> </ol>

**OPERATIONAL PHASE**

<p><b>ALTERNATIVE A1:</b> Portal culverts and causeway pipes varying in size from 900mm to 1200mm in diameter will be used.</p>	
<p><b>Impacts</b> The following lists the potential impacts associated with the operational phase and is applicable to the proposed technology alternatives.</p>	<p><b>Mitigations</b> The following lists mitigation measures that may eliminate or reduce the potential impacts listed:</p>
<p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>Pipes may become blocked leading to water damming up and over topping the causeway, resulting in localized flooding and erosion around the causeway and undermining of the structure.</li> </ol> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>In the long term, larger diameter pipes will need less upkeep as they are less likely to</li> </ol>	<p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>Larger diameter pipes are less likely to become blocked and require clearing. Blockages may lead to localized flooding and erosion which would damage roads and property. Larger diameter pipes allow better flow and prevent damming of water causing erosion and resulting in the river overtopping the causeway during high</li> </ol>

<p>become blocked. This will help to maintain access throughout the community all year round.</p> <p><b>Cumulative impacts:</b></p> <ol style="list-style-type: none"> <li>3. Less maintenance required and the structure is less likely to fail during a storm event meaning less chance of the structure becoming damaged or washed away and ultimately costing more money to repair or replace.</li> </ol>	<p>flow events.</p> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>2. Positive impact.</li> </ol> <p><b>Cumulative impacts:</b></p> <ol style="list-style-type: none"> <li>3. Positive impact</li> </ol>
<p><b>ALTERNATIVE A2:</b> Portal culverts and causeway pipes varying in size from 350mm to 600mm in diameter will be used.</p>	
<p><b>Impacts</b> The following lists the potential impacts associated with the operational phase and is applicable to the proposed technology alternatives.</p>	<p><b>Mitigations</b> The following lists mitigation measures that may eliminate or reduce the potential impacts listed:</p>
<p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>1. Pipes may become blocked leading to water damming up and over topping the causeway, resulting in localized flooding and erosion around the causeway and undermining of the structure.</li> </ol> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>2. Increased maintenance and upkeep, increasing cost of structure in the long-term.</li> </ol> <p><b>Cumulative impacts:</b></p> <ol style="list-style-type: none"> <li>3. Increased maintenance and upkeep, increasing cost of structure in the long-term.</li> </ol>	<p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>1. Smaller diameter pipes are more at risk of becoming blocked by silt and other materials. These blockages could cause the pipes to backup resulting in localized flooding and erosion. This would have a greater impact on the mobility of aquifauna when compared to Alternative A1. This can however be mitigated by regular clearing and maintenance of the causeway pipes. Smaller pipes will also lead to water damming up in front of the causeway forcing it to overtop the structure, making access difficult.</li> </ol> <p><b>Indirect impacts:</b></p> <ol style="list-style-type: none"> <li>2. More regular maintenance required due to smaller pipes becoming blocked. Smaller diameter pipes will be less efficient at handling heavy rainfall events which may cause flooding, pooling and erosion.</li> </ol> <p><b>Cumulative impacts:</b></p> <ol style="list-style-type: none"> <li>3. Smaller diameter pipes are more likely to become blocked and require clearing. Blockages may lead to localized flooding and erosion which would damage roads and property. This can be mitigated by regular clearing and maintenance of the causeway pipes but this will increase the cost of the structure in the long-term.</li> </ol>

**The following is applicable to all three causeways and the pipe crossing:**

**No-go alternative (compulsory)**

<p><b>Direct impacts:</b></p> <ol style="list-style-type: none"> <li>1. There are no impacts associated with the construction phase of the causeways and pipe crossing as the no-go option will not involve any construction.</li> <li>2. During the operational phase of A1756 which has an existing structure in place, residents will continue to be inconvenienced and experience access related issues as these structures are frequently overtopped by floodwater making them impassable.</li> </ol>
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3. At present the community is using the temporary crossing created by the placement of a single pipe crossing on the OLO 1937 which is located off the road alignment. They will be able to continue to use his temporary structure but it is not stabilized or fitted with any erosion protection measures and so will not remain in place indefinitely.
4. The current water flow below the road surface at the proposed location for the pipe crossing on OLO1937, could potentially lead to damage of the road surface ultimately leading to the access related issues in the area and the high input of sediment into the water course.
5. Without the construction of the A2867 Causeway, community members will be unable to cross the river safely as the previous structure was destroyed by a high flow event.
6. Ongoing access problems for passenger vehicles and pedestrians during both low and high flow events.
7. Emergency vehicles unable to access the area under certain conditions.
8. Ongoing risk for pedestrians to cross these streams during high flow events, especially for young children and the elderly.

