

# **DRAFT BASIC ASSESSMENT REPORT SOUTHERN REGIONAL BULK WATER AND SANITATION SCHEME, ILEMBE DISTRICT MUNICIPALITY, KZN**



**15 JANUARY 2018**



## agriculture & environmental affairs

Department:  
Agriculture  
& Environmental Affairs  
**PROVINCE OF KWAZULU-NATAL**

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**THIS REPORT WAS COMPILED BY TRIPLO4 SUSTAINABLE SOLUTIONS (PTY) LTD  
IN TERMS OF APPENDIX 1 TO GNR 326**

3 (1) (a) details of (i) the EAP who prepared the report; and (ii) the expertise of the EAP. Please see Appendix H for EAP Declaration and full Curriculum Vitae.

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**SUBCONSULTANT RESPONSIBLE FOR ASSESSMENT OF PORTIONS 235-239 (ALL OF 221) OF THE FARM LOT 69 NO. 917 SITUATE IN KDM**

The landowner, Mr. A.C Reynolds has a moral obligation to Metamorphosis Environmental Consulting to allocate any environmental assessments pertaining to his property (Property Portions 235-239 (all of 221) Of the Farm Lot 69 No. 917 Situate in KDM). Therefore, Triplo4 was requested by Escongweni Engineers to appoint Metamorphosis Environmental Consulting (Ms. Vicki King) as a sub-consultant to undertake the environmental assessment for the portions as relevant to Mr. Reynolds Property. Should any stakeholder or I&AP require any further clarity on the above-mentioned, please contact Triplo4.

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## DETAILS OF THE PROJECT PROPONENT

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## EXECUTIVE SUMMARY

The proposed Southern Regional Bulk Water and Sanitation Scheme (SRBWSS) aims to provide sustainable bulk water and sanitation to areas such as Etete, Nkobonga, Shayamoya and Shakaskraal within the iLembe District Municipality.

The proposed development will comprise the construction of potable and sewage bulk pipelines and associated infrastructure. The project comprises of Phase 1a and Phase 1b. Phase 1a entails the construction of a clear water rising main from the proposed Etete Reservoir to the existing reservoir, upgrades to existing water reticulation and the construction of a clear water pump station. Phase 1b which is the sanitation scheme servicing the above mentioned areas, includes the construction of a sewer gravity trunk main, long sewer rising main and the construction of a sewer pump station. The specifications of the bulk pipelines and associated infrastructure is detailed in section 1.2.

The proposed pipelines and associated infrastructure has been re-aligned to transformed areas to reduce the impact to indigenous and protected vegetation as well as hydrological flow regime. The pipeline crosses several watercourse crossing inclusive of the Tete and Mhlali Rivers, however, crossings will be sub-surface to reduce disturbance. Due to the nature of the sewer gravity main, the development occurs within the flood line however efforts to minimize and mitigate impacts will be taken. This will result in excavation, moving and depositing of material within the water-crossings which are subject to a Basic Assessment process. Please refer to Appendix C: Facility Illustration(s) for detailed designs.

The following key impacts and mitigation measures were assessed:

- **Destruction to wetlands, watercourses and riparian areas:**  
Where possible, the proposed pipeline has be shifted to reduce disturbance within sensitive areas. No stockpiling of any material is permitted within watercourses. Any excavation activities within the watercourse crossings is to be carried out by hand, where possible, vehicles to avoid activities within the watercourse. Trenches are to be kept to a minimum width to reduce the disturbance footprint.
- **Loss of riparian and indigenous vegetation during excavation:**  
Vegetation clearing is to be kept to a minimum. Any excavation activities within the watercourse crossings is to be carried out by hand thereby reducing the clearance of vegetation. The trench must be filled in as soon as the pipeline is installed as it could potentially result in a pit-fall trap for remaining animal species migrating to and away from the remnant patch of seepage wetland, floodplain wetland and non-perennial and perennial drainage lines. Erosion control must be monitored by the Engineer or Contractor and measures must be implemented as per the EMPr (Appendix G). The rehabilitation of the pipeline servitude including removal of alien invasive vegetation and re-vegetation with indigenous (to the area) grass species could potentially result in a slight positive impact within the adjacent non-perennial drainage lines.
- **Disturbance to properties and existing services:**  
Construction activities will result in disturbance to existing services, surrounding properties. All services must therefore be identified prior to construction and the community in the area notified.
- **Sustainable water and sanitation provision:**  
The proposed scheme aims to upgrade and improve service delivery based on municipal potable water supply and improved sanitation to the Etete, Palm Lakes, Shayamoya and Nkobongo areas.

These impacts can be mitigated by following the recommendations in this report and the Environmental Management Program (EMPr). Construction activities will be monitored on a monthly basis by an independent Environmental Control Officer (ECO) and controlled through the implementation of the attached EMPr (Appendix G)

Taking into consideration the impacts mentioned above and mitigation measures included within this report and the EMPr, it is the EAP's opinion that there are no significant environmental impacts associated with the proposal which cannot be mitigated. Therefore, it is recommended that the preferred Layout Alternative 1 be authorised.

## **ADDITIONAL AUTHORISATIONS REQUIRED**

The NWA defines a Section 21 water uses as:

Section 21 (c) & (i) – Impeding and diverting the flow of water in a watercourse. Altering the bed, bank, course or characteristics of a watercourse

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Appendix C: Facility Illustration(s)

Appendix D: Specialist Reports (Including Terms of Reference)

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## 1 SECTION 1: DESCRIPTION OF THE PROPOSED ACTIVITY & LOCALITY

### 1.1 Project Title

Proposed Southern Regional Bulk Water and Sanitation Scheme (SRBWSS), iLembe District, KwaZulu-Natal.

### 1.2 Description of the Activities to be Undertaken Including Associated Structure and Infrastructure as per Section 3(d) (ii)

#### THIS IS SECTION HAS BEEN COMPLETED BY TRIPLO4

Escongweni Engineers were appointed on behalf of the proponent (iLembe District Municipality) to upgrade the potable and sewage supply scheme for the Etete, Palm Lakes, Shayamoya and Nkobongo Townships. The scope of this application covers the bulk infrastructure, and associated infrastructure. The proposed SRBWSS extends across 3 municipal wards (7, 20 and 22) and approximately 10km in length. A complete list of the properties, zoning and landowners is provided in Appendix E.

The project comprises of Phase 1a and Phase 1b and the specifications are detailed below:

#### Phase 1a (Potable Water Scheme)

The proposed bulk water supply scheme will include the construction of a 1.6km long clear water rising main with 250mmØ, uPVC (Class 12), from the Honolulu Reservoir to the Etete Reservoir. The water scheme will also include the replacement of an existing water reticulation pipeline uPVC with a length of 600m. A Clear Water Pump station will be constructed adjacent to the existing Honolulu Reservoir to pump water to the proposed Etete Reservoir. In addition, a 3ML Concrete Reservoir at Etete is proposed adjacent to the existing 1.5ML Etete Reservoir, however, this is excluded from this application as it does not trigger any listing notices. Please refer to Appendix D: Specialist Reports, Engineering Reports by Escongweni Engineers dated October 2017.

For Phase 1a, two wetland units (W units) and three aquatic resources (AR units) were delineated along/adjacent to the proposed route. There are three crossings associated with the proposed bulk water scheme. The three AR units were delineated as incised and degraded non-perennial drainage lines found to be a low impact risk. Wetland units (W1 and W2) were both delineated as remnant patches of Imperata cylindrica dominated hillslope seepage wetlands and occur upstream from the proposed bulk water pipeline servitude. W1 and W2 were assessed and will not be impacted on.

#### Phase 1b (Sanitation Scheme)

The bulk gravity sewer outfall facilitates the flow of wastewater through Etete, past Palm Lakes, across the R102 and two railway lines, across the N2 freeway to a sewer pumpstation (located adjacent to the N2 freeway). The proposed sewer rising main extends from the proposed sewer pumpstation to the existing Sheffield wastewater treatment works (WWTW).

The proposed bulk sanitation supply scheme will include the construction of an 8.5km long sewer gravity trunk main designed for an ultimate flow of 57.89ml/day. In addition, the construction of a 0.6km long sewer rising main (designed for Etete flows only). The proposed bulk gravity sewer outfalls for this development range between 160mm – 500mmØ. uPVC Class 51 (8.5km in length) and 600mm – 800mmØ, concrete SS 100D

pipelines. The proposed sewer pumpstation will consist of a wetwell, adjacent chamber for mechanical pipework and associated pumps/mechanicals with a design flow of 4.492ML/day. A minimum trench width of 760mm will be required for the proposed sanitation scheme.

Further information on the design specification of the proposed SRBWSS, please refer to Appendix D: Specialist Reports, Engineering Reports by Escongweni Engineers dated October 2017.

For the northern portion of Phase 1b, a total of 5 AR units were delineated varying from medium-high to no impacts. Two wetlands (W1 and W2) were delineated as a remnant patches of *Imperata cylindrica* dominated hillslope seepage wetlands with no associated impacts due to the location upstream from the proposed northern portion of the alignment. An additional 8 AR units were delineated directly within and within 500m of the proposed southern alignments. Three wetlands (W3, W4, W5) was delineated as a freshwater floodplain wetland and hillslope seepage wetlands respectively. W3 and W4 will have a medium to low impact while W5 will have no impact as it occurs upstream from the proposed southern portion of the sanitation scheme.

The proposed bulk outfall sewer alignment bisects two Swamp Figs (*Ficus trichopoda*) as well as being within 20 m of several Powder-Puff Trees (*Barringtonia racemosa*). The proposed sewer alignment should be shifted 10m in order to avoid the destruction of a protected Swamp Fig (*Ficus trichopoda*). Where the pipeline bisects natural moist riparian zones it should ideally be shifted towards any transformed or alien invaded sections.

The watercourse crossings have been designed depending on the type of in-situ material associated with that specific watercourse. Watercourse crossings will be sub-surface where possible and in accordance to engineering detail. Pipe bridges will be provided where are required. A specific drawing per crossing has been developed for sections due to varying pipeline depths. Please refer to Appendix C: Facility Illustration(s).

The road crossings have been designed in accordance to engineering detail. Two KZN DoT encroachments occur and one SANRAL road reserve (N2) encroachment is within the project area. The pipeline will be pipejacked beneath the roads encountered.

The development and operation of the bulk sewer pipeline will exceed 1000m (85000m) in length with an internal diameter of 0,384m, 0,480m, 0,585m and 0,788m occurring outside the urban edge. In addition, the bulk water and sewer pipelines will result in more than approximately 100m<sup>2</sup> of infrastructure being placed within a watercourse and 32m of watercourses occurring outside the urban edge. Where the pipeline crosses a watercourse, this will result in the excavation and deposition of more than 10m<sup>3</sup> (approximately 300m<sup>3</sup>) of material in or from that watercourse.

This report and the attached EMP, therefore primarily focus on the proximity to watercourse crossings as well, as these are the activities that trigger the Environmental Impact Assessment regulations and are considered the sensitive environmental areas.

#### **THIS IS SECTION HAS BEEN COMPLETED BY METAMORPHOSIS**

The project will involve the construction of a gravity bulk sewer line which runs for approximately 2.5kms on the AC Reynolds Farm in Salt Rock, Kwazulu Natal. The pipeline comprises concrete pipes, 600mm in diameter for the first section of the property and increasing in size to 800mm diameter in the eastern portion of the property, closer to the Sheffield Waste Water Treatment Works where it culminates. The pipeline crosses

one main road and the N2 Freeway and will be pipejacked beneath both of these roads. There is one major river crossing on the AC Reynolds Farm, where the pipe crosses the Mhlali River and an additional three stream crossings on the property.

The pipe runs within the 1:100 year floodline throughout its length and the majority of the route lies within highly transformed floodplain wetland. The predominant land use is sugar cane. The pipe runs along the Tete and Mhlali Rivers and is located between 50 and 130m away from the river channel along its course.

The pipe will be buried between 1.2 and 3m below surface, depending on the topography. Construction will take approximately 18 months to complete. The pipeline will be constructed in sections and rehabilitation will be undertaken on an incremental basis as construction proceeds.

There will be manholes located along the pipeline to allow for future access for maintenance. The working servitude will be approximately 10 – 15m wide and the final servitude is likely to be approximately 8m.

### 1.3 Description of Feasible Alternatives as per Section 3(h) (i)

**“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;**

**Alternative S1 (Preferred) - SRBWSS Alignment within the Etete, Palm Lakes, Shayamoya and Nkobongo Area (Only One Site Considered for Pipelines); New Pumpstation at Royal Palm (Option 2)**

The objective of the proposed scheme is to provide sustainable bulk water and sanitation to the Etete, Palm Lakes, Shayamoya and Nkobongo Townships in the iLembe District. There are therefore no site alternatives.

In initial layout presented to the Environmental Assessment Practitioner (EAP) by the engineers was from an engineering perspective and did not take into account sensitive environmental areas. After reviewing maps and conducting of the specialist reports, sensitive environmental areas were identified by the EAP such as protected trees, indigenous vegetation and wetlands and rivers. Several sections of the pipeline route were then re-aligned to avoid the unnecessary clearance of protected trees, while still ensuring supply to all relevant households. Layout Alternative 1 is the preferred layout that was amended, while Layout Alternative 2 is the original layout that was proposed

**Alternative S2 – (Not Supported) - New Royal Palm Pumpstation Option 1**

The proposed New Royal Palm Pumpstation Option 1 is located in close proximity to the Shree Siva Temple and Tinley Manor train station.

