

**SCREENING ASSESSMENT FOR THE PROPOSED AUGMENTATION
OF THE KWAZAKHELE MAIN SEWER (PHASE 3), NELSON MANDELA
BAY MUNICIPALITY, EASTERN CAPE PROVINCE**



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Prepared by:

TERRATEST (PTY) LTD

PO Box 27308

Greenacres

Port Elizabeth

6057

Tel: 041 363 1900

Fax: 041 363 1922

Email: baxters@jgi.co.za

Contact: Sarah Baxter

Prepared for:

AFRI-COAST ENGINEERS

PO Box 5104

Walmer

6065

Tel: 041 505 8000

Fax: 041 585 3437

Email: elana@africoast.com

Contact: Elana Keef

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1. INTRODUCTION

Terratest (Pty) Ltd was appointed by Afri-Coast Engineers SA (Pty) Ltd (AfriCoast) to complete a Screening Assessment of the proposed augmentation of the Kwazakhele Bulk Sewer Line, located within Nelson Mandela Bay Municipality.

The Screening Assessment comprised a site visit, review of the proposed development layout and an evaluation of the current and relevant environmental legislation. This was done with the aim of identifying the authorisation, permitting and licensing requirements, if any, which would need to be complied with prior to the commencement of construction activities.

2. PROJECT DESCRIPTION

The Kwazakhele Main Sewer line, in its current form, does not provide adequate capacity to convey peak wet weather sewage outflow from the Kwazakhele catchment area to the wastewater treatment works (WWTW) at Fishwater Flats. This has resulted in a number of failures, including surcharge and overflow from existing manholes and the collapse of sections of the pipeline, in particular in Murdoch Street and under Grahamstown Road.

In addition to being insufficient to accommodate stormwater influxes, the pipeline is unable to meet the demand of the Kwazakhele area, which has undergone significant growth since the pipeline was installed.

In order to prevent future disastrous failures, the Nelson Mandela Bay Municipality (NMBM) has implemented an augmentation programme. This has the dual purpose of increasing the capacity of the existing sewerage system and rehabilitating the system.

Phases 1 and 2 of the augmentation programme have been completed. These included the construction of a permanent bypass sewer to convey the peak dry weather flows from the Kwazakhele Catchment around privately owned land (on which the Tenneco Automotive Industrial site was located). In addition, rehabilitation of the existing sewer under Grahamstown Road, down Murdoch Street and through the Tenneco Automotive site, has been undertaken.

This Screening Assessment examines the activities proposed to be undertaken as part of Phases 3 and 4 of the programme.

Phase 3 of the augmentation programme will comprise the construction / extension of the bypass all the way to the Fishwater Flats WWTW. This will require the installation of a 950 m long, 700 mm diameter GRP sewer pipe from the northern boundary of the Tenneco Automotive site to the WWTW. Once inside the fence of the WWTW, the diameter of the pipe will be increased to 1 100 mm.

Phase 4, which is the final phase of the augmentation programme, will comprise the rehabilitation of the existing sewer to Fishwater Flats WWTW, entailing the relining of the existing pipe.

3. THE PROPOSED DEVELOPMENT SITE

The section of pipeline under investigation will run from an existing manhole, located along Access Road, within the existing foulwater servitude located adjacent to Grahamstown Road, crossing beneath the John Tallent Road (MR 443) and terminating at a connection point within the Fishwater Flats WWTW.

Maps indicating the route of the proposed pipeline are included, labelled as Figures 1 and 2.