**Indirect impacts:**

9. There are no impacts associated with the construction phase as the no-go option will not involve any construction.
10. Given the small diameter of the pipes on A1756, this infrastructure will continue to require additional maintenance to prevent blockages when compared to the new proposed structure.

**Cumulative impacts:**

11. There are no impacts associated with the construction phase as the no-go option will not involve any construction.
12. Surrounding communities become isolated and inaccessible, children are prevented from reaching schools and the sick are prevented from reaching or being reached by medical services.

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

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

The following is applicable to all three causeways and the pipe crossing

**Alternative S1 (preferred alternative)**

**Direct impacts:**

1. Potential contamination of the surrounding environment with construction rubble and waste.
2. Damage to river banks and channel by construction vehicles.
3. Potential generation of noise and dust.

**Indirect impacts:**

4. Residents will have to revert back to crossing the rivers without the causeways.

**Cumulative impacts:**

5. Increase in the amount of waste sent to the landfill site.
6. Loss of social connectivity for community.

**No-go alternative (compulsory)**

**No-go alternative (compulsory)**

The impacts associated with operation of the either Alternative have been discussed in the above section.

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

**Alternative S1**

**Direct impacts:**

1. All construction rubble and waste would need to be disposed of appropriately at an appropriate land fill site.
2. Existing roads must be used. Where no roads exist, tracks must be designated and marked out and vehicles must only use these designated and marked paths. No ad hoc roads may be created. The contractor must mark out the crossing point and minimum required construction area on the water course and vehicle access must be restricted to this area only. Vehicles may not cross the water course at any other point than where construction is to occur. Where

possible, heavy vehicle access to the stream/ river and stream/ river banks must be restricted. Non-essential equipment and vehicles are to remain at least 15m from the stream/ river banks at all times. Materials may not be stored within 15m of the stream/ river bank. Vehicles are not permitted to operate along the stream/ river banks (except within the designated construction area).

- 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.

**Indirect impacts:**

- Ongoing risk for residents traversing at the informal crossing points.

**Cumulative impacts:**

- Land fill sites become overloaded which is an unavoidable impact.
- Residents remain disconnected from surrounding community and facilities.

## 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**

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

**Alternative A2**

Construction phase: It is suggested that monitoring be done through monthly construction audits to ensure compliance with the Environmental Management Program (EMPr).	Construction phase: It is suggested that monitoring be done through monthly construction audits to ensure compliance with the Environmental Management Program (EMPr).
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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.

### 1) A1756 in the Mandeni Local Municipality.

**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 causeway have been identified and key impacts and their mitigation measures are provided below.

**Key Construction Impacts:**

**Damage to Stream and surrounding environment:**

Specific concerns would be heavy vehicle traffic operating in close proximity to the stream causing banks to erode and collapse, resulting in sedimentation of the stream. Storage of materials and soil within or near the stream could also result in the deposition of these materials into the stream leading to contamination of the river system.

Heavy vehicles should be kept at least 15m away from the stream except where needed for

the construction of the causeway. As per the EMPr, no materials may be stored within 15m of the stream. No dumping is to be permitted within these areas. There is an area to the south east of the proposed causeway location that contains vegetation that is indicative of a wetland. This wet area which will be demarcated as a 'no-go' zone and potential disturbance to it prevented.

During the removal and disposal of existing structure, the stream and its banks may be damaged while rubble from the bridge may be illegally buried or dumped, impacting the area affected.

The existing low level bridge must be removed with care to avoid damage to the stream channel and banks. The concrete may be re-used for gabion baskets or fill when constructing the new structure but may not be disposed of in the stream or surrounding grassland. If this material is not used, it must be disposed of at a permitted landfill site that accepts builder's rubble. Delivery notes and safe disposal certificates to prove appropriate disposal will be required during the construction audits conducted by an independent environmental consultant.

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.