This site alternative has an increased environmental impact (on the adjacent Tete River, transformed floodplain wetland and the Umhlali River and closed - moist woodland.

Given the potential increased impact on the adjacent sensitive associated within this site alternative for the pump station, this alternative is not supported by Triplo4.

**(b) the type of activity to be undertaken;**

The proposed activities associated with the construction of the pipelines and associated infrastructure that are necessary for overall water and sanitation scheme. Thus, no other activities for any other purposes will be undertaken

**(c) the design or layout of the activity;**

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Two layout alternatives were considered for the proposed scheme:

**Alternative A1 (Preferred alternative) – Incorporating Specialist / Environmental Recommendations**

The preferred layout had considered specialist inputs and realigned sections of the pipeline to reduce the number of watercourse crossings and the area of indigenous vegetation and protected trees to be cleared. The pipeline runs parallel to the Tete and Umhlali Rivers and will impact on transformed or degraded outer margins of the riparian zone. However, the pipeline alignment will have a medium-low impact on the adjacent riparian zone and sections of the Rivers as environmentally practices will be implemented during the construction phase and the pipeline servitude will be appropriately rehabilitated and re-vegetated as mitigated in the EMPr (Appendix G).

**Alternative A2 (Not supported) – Initial Layout**

The initial layout had several more watercourse crossings and traversed through the Tete and Umhlali Rivers resulting in an increased environmental impact. In addition, sections of the pipeline crossed several protected trees and large indigenous vegetation areas which would require increased vegetation clearance. Thus, sections of the pipelines were re-aligned in Alternative 1 (Preferred) to reduce the number of watercourse crossings and areas of vegetation clearance

Given the potential increased wetland destruction and protected and indigenous clearance associated within this alternative, this alternative is not supported by Triplo4.

**THIS IS SECTION HAS BEEN COMPLETED BY METAMORPHOSIS**

The preferred layout has taken into account specialist inputs and information gathered during site visits. Certain portions of the pipeline have been realigned in order to reduce the potential impact on indigenous vegetation and long term stability of riverine areas. Further localised amendments will be undertaken once the line has been surveyed to ensure that individual tree specimens are avoided as required wherever possible. The pipeline runs parallel to the Tete and Umhlali Rivers and will mostly impact on transformed or degraded outer margins of the riparian zone, the majority of the route lies in sugar cane adjacent to the farm road which runs along the rivers. The pipeline alignment will have a medium-low impact on the adjacent riparian zone and sections of the Rivers if the recommendations of the EMPr are satisfactorily implemented **during** the construction phase. The pipeline servitude will be appropriately rehabilitated and re-vegetated as construction progresses along the route as described in the EMPr (Appendix G).

**(d) the technology to be used in the activity;**

The technology to be used during the construction of the pipeline is associated with general work relating to pipeline construction.

The following will be undertaken for the proposed water and sanitation scheme:

**Water Scheme:**

The construction of a 1.6km long clear water rising main with 250mmØ, uPVC (Class 12), from the Honolulu Reservoir to the Etete Reservoir. A Clear Water Pump station will be constructed adjacent to the existing Honolulu Reservoir to pump water to the proposed Etete Reservoir.

**Sanitation Scheme:**

The proposed bulk sanitation supply scheme will include the construction of an 8.5km long sewer gravity trunk main designed for an ultimate flow of 57.89ml/day. In addition, the construction of a 0.6km long sewer rising main (designed for Etete flows only). The proposed bulk gravity sewer outfalls for this development range between 160mm – 500mmØ. uPVC Class 51 (8.5km in length) and 600mm – 800mmØ, concrete SS 100D pipelines. The proposed sewer pumpstation will consist of a wetwell, adjacent chamber for mechanical pipework and associated pumps/mechanicals with a design flow of 4.492ML/day

No other technology alternatives are deemed relevant or appropriate for this project.

**(e) the operational aspects of the activity; and**

The aim of the proposed project is to provide bulk water and sanitation to the areas of Etete, Palm lakes, Shayamoya and Nkobongo. The bulk pipelines and associated infrastructure will serve to increase both the water supply, address water service provision backlogs and provide waterborne sanitation to the areas mentioned.

The operational aspects relate to the provision of potable water and sanitation to areas that currently do not have access to reticulated water and waterborne sewage especially in rural areas where water service and sanitation provision is a priority.

**(f) the option of not implementing the activity.**

The no-go option will entail maintaining the status quo namely inadequate water and sanitation supply to meet future demands of the local communities and neighbouring areas. In addition the no-go option implies that the bulk sewer would not be constructed and the current status quo of pit latrines would prevail.

As the water demand continues to grow, the storage capacity of potable water in the existing reservoirs will continue to fall below its supply security level. Secondary benefits of providing temporary employment opportunities will not be realised. If the pipelines and associated infrastructure does not go ahead, the negative environmental impacts which have been identified during this assessment, would not occur. However, if the proposed pipelines and associated infrastructure is not constructed and commissioned, the areas mentioned would be negatively affected by an inadequate sewage reticulation (basic service) which would inhibit future development in the area and result in the continuance of lack of decent hygiene facilities in the area

Given the afore-mentioned, the “No-Go” alternative has very real and significant negative social and economic impacts, and the significant positive impacts that will result from the bulk pipelines and associated infrastructure construction will not be realised. Thus the no-go option is not supported.

#### 1.4 All Listed and Specific Activities Triggered and Applied for as per Section 3(d) (i)

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GNR	Activity No.	Activity as per the legislation	Activity Applicability
L1 327	10	<i>The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – i) with an internal diameter of 0,36 metres or more; or ii) with a peak throughput of 120 litres per second or more;</i>	The length of the sewer gravity main pipeline is 85 000m. The length of the long sewer rising main is 6000m. The total length of the bulk sewer is 91 000m.  The internal diameter of portions of the sewer gravity main pipeline is 0,384m, 0,480m, 0,585m and 0,788m.
L1 327	12	<i>The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.</i>	The proposed pipelines and associated infrastructure will exceed 100m <sup>2</sup> and will bisect several water crossings and certain portions are within 32m of a watercourse.
L1 327	19	<i>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.</i>	It is anticipated that more than 10 cubic meters (approximately 300m <sup>3</sup> overall) of soil, sand or rock will be infilled or deposited or excavated or moved during the construction of the pipeline from several watercourse crossings.

**THIS IS SECTION HAS BEEN COMPLETED BY METAMORPHOSIS**

GNR	Activity No.	Activity as per the legislation	Activity Applicability
L1 327	10	<i>The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste</i>	The proposed pipeline is approximately 2 500 metres in length on AC Reynolds Property with an internal pipeline diameter of 0.585 to 0.788m.

		water, return water, industrial discharge or slimes – iii) with an internal diameter of 0,36 metres or more; or iv) with a peak throughput of 120 litres per second or more;	
L1 327	12	The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	Much of the pipeline falls within the floodplain of the Mhlali River on the property and therefore the footprint may exceed the threshold.
L1 327	19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.	It is likely that the construction of the pipeline will involve the movement of significantly more than 10m <sup>3</sup> of material within watercourses on AC Reynold's Property.

### 1.5 Project Locality as per Section 3(b) (i) – (iii)

**THIS IS SECTION HAS BEEN COMPLETED BY TRIPLO4**

**Table 1: Location of the Proposed Activity**

<b>District Municipality</b>	iLembe District Municipality
<b>Local Municipality</b>	KwaDukuza Local Municipality
<b>Ward</b>	7, 20,22
<b>Area / Town / Village</b>	Etete, Nkobonga, Shayamoya, Palm Lakes
<b>Property Description</b>	Please see attached Spread Sheet with all property descriptions under Appendix E: Public Participation – I&AP Database.

#### Site Alternative

**In the case of linear activities:**

#### Water Scheme:

<b>Alternative:</b>	<b>Latitude (S):</b>	<b>Longitude (E):</b>
Alternative S1 (preferred or only route alternative)		
• Starting point of the activity	29°24'42.61"	31°14'25.54"
• Middle point of the activity	29°24'38.77"	31°14'5.04"
• End point of the activity	29°24'32.77"	31°13'37.36"



**Associated Infrastructure**

Clear Pump Station	29°24'42.61"	31°14'25.54"
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**Sanitation Scheme:**

Alternative:	Latitude (S):	Longitude (E):
Alternative S1 (preferred or only route alternative)		
• Starting point of the activity	29°24'45.03"	31° 13' 59.34"
• Middle point of the activity	29°25'55.99"	31°14'44.85"
• End point of the activity	29°25'00.63"	31°14'42.34"
• End point of the activity	29°27'27.46"	31° 15' 13.60"

**Associated Infrastructure**

Sewer Pump Station		
Option 1	29°26'32.26"	31°14'44.84"
Option 2	29°27'14.37"	31°15'6.30"

**No other site alternatives were considered for proposed bulk water and sanitation scheme.**

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. **Please refer to Appendix A: Site Plans / Maps.**

**Design or Layout Alternative**

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

For linear activities:

**Alternative:****Length of the activity:**

Alternative A1 (preferred activity alternative)

Bulk Water: 25 000m
Bulk Sewer: 91 000m

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

**Alternative:****Size of the site/servitude:**

Alternative A1 (preferred activity alternative)

10 -15 m
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Alternative A2 (if any)

10 – 15 m
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**THIS IS SECTION HAS BEEN COMPLETED BY METAMORPHOSIS**

<b>Province</b>	Kwazulu Natal
<b>District Municipality</b>	iLembe
<b>Local Municipality</b>	KwaDukuza
<b>Ward Number(s)</b>	28
<b>Farm name and number</b>	Remainder of Portion 221 of the Farm Lot 69 No 917
<b>Portion number</b>	221
<b>SG Code</b>	

<b>Current Land Use</b>	Agriculture
-------------------------	-------------

## 1.6 Site Access

Does ready access to the site exist?	YES	<input checked="" type="checkbox"/>
If NO, what is the distance over which a new access road will be built		m
Describe the type of access road planned: <b>Not Applicable. Access is available via existing farm roads.</b>		

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. **Refer to Appendix A, Maps for proposed locality.**

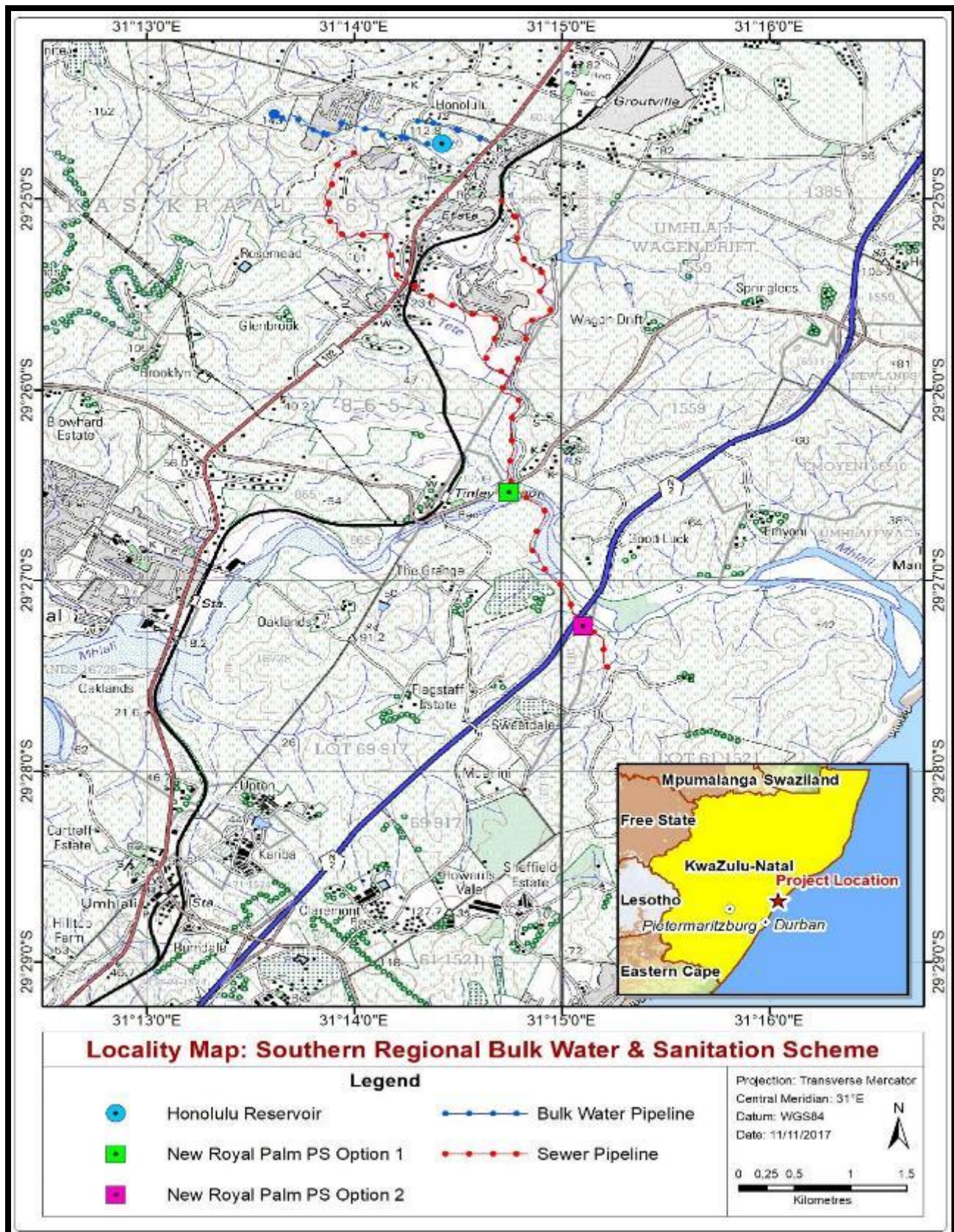


Figure 1: Locality map showing the location of the Proposed SRBWSS



## 1.7 Zoning and Land Use Rights

What is the land currently zoned for?		
Please refer to Appendix E: Public Participation – I&AP Database.		
Will any person's rights be negatively affected by the proposed activity/ies?	YES	<input type="checkbox"/>
Will the activity be in line with the following?		
The Provincial and Local Spatial Development Framework	YES	<input type="checkbox"/>
The Provincial and Local Integrated Development Framework	YES	<input type="checkbox"/>
The Provincial Environmental Management Framework	YES	<input type="checkbox"/>

The UN Sustainable Development Goals are incorporated into the Provincial and Local Integrated Development Framework. Goal #6 is to ensure availability and sustainable management of water and sanitation for all. The SRBWSS adheres to this goal by providing potable water and sanitation in areas where is currently not available.