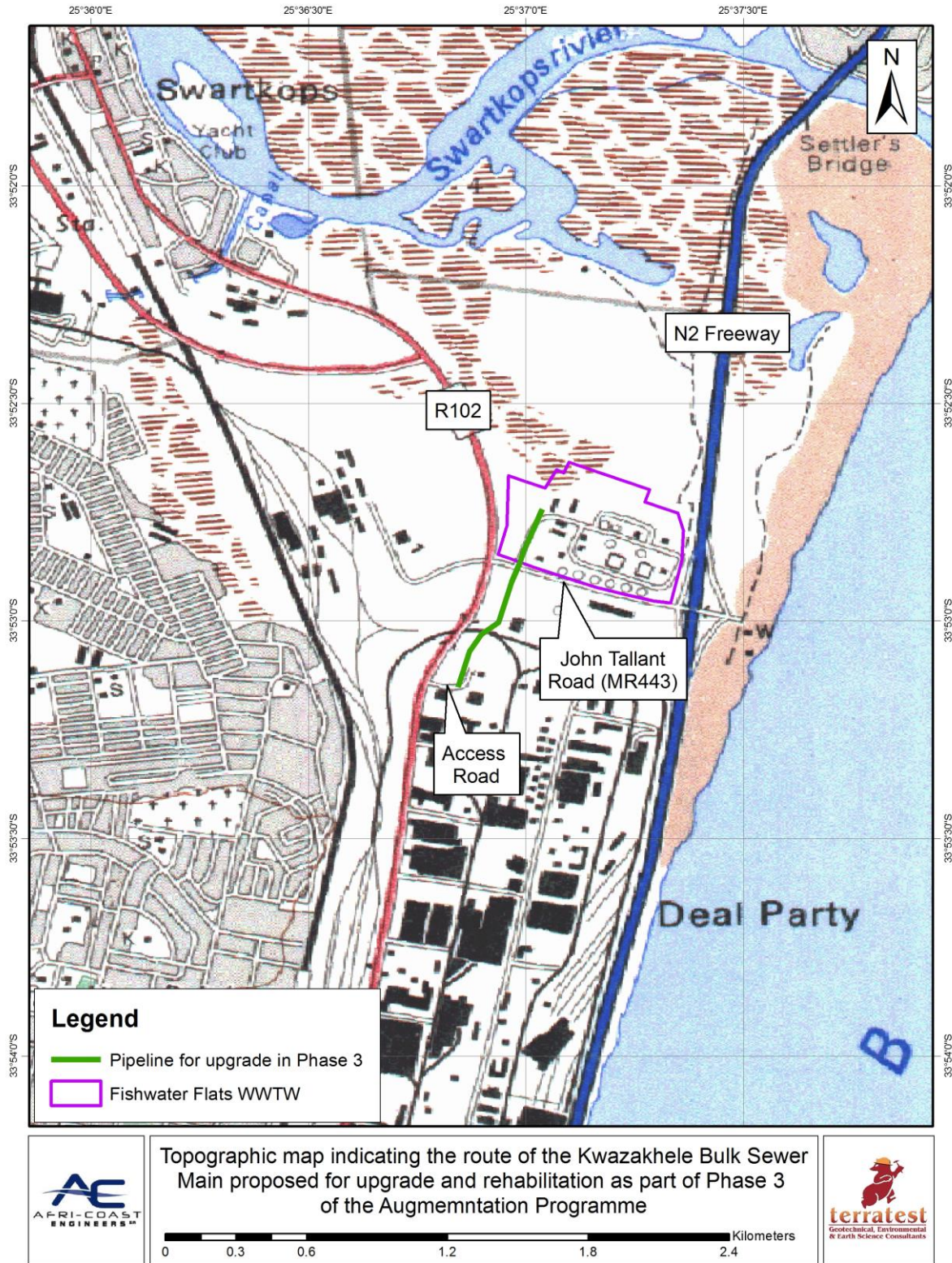


Figure 1: Topographic map indicating the route of the section of the Kwazakhele bulk sewer main line which is proposed for upgrade and rehabilitation as part of Phase 3 of the NMBM's Augmentation Programme.