**Key Operational Impacts:**

**Overtopping and flooding of the structure resulting in damage to causeway**

The current structure is inundated during high flow events making it difficult to cross. This also results in damage to the structure which is then repeatedly repaired by the Department of Transport. The new causeway needs to be raised high enough to reduce this risk and the use of larger diameter pipes will ensure that this risk is further reduced. The proposed upgrade is aimed at resolving this issue therefore this is rated as low.

**Pipework becoming blocked leading to localized flooding and erosion**

The pipe causeway will allow for the through flow of water but there is a risk that these pipes may become blocked, resulting in flooding and erosion, potentially undermining the causeway. This can be mitigated against through installation of pipework of sufficient diameter which is the intention of this proposal. The pipes will have a minimum diameter of 600mm which will allow sediment and debris to pass through without creating an obstruction. The above impacts can be mitigated against and are rated as low.

**Destabilization and undermining of the structure**

Poor construction could result in the causeway being undermined, destabilizing it and resulting in material loss which will inevitably enter the river. This can be mitigated through installation of erosion protection features i.e. gabion baskets on either side of the structure ensuring that storm water does not erode the foundations and wing walls of the new structure. This impact can be mitigated against and is rated as medium.

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

**2) A2867 in the Maphumulo Local Municipality**

**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 causeway have been identified and key impacts and their mitigation measures are provided below.

**Key Construction Impacts:**

**Damage to stream and surrounding environment:**

Specific concerns would be heavy vehicle traffic operating in close proximity to the stream

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causing banks to erode and collapse, resulting in sedimentation of the stream. Storage of materials and soil within or near the stream could also result in the deposition of these materials into the stream leading to contamination of the river system.

Heavy vehicles should be kept at least 15m away from the stream except where needed for the construction of the causeway. As per the EMPr, no materials may be stored within 15m of the stream. No dumping is to be permitted within these areas.

The debris from the previous causeway that is lying in the river bed must be removed and disposed of at a permitted landfill. Safe disposal certificates must be kept on record.

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.

**Key Operational Impacts:**

**Destabilization and undermining of the structure**

Poor construction could result in the causeway being undermined, destabilizing it and resulting in material loss which will enter the river. This can be mitigated through installation of erosion protection features i.e. gabion baskets on either side of the structure ensuring that storm water does not erode the foundations and wing walls of the new structure. This impact can be mitigated against and is rated as medium.

**Pipework becoming blocked leading to localized flooding and erosion**

The pipe causeway will allow for the through flow of water but there is a risk that these pipes may become blocked, resulting in flooding and erosion, potentially undermining the causeway. This can be mitigated against through installation of pipework of sufficient diameter which is the intention of this proposal. The pipes will have a minimum diameter of 600mm which will allow sediment and debris to pass through without creating an obstruction.

The above impacts can be mitigated against and are 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 causeway 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.

**3) OLO1937 in the Ndwedwe Local Municipality including road and pipe crossing.**

**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 causeway have been identified and key impacts and their mitigation measures are provided below.

**Key Construction Impacts:**

**Damage to Stream during construction of new crossing and demolition and removal of temporary pipe crossing:**

Specific concerns would be heavy vehicle traffic operating in close proximity to the stream causing banks to erode and collapse, resulting in sedimentation of the stream. Storage of materials and soil within or near the stream could also result in the deposition of these materials into the stream leading to contamination of the river system.

Heavy vehicles should be kept at least 15m away from the stream except where needed for the construction of the causeway. As per the EMPr, no materials may be stored within 15m of the stream. No dumping is to be permitted within these areas. During the road upgrade, graded material may not be pushed into the river as this will cause increased sediment load in the water course. Graded material may not be left on the side of the road if it is within 15m of the river as this could be washed into the river during a rainfall event, causing increased sedimentation.

There may be damage to the water course during the removal of the temporary pipe crossing,

and once the pipe has been removed, the material needs to be disposed of. Improper disposal i.e. dumping in the river or nearby land would result in impacts on the nearby environment.

Therefore the temporary pipe crossing must be removed with care to avoid damage to the stream channel and banks. The concrete may be re-used for gabion baskets or fill when constructing the new structure but may not be disposed of in the stream or surrounding grassland. If this material is not used, it must be disposed of at a permitted landfill site that accepts builder's rubble. Delivery notes and safe disposal certificates to prove appropriate disposal will be required during the construction audits conducted by an independent environmental consultant.

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.