As per the Provincial Growth and Development Strategy, 2016 (PGDS) there is currently a backlog in access to water and sanitation which is a matter of concern. This matter is addressed by the implementation of new infrastructure. Included in the PGDS are the strategic objectives. Once such objectives includes Strategic Objective 3.2: Enhance the health of communities and citizens. A healthy lifestyle is the product of many aspects including access to clean water and sanitation. Another objective is Strategic Objective 4.4: Ensure availability and sustainable management of water and sanitation for all. In order for this objective to be implemented greater and better infrastructure needs to be enforced in order to meet the needs of the local community. In implementing the SRBWSS these needs can be met for the local community and thus striving towards the Strategic Objective of water and sanitation for all.

As per the KwaZulu-Natal Rural Development Framework, Goal 4 is related to Strategic Infrastructure. This encompasses the improvement of the water resource management and supply. By implementing the SRBWSS, it contributes to the improvement for water and sanitation infrastructure in the development area (Etete, Shayamoya, Nkobongo and Palm Lakes within the iLembe District).

According to the KwaDukuza Integrated Development Plan water, sanitation, storm water infrastructure is a threat to the Municipalities development plans. Within Chapter 9: Sustainable Infrastructure Development the primary components for infrastructure development include water supply and distribution, and sanitation. In order to achieve this the municipality intends on developing the infrastructure by using local labourers to create job opportunities.

## 1.8 Water Use and Bulk Service Availability

Please indicate the source(s) of water that will be used for the activity.

Municipal
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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:

Not Applicable
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Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water & Sanitation?

Please provide proof that the application has been submitted to the Department of Water & Sanitation.

Yes. A Water Use Licence Application will be submitted to the Department of Water and Sanitation Regional Office for the development being within 500m of a wetland as per Section 21 (c) and (i) of the National Water Act.

Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?

Not Applicable

### 1.9 Energy Efficiency

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

In terms of energy efficiency, the proposed pipeline should be undertaken during normal working hours to reduce the use of artificial lighting. Additionally, The contractor will be advised to transport all construction materials on site at the same time where possible and the collection of waste material conducted simultaneous with other activities to reduce the amount fuel usage for such transportation. Waste management methods (i.e. recycling and reusing), and sourcing local materials are recommended and are included in the EMP.

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

It is recommended that the developer makes reference to energy efficiency measures and green energy projects to reduce energy consumption where possible.

## 2 SECTION 2: SITE DESCRIPTION OF SURROUNDING LAND USE AS PER SECTION 3(H) (IV) AND (K)

### 2.1 Topography and Biophysical Environment

The communities surrounding Etete, Palm lakes, Shayamoya and Nkobongo at an elevation profile ranging 71m – 132m (water scheme) and 9m-137m (sanitation scheme). The water pipeline has a sloping topography averaging 7.2 whereas the sanitation pipeline has a maximum slope of 23.4 % and an average of 2.4 %.. The area for the proposed pipeline route is generally underlain by sandy fill and alluvial soils, and silty/clayey colluvial and residual soils which overlie tillite bedrock of the Dwyka Group, shale bedrock of the Pietermaritzburg Formation and sandstone bedrock of the Vryheid Formation. The site falls within the Kwazulu-Natal Coastal Belt (CB 3) vegetation unit (Mucina & Rutherford 2006). The landform across the study area is gently to moderately sloping for the most part, with some localised steep sections. The area surrounding the proposed site consists fallow sugarcane lands dominated by moist secondary succession *Imperata cylindrica*-*Aristida junciformis* grasslands and on the edges of current sugarcane plantations and informal access roads. The bulk sewer pipeline bisects the moist coastal woodland in the valley above the non-perennial drainage line, a large section of transformed and degraded floodplain wetlands, the Tete River and The Umhlali River. Photographs taken within the project areas showing the surrounding topography are included in the sections below.

Component	Gradient	Landform
3ML Reservoir	1: 20 – 1: 15	Ridgeline
Pump Station (next to Honolulu Reservoir)	1: 15 – 1: 10	Side slope of hill
Royal Palm Pump Station (Option 2)	1: 10 – 1: 7.5	Side slope of hill
Water and Sewer Pipeline	1: 15 – 1: 10	Side slope of hill Undulating plain – low hills

### 2.2 Fauna and Flora

#### THIS IS SECTION HAS BEEN COMPLETED BY TRIPLO4

The majority of the project and associated outfall bulk water and sewer pipelines are situated within fallow sugarcane lands dominated by moist secondary succession *Imperata cylindrica*-*Aristida junciformis* grasslands and on the edges of current sugarcane plantations and informal access roads. The bulk sewer pipeline bisects the moist coastal woodland in the valley above the non-perennial drainage line, a large section of transformed and degraded floodplain wetlands, the Tete River and The Umhlali River.

The bulk outfall water pipeline is situated within transformed formal and informal settlements and road reserves. The road reserve is dominated by alien invasive and pioneer and weedy plant species. The pipeline servitude bisects completely transformed vegetation units and habitats with little or no indigenous vegetation present. The water pipeline bisects three heavily degraded non-perennial drainage lines. The pipeline will not result in the destruction of any large indigenous riparian tree species or patches of hygrophilous (wetland) vegetation.

The sewer pipeline bisects natural riparian areas as well as a 'protected' Swamp Fig (*Ficus trichopoda*). The pipeline bisects the road reserves of several informal access roads adjacent to the lower-lying drainage lines. The bulk sewer pipeline bisects the moist coastal woodland in the valley above the non-perennial drainage line, a large section of transformed and degraded floodplain wetlands, the Etete River and The Umhlali River.

Two types of protected tree species were recorded growing naturally within the moist closed woodland riparian zones along the perennial rivers namely several Swamp Figs (*Ficus trichopoda*) and Powder-Puff Trees (*Barringtonia racemosa*). The proposed bulk outfall sewer alignment bisects two Swamp Figs (*Ficus trichopoda*) as well as being within 20 m of several Powder-Puff Trees (*Barringtonia racemosa*). The Department of Agriculture, Forestry and Fisheries (DAFF) will have to be approached to obtain the required permits for the removal of any protected tree species. A few planted or naturalized Raphia Palms (*Raphia australis*) were observed around the adjacent artificially created dams to the south of the sewer alignment.

No sensitive or endangered mammals were recorded within the study area. It is highly unlikely that the proposed water and sewer pipeline alignments, new reservoir and pumping station sites constitutes significant habitat for any threatened mammal species.

Please refer to Appendix D – Specialist Studies, Ecological Assessment by Clayton Cook dated November 2017.

#### **THIS IS SECTION HAS BEEN COMPLETED BY METAMORPHOSIS**

**This information is taken from the Southern Regional Bulk Water Sanitation Project – Preliminary Ecological Survey December 2017 by CL Cook.**

The site falls within the Kwazulu Natal Coastal Belt (CB3) vegetation unit with some remnants of Subtropical Freshwater Wetlands (AZf 6) (Mucina and Rutherford 2006).

#### **Vegetation**

The pipeline runs along the Tete River, crosses an 85m degraded section of the riparian zone of the Mhlali Rier and then runs to the Mhlali River throughout its length in the property. It is situated mainly in sugar cane lands. Some of the areas comprise roadways, with indigenous vegetation encountered only in the valleys where the pipeline crosses tributaries and in the area adjacent to the N2 freeway where the landowner has undertaken significant rehabilitation.

The sugar-cane (*Saccharum officinarum*) plantations and the road reserves which are dominated by pioneer weedy species such as Tall Fleabane (*Conyza albida*), Flax-Leaf Fleabane (*Conyza bonariensis*), Common Black jack (*Bidens pilosa*), Tall Khaki weed (*Tagetes minuta*), Broad-leaved Leonotis (*Leonotis intermedia*), Mexican Poppy (*Argemone ochroleuca*), Daisy Bush (*Euryops chrysanthemoides*), Hottentot's Tea (*Helichrysum nudifolium*), *Helichrysum cymosum*, *Nidorella auriculata*, Mexican Poppy (*Argemone ochroleuca*), *Ambrosia artemisifolia*, *Ageratum houstonianum*\*, *Ageratum conyzoides*\*, and *Parthenium hyserophorus*. Pioneer grass species such as *Aristida congesta*, *Hyparrhenia hirta*, Rhodes Grass (*Chloris gayana*), Crab finger-Grass (*Digitaria sanguinalis*) Weeping Love Grass (*Eragrostis curvula*), Natal red-Top (*Melinis repens*), Common Buffalo Grass (*Panicum maximum*) and Couch Grass (*Cynodon dactylon*).

The vegetation along the artificially created drainage furrows which feed into the lower-lying non-perennial and perennial drainage lines have been historically transformed and degraded due to surrounding anthropogenic activities including the removal of vegetation during ploughing of lands and planting of sugarcane.

The vegetation along the Mhlali River is defined as Moist Closed Woodland Riperian Zone.

The proposed sewer pipeline bisects the moist closed woodland as well as riparian zones of the non-perennial and perennial drainage lines. Certain sections are transformed and colonised by woody alien invasive vegetation (*Melia azedarach*, *Schinus terebinthifolius*, *Lantana camara*) whilst others display a more natural species composition (*Syzygium cordatum*, *Bridelia micrantha*, *Ficus sur*, *Trichilia dregeana*, *Erythrina lysistemon*, *Vachellia robusta*, *Vachellia nilotica*). The sewer-pipeline bisects a large protected Swamp Fig (*Ficus trichopoda*) above the confluence of the Tete River and the Umhlali River.

The site has been historically annually ploughed and old fallow lands and road reserves are dominated by secondary succession grasses (*Cynodon dactylon*, *Cynodon nlemfuensis*, *Eragrostis curvula*, *Digitaria eriantha*, *Poa annua*\*) pioneer weedy plant species or ruderals (*Commelina erecta*, *Trifolium repens*, *Centella asiatica*, *Veronica persica*) as well as patches of hygrophilous sedges (*Mariscus solidus*, *Fuirena hirsuta*, *Eleocharis dregeana*, *Mariscus solidus*, *Pycnus polystachyos*, *Cyperus denudatus*, *Cyperus dives*) and Bull-rushes (*Typha capensis*) occur within the drainage lines as well as around the inflows of the artificially embanked dams. A few Umdoni or Waterberries (*Syzygium cordatum*), Paper-bark Acacia (*Vachellia sieberiana* var. *woodii*) as well as Pigeonwood (*Trema orientalis*) Scented-pod Acacia (*Vachellia nilotica*), Cluster Fig (*Ficus sur*) and Mitzeeri (*Bridelia micrantha*) occur along the artificially created drainage lines

Indigenous species recorded within the riparian zones of the non-perennial and perennial drainage lines included Umdoni Waterberry (*Syzygium cordatum*), Wild Date Palm (*Phoenix reclinata*), Flat-Crown (*Albizia adianthifolia*\*), River Bushwillow (*Combretum erythrophyllum*), Cluster Fig (*Ficus sur*), Sycamore Fig (*Ficus sycomorus*), Red Currant (*Searsia chirindensis*), Coast Currant (*Searsia nebulosa*), Common Wild Currant (*Searsia pyroides*), Wild Plum (*Harpephyllum caffrum*), White Stinkwood (*Celtis africana*), Weeping Brides-bush (*Pavetta lanceolata*), Paperbark Thorn (*Acacia sieberiana* var. *woodii*), Broad-pod Robust Thorn (*Acacia robusta* subsp. *robusta*), Coral Tree (*Erythrina lysistemon*) and Black Bird-berry (*Psychotria capensis*).