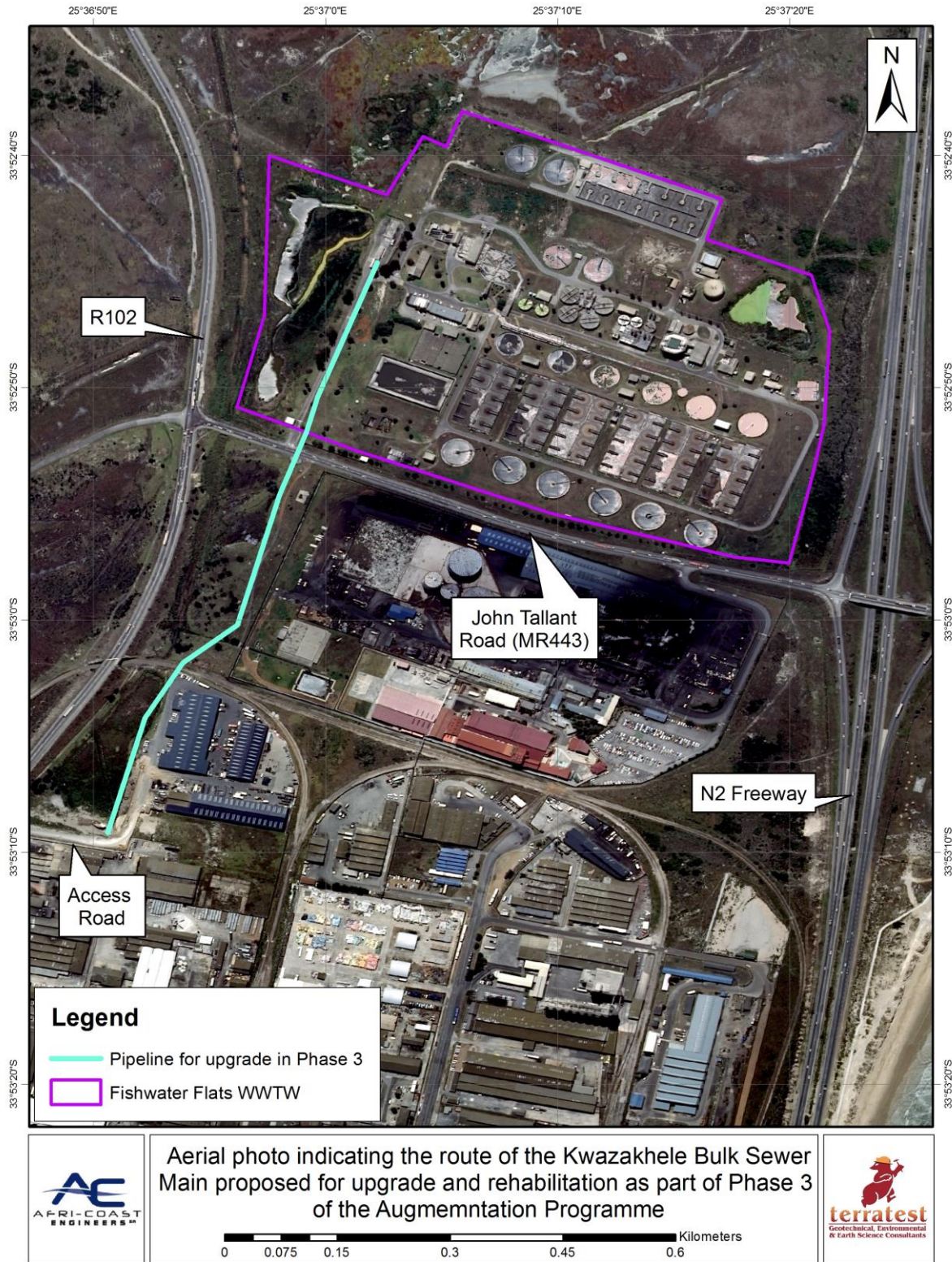


Figure 2: Aerial photo indicating the route of the section of the Kwazakhele bulk sewer main line which is proposed for upgrade and rehabilitation as part of Phase 3 of the NMBM's Augmentation Programme.

4. THE RECEIVING ENVIRONMENT

The description of the receiving environment is based on a desktop assessment, utilising various environmental GIS databases available to Terratest (Pty). This desktop-level assessment was supplemented by a visit to the proposed development site.

4.1 Geology and Soils

Regional geology comprises predominantly of aeolian dune sands derived from the Schelm Hoek Formation of the Algoa Group.

4.2 Vegetation

The vegetation of the development site is predicted by Mucina and Rutherford (2006) to comprise of a combination of Cape Estuarine Salt Marshes (AZe 2), Sundays Thicket (AT 6) and Algoa Dune Strandveld (AZs 1) (see Figure 3).

Cape Estuarine Salt Marsh is described as comprising of estuarine flats and systems of low riverine terraces supporting complexes of low herblands and shrublands dominated by succulent chenopods and other flood-tolerant hydrophytes. Salt marsh meadows tend to be dominated by rushes and sedges.