**Key Operational Impacts:**

**Overtopping and flooding of the structure resulting in damage to causeway**

The new causeway needs to be raised high enough to reduce this risk and the use of larger diameter pipes will ensure that this risk is further reduced. Given its location within the Tongati River floodplain, the causeway will likely be inundated in high flow events as will the road leading up to it. The causeway will need to be designed to ensure that it is able to withstand this. The present crossing in use is temporary only and a more permanent structure needs to be built to maintain access for the community. The proposed upgrade is aimed at ensuring access is not frequently disrupted and therefore this is rated as low.

**Destabilization and undermining of the structure**

Poor construction could result in the causeway being undermined, destabilizing it and resulting in material loss which will enter the river. This can be mitigated through installation of erosion protection features i.e. gabion baskets on either side of the structure ensuring that storm water does not erode the foundations and wing walls of the new structure. This impact can be mitigated against and is rated as medium.

**Pipework becoming blocked leading to localized flooding and erosion**

The pipe causeway will allow for the through flow of water but there is a risk that these pipes may become blocked, resulting in flooding and erosion, potentially undermining the causeway. This can be mitigated against through installation of pipework of sufficient diameter which is the intention of this proposal. The pipes will have a minimum diameter of 600mm which will allow sediment and debris to pass through without creating an obstruction. The above impacts can be mitigated against and are 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 causeway construction can be mitigated against. It is thus the opinion of the EAP that there are no significant environmental impacts associated with the proposal that cannot be mitigated against.

**Technology Alternative**

The following is applicable to all three causeways and the pipe crossing.

**Alternative A1 (preferred alternative) - Causeway pipes varying in size from 900mm to 1200mm in diameter will be used.**

Technology alternative A1 which involves installation of larger diameter portal culverts (A1756 and A2867) and larger diameter causeway pipes (OLO1937) will have a slightly larger footprint compared to alternative A2 from a construction perspective. However alternative A1 will allow for an increased carrying capacity which will be better suited to handling storm events. Larger diameter portal culverts and pipes are also less likely to become obstructed during operation.

Construction impacts associated with this technology alternative will be similar to those

discussed under the site alternative above.

Use of larger culverts and pipes is expected to reduce the risk of blockages which may cause pipes to backup resulting in flooding and erosion. This in turn will mean that larger diameter culverts and pipes will require less maintenance which will reduce costs in the long term.

It is the opinion of the EAP that the larger diameter culverts and pipes will prove to be more sustainable in the long term. The larger diameter pipes are less likely to become blocked thereby reducing the risk of flooding and erosion that could impact on the stream. It will also mean lower maintenance costs and less need for ongoing repairs and construction in the area.

Therefore it is believed that this alternative will ultimately have a smaller operational footprint.

**Alternative A2 – Causeway pipe sizes measuring a maximum of 350mm – 600mm in diameter will be used.**

Technology alternative A2 which involves the placement of smaller diameter stormwater pipes (350mm) will have a slightly smaller footprint compared to alternative A1 from a construction perspective only.

Construction impacts associated with this technology alternative will be similar to those discussed under the site alternative above.

The key operation risks discussed were the risk of the pipes becoming blocked resulting in water backing up and causing localized flooding and erosion. This can be mitigated through more regular maintenance.

It should be noted however that the smaller diameter pipes will be less likely to handle heavy rainfall events, increasing the risk that the causeway may be damaged and require extensive repairs. Damage to the causeway would lead to introduction of concrete and sediment in the stream.

It is the opinion of the EAP that the smaller diameter pipes will prove to be less sustainable in the long term. The smaller diameter pipes are more likely to become blocked thereby increasing the risk of flooding and erosion in the long term that could impact on the stream. This would have a greater impact on the mobility of aquifauna when compared to Alternative A1 and would also mean higher maintenance costs and increased need for ongoing repairs and construction in the area.

Therefore it is believed that this alternative will have a larger operational footprint.

**No-go alternative (compulsory)**

**1) A1756 in the Mandeni Local Municipality.**

The existing structure is insufficient in handling the volume and velocity of water and is regularly overtopped during heavy rainfall events; this makes the crossing impassable during these times. This means that there is ongoing activity required in order to maintain access, which in the long term has high impacts on the river system compared to a once off construction of a suitable structure.

**2) A2867 in the Maphumulo Local Municipality**

The previous structure that allowed access across the river has been destroyed. At present there is no safe way for community members to cross the river and during high flow events the river is impassable and unsafe for people, especially the elderly and small children. The debris from the previous structure will remain in the river, causing ongoing damage and blockage of the river.