Floodplain wetlands, such as those found within the study area comprise a habitat which is restricted in extent, highly productive and which contains a high diversity of plants and animals, many of which are restricted or heavily dependent on such habitat. The marshland or seepage vegetation and seasonal wetlands and seasonally inundated margins around certain artificially created dams are dominated by dense patches of *Leersia hexandra*, *Echinochloa colona*, *Paspalum urvillei* comprises the most important habitats, within the study area, for remaining threatened wetland and grassland faunal species which may possibly occur, e.g.: Natal Leaf-folding Frog, African Marsh Harrier, Southern Bald Ibis, Grey Crowned Crane, Grey Crowned Crane and African Grass Owl. These floodplain wetlands on site have a PES of D (at least 50% of wetland integrity has been lost) and an EIS of 1.7 (low to moderate sensitivity).

Species common to the seasonally wet zones include the grasses *Schizachyrium sanguineum*, *Setaria sphacelata*, *Paspalum urvillei*, *Leersia hexandra*, *Agrostis lachnantha* and the forbs *Mariscus congestus*, *Persicaria lapathifolia* and *Juncus* spp. The seasonal and temporary wet zones are characterised by the



presence of the grasses *Imperata cylindrica*, *Aristida junciformis*, *Eragrostis plana*, and the forbs *Centella asiatica*\*, *Pelargonium luridum*, *Berkheya radula*, *Nidorella anomala* and *Wahlenbergia caledonica*. Several clumps of the alien invasive *Canna indica*\* were observed within the seasonally inundated zones of the seepage wetlands.

The lower lying non perennial Tete River and the perennial Mhlali River are deemed to be sensitive habitats due to their hydrological functioning as well as limited ecological functioning. They are considered of high conservation importance. All the rivers and streams must be considered as sensitive habitats due to the ecological functioning as well as providing suitable habitat and biological or dispersal corridors for remaining faunal species. The pipe runs in a transformed Floodplain Wetland Along the Tete River on the Northern portion of the property, whilst areas of channelled valley bottom wetland and seeps are crossed by the pipeline in the southern portion of the property.

The Transformed Floodplain wetland is considered to be Medium-low impact and Medium sensitivity, whilst the Tete River is deemed to have a Medium-high impact and a Medium to high sensitivity and the Mhlali River Closed Moist Woodland has a Medium-high impact and a High sensitivity.

#### **Protected Species:**

Two protected tree species were encountered in the moist closed woodland riparian zones, these were swamp figs (*Ficus trichopoda*) and Powder Puff Trees (*Barringtonia racemosa*). A suitably qualified ecologist must inspect the finalised route to ensure that all protected species are identified and appropriate action is taken.

#### **Red Data Species**

No threatened species were encountered during the ecological study and it is unlikely that there will be any Red Data species occurring on the pipeline route due to the high levels of disturbance in the area. However, an ecologist will confirm this in a detailed assessment once the route has been surveyed and pegged. It is possible that *Crinum macowanii* (River Lillies), *Cassipourea gummiflua* var. *verticillata* (Large Leaved Onionwoods) and *Kniphofia littoralis* could occur in some of the less disturbed areas.

#### **Fauna**

The majority of habitat on the site is highly disturbed, offering limited habitat for wildlife. However the Moist closed woodland and dams in the vicinity of the proposed pipeline will offer suitable habitat for certain species.

Sixteen species of frog are likely to occur in the area, four of these species were recorded during the site investigation, namely the Guttural Toad (*Sclerophrys gutturalis*), Painted Reed Frog (*Hyperolius marmoratus*), Snoring Puddle Frog (*Phrynobatrachus Natalensis*) and Delalande's River Frog (*Amietia delalandii*).

The non perennial and perennial drainage lines and small seasonal dams offer suitable habitats for many of the frogs in the area. The Rain frogs are more likely to be encountered in the areas with sandy soils.

Three reptile species were recorded during the survey, these were the Rhombic Night Adder (*Causus rhombeatus*), Flap necked Chamaeleon (*Chamaeleo dilepis*) and the Variable Skink (*Trachylepis (Mabuya) varia*). Many other species of reptiles are expected to occur in the area. Over 45 species could occur in the area although it is thought to be unlikely that there will be a wide diversity of species due to the high levels of transformation on the property.

The area has an extremely diverse avifaunal population, with 278 species recorded for the area. One hundred and twenty two species were recorded during the survey. Several rare or secretive birds were recorded in the closed woodlands along the drainage channels, these included the Narina Trogon, Green Twinspot, African Dwarf Kingfisher and Emerald Forest Cuckoo.

Species of mammals which were identified as occurring in the area during the survey included the Common Mole, Natal Multimammate Mouse, Scrub Hare, Striped mouse, Grey Climbing mouse, Brandt's Climbing Mouse, Highveld Gerbil, Namaqua Rock Mouse, House Mouse, House Rat, Domestic Dog, Feral Cat, common Duiker, Bushbuck, Vervet Monkey, Water Mongoose, Cape Clawless Otter, Slender Mongoose, Striped Polecat, Large Spotted Genet and Porcupine.

### Red Data Species

It is possible that the Natal Leaf Folding Frog (*Arixalus spinifrons*) could occur in the area. The reed dominated seasonal shallow margins around permanent dams offer suitable habitat for these frogs. The Spotted Shovel-Nose Frog (*Hemisus guttatus*) could also occur in the area within grasslands adjacent to the close woodlands.

Three Red Data reptile species could occur in the area, these are the Kwazulu Dwarf Chamaeleon (*Bradypodion melanocephalum*), the Green Mamba (*Dendroaspis angusticeps*) and the Large Scaled Grass Lizard (*Chamaesaura macrolepis*). The closed forest is the ideal habitat for the Green Mamba, which has also been recorded in sugar cane fields.

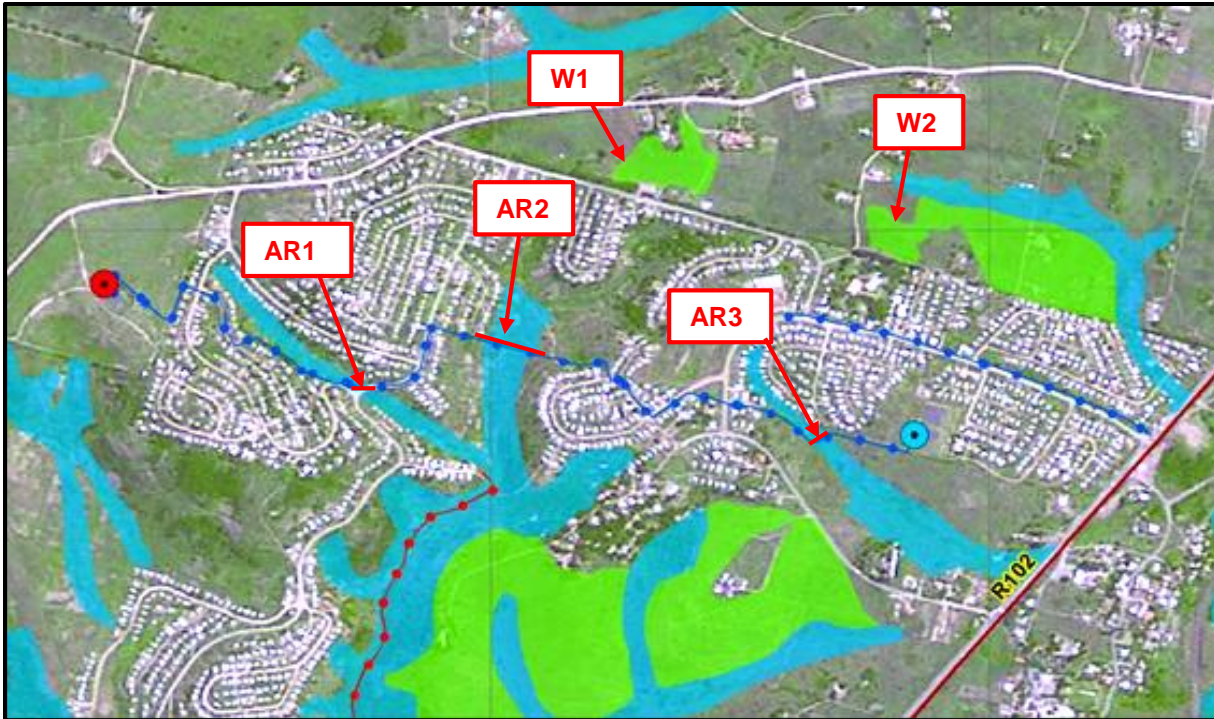
Eight listed bird species have been recorded in the area which could potentially occur on site due to the presence of suitable habitat. These are the Southern Bald Ibis, African Crowned Eagle, African Marsh Harrier, Lanner Falcon, Grey Crowned Crane, African Finfoot, European Roller and African Broadbill.

## 2.3 Wetland Assessment

The functions of wetland ecosystems have been severely compromised and have lost the natural connectivity due to current and historic agricultural practices. Thus the transformed hillslope seepage wetlands surrounding the pipeline alignment have extremely limited hydrological functioning as the water is directed into artificially created drainage lines. The majority of the hillslope seepage wetland surrounding the site is completely transformed and the natural hydrological patterns totally disrupted. Due to the nature of the transformation, there is little or no chance that these areas will be able to be returned to a natural state, and would likely remain permanently modified.

The proposed water pipeline bisects the completely transformed (old vegetable crops) sections of 3 degraded non-perennial drainage lines. The pipeline will not result in the destruction of any indigenous hygrophilous (wetland) or riparian vegetation. Based on Figure 2, Aquatic Resources: (AR-1) was delineated as an incised and degraded non-perennial drainage line. The proposed water pipeline bisects an approximately 50m section of the transformed riparian zone and degraded non-perennial drainage. AR-2 was delineated as an incised and degraded non-perennial drainage line which the proposed bulk water pipeline alignment bisects for approximately 80m. AR-3 was delineated as an incised and degraded non-perennial drainage line which the proposed bulk water pipeline alignment bisects for approximately 24m. The proposed crossings will have a low impact on the sensitive areas if environmentally practices are implemented during the construction phase and the pipeline servitude is appropriately rehabilitated and re-vegetated

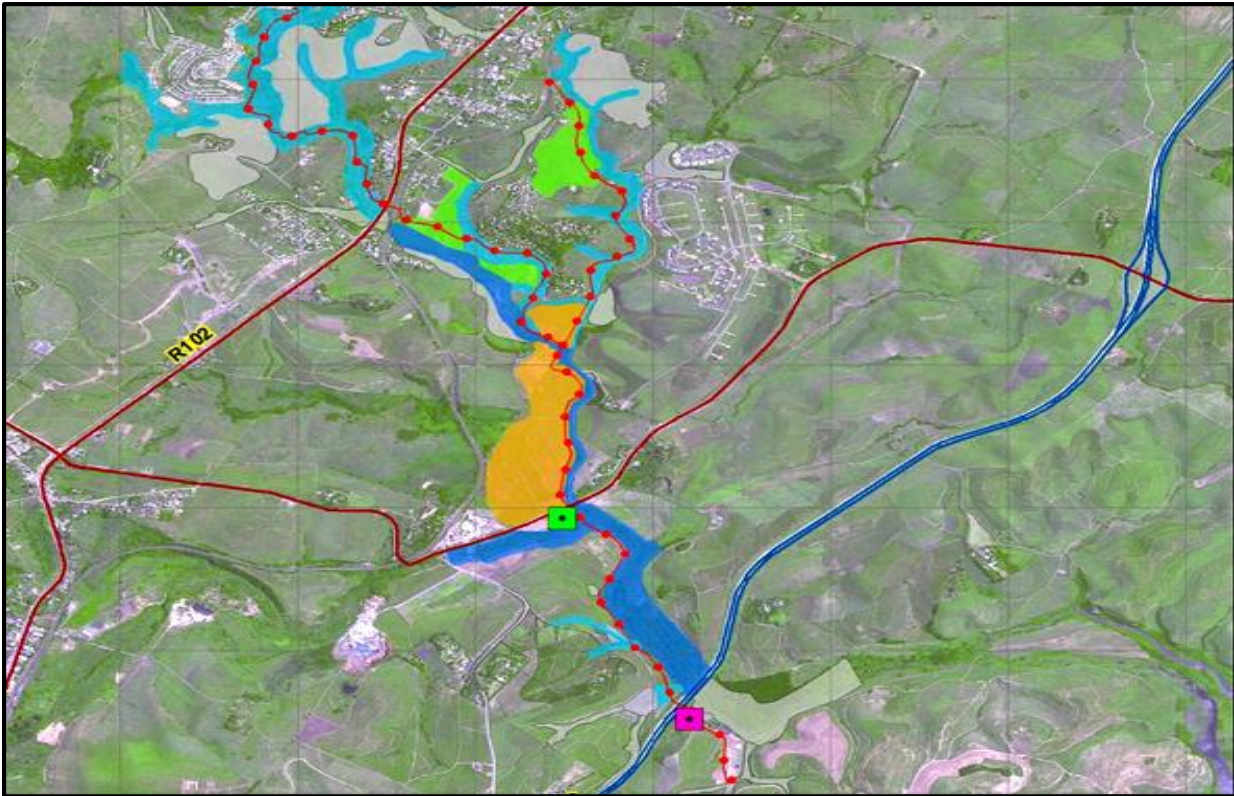
Wetland 1 or (W1) was delineated as a remnant patch of *Imperata cylindrica* dominated hillslope seepage wetland situated approximately 270m to the north of the bulk water pipeline servitude. (W2) was delineated as a remnant patch of *Imperata cylindrica* dominated hillslope seepage wetland situated approximately 150 m to the north of the bulk water pipeline servitude. These pipeline crossings will have no-impact on the adjacent wetlands as it occurs upstream from the pipeline alignments and is buffered by existing houses and access roads.