Sundays Thicket is described as comprising of tall, dense thicket where trees, shrubs and succulents are common, with many spinescent species present. Algoa Dune Strandveld is made up of tall dense thickets, located on dunes which fall outside the influence of salt spray. These are dominated by stunted trees, shrubs, abundant lianas and sparse herbaceous and grassy undergrowth.

All three vegetation types were classified as Least Threatened in the 2004 National Biodiversity Assessment. None of the three is listed as a threatened ecosystem on the list published in GN 1002 (9 December 2011) in terms of the National Environmental Management Biodiversity Act, 2005 (Act No 10 of 2004) (NEMBA).

During the site visit it was noted that the areas through which the pipeline is proposed to be routed have been disturbed or entirely transformed by previous development activities and surrounding land uses. Vegetation in the area does not therefore very closely resemble the vegetation types described below.



Figure 3: Map indicating the vegetation types occurring on and in the areas surrounding the proposed development site (Mucina and Rutherford, 2006).

4.3 NMBM Conservation Assessment & Plan (2010) and Bioregional Plan (2014)

The Systematic Conservation Assessment and Plan (December, 2010) for the NMBM was compiled with the aim of ensuring the effective conservation of a representative proportion of all biodiversity occurring within the NMBM. The Bioregional Plan (November, 2014), which grew from the Conservation Assessment and Plan, sought to assist in this by providing a map of biodiversity priorities and accompanying guidelines to inform landuse planning, environmental assessment and authorisations and natural resource management.

Both plans identify a suite of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) which are deemed to be the minimum areas required to meet conservation targets set both within the municipality and at a national scale.

The delineation of these CBAs and ESAs is based on historical vegetation / biodiversity patterns, the presence of critical ecological processes and the location of species of special concern. Each of these is discussed in terms of the proposed development site, below.

4.3.1 Historical Vegetation Distribution

The NMBM area is divided into 12 broad habitat types and 58 specific vegetation types, based on the historical, pre-development distribution of natural vegetation types. According to this database, the vegetation which would historically have occurred on the development site includes Swartkops Salt Marsh, Colchester Strandveld and Motherwell Karroid Thicket. These are indicated in Figure 4.

Swartkops Salt Marsh is listed as a wetland system, and has been categorised in the Final Conservation Assessment and Plan (2010) as Critically Endangered.

Colchester Strandveld is described as comprising of thicket clumps, typical of Algoa Dune Thicket, within a matrix of shrubland which is dominated by Honey Thorn (*Lycium cinereum*) and an abundance of grass (e.g. *Cynodon dactylon* (Quick grass)). In general, this vegetation type establishes on aeolianite / calcareous sandstone / sand. This vegetation type is listed in the Conservation Assessment and Plan as Vulnerable.

Motherwell Karroid Thicket contains species typical of Sundays Valley Thicket, occurring in a matrix of succulent karroo, dominated by asbossie (*Pteronia incana*). *Themeda triandra* (Red grass) is the dominant grass. This vegetation type tends to occur on calcareous limestone of the Alexandria Formation. This vegetation type is listed in the Conservation Assessment and Plan as Endangered.



Figure 4: Map indicating the historical vegetation types occurring on and in the areas surrounding the proposed development site (CA&P, 2010).

4.3.2 Critical Ecological Processes

Critical ecological processes are those that are required to sustain evolutionary processes. The Conservation Assessment and Plan identified a number of ecological corridors which promote connectivity between natural areas, allowing for critical ecological processes, such as migration, pollination, cross breeding and seed dispersal, to continue.

The proposed pipeline runs entirely within one such ecological corridor, designated as a riverine corridor and linked to the Swartkops River which is located to the north of the site.

4.3.3 Species of Special Concern

Known locations of Red Data Book species and localised endemics with limited distributions were mapped to ensure that these were conserved, particularly in those areas where the habitat did not overlap with a vegetation type or ecological process identified for conservation.

The proposed pipeline runs entirely within an area identified as incorporating the distribution of one such species.

4.3.4 Critical Biodiversity Areas

Using the above-mentioned spatial information, together with, current and planned patterns of land use and a system of ranking and prioritising, the municipal area was categorised into various CBAs.

