DRAFT BASIC ASSESSMENT REPORT

Draft Basic Assessment Report (DBAR) for the Proposed Upgrade of the Tongaat Bulk Water Pipelines and Reservoir Extension located within oThongathi, eThekwini Metropolitan Municipality, KZN

A Project of the eThekwini Municipality: Water & Sanitation Unit

November 2026

THIS REPORT WAS COMPILED BY WALLACE AND GREEN (PTY) LTD. IN TERMS OF APPENDIX 1 TO GNR 326 (AS AMENDED)

2014 NEMA EIA Regulations (As amended 2017), Appendix 1- 3(a) a basic assessment report must contain the information that is necessary for the competent authority; (i) EAP who prepared the report and (ii) the expertise of the EAP, including curriculum vitae. 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.

DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONERS

Table 1.1: Details of the Senior Environmental Assessment Practitioner

Contact Persons	Ms. Perushni Nicole Naidoo
Postal Address	10 Cherron Avenue, La Lucia, 4051
Telephone	031 563 4466
Facsimile	086 613 8535
E-mail	nicolen@wallaceandgreen.co.za
Qualification	BSc Honours in Environmental Management
Professional Registrations	Reg. EAP (EAPASA)
Experience	11 years

Table 1.2: Details of the Environmental Assessment Practitioner

Contact Persons	Ms. Sayantha Padayachee
Postal Address	10 Cherron Avenue, La Lucia, 4051
Telephone	031 563 4466
Facsimile	086 613 8535
E-mail	sayantha@wallaceandgreen.co.za
Qualification	BSc Honours in Environmental Management
Experience	3 years

DETAILS OF THE PROJECT APPLICANT

Table 1.3: Details of the Project Applicant

Applicant	eThekwini Municipality: Water & Sanitation Unit
Representative	Mr. Siyanda Mwelase
Physical Address	Water and Sanitation – Head Office, 3 Prior Road, 4th Floor
Postal Address	PO Box 828 Durban 4001
Telephone	031 311 8600
E-mail	Siyanda.Mwelase@durban.gov.za

EXECUTIVE SUMMARY

Wallace and Green (Pty) Ltd., were appointed by Naidu Consulting on behalf of eThekwini Municipality: Water and Sanitation Unit to provide Independent Environmental Consulting Services for the Proposed Upgrade of the Tongaat Bulk Water Pipelines, by conducting a Basic Assessment (BA) study in terms of the Environmental Impact Assessment (EIA) Regulations of 2014 (GNR 326 of December 2014 as amended), as promulgated under the National Environmental Management Act (NEMA) (Act No. 107 of 1998).

Project description

The applicant, eThekwini Municipality: Water and Sanitation Unit, noted that the existing water pipeline systems which conveys treated potable water from the Tongaat Water Treatment Works (TWTW's) to the four (4) reservoirs, namely: Tongaat South, Hambanathi, Metcalfe, and Belvedere have shown signs of deteriorated structural integrity.

The existing pipeline systems have been compromised due to a combination of factors including aged infrastructure and structural vulnerabilities at the existing river crossings. Furthermore, key operational challenges such as inaccessible routes to the existing pipeline, informal connections, and damaged valves and chambers, results in frequent bursts. This poses an ongoing risk to water security in the region and has significantly disrupted the reliable supply of potable water to Tongaat and surrounding areas.

To address this challenge, the eThekwini Municipality intends to upgrade the TWTW's pipeline system. **Table 1.4** below outlines the existing and the proposed pipeline infrastructure.

Table 1.4: Existing and proposed pipeline infrastructure

Pipeline	Existing Pipeline	Pipeline Upgrade
Tongaat South	Length: 8.4Km Diameter: 250mm⌀ Material: unplasticized polyvinyl chloride (uPVC)	Length: 8.4Km Diameter: 315mm⌀ Material: High-density Polyethylene (HDPE) Distance from existing pipeline: 0 – 156m
Hambanathi	Length: 2.2Km Diameter: 250mm⌀ and 300mm⌀ Material: Steel and Asbestos Cement	Length: 2.2Km Diameter: 315mm⌀ Material: HDPE Distance from existing pipeline: 0 – 86m
Metcalfe	Length: 3.5Km Diameter: 250mm⌀ Material: uPVC	Length: 3.5Km Diameter: 315mm⌀ Material: HDPE Distance from existing pipeline: 0 – 83m
Belvedere	Length: 8.3Km Diameter: 300mm⌀ and 400mm⌀ Material: Steel	Length: 3.2Km and 5.1Km Diameter: 400mm⌀ and 250mm⌀ Material: HDPE Distance from existing pipeline: 0 – 152m

Once the proposed pipelines and associated tie-in connections are near completion, the existing pipelines will be temporarily isolated to facilitate the changeover. Following successful commissioning of the proposed pipelines, the existing pipelines will be decommissioned and will remain in situ.