**Figure 2: Preliminary risk assessment of the wetland resources situated directly within and within 500m of the proposed bulk outfall water pipeline or Phase 1a.**

The proposed sewer pipeline bisects the moist closed woodland as well as riparian zones of the non-perennial and perennial drainage lines. Certain sections are transformed and colonised by woody alien invasive vegetation whilst others display a more natural species composition (*Syzygium cordatum*, *Bridelia micrantha*, *Ficus sur*, *Trichilia dregeana*, *Erythrina lysistemon*, *Vachellia robusta*, *Vachellia nilotica*). The sewer-pipeline bisects a large protected Swamp Fig (*Ficus trichopoda*) above the confluence of the Tete River and the Umhlali River. An aquatic resource was delineated as a perennial drainage line or the Tete River which the proposed bulk sewer pipeline alignment bisects four times for approximately 62m-20m. The pipeline alignment runs within the degraded and alien invaded margins of the closed coastal woodland riparian zone for approximately 1.1 km.





**Figure 3: Preliminary risk assessment of the wetland resources situated directly within and within 500m of the proposed alignments of the bulk outfall sewer pipeline or Phase 1b**

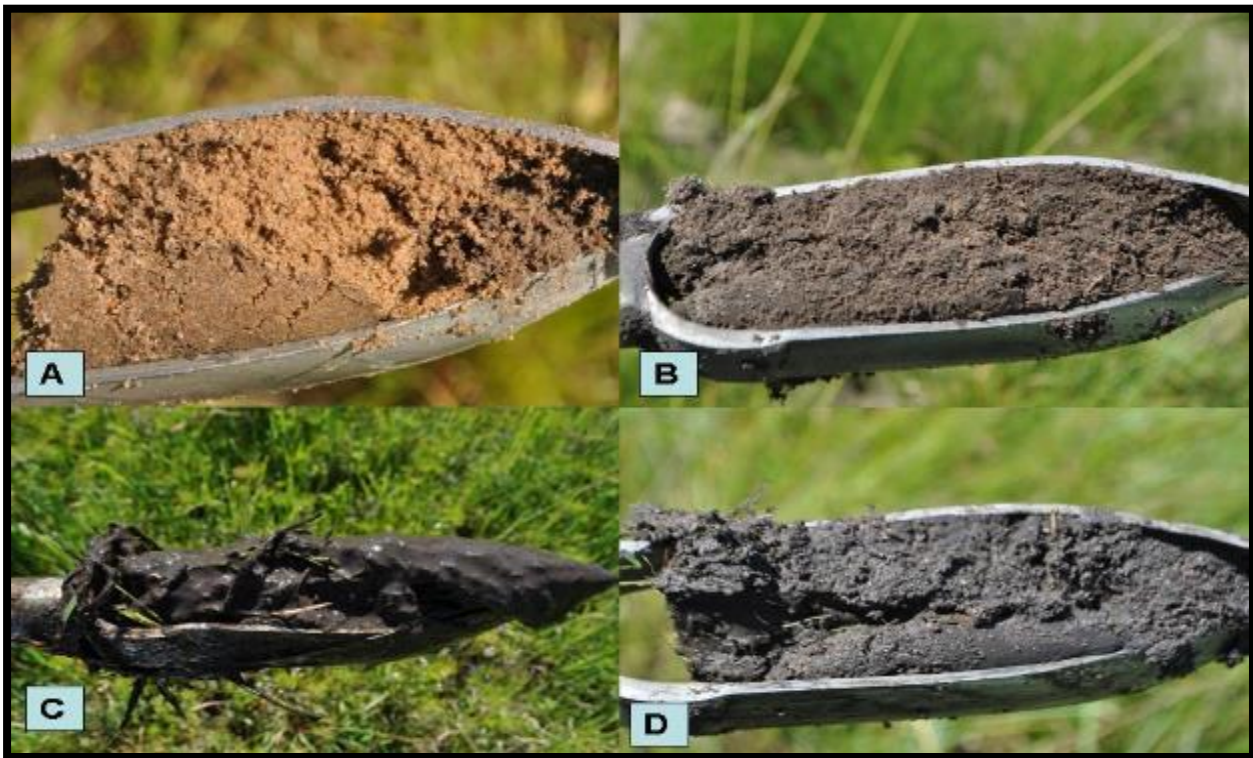
The proposed sewer pipeline is situated adjacent and bisects open *Imperata cylindrica* dominated hillslope seepage wetlands. The wetlands have been historically transformed and planted with sugarcane. The proposed pipeline construction will have a medium-low impact on the seepage wetlands if construction activities are restricted to the actual pipeline servitude and the servitude is appropriately stabilized and re-vegetated with indigenous (to the area) hydrophilic grass species. The pipeline bisects several incised and degraded non-perennial drainage lines. The riparian zone has been invaded by alien invasive vegetation due to high levels of anthropogenic disturbances. The pipeline runs parallel to the Tete and Umhlali Rivers and will impact on the transformed or degraded outer margins of the riparian zone. Vegetation clearance will mainly be restricted to alien invaded areas. The pipeline bisects the active channel of the Tete River which is dominated by dense macrophyte (*Phragmites australis*, *Phragmites mauritianus* and *Typha capensis*) as well as sedge beds (*Cyperus dives*, *Cyperus sexangularis* and *Cyperus latifolius*). The proposed pipeline runs adjacent to the moist closed woodland riparian zone and follows existing informal access roads as well as transformed sugarcane plantations. The proposed pipeline will most likely have a medium to low impact on the adjacent drainage lines as well as closed woodland riparian zones. Based on the low PES score (Category D) for the historically transformed floodplain and hillslope seepage wetland which the proposed pipeline servitude bisect are regarded as moderately low sensitivity. Placing the sewer pipeline away from the lower-lying non-perennial and perennial drainage lines is not a viable alternative due to the fact that the pipeline is an outfall sewer line and needs to be in the lower-lying areas adjacent to the drainage lines and floodplain wetland. The *Imperata cylindrica* dominated hillslope seepage wetlands boundaries extend beyond (over 100m) from the proposed bulk sewer pipeline alignments

Please refer to Appendix D – Specialist Studies, Wetland Delineation and Functionality Assessment by Clayton Cook dated November 2017.

## 2.4 Geology and Soils

The area for the proposed pipeline route is generally underlain by sandy fill and alluvial soils, and silty/clayey colluvial and residual soils which overlie tillite bedrock of the Dwyka Group, shale bedrock of the Pietermaritzburg Formation and sandstone bedrock of the Vryheid Formation. Weathering of the old dunes has produced the red sand, called the Berea Red Sand in the adjacent hillslopes. The soils supported by the above-mentioned rocks are shallow over hard sandstones and deeper over younger, softer rocks.

The site is generally stable and suitable for development provided that the recommendations given in the Geotechnical Report are adhered to. It is, however, important to consider that the sandy fill and alluvial soils occurring on the site are highly collapsible and considered susceptible to erosion by stormwater.



**Figure 4: A collage of photographs displaying soil auger samples. A:** The soils within the higher lying upper hillslopes on the eastern portion of the site were deep (>1.2 m) well-drained, coarse-grained, siliceous quartz (arenites) sandy soils. No hydric indicators (mottling) were observed within the top 50 cm of the soil profile. **B:** The soils within the mid hillslopes were shallow and situated on a hard sandstone plinthite and comprised of moist sandy-clays with limited hydric indicators indicating temporary inundation of temporary wetness. **C & D:** The soils within the lower-lying foot-slope seepage wetlands are moist dark sandy-clays with hydric indicators of seasonal wetness or inundation. Limited hydric indicators due to the low iron content in the sandy soils.

Please refer to Appendix D – Specialist Studies, Ecological Assessment by Clayton Cook dated November 2017 and Geotechnical Investigation by Syncline dated October 2017 and Wetland Delineation and Functionality Assessment by Clayton Cook dated November 2017.

## 2.5 Hydrology

### Regional:

The proposed project is to take place in the iLembe District Municipality (in the town of Ballito) situated in the province of KwaZulu-Natal of South Africa. The development is located within the U30 E QDGC Quaternary Catchment of the Pongola to Umzimkulu Water Management Area (WMA).

### Local & Surface Water:

The drainage on the site broadly mimics the undulating topography of the site, which entails that overland and subsurface drainage would flow from the higher parts on the eastern and western hillslopes towards the lower lying non-perennial and perennial drainage lines mainly through artificially excavated drainage channels or furrows. Historic as well as current agricultural activities include the cultivation of sugar-cane, compaction and ripping of hydric soils within the seasonal and temporary wet zones of the hillslope seepage and floodplain wetlands. Artificially created drainage furrows have been created to drain water from these areas. The compacted R-101, N2 and farm-roads result in decreased infiltration and increased stormwater runoff onto the site. It thus appears as if drainage would naturally have collect in these flatter areas on the western and eastern footslopes. The hydrological patterns have been completely transformed by extensive agricultural activities, artificially excavated drainage furrows and channels as well as informal farm roads which run throughout the sugarcane plantations. Surface water-fed hillslope seepage wetlands are underlain by impermeable strata (sandstone layer) or deep clays. Input dominated by over-bank flow and lateral flow from the adjacent artificially excavated drainage channels, supplemented by precipitation and surface runoff from the hardened surfaces and roads. Output is by drainage, surface outflow and evaporation. Inflows and outflows are controlled largely by the water level

### Groundwater:

Surface and groundwater-fed hillslope seepage wetlands are separated from underlying aquifer by a lower permeability layer. Input from over-bank flow and groundwater discharge, supplemented by runoff and precipitation. Groundwater may be restricted by intervening permeability layer. Output by drainage, surface outflow, evaporation and groundwater recharge. The extent of the contribution of groundwater flow to the hydrological input of the area is not known, but it is possible that a large amount of diffuse groundwater input from the hillslope seepage areas do occur especially during the wet season. By their nature, hillslope seepage wetlands are surface and groundwater fed (Kotze et al, 2005).

The permanent water table was not encountered in the study area and is inferred to occur at a depth in excess of 5.0 metres below EGL. However, a perched water table was encountered during the field investigation at depths typically less than 2.5 metres below EGL, in the vicinity of drainage courses. Due cognisance of the perched groundwater table will need to be taken into account during the construction phase and an allowance for de-watering of foundation excavations is considered prudent, especially near drainage courses and in low lying pan areas.

Please refer to Appendix D: Specialist Studies, Geotechnical Investigation by Syncline dated October 2017.

## 2.6 Cultural / Historical Features

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

**Please refer to Appendix D: Specialist Studies, Heritage Impact Assessment.**

Briefly explain the recommendations of the specialist:	<b>The proposed SRBWSS may proceed from a heritage perspective as no sites are threatened by the development. The area is also not part of any known cultural landscape. It should, however, be pointed out that the KwaZulu-Natal Heritage Act requires that operations exposing archaeological and historical residues, including graves, should cease immediately pending an evaluation by the heritage authorities.</b>
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Will any building or structure older than 60 years be affected in any way?		NO
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?		NO

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

**The application has been lodged with AMAFA. The Amafa case no for this project is:12051.**

## 2.7 Socio-economic Environment

What is the expected capital value of the activity on completion?	Approx. R 70 000 000.00
What is the expected yearly income that will be generated by or as a result of the activity?	R 70 000 000.00
Will the activity contribute to service infrastructure?	YES
Is the activity a public amenity?	YES
New skilled employment opportunities created in the construction phase of the project	10 people
New skilled employment opportunities created in the operational phase of the project	10 people
New un-skilled employment opportunities created in the construction phase of the project	30 people
New un-skilled employment opportunities created in the operational phase of the project	30 people
What is the expected value of the employment opportunities during the operational and construction phase?	R 30 million

## 2.8 Surrounding Environment and Land Uses

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:

Land use character			Description
Natural area		NO	
Low density residential		NO	
Medium density residential		NO	
High density residential	YES		There are housing developments situated adjacent to the property.