CBAs comprise all critically endangered habitats, ecological process areas, ecological corridors and habitats for species of special concern, as well as some endangered, vulnerable or least threatened habitats. These areas are required to be managed for biodiversity conservation purposes, should be maintained or restored to their natural structure and ecosystem functioning and incorporated into the Protected Area system.

Figure 5 indicates the CBAs in proximity to the proposed development. From this map it can be seen that the pipeline is routed predominantly along the edges of the CBAs.



Figure 5: Map indicating the CBAs occurring on and in the areas surrounding the proposed development site.

4.4 Surface Water Features

4.4.1 Wetlands

The SANBI (2008) and National Fresh Water Ecosystem Priority Areas (NFEPA) (2011) databases were queried. These both indicate that a section of the proposed pipeline will run through a wetland area (see Figures 6 and 7). The NFEPA database identifies this as a natural valley-head seep wetland which has been found to be heavily to critically modified as a result of overlap with an artificial inland water body (identified by the Department of Land Affairs: Chief Directorate of Surveys and Mapping (2005 – 2007)). It is likely that the artificial water body referred to is an excavated drainage channel established in the past to drain and dry out the floodplain / estuary area associated with the Swartkops River, and therefore allow development to occur. In addition, it is likely that this channel functions as a stormwater drain for water running off the R102 Road.

According to the NFEPA Database, none of the wetland areas occurring in proximity to the proposed development site are listed as Priority Areas for conservation.

4.4.2 Estuaries

The National Biodiversity Assessment (2011) included a detailed assessment of estuarine areas. The Swartkops Estuary and its functional zone were mapped during the assessment (see Figure 8). The current health of the system was categorised as C = moderately modified. The estuary was recommended for partial protection.



Figure 6: Map indicating the location of wetlands occurring on and in the areas surrounding the proposed development site (SANBI, 2008).



Figure 7: Map indicating the location of wetlands occurring on and in the areas surrounding the proposed development site (NFEPA, 2011).



Figure 8: Map indicating the extent of the Swartkops Estuary Functional Zone in relation to the proposed development site.

4.5 Eastern Cape Biodiversity Conservation Plan

The Eastern Cape Biodiversity Conservation Plan, 2007 (ECBCP) identifies two types of CBAs, namely terrestrial and aquatic. These areas contain terrestrial or aquatic features which are deemed to be critical for conserving biodiversity and maintaining ecosystem functioning. Features which contribute to biodiversity conservation and ecosystem functioning, and which require conservation include threatened ecosystems, ecological corridors, special habitats, wetlands, important rivers, sensitive estuaries and priority sub-catchments.

The proposed development site falls within Terrestrial CBA 1 and 2 areas but does not fall within any Aquatic CBAs (see Figure 9). The terrestrial CBAs were identified due to the presence of:

- Critically endangered and endangered vegetation types as identified in STEP;
- 1 km coastal buffer strip; and
- Sensitive, expert-mapped areas.

4.6 Protected Areas

The South African Protected Areas Database, dated 4 November 2014 and maintained by the Department of Environmental Affairs (DEA), was queried. This revealed that the proposed development site is located within 5 km of the boundary of the Zwartkops Valley Nature Reserve.