**3) OLO1937 in the Ndwedwe Local Municipality including road and pipe crossing.**

The temporary crossing which is currently being used has not been designed for long service therefore it is expected that this structure will ultimately be washed away, leaving the community with no way to cross the river at this point, isolating the community. Further along the road, a pipe crossing is also required to allow water to flow below the road surface. Without this, the road will become eroded and damaged ultimately leading to access related issues in the area and the high input of sediment into the water course. This situation is

therefore not sustainable in the long term as it would be more efficient to construct a formal causeway than to continue replacing the pipe structure to maintain access on this section of road.

## 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

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:

With respect to the technology alternatives, it is recommended that preferred alternative A1, be authorized. Technology alternative A1 involves installation of larger diameter culverts and pipes (900mm to 1200mm) when constructing the causeway structures. 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.

The following recommendations are applicable to all three causeways and the pipe crossing.

### Stakeholders, Properties & Services

1. As standard construction practice the engineer and contractor should identify all existing services that may be affected prior to construction.
2. The contractor should liaise with local road users regarding restriction of access during construction.

### Traffic & Construction Vehicles

3. The contractor must take into consideration the potential movements of surrounding stakeholders.
4. Appropriate signage and barriers must be used to cordon off construction areas.
5. All construction vehicles should be fitted with the appropriate silencers and exhausts.
6. Speed limits must be obeyed.

### Housekeeping, waste management, storage and materials handling

7. Littering must not be permitted on site.
8. 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.
9. Cement mixing must be done on a hard surface that is protected from storm water runoff.
10. 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.
11. Appropriate and sufficient toilet facilities must be provided by the contractor.
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.

### Dust and erosion control

13. A water cart should be used to dampen dusty surfaces and suppress dust.
14. Exposed areas should be rehabilitated and re-vegetated as soon as possible during construction.
15. 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.

**Stormwater management and protection of river/ stream**

16. The engineer/contractor must ensure that only clean storm water runoff enters the environment. Any contaminated run off must be collected and disposed of.
17. No excavated material or fill material may be stored within the river or within 15m of the river.
18. Only the area directly in the path of construction may be cleared and excavated. The remainder of the river must be demarcated as a no-go area.
19. Heavy vehicles should avoid working near the river as much as possible.
20. Any temporary diversions made in the stream should not result in the impediment of water flow, all temporary structures or channels to be removed once construction is complete.
21. No person may utilise any water course for washing of any vehicles or equipment associated with the causeway construction.

**Causeway construction**

22. Erosion protection features must be installed to protected the causeway structure i.e. gabion baskets on either side of the structure ensuring that storm water does not erode the foundations and wing walls of the new structure.

**Specific conditions**

**A1756 in the Mandeni Local Municipality.**

23. If possible the construction camp should be located on the existing access road.
24. There is a wet area to the south east of the proposed causeway location. This wet area must be demarcated as a 'no-go' zone and potential disturbance to it prevented.
25. The existing low level bridge must be removed with care to avoid damage to the stream channel and banks.
26. The concrete may be re-used for gabion baskets or fill when constructing the new structure but may not be disposed of in the stream or surrounding grassland.
27. If this material is not used, it must be disposed of at a permitted landfill site that accepts builder's rubble. Delivery notes and safe disposal certificates to prove appropriate disposal will be required during the construction audits conducted by an independent environmental consultant.

**A2867 in the Maphumulo Local Municipality**

28. The debris from the previous causeway that is lying in the river bed must be removed and disposed of at a permitted landfill. Safe disposal certificates must be kept on record.

**OLO1937 in the Ndwedwe Local Municipality including road and pipe crossing.**

29. During the road upgrade, graded material may not be pushed into the river or left within 15m of the water course as it may be washed into the river.
30. The temporary pipe crossing must be removed with care to avoid damage to the stream channel and banks.
31. The concrete may be re-used for gabion baskets or fill when constructing the new structure but may not be disposed of in the stream or surrounding grassland. If this material is not used, it must be disposed of at a permitted landfill site that accepts builder's rubble. Delivery notes and safe disposal certificates to prove appropriate disposal will be required during the construction audits conducted by an independent environmental consultant.

## 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;

### 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.

**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;

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

**Registered I & APs**

## Appendix F: Draft Environmental Management Programme (EMPr)

Basic Assessment Report