Informal residential	YES	■	The water pipeline alignments are situated within transformed informal residential hillslopes.
Retail commercial & warehousing	YES	■	There's Sasko Bakery next to Etete river and several small food stores and hardware stores as well as some warehouses currently under construction at Woodmead Estate
Light industrial	■	NO	
Medium industrial	YES	■	Inkunzi Ready Mix situated adjacent to the site (Next to Tinley Manor train station).
Heavy industrial	■	NO	
Power station	■	NO	
Office/consulting room	■	NO	
Military or police base/station/compound	■	NO	
Spoil heap or slimes dam	■	NO	
Quarry, sand or borrow pit	■	NO	
Dam or reservoir	YES	■	The existing Honolulu Reservoir is situated approximately and the existing Etete Reservoir is situated approximately as well as farmer dam next to N2.
Hospital/medical centre	■	NO	
School/ crèche	YES	■	The Trinity House Primary school is situated within 500m of the site
Tertiary education facility	■	NO	
Church	YES	■	Shree Siva Temple is situated approximately and other several church located in the project area.
Old age home/ Orphanage	YES	■	The Summerhill house orphanage is situated in close proximity to the site activities.
Sewage treatment plant	YES	■	Sheffield WWTW is situated adjacent to the N2.
Train station or shunting yard	YES	■	Tinley Manor train station in close proximity to the site activities.
Railway line	YES	■	Two rail servitude encroachments occur in the project area.
Major road (4 lanes or more)	YES	■	One SANRAL road reserve encroachment (N2 Pipejack) within the project area.
Airport	■	NO	
Harbour	■	NO	
Sport facilities	■	NO	There are several small informal soccer fields around project area.
Golf course	■	NO	
Polo fields	■	NO	
Filling station	■	NO	
Landfill or waste treatment site	■	NO	No formal landfill site but there are several dump site around project area.
Plantation	YES	■	Nuts plantation adjacent to the site next to N2
Agriculture	YES	■	Sugarcane plantation from Palm lakes towards N2 (south east) to the site.



River, stream or wetland	YES	<input checked="" type="checkbox"/>	<p>There are several wetlands within the project site and within 500m of the project site.</p> <p>The sewer-pipeline bisects a Swamp Fig above the confluence of the Tete River and the Umhlali River. An aquatic resource was delineated as a perennial drainage line or the Tete River which the proposed bulk sewer pipeline alignment bisects four times for approximately 62m-20m. The pipeline alignment runs within the degraded and alien invaded margins of the closed coastal woodland riparian zone for approximately 1.1 km.</p>
Nature conservation area	<input checked="" type="checkbox"/>	NO	
Mountain, hill or ridge	<input checked="" type="checkbox"/>	NO	
Museum	<input checked="" type="checkbox"/>	NO	
Historical building	<input checked="" type="checkbox"/>	NO	
Protected Area	<input checked="" type="checkbox"/>	NO	
Graveyard	<input checked="" type="checkbox"/>	NO	
Archaeological site	<input checked="" type="checkbox"/>	NO	As per the HIA, no archaeological sites were identified.
Other land uses (describe)	<input checked="" type="checkbox"/>	NO	

## 2.9 Nuisance Considerations

### Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES	<input checked="" type="checkbox"/>
If yes, what estimated quantity will be produced per month?	m <sup>3</sup>	
How will the construction solid waste be disposed of? (describe)		
<p><b>Waste skips/bins will be provided throughout the construction working servitude with separate skips/bins made available for road construction debris and solid waste. The waste will be recycled or reused whenever possible and the rest disposed to the registered waste disposal site, to avoid the pollution of surrounding areas. Small amounts of hazardous waste such as discarded oil or grease may be generated on site. Hazardous waste will be disposed of at an appropriately licensed and registered hazardous waste disposal facility. Waste management will be dealt with more extensively within the EMP for the different phases of the project.</b></p>		
Where will the construction solid waste be disposed of? (provide details of landfill site)		
Will the activity produce solid waste during its operational phase?	YES	<input checked="" type="checkbox"/>
If yes, what estimated quantity will be produced per month?	m <sup>3</sup>	
How will the solid waste be disposed of? (provide details of landfill site)		
<p><b>Where possible, waste will be reused or recycled. Non-recyclable solid waste will be disposed of at the nearest licensed general waste disposal facility, such as the Dolphin Coast Landfill.</b></p>		
Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	<input checked="" type="checkbox"/>	NO

<b>If yes, contact the KZN Department of Economic Development, Tourism &amp; Environmental Affairs to obtain clarity regarding the process requirements for your application.</b>		
Is the activity that is being applied for a solid waste handling or treatment facility?	<input type="checkbox"/>	NO
<b>If yes, contact the KZN Department of Economic Development, Tourism &amp; Environmental Affairs to obtain clarity regarding the process requirements for your application.</b>		
Not applicable.		

#### Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	<input type="checkbox"/>	NO
If yes, what estimated quantity will be produced per month?	m <sup>3</sup>	
Will the activity produce any effluent that will be treated and/or disposed of on site?	<input type="checkbox"/>	NO
<b>If yes, contact the KZN Department of Economic Development, Tourism &amp; Environmental Affairs to obtain clarity regarding the process requirements for your application.</b>		
Will the activity produce effluent that will be treated and/or disposed of at another facility?	<input type="checkbox"/>	NO
If yes, provide the particulars of the facility:		
Facility name:		
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:		
<b>The proposed pipeline and associated infrastructure will not produce any liquid effluent, rather transport sewage via pipelines. Toilet facilities will be provided by the contractor in the way of chemical toilets. Disposal of sewage from the chemical toilets will be done by the sub-contractor who provides these facilities.</b>		

#### Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	YES	<input type="checkbox"/>
If yes, is it controlled by any legislation of any sphere of government?	<input type="checkbox"/>	NO
<b>If yes, contact the KZN Department of Economic Development, Tourism &amp; Environmental Affairs to obtain clarity regarding the process requirements for your application.</b>		
If no, describe the emissions in terms of type and concentration:		
<b>Limited dust liberation and emissions during construction phase due to the off-loading of construction materials, such as sand and cement, movement of construction vehicles and clearing. Emissions generated will be in the form of dust, carbon dioxide and other vehicle emissions generated by diesel powered machinery and trucks during the construction process i.e. tip trucks, TLB's, excavators and dust from the movement of the construction vehicles. These emissions will be composed primarily of CO<sup>2</sup> and will be of a low concentration. Dust generation can be mitigated by either water spraying and / or dust suppressants. The speed of construction vehicles and other vehicles should be strictly controlled to avoid excessive dust generation.</b>		

### Generation of noise

Will the activity generate noise?	YES	<input checked="" type="checkbox"/>
If yes, is it controlled by any legislation of any sphere of government?	<input checked="" type="checkbox"/>	NO
If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.		
If no, describe the noise in terms of type and level:		
<ul style="list-style-type: none"> <li>▪ During the construction phase noise associated with normal construction activities i.e. vehicles, generators and plant equipment will be used on the site.</li> <li>▪ Noise levels are to be kept within the legislated limits for the area, in accordance with the requirements of the relevant national and local noise control statutes (i.e. SANS 10103 which specifies the required noise levels in rural residential areas and sensitive noise receptors such as schools).</li> <li>▪ The noise generated will be limited to daylight hours during workdays for the duration of the construction phase and is not anticipated to cause long term negative impacts.</li> <li>▪ Other noise disruptions could potentially be experienced during the construction phase through activities such as drilling or jack-hammering. This will be a temporary disturbance and it the ambient noise generated is expected to be well below 85dBA (Occupational Health and Safety Act, 1993; Environmental Regulations for Workplaces, 1987, Noise and Hearing Conservation from SABS 083-1983) at potential receptor sites.</li> <li>▪ Measures to minimise noise generation during construction are contained in the EMP.</li> </ul>		

### 3 SECTION 3: POLICY AND LEGISLATIVE FRAMEWORK

#### 3.1 Identification of All Legislation, Policies, Plans, Guidelines, Spatial Tools, Municipal Development Planning Frameworks And Instruments as per Section 3(e)(i) and Compliance Of Proposed Activity With Legislation And Policy 3(e)(ii)

Legislation	Section	Relates to
The Constitution (No 108 of 1996)	Chapter 2	Bill of Rights.
	Section 24	Environmental rights.
National Environmental Management Act (No 107 of 1998 [as amended])	Section 2	Defines the strategic environmental management goals and objectives of the government. Applies through-out the Republic to the actions of all organs of state that may significantly affect the environment.
	Section 24	Provides for the prohibition, restriction and control of activities which are likely to have a detrimental effect on the environment.
	Section 28	The developer has a general duty to care for the environment and to institute such measures as may be needed to demonstrate such care.
	Section 30	Deals with the control of emergency incidents, including the different types of incidents, persons responsible for the incidents and reporting procedures to the relevant authority.
National Environmental Management: Waste Act (No 59 of 2008)		Provides for specific waste management measures and the remediation of contaminated land.
		Regulations for waste management licensee activities
National Environmental Management: Biodiversity Act (No 10 of 2004)		Provides for the management and conservation of biodiversity, protection of species and ecosystems, and sustainable use of indigenous biological resources
National Environmental Management: Air Quality Act (No 39 of 2004)	Section 32	Control of dust
	Section 34	Control of noise
	Section 35	Control of offensive odours
National Heritage Resources Act (No 25 of 1999) and regulations	Section 34	No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.
	Section 35	No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site.
	Section 36	No person may, without a permit issued by the South African Heritage Resource Agency (SAHRA) or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. "Grave" is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place.

	Section 38	This section provides for Heritage Impact Assessments (HIAs), which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during the HIA process. The Heritage Impact Assessment (HIA) will be approved by the authorising body of the provincial directorate of environmental affairs, which is required to take the provincial heritage resources authorities' comments into account prior to making a decision on the HIA.
Occupational Health and Safety Act (No 85 of 1993)	Section 8	General duties of employers to their employees
	Section 9	General duties of employers and self-employed persons to persons other than their employees
National Water Act (No 36 of 1998) and regulations	Section 19	Prevention and remedying the effects of pollution
	Section 20	Control of emergency incidents
	Section 21	Licenses for water use
Hazardous Substances Act (No 15 of 1973) and regulations		Provides for the definition, classification, use, operation, modification, disposal or dumping of hazardous substances
Nation Veld & Forest Fire Act		Provides for a variety of institutions, methods and practices to prevent and combat veld, forest and mountain fires.
National Road Traffic Act (No 93 of 1996)		Provides for controlling transport of dangerous goods, hazardous substances and general road safety
Spatial Planning and Land Use Management Act (No. 16 of 2013).		Provides the framework for spatial planning and land use management in South Africa at the different spheres of government and for the establishment, functions and operations of Municipal Planning Tribunals.
Occupational Health and Safety Act (No 85 of 1993) and regulations		Addresses occupational health and safety aspects
SANS 10103 (Noise Regulations)		The measurement and rating of environmental noise with respect to annoyance and to speech communication
KwaZulu-Natal Planning and Development Act,(No. 6 of 2008);		Strategic spatial development intentions for the municipality based on the IDP and SDF, influenced by and in alignment with adjacent municipalities
KwaDukuza Municipality Planning and Land Use Management By-law, 2015		Provides for the establishment of the Municipal Planning Approval Authority, Municipal Planning Appeal Authority and the Municipal Planning Enforcement Authority as well as the adoption and amendment of the Municipality's land use scheme; applications for municipal planning approval and appeals against decisions of the Municipal Planning Approval Authority.

## 4 SECTION 4: MOTIVATION, NEED AND DESIRABILITY

### 4.1 Need and Desirability as per Section 3(f)

This project aims to secure safe potable water and waterborne sewage to the future needs of the growing population of the Etete, Palm Lakes, Shayamoya and Nkobongo Townships in the iLembe District

There is a growing need and urgency to provide adequate potable water and sanitation to many communities that do not have access to the reticulated water and waterborne sewage. Etete, Palm Lakes, Shayamoya and Nkobongo Townships and its neighbouring areas form part of the millions of South Africans, particularly in rural areas that do not have access to safe potable water and sanitation, thus the iLembe District Municipality is currently implementing the Southern SRBWSS to address the challenges associated with poor supply of water and waterborne sewage in the area as the population is on the rise so too is the demand for water and sanitation, thus supply needs to meet the demands of current and future populations in the mentioned areas.

The construction of the pipelines and associated infrastructure will ensure the provision of adequate quantity and quality of potable water and waterborne sanitation for the local residents. Generally, development projects ensure continuous provision of temporary and permanent employment to the society. The proposed scheme will provide employment in society.

In terms of The Constitution of the Republic of South Africa (Act No. 108 of 1996) everyone has the right:

- To clean water and sanitation;
- To an environment that is not harmful to their health or well-being and to have the environment protected, for benefit of present and future generations, through reasonable legislation and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

During the construction phase, limited temporary work opportunities or continued working opportunities for local contractors would be provided for those within the community. Local businesses will benefit by supplying of materials and equipment. During the operational phase, the local communities and business will benefit from adequate and sustainable supply of water and waterborne sewage.

This need had been identified in response water service backlogs in the proposed areas that is rural in nature and water service and waterborne sewage provision is a high priority. The benefits to the local community that will arise from the activity include both employment opportunities as well as access to reticulated potable water that will be positive in terms of improved livelihoods and decrease in the water borne related illnesses.

The overall benefits to the local community include healthier and uplifted communities.