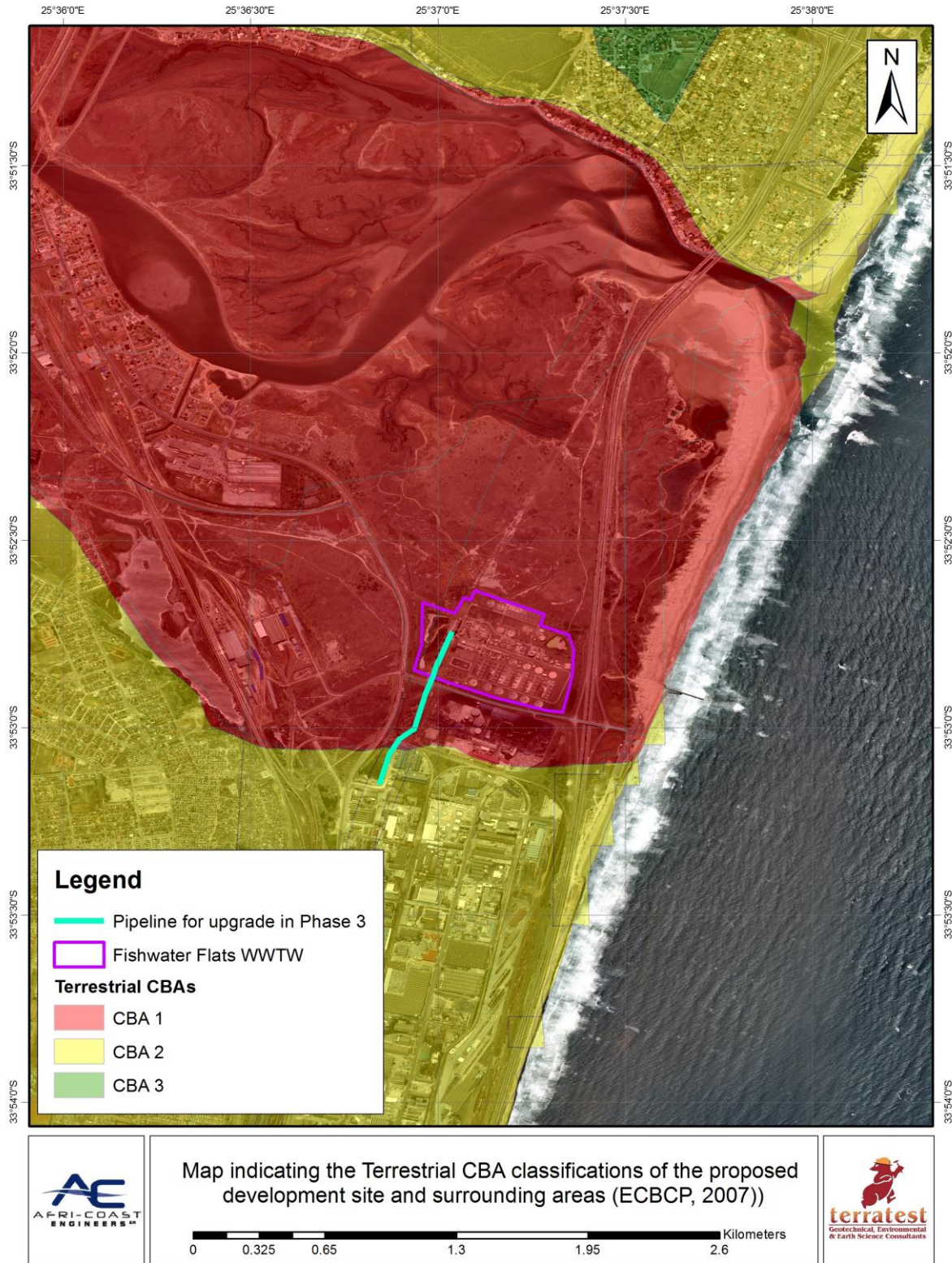


Figure 9: Map indicating the Terrestrial CBA classification of the proposed development site (ECBCP, 2007).

5. LEGISLATIVE REQUIREMENTS

5.1 National Environmental Management Act, 1998

5.1.1 Listed Activities

An assessment of the current Environmental Impact Assessment (EIA) Regulations as contained in GN R983, R984 and R985 of 4 December 2014 promulgated under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), was made.

The Listed Activities published in terms of the NEMA EIA Regulations (2014), which are potentially triggered by the proposed development are summarised and discussed in Table 1.

Table 1: Summary of Listed Activities in terms of NEMA which are potentially applicable