An onsite storage reservoir with a capacity of 1 775m^3 exists within the TWTW. As per the Design Report compiled by Naidu Consulting (April, 2026), the capacity analysis found that the existing storage was insufficient for the proposed pipeline upgrades as the reservoir capacity only allows for approximately 0.6 hours of operational storage based on all the pumps operating simultaneously to pump water to the various reservoirs.

The Design Report noted that the peak operating flow of the TWTW must be managed operationally to mitigate excessively draining the onsite storage as well as limiting down time on the system.

As such, eThekwini Municipality: Water and Sanitation Unit intends on extending the existing reservoir at the TWTW's from a capacity of 1 775m^3 to a capacity of 2 975m^3. The reservoir extension will comprise of a separate storage unit with a capacity of 1 200m^3, to supplement the existing storage unit on site. The storage units will be linked with pipe work and will not disrupt the existing structure. The reservoir extension will comprise of 30m(L) x 10m(W) x 5m(H) reinforced concrete.

Refer to **Appendix D4** – Engineering Design Report.

Alternatives

Site Alternative

Alternative S1 (Only Site Alternative): Upgrade of the Tongaat Bulk Water Pipelines and Reservoir Extension located within oThongathi, eThekwini Metropolitan Municipality, KwaZulu-Natal.
No site alternatives were assessed for the proposed project as the project is aimed at upgrading an existing pipeline system and extending the reservoir within the Tongaat Treatment Works.

Layout Alternative

Alternative A1 (Only layout alternative): The proposed layout is as per Drawing No. D791-51-5000-A REV. 0 compiled by Naidu Consulting (Pty) Ltd, dated November 2025.
No layout alternatives are applicable as the project is aimed at provided uninterrupted water supply to Tongaat and the surrounding areas. Furthermore, the proposed pipelines are located along the existing pipeline servitude.

Technology Alternatives

Two(2) technology alternatives were investigated for the proposed project and the associated watercourse crossings. The proposed pipelines traverse various watercourses along the route and as such, the feasibility and environmental impact of the different watercourse crossing methodologies were assessed.

- **Technology Alternative T1 (Preferred): The proposed installation of below ground pipelines which will be laid in a trench with a 25MPa reinforced concrete encasement.**

Alternative T1 involves the excavation of the riverbed and the laying of pipeworks below the watercourse, within reinforced concrete encasements. The methodology for Alternative T1 is outlined below:

Temporary flow diversion

- To avoid disrupting the river flow during construction, the works will be undertaken in two segments using temporary earth berms to divert the flow.
  - For Segment 1, an earth berm will be constructed to temporarily divert a portion of the river flow, allowing the pipeline to be laid and encased on one side of the river crossing.
  - Upon completion of Segment 1, the earth berm will then be removed and the riverbed will be rehabilitated to the pre-disturbed topography.
  - The earth berm will then be reconstructed along the opposite bank to divert the flow to the completed side.
  - Segment 2 will be constructed in a similar manner, completing the remaining section of the pipeline encasement.
  - Upon completion of Segment 2, the earth berm will then be removed and the riverbed will be rehabilitated to the pre-disturbed topography.

- Galvanized dowel bars will be anchored into the bedrock to improve structural stability of the encasement.

Installation of the pipeline within the watercourse

- The watercourse crossing will be excavated down to the competent bedrock and the founding level for pipeline installation will be prepared.
- The HDPE pipeline will be installed at the required line and level.
- A 25MPa reinforced concrete encasement will be constructed around the pipeline to provide protection against erosion, impact and flotation during flood events.
- The concrete encasement will be extended across the full river width and into the riverbanks beyond the anticipated scour zone.
- The riverbed profile will be reinstated to restore the river to its original flow conditions upon completion of the works.

Alternative T1 was ranked as the preferred watercourse crossing method following a detailed assessment of impacts using the mitigation hierarchy. Other aspects as provided below in **Table 1.5** further deemed this alternative as being environmentally and financially suitable.