### 4.2 Motivation for the Preferred Site, Activity and Technology as per Section 3(g)

The objective of the project is upgrade municipal potable water supply and improved sanitation to the Etete, Palm Lakes, Shayamoya and Nkobongo areas. There are no site alternatives. Several piping materials were investigated, however, pipe specifications were determined based on the appropriate design standards. Layout Alternative 1 is the preferred layout as a result of the following:

- Certain sections of the pipeline were re-aligned to avoid protected trees, indigenous vegetation and riparian vegetation;
- The initial pipeline route (Alternative 2) originally traversed through the Mhlali and Tete Rivers and transgressed through a greater portion of the floodplain and 1:100 year flood line. The preferred route (Alternative 1) has been re-aligned out of the Mhlali and Tete Rivers, although still within the floodplain and 1:100 year flood line, affects a smaller portion.

It is therefore the opinion of the EAP that the environmental impacts have been reduced in the preferred layout and that there are no significant environmental impacts that cannot be mitigated against. The preferred Layout Alternative 1 should be authorised.

## 5 SECTION 5: PUBLIC PARTICIPATION

### 5.1 Notification of Interested and Affected Parties

- (a) *fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of—*
  - (i) *the site where the activity to which the application or proposed application relates is or is to be undertaken; and*
  - (ii) *any alternative site;*

**7 noticeboards were placed along the pipeline route during December 2017. Due to the extent of the project site, the notice boards were strategically placed at Palm Lakes Resident Entrance, adjacent to Shree Siva Temple, at Snemani Hall, Taxi Stop adjacent to the R102, at Velani Hall, at Sobonakhona Tuckshop & Tarven and adjacent to a Crèche. The noticeboard detailed the proposed activity to construct bulk water and sanitation pipelines and associated infrastructure, subject to a Basic Assessment. Refer to Appendix E for proof of placement of the site notice boards.**

- (b) *giving written notice, in any of the manners provided for in section 47D of the Act, to—*
  - (i) *the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
  - (ii) *owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
  - (iii) *the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;*
  - (iv) *the municipality which has jurisdiction in the area;*
  - (v) *any organ of state having jurisdiction in respect of any aspect of the activity; and*
  - (vi) *any other party as required by the competent authority;*

**Due to the rural nature of the project, site notices were strategically placed at Palm Lakes Resident Entrance, adjacent to Shree Siva Temple, at Snemani Hall, Taxi Stop adjacent to the R102, at Velani Hall, at Sobonakhona Tuckshop & Tarven and adjacent to a Crèche. An advert was also published in the local newspaper (The Stanger Weekly- 06 December 2017). Refer to Appendix E–Proof of Placement of Advert.**

**Sbo Madlala from Sinesihle Consulting was appointed as the Social Facilitator for the project and has been in consultation with landowners which have been affected by the proposed water pipeline. Consultation is still taking place with landowners as well acquiring property owner details from the Local Municipality. Triplo4 had consulted with the identified 3 Ward Councillor's and provided each with the BID via email communication. In addition, the Ms. Madlala has also been in consultation with the ward councillors.**

**With regards to authority communications, all relevant authorities have been notified of the application and have been provided with copies of this BAR. Refer to Appendix E – Proof of Notification.**



- (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 paragraph (c)(ii); and*

**Advertisements regarding inter alia the proposed project scope of works, location and details of locations and date for draft Basic Assessment Report review as well as details of EAP were placed in the Stanger Weekly on the 06<sup>th</sup> December 2017.**

**Refer to Appendix E–Proof of Placement of Advert.**

#### **Background Information Document**

During the PPP, BID (including registration and comments forms) was distributed via email, postage and delivering to neighbouring properties, stakeholders as well as other interested and affected parties (I&APs) on the 06<sup>th</sup> December 2017. Refer to Appendix E for proof.

#### **Public Meeting**

No public meeting was held but stakeholders will be engaged with.

#### **Public Review of the Draft Basic Assessment Report**

The DBAR (this document) is placed for public review for a period of 30 days 15<sup>th</sup> January to 13<sup>th</sup> February 2018, at the following venues:

- Velani Community Hall
- Triplo4 Sustainable Solutions offices (Suite 5, The Circle, Douglas Crowe Drive, Ballito, 4420)
- [www.triplo4.com](http://www.triplo4.com)

This draft Basic Assessment Report, inclusive of specialist reports and Environmental Management Programme (EMPr), has been distributed for comment prior to an application for environmental authorisation being submitted to the competent authority, the KwaZulu-Natal Department of Economic Affairs, Tourism and Environmental Affairs (EDTEA).

This is in keeping with Regulation 40(3) of the EIA Regulations, 2014 which provides that “[p]otential or registered interested and affected parties [I&APs], including the competent authority, may be provided with an opportunity to comment on [the Basic Assessment Report and EMPr] ..... prior to submission of an application”

Further, Regulation 40(3) requires that potential and registered I&APs “..... must be provided an opportunity to comment on such reports once an application has been submitted to the competent authority”. Thus, I&APs will have a second opportunity to comment on the Basic Assessment Report, including specialist reports and EMPr once an application has been submitted to EDTEA. As a registered I&AP you will automatically receive notification of and copies of these documents.

## 5.2 Authority Notification

A pre-application meeting will be scheduled with EDTEA following the submission of this draft BAR prior to the submission of the application.

## 5.3 Registered Interested and Affected Parties

*A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of—*

- (a) all persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;*
- (b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and*
- (c) all organs of state which have jurisdiction in respect of the activity to which the application relates.*

**The contact details of all I&APs that have registered have been provided in the Registered I&AP list in Appendix E, I&AP Database.**

## 5.4 Comments and Responses Report

44. (1) *The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.*
- (2) *Where a person desires but is unable to access written comments as contemplated in subregulation (1) due to—*
- (a) a lack of skills to read or write;*
  - (b) disability; or*
  - (c) any other disadvantage;*
  - (d) reasonable alternative methods of recording comments must be provided for.*

**All concerns, comments, viewpoints and questions (collectively referred to as ‘issues trail’) will be documented and responded to adequately in a Comment and Response Report – Appendix E.**

**Refer to Appendix E – Issues Trail and I&AP Correspondence.**

**THIS IS SECTION HAS BEEN COMPLETED BY METAMORPHOSIS**

**Comments received by Mr. A.C Reynolds.**

<b>Summary of main issues raised by I&amp;APs</b>	<b>Summary of response from EAP</b>
The landowner is concerned with regard to the damage of trees and wildlife on his property. All damage to and removal of trees should be avoided wherever possible.	This has been discussed, worker training will be undertaken, the working servitude will be fenced and working areas kept to a minimum. An ecologist will walk the surveyed route to check for sensitive species.
Several particularly sensitive areas have been identified and the landowner wishes to have input	This has been agreed by the engineers. However it must be recognised that there is only a limited

into the exact alignment in these areas once they are pegged.	amount of flexibility as the sewer is a gravity main.
The landowner stated that the entire area floods regularly and therefore work should not be undertaken in the rainy season. Topography must be carefully reinstated to ensure that the rivers do not change course as a result of the construction.	This has been discussed with the engineers who have noted the particularly sensitive areas.
Compensation needs to be discussed with the landowner.	This will be undertaken.
Working hours must be restricted to normal working hours with no work on Sundays or public holidays and access routes, contractor camps and laydown areas must be agreed with the landowner.	Working hours will be restricted to 7.30 to 4.30 on weekdays and until 12 on Saturdays. No work will be undertaken at night or on Sundays and Public Holidays.
There are a number of areas where the landowner feels that there should a realignment of the pipe.	These were discussed with the engineers at a meeting on the 11 <sup>th</sup> December.
The landowner stated that all trees removed must be replaced and appropriate rehabilitation undertaken and maintained.	Trees will be moved where this is feasible. The landowner will advise in terms of individual specimens encountered. Saplings will be purchased and used in rehabilitation where trees are destroyed. The roadways will be re-grassed with Buffalo grass on completion and the rehabilitation will be maintained and alien plants removed for a period of 6 months after completion.

## 6 SECTION 6: IMPACT ASSESSMENT

### 6.1 Methodology to Determine and Rank Significance and Consequences of Impacts Associated with all Alternative as per Section 3(h)(vi)

Scoring of Impacts	
Consequence	
Severity	1 – Insignificant / Non-harmful 2 – Small / Potentially harmful 3 – Significant / Slightly harmful 4 – Great / Harmful 5 – Disastrous / Extremely harmful
Duration	1 – Up to 1 month 2 – 1 month to 3 months 3 – 3 months to 1 year 4 – 1 to 10 years 5 – Beyond 10 years / Permanent
Spatial Scale	1 – Immediate, fully contained area 2 – Surrounding area 3 – Within business unit area or responsibility 4 – Within mining boundary area / Beyond BU boundary 5 – Regional, National, International
<b>Overall Consequence = (Severity + Duration + Extent) / 3</b>	
Likelihood	
Frequency of the Activity	1 – Once a year or once / more during operation / LOM 2 – Once / more in 6 months 3 – Once / more a month 4 – Once / more a week 5 – Daily / hourly
Probability of the Incident / Impact	1 – Almost never / almost impossible 2 – Very seldom / highly unlikely 3 – Infrequent / unlikely / seldom 4 – Often / regularly / likely / possible 5 – Daily / highly likely / definitely
<b>Overall Likelihood = (Frequency + Probability) / 2</b>	
<b>Overall Environmental Significance = Overall Consequence X Overall Likelihood</b>	
Overall Environmental Significance:	
0 - 2.9	Very Low
3 - 4.9	Low
5 - 6.9	Medium - Low
7 - 8.9	Medium
9 - 10.9	Medium - High

Refer to worksheet 1 of the Impact Assessment Matrix- Appendix F

### 6.2 Impacts that may result from the Planning and Design, Construction, Operational, Decommissioning and Closure Phases as well as Proposed Management of Identified Impacts and Proposed Mitigation Measures

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

Refer to Impact Assessment Matrix- Appendix F

### 6.3 Environmental Impact Statement as per Section 3(I)

**THIS IS SECTION HAS BEEN COMPLETED BY TRIPLO4**

Alternative S1: SRBWSS alignment within the Etete, Palm Lakes, Shayamoya and Nkobongo Area (Only One Site Considered For Pipelines) ; New Pumpstation At Royal Palm (Option 2)

*The proposed development will occur in an area that has been severely compromised environmentally as a result of current and historic agricultural practices. The threat level posed by the proposed development is considered low and there will be little disruption in terms of ecosystem and wetland functioning, provided that rehabilitation measures stipulated in the Ecological and Wetland Assessment are undertaken. The preferred layout incorporates the environmental and specialists recommendations, including realignment of the proposed pipeline to avoid the protected trees therefore reducing impacts to the sensitive areas (non-perennial and perennial drainage lines, Imperata cylindrica hillslope seepage wetland, floodplain wetlands, seasonally and permanently inundated dam).*

*The Basic Assessment considered relevant environmental aspects and impacts from the proposed development and proposed mitigation during the planning, construction and operational phases. The proposed site (S1) and layout alternative (A1) is recommended based on the following:*

#### **Planning Phase – Short Term Duration**

- *Potential environmental impacts were identified and addressed during the Basic Assessment process. Capacities and availability of connection to bulk infrastructure were confirmed. Amendments were made to the proposed lay-out to incorporate concerns raised by the specialists regarding the ecological sensitivities. Although the proposed SRBWSS occurs within the floodline, the impacts are significantly reduced. The recommended lay-out provides for preservation of identified protected species.*
- *Confirmation was obtained from the Specialist that the area has been transformed and although sensitive areas were identified, these could be mitigated to low- medium impacts.*
- *The EMPr developed incorporated the lay-out and Specialist recommendations to ensure that positive impacts be maximised and negative impacts be prevented or minimised.*

#### **Construction Phase – Short Term Duration**

- *The probable impacts on the biophysical environment (e.g. loss of vegetation, degradation or alteration to the flow regime of the Wetland & Aquatic Resource units, alteration of topography, erosion potential, pollution can all be mitigated to Very Low to Medium - Low Negative.*
- *The probable impacts of the dust, noise and visual disturbance, waste, pollution, contamination and stormwater management are Medium-High to High Negative but can all be mitigated to Low to Low- Medium Negative.*
- *The probable negative socio-economic impacts (i.e. commuters, health and safety issues, traffic disturbance) can be mitigated to Low, while the opportunity for temporary and permanent employment is considered Medium to High Positive impact.*

#### **Operation Phase – Long Term Duration**

- *The probable negative impacts associated with the pollution of surface water towards the HGM units are medium – Low to can be mitigated to Very Low – Low.*
- *The definitive impacts associated with improved social, environmental and economic opportunities through the provision of basic services, and limited permanent employment opportunities are all considered Medium-High Positive Impacts.*  
*The probable negative impacts associated with erosion from poor storm water management and inadequate vegetation cover, waste generation, increased traffic volume, waste materials, noise disturbance can all be mitigated to Low to Low-Medium Negative impacts.*

#### **Alternative S2 ( Not Applicable)**

*Alternative S2 (New Royal Palm Pumpstation Option 1) is not supported in preference to the S1 alternative.*

*The Alternative S2 does not consider the environmental and specialist recommendations and is located within closer proximity to sensitivity areas in comparison to the preferred alternative.*

*Although the direct, indirect and cumulative impacts can be mitigated to Low impacts, the overall significance is greater than*