NOTICE	NUMBER	LISTED ACTIVITY
GN R983 Listing Notice 1 4 December 2014	10	<p><i>The development and related operation of infrastructure exceeding 1 000 meters in length for the bulk transportation of sewage...</i></p> <p><i>(i) With an internal diameter of 0.36 meters of more...</i></p> <p><i>Excluding where –</i></p> <p><i>(b) Such development will occur within an urban area.</i></p> <p>The proposed pipeline will have an internal diameter of 0.6 to 0.9 m (600 – 900 mm) which exceeds the above mentioned threshold. In addition, the pipeline will transport sewage. However, the total length of the pipeline under consideration is only approximately 826 m and it is routed entirely within the urban area delineated by the urban edge defined in the NMBM Spatial Development Framework (SDF) (2009). For these reasons, the proposed development will not trigger this listed activity.</p>
GN R983 Listing Notice 1 4 December 2014	12	<p><i>The development of –</i></p> <p><i>(xii) Infrastructure or structures with a physical footprint of 100 square meters or more;</i></p> <p><i>Where such development occurs –</i></p> <p><i>(a) Within a watercourse;</i></p> <p><i>(c) ...within 32 meters of a watercourse, measured from the edge of the watercourse –</i></p> <p><i>Excluding –</i></p> <p><i>(dd) Where such development occurs within an urban area.</i></p> <p>The proposed infrastructure will have a physical footprint of 826 m x 0.9 m = 743.4 m². This exceeds the 100 m² threshold specified.</p> <p>A watercourse is defined in the Regulations as:</p> <p><i>(a) A river or spring;</i></p> <p><i>(b) A natural channel in which water flows regularly or intermittently;</i></p> <p><i>(c) A wetland, pan, lake or dam into which, or from which, water flows; and</i></p>

		<p><i>(d) Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998); and</i></p> <p><i>A reference to a watercourse includes, where relevant, its bed and banks.</i></p> <p>Based on this definition, and on the identification in Section 4.4.1 of this Report of the natural wetlands which the proposed pipeline will run through, parts (a) and (c) of Activity 12 are applicable and potentially triggered.</p> <p>Consideration of the exclusions, however reveals that despite having a physical footprint in excess of 100 m², and in spite of occurring within a watercourse, this proposed development is excluded from triggering as it is routed entirely within the urban area delineated by the urban edge defined in the NMBM SDF (2009). For this reason, the proposed development will not trigger this listed activity.</p>
<p>GN R983 Listing Notice 1 4 December 2014</p>	17	<p><i>Development –</i> <i>(ii) In an estuary</i></p> <p><i>In respect of –</i> <i>(f) Infrastructure with a development footprint of 50 square meters or more –</i></p> <p><i>But excluding –</i> <i>(dd) where such development occurs within an urban area.</i></p> <p>As described in Section 4.4.2 of this Report, the proposed pipeline is routed within the functional zone of the Swartkops Estuary, as delineated in the National Biodiversity Assessment, 2011.</p> <p>In addition, as calculated previously, the development footprint of the proposed pipeline is 743.4 m², which exceeds the 50 m² threshold specified in Activity 17.</p> <p>However, this proposed development is excluded from triggering as it is routed entirely within the urban area delineated by the urban edge defined in the NMBM SDF (2009). For this reason, the proposed development will not trigger this listed activity.</p>
<p>GN R983 Listing Notice 1 4 December 2014</p>	19	<p><i>The infilling or depositing of any material of more than 5 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic meters from –</i> <i>(a) A watercourse;</i></p> <p>As described previously, sections of the proposed pipeline will run through wetland areas. These are included in the definition of watercourse. Construction activities will therefore require the excavation and removal of material from these watercourses to allow for the installation of the pipeline. As the volume of material to be excavated will exceed 5 m³, this listed activity is triggered.</p>
GN R983	27	<p><i>The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such</i></p>

<p>Listing Notice 1 4 December 2014</p>		<p><i>clearance of indigenous vegetation is required for –</i> <i>(i) The undertaking of a linear activity.</i></p> <p>It is likely that the construction of the proposed pipeline will require the clearance of vegetation up to 5 m on either side of the pipeline trench. This equates to a total clearance of approximately 826 m x 10 m = 8 260 m² = 0.8 ha. The 1 ha threshold of vegetation clearing is therefore not exceeded.</p> <p>In addition, the proposed pipeline constitutes a linear activity and is therefore excluded from triggering. For this reason, the proposed development will not trigger this listed activity.</p>
<p>GN R985 Listing Notice 3 4 December 2014</p>	<p>12</p>	<p><i>The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p><i>(a) In Eastern Cape...</i></p> <p><i>(i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment, 2004;</i></p> <p><i>(ii) Within critical biodiversity areas identified in bioregional plans;</i></p> <p><i>(iii) within...an estuarine functional zone...excluding where such removal will occur...on erven in urban areas;</i></p> <p>As calculated previously, construction activities will result in the clearance of approximately 8 000 m² of indigenous vegetation. This exceeds the 300 m² threshold of the Listed Activity.</p> <p>As described in Section 4.2, the vegetation of the proposed development site has been categorised as Least Threatened under the National Spatial Biodiversity Assessment (2004) and has not been included on the list of Threatened Ecosystems published in GN 1002 (of 9 December 2011) in terms of the Section 52 of the NEMBA. Part (a)(i) of Activity 12 is there for not triggered.</p> <p>The Final NMBM Bioregional Plan (dated 14 November 2014) identifies the proposed pipeline as being routed along the edge of and within a CBA (see Section 4.3.2 and Figure 5). Part (a)(ii) of Activity 12 is therefore triggered.</p> <p>Section 4.4.2 of this Report describes that the proposed pipeline is routed within the functional zone of the Swartkops Estuary, as delineated in the National Biodiversity Assessment, 2011. Despite this, Part (a)(iii) of Activity 12 is excluded from triggering as the pipeline is routed entirely on erven within the urban area, delineated by the urban edge defined in the NMBM SDF (2009).</p>

<p>GN R985 Listing Notice 3 4 December 2014</p>	<p>14</p>	<p><i>The development of –</i> <i>(xii) infrastructure or structures with a physical footprint of 10 square meters or more</i> <i>Where such development occurs –</i> <i>(a) within a watercourse;</i> <i>(c) ...within 32 meters of a watercourse, measured from the edge of the watercourse;</i> <i>Excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</i> <i>(c) In Eastern Cape</i> <i>(i) In an estuarine functional zone.</i></p> <p>The footprint of the proposed pipeline has been calculated to be approximately 743.4 m², which exceeds the 10 m² threshold set in the Listed Activity.</p> <p>The development site does not fall within an existing port or harbour, so the exclusion provided for does not apply.</p> <p>As described in Section 4.4.2, the proposed pipeline is routed within the functional zone of the Swartkops Estuary, as delineated in the National Biodiversity Assessment, 2011. This Listed Activity is therefore triggered.</p>
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The proposed development triggers Activity 19 of GN R983 and Activities 12 and 14 of GN R985 of the EIA Regulations (2014) and as such, requires Environmental Authorisation subject to a Basic Assessment Process.

In undertaking this application process, it is likely that, as the Listed Activities triggered relate to development in wetland / watercourse areas and estuarine functional zones, that specialist assessments of these systems will need to be undertaken. This will allow for an identification of all potential impacts on these sensitive features as a result of the proposed development, a determination of the significance of these impacts and therefore the need for mitigation, and the selection of appropriate mitigation measures for impact avoidance, minimisation and control.

5.2 National Water Act, 1998

Section 21 of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) lists activities which are defined as Water Uses. The Act specifies that if certain thresholds are exceeded when undertaking these Water Uses, an application for General Authorisation or a Water Use License from the Department of Water and Sanitation (DWS) is required.

The NWA, like the NEMA, includes wetlands into its definition of a watercourse. For this reason, the undertaking of construction activities in the wetland areas (as identified in Section 4.4.1 and indicated in Figures 6 and 7) will be deemed as undertaking the following two water uses as listed in Section 21 of the NWA:

- (c) Impeding or diverting the flow of water in a watercourse; and
- (i) Altering the bed, banks, course or characteristics of a watercourse.

As per the provisions contained in Section 6(b) of GN 1199 of 18 December 2009, as the proposed water uses will be undertaken within a 500 m radius of a wetland area, they are excluded from General Authorisation and require an application for a Water Use License. This will need to be confirmed, however, through consultation with the DWS.

6 CONCLUSION

Based on the information provided by the Project Team to date, and following a site visit, Terratest (Pty) Ltd is of the opinion that the proposed development requires Environmental Authorisation in terms of the NEMA, 1998, as well as a Water Use License in terms of the NWA, 1998.

Terratest (Pty) Ltd has previously submitted a methodology and quotation for the provision of these services. Upon receipt of confirmation of the opinions contained in this Screening Assessment from AfriCoast, Terratest (Pty) Ltd will continue with the undertaking of the required applications for Environmental Authorisation and Water Use License.