❖ **Technology Alternative T2 (Not Supported): Trenchless watercourse crossing using Horizontal Directional Drilling (HDD).**

Alternative T2 involves the installation of the pipeline below ground using a trenchless Horizontal Directional Drilling (HDD). The methodology for the HDD alternative is outlined below:

- The drilling entry and exit points will be established outside the watercourse and, where practicable, beyond the riparian zone.
- Temporary drilling pads will be prepared and the HDD drilling equipment, the drilling fluid management system, and the ancillary plant will be positioned at the entry and exit locations.
- A pilot borehole will be drilled beneath the watercourse along the designed alignment using a steerable drilling system.
- The HDPE pipeline will be thread through the enlarged borehole in a single continuous operation using the HDD rig.
- Drilling fluid circulation must be monitored throughout the drilling process and the appropriate containment and contingency measures must be implemented to manage any inadvertent drilling fluid returns.
- The installed pipeline will then be connected to the remainder of the proposed pipeline network at the entry and exit points.
- All temporary works and drilling equipment will be removed and all disturbed areas will be rehabilitated to pre-disturbed conditions..

Table 1.5 below outlines the advantages and disadvantages of Technology Alternatives T1 and T2.

Table 1.5: Comparative Analysis of Alternative T1 (Preferred) and Alternative T2 (Not Supported)

Technology Alternative T1 (Preferred)	Technology Alternative T2 (Not Supported)
The reinforced concrete encasement provides long-term protection against erosion, scour, impact, and buoyancy during extreme precipitation events.	There is no protection against environmental factors such as erosion and scouring which increases the risk of borehole collapse.
Greater certainty and visualisation of underground conditions.	Technical risks such as borehole instability and deviation from the intended alignment. Inability to visualise the underground pipeline.
Quality control of the pipeworks can be conducted prior to backfilling.	Inability to visualise the underground pipeline.

No risk of inadvertent drilling fluid (frac-outs) polluting the watercourse and/or riparian area.	Potential for inadvertent drilling fluid returns (frac-outs) to pollute the watercourse and/or riparian area.
Does not require highly specialised equipment and expertise.	Requires highly specialised equipment and expertise.
Overall lower construction cost.	Comparatively larger construction cost due to the HDD Drill and Rig, and the skilled contractors required. Additionally, frac-out clean up is expensive.

No-go Option

The no-go alternative involves not undertaking the proposed bulk water pipeline upgrade and reservoir extension. The no-go option was not supported due to the following:

- The existing infrastructure deficiencies will remain unchanged.
- While the no-go alternative would avoid the temporary construction-related disturbance, it would not eliminate the ongoing environmental risks associated with deteriorating infrastructure as recurring leaks would result in unnecessary water loss and the need for frequent repairs.
- Retaining the existing infrastructure may lead to financial implications for emergency repairs and unplanned service outages.
- An unreliable water supply could constrain future residential, commercial, and industrial development within the area, thereby limiting opportunities for economic growth and investment.
- Without increasing the capacity of the onsite reservoir at the TWTW, the existing storage reservoir will be excessively drained.

EIA Process

Based on the project activities the proposed project will require Environmental Authorisation via a Basic Assessment (BA) Process due to the following listed activities in terms of the NEMA EIA Regulations 2014 (as amended):

- **Listing Notice 1, Activity 19:** The proposed pipelines upgrade and reservoir extension involves the infilling of 20 625m^3 of material into the following watercourses:
  - Two (2) unchanneled valley-bottom wetlands.
  - Four (4) channelled valley-bottom wetlands.
  - Two (2) seep wetlands
  - One (1) depression wetland.
  - Tongati River
  - Hlawe River

- **Listing Notice 1, Activity 67:** The proposed development triggers Listing Notice 1, Activity 19 and the pipeline upgrades will be conducted in a phased approach due to budget constraints. The phased approach will comprise of the following:

  - Phase 1 – Hambanathi and Tongaat South pipeline upgrade (±24 Months)
    - Upgrade of ±2.2km of the DN315 pipeline (Hambanathi).
    - Upgrade of ±8.4km of the DN315 pipeline (Tongaat South).
    - Phase 1 will be conducted within the 2028 and 2029 financial years.

  - Phase 2 – Metcalfe pipeline upgrade (±12 Months)
    - Upgrade of ±3.5km of the DN315 pipeline (Metcalfe).
    - Phase 2 will be conducted within the 2029 and 2030 financial year.

  - Phase 3 – Belvedere (±18 Months)
    - Upgrade of ±3.2 km of the DN400 pipeline.
    - Upgrade of ±5.1km of the DN250 pipeline.

- Phase 3 will be conducted within the 2030 and 2031 financial years.

- **Listing Notice 3, Activity 2:** The proposed reservoir extension at the Tongaat Water Treatment Works will have a bulk water storage capacity of 1 200m³ and traverses D'MOSS. As per the Ecological Assessment conducted by Wallace and Green (Pty) Ltd (2026), the conservation value of the D'MOSS area is low as the area is dominated by invasive alien plant species. The species richness and composition are not a good representation of the natural vegetation associated with this area.

- **Listing Notice 3, Activity 12:** As per the Ecological Assessment conducted by Wallace and Green (Pty) Ltd (2026), sections of the proposed pipeline upgrades intercepts a CBA and will involve the clearance of approximately 7000m^2 of indigenous vegetation (e.g., Sporobolus pyramidalis, Cheilanthes viridis, Cyperus albostriatus, and Cynodon dactylon).

- **Listing Notice 3, Activity 26:** The proposed upgrade triggers Listing Notice 3, Activities 2 and 12, and will be conducted in a phased approach due to budget constraints. The phased approach will comprise of the following:

  - Phase 1 – Hambanathi and Tongaat South pipeline upgrade (±24 Months)

    - Upgrade of ±2.2km of the DN315 pipeline (Hambanathi).
    - Upgrade of ±8.4km of the DN315 pipeline (Tongaat South).
    - Phase 1 will be conducted within the 2028 and 2029 financial years.

  - Phase 2 – Metcalfe pipeline upgrade (±12 Months)
    - Upgrade of ±3.5km of the DN315 pipeline (Metcalfe).
    - Phase 2 will be conducted within the 2029 and 2030 financial year.

  - Phase 3 – Belvedere (±18 Months)
    - Upgrade of ±3.2 km of the DN400 pipeline.
    - Upgrade of ±5.1km of the DN250 pipeline.
    - Phase 3 will be conducted within the 2030 and 2031 financial years.

This BA follows the legislative process prescribed in the Environmental Impact Assessment (EIA) Regulations (2014). This report constitutes the Draft Basic Assessment Report (DBAR) which details the environmental outcomes, impacts and residual risks of the proposed activity. The report aims to assess the key environmental issues and impacts associated with the development and to document Interested and Affected Parties' (I&APs) issues and concerns. Furthermore, it provides background information of the proposed project, a motivation, and details of the proposed project, and describes the public participation undertaken to date.

To protect the environment and ensure that the development is undertaken in an environmentally responsible manner, there are several significant portions of environmental legislation and specialist studies that were taken into consideration during this assessment and are elaborated on in this report.

The KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (KZN EDTEA) is the competent authority for this Basic Assessment process, and the development needs to be authorised by this Department.

Public Participation Process

The public participation process comprised of the following:

- **Background Information Document:** Notification and distribution of the Background Information Document (this document) to identified stakeholders and I&APs on the 22nd of April 2026 to announce

the project and inviting stakeholders to register as an I&AP and participate in the public participation process;

- **Advertisement:** Placement of an advertisement in the local/regional newspaper. Advertisement were placed in the Metro Ezasegagasini Newspaper in English and IsiZulu on the 3rd of July 2026; and
- **Site notices:** Placement of site notices at conspicuous locations on site. Three (3) site notices were erected on site at the TWTW (start of the proposed pipelines) and the middle and end points of the proposed pipeline on the 3rd of July 2026 notifying I&APs of the proposed activity and inviting them to register.

Specialist Studies

Ecological Assessment

The Ecological Assessment was undertaken by Wallace and Green (Pty) Ltd in March 2026 and identified the KwaZulu-Natal Coastal Belt Grassland and Lowveld Riverine Forest as the natural vegetation types associated with the study area. Although portions of the proposed pipeline routes traverse Critical Biodiversity Areas (CBAs) and a substantial portion of the study area falls within the Durban Metropolitan Open Space System (D'MOSS), much of the affected area is already disturbed and characterised by invasive alien vegetation, with approximately 50% of recorded plant species comprising alien species.

Three(3) habitat types were identified, namely grassland, riparian and alien-dominated vegetation, with habitat sensitivity ranging from Very Low to High Site Ecological Importance (SEI). The grassland areas generally comprise good-quality vegetation with approximately 60-80% ground cover, while the riparian areas are highly invaded and retain limited elements of the natural Lowveld Riverine Forest.

One(1) Species of Conservational Concern, *Hypoxis hemerocallidea*, and two(2) nationally protected tree species, namely; *Barringtonia racemosa* and *Podocarpus falcatus*, were recorded along the survey route. Approximately 7000m² of indigenous vegetation is anticipated to