*the preferred alternative.*

#### **Alternative A2 (Not supported) – Initial Layout**

*The A1 (preferred option) is supported in preference to the A2 alternative.*

*The Alternative 2 does not consider the environmental and specialist recommendations within the layout plan therefore the ecological aspects not included within A2.*

*This will result in a greater potential for negative environmental impacts to the sensitive areas as well as the river with an associated riparian area during the construction and operational phases. As result of the specialist recommendations, the layout was revised to incorporate the specialist recommendations by altering the proposed alignment to avoid protected species.*

#### **No-go alternative (compulsory)**

*The no-go alternative implies that the status quo remains and the proposed Southern Regional Bulk Water and Sanitation Scheme (SRBWSS) development will not be developed. This is not considered to be practical or desirable as the local community will not be provided with formal water and sanitation in the area, and it would not enable the proponent to provide this need and benefit to the communities within the iLembe District Municipality.*

- *The definitive non-realization of potential temporary and permanent employment during the construction and operational phases is considered Medium Negative short-term impacts, which will persist at the site in the No-Go alternative.*
- *The potential increased rates of water borne diseases considered Medium-High Negative long-term impacts, which will persist at the site in the No-Go alternative.*
- *The lack of provision of adequate and sustainable potable water as well as waterborne sanitation for the local communities is considered Medium-High to High Negative long-term impacts, which will persist at the site in the No-Go alternative.*
- *Overall, the social, environmental and economic benefits for the local communities and businesses will not be realised, and the degraded quality of the local community life style will remain unchanged, which considered Medium-High to High Negative long-term impacts, which will persist at the site in the No-Go alternative.*

*Thus, from a sustainability perspective as per NEMA, considering the positive social, economic and environmental impacts and very limited negative environmental impacts that have been mitigated as per lay-out and EMP commitments, the no-go is not supported.*

### **THIS IS SECTION HAS BEEN COMPLETED BY METAMORPHOSIS**

#### **Alternative 1 (Preferred Alternative):**

##### **Planning Phase**

*Impacts relating to the planning phase of the pipeline relate to disturbances associated with physical investigations undertaken such as the geotechnical investigations and survey. All efforts must be made to reduce these impacts. Alternative routes were considered during the planning phase, both at the macro and micro scales. Minor amendments to the final route will be undertaken several times once the route is pegged to enable the avoidance of sensitive areas and individual trees.*

##### **Construction phase**

*The pipeline runs along in totally transformed wetland along the Tete and Mhlali Rivers. The pipeline is within the floodplain of both rivers.*

*The pipeline crosses the Mhlali River and there are an additional three stream crossings on the AC Reynolds property.*

*The majority of the route comprises sugarcane land, adjacent to cane roads which run along the sides of the riverine vegetation of the Tete and Mhlali Rivers. Riverine vegetation is only encountered on the pipeline route at the stream crossings.*

*The stream crossings have been located to take the shortest route across the rivers and through the sensitive vegetation wherever possible.*

*There are potentially some protected tree species and Red Data plant species along the route and these will be identified by an ecologist once the route has been pegged. There are unlikely to be any sensitive fauna encountered during construction as long as the disturbed areas are minimised and do not encroach into the riverine vegetation adjacent to the working areas. It is possible that some sensitive species may be encountered at the river and stream crossings.*

*The lower lying non perennial Tete River and the perennial Mhlali River are deemed to be sensitive habitats due to their hydrological functioning as well as limited ecological functioning. They are considered of high conservation importance. All the rivers and streams must be considered as sensitive habitats due to the ecological functioning as well as providing suitable habitat and biological or dispersal corridors for remaining faunal species. The pipe runs in a transformed Floodplain Wetland along the Tete River on the Northern portion of the property and the Mhlali River, in the southern portion. These floodplain wetlands on site have a PES of D (at least 50% of wetland integrity has been lost) and an EIS of 1.7 (low to moderate sensitivity). The impacts of construction will therefore be low.*

*The Tete River is deemed to have a Medium-high impact and a Medium to high sensitivity and the Mhlali River Closed Moist Woodland has a Medium-high impact and a High sensitivity. However, the construction activities only affect very small areas of these habitats where the river crossings occur and the impact is therefore deemed to be of low significance if appropriate mitigation is undertaken.*

*Potential impacts on the flora and fauna along the route are deemed to be potentially low impact if all mitigation is undertaken and rehabilitation is appropriately implemented and maintained. The working footprint must be kept as small as possible and all working areas demarcated to reduce impacts in the vicinity of the pipe installation. The presence of heavy machinery and people in the area will impact the local fauna for the duration of construction.*

*There are no sites of cultural or heritage significance along the pipeline route.*

*Impacts on land use will not be significant, although the landowner will need to be compensated for the loss of sugar cane during construction. However, the noise, dust, waste and general disruption may affect the landowner if not properly managed.*

*Impacts on water resources could be significant if not adequately managed during construction due to the pipeline location within the floodplain of a major river. No construction should be undertaken in the low lying areas or river channels during the rainy season. Pollution may occur during construction in the river channels and the flow regime of the rivers could be altered in the long term if the channel shape and topography are not adequately re-instated.*

*There will be damage to access roads on the property due to the heavy machinery required to transport the large concrete pipes onto and around the site. Access must be restricted to certain roads and appropriate rehabilitation undertaken on completion of the project.*

*Safety will be a potential issue with the presence of the open trench, manholes and pipe jacking pits. These must be adequately fenced/demarcated to reduce risks. Employment opportunities present a positive impact.*

*The overall potential impact of the construction phase of the pipeline will be low if the Environmental Management Programme is properly implemented. The duration of construction on the property will be a maximum of 18 months, therefore limiting the timeframe for impacts.*

#### **Operation**

*There will be a long term socio-economic benefit from the availability of sewer on the property.*

*The landowner will have restricted usage over the servitude and will not be able to plant fruit and nut trees in or close to the servitude.*

*There will be long term risks associated with the possibility of leaks and blockages in the pipeline which could lead to odour and water and land contamination in the event of an overtopping.*

*The disturbance may lead to an infestation of alien vegetation in the longer term. However, the operational impacts are deemed to be low as long as the Environmental Management Programme is implemented and maintenance of the infrastructure and servitude are undertaken regularly.*

#### **6.4 Impact Management Measures from Specialist Reports for the Development for Inclusion in the EMPr as per Section 3(m)**

The following objectives and outcomes must be considered for this project:

**Objectives:**

- To determine potential impacts of the SRBWSS on the sensitive areas and provide practical mitigation measures.
- To ensure construction occurs in an environmentally responsible manner and that the proponent/contractors implement the guidelines specified in the EMPr.

**Outcomes:**

- To provide water and sanitation to the specified areas within the iLembe District and ensure sufficient infrastructure is provided for future generations to come.

#### **6.5 Assumptions, Uncertainties and Gaps in Knowledge relating to the Assessment and Mitigation Measures Proposed as per Section 3(o)**

The information in this report is based on findings of the Heritage, Wetland and Geotechnical assessments. The design drawings of the proposed water and sanitation scheme, have been provided to the EAP by the engineer. The EAP is therefore satisfied that there are no gaps in knowledge relating to this assessment.

#### **6.6 Period for which Authorisation is required, Proposed Monitoring and Auditing and Post Construction Requirements as per Section 3(q)**

Environmental authorisation is required for the construction of the water and sanitation scheme towards the end of April 2017. It is therefore recommended that the authorization be valid for a period of five years, within which time construction would need to commence.

Given the nature of this project, it is recommended that fortnightly ECO site inspections and monthly audit reports be carried out for the duration of the construction phase of this project. One post-construction audit should be conducted once construction is complete.

The EMPr (Appendix G) details the post construction, rehabilitation and closure objectives, which will be monitored by the ECO and compliance authorities. The ECO is to include findings in the monthly audit report on the status of the vegetation associated with all disturbed areas to ensure that rehabilitation has been conducted concurrently and effectively.

As recommended by the:

- Ecological & Wetland Assessment, vegetation clearance must be restricted to the actual pipeline and servitudes especially within the sections which bisect the closed woodlands, non-perennial and perennial drainage lines and moist coastal woodland riparian zones, transformed and degraded floodplain wetland as well as *Imperata cylindrica-Aristida junciformis* secondary succession moist grasslands or hillslope seepage wetlands.
- Ecological Assessment, prior to construction activities a suitably qualified ecologist should undertake a walk-through of the closed woodland and drainage line crossings. All crossings should be clearly pegged or demarcated in the field by a land-surveyor. This will give the ecologist an opportunity to mark any protected tree species as well as rescue and relocate any indigenous geophytes or Aloes from the pipeline servitude

- Ecological Assessment, proposed bulk water and sewer pipeline servitudes bisecting the drainage lines, closed coastal woodland and open *Imperata cylindrica* hillslope grasslands must be appropriately rehabilitated and re-vegetated with suitable indigenous grasses.
- Heritage Assessment, operations exposing archaeological and historical residues, including graves, should cease immediately pending an evaluation by the heritage authorities.
- Geotechnical Investigation, adequate and constant supervision by a geotechnical professional is considered necessary during construction. Monitoring and approval of the safety controls throughout the pipeline routes is recommended.

## 6.7 Financial Provisions as per Section 3(s)

No upfront financial provision is required for the proposed project. The applicant and contractor is, however responsible for and must ensure that the site has been rehabilitated in full as per EMPr requirements before leaving the site.

## 6.8 EAP's Opinion on whether or not to Authorise the Activity and Recommendations & Conditions for Authorisation as per Section 3(n) and (p)

The impacts associated with the planning, construction and operation of the proposed SRBWSS have been mitigated to low - medium, however the following conditions are recommended for inclusion in the authorisation:

### Properties and Infrastructure:

- Signage must be placed prior to commencement of construction in order to make the community aware of the upcoming activities.
- The engineer must identify any existing infrastructure services that may be affected prior to commencement of construction.
- Any structures that are required to be removed, must be replaced and any damaged incurred must be repaired.

### Waste Management, Storage Areas:

- The Contractor must ensure that all litter is collected from the work and camp areas daily.
- All hazardous substances must be stored within a secured storage area, with impervious lining and bunding. Drip trays must be used where suitable.
- The mixing of concrete must be done on mortar boards or similar structures to prevent the risk of run-off.
- Chemical toilets must be used as ablution facilities during the construction period by all contractors.
- Chemical toilets must not be located closer than 100m from any watercourse.

### Traffic and Construction Vehicles:

- Appropriate safety signage must be used to cordon off construction areas
- Construction vehicles must adhere to speed limits.
- Access to the site for site establishment and construction activities must be planned from the existing roads only. No new access roads must be created.

### Stormwater Management:

- Prevent runoff loaded with sediment and other suspended materials from the site/working areas from discharging to adjacent watercourses and/or stormwater infrastructure.

- The Engineer or Contractor must ensure that no excavated or fill material may be deposited within or directly adjacent to the watercourses / wetlands.
- Heavy machinery must be working within close proximity to watercourses
- Once constriction activities are completed, the Engineer or Contractor is to check that all watercourses are free from building rubble, spoil materials, debris and waste materials.

#### **Dust and Erosion Control**

- The liberation of dust into the surrounding environment must be effectively controlled by the use of water sprays, fabric containment or curtains, where required.
- Suitable erosion control measures must be implemented in areas sensitive to erosion i.e. storm water discharge points, exposed areas and embankments.
- All exposed surfaces must be re-vegetated and/or stabilised as soon as is practically possible.
- The topsoil must be removed along the proposed pipeline route to suit trench width, at a depth of 150mm and stockpiled separately to mitigate against topsoil mixing.
- On downhill slopes the trench will also be backfilled so that the backfill material forms cut-off berms at regular intervals, at least 150mm higher than the ground either side of the trench to prevent surface water from running along the trench and eroding the backfilled material.

#### **Pipe Trenches:**

- Vegetation clearance is permitted to only the minimum area required.
- Trenching activities must be completed in sections and then closed off and re-vegetated as per EMPr conditions.
- No trenches are permitted to be left open during ended holiday periods.
- Trench barricading will have openings to prevent build-up of storm water runoff behind;
- Cut-off berms will be constructed on the high side of all trenches to prevent excessive water flow and erosion. This will be particularly relevant for areas with steep slopes. For these areas, berms will be constructed so that the velocity of run-off is reduced.

#### **Watercourse Crossings:**

- All watercourse crossings must be demarcated prior to commencement of construction.
- Construction activities should ideally be carried out when flow rates are low, preferably during winter.
- Erosion protection measures must be installed at the water-crossings if there are no existing structures.

#### **Archaeological Resources:**

- Operations exposing archaeological and historical residues, including graves, should cease immediately pending an evaluation by the heritage authorities

#### **Monitoring and Auditing**

- The EMPr (Appendix G) and conditions thereto should be adhered to.
- An ECO must be appointed and all contractor staff to be trained on the EMPr and Environmental Authorisation requirements prior to commencement of activities.
- Environmental monitoring and auditing shall be undertaken by the ECO on a fortnightly basis with a monthly audit report during the construction phase
- All maintenance activities during operation must comply with the construction measures detailed in the construction phase of the EMPr.



- All the necessary permits / licenses (Water Use Authorisation) must be obtained prior to commencement of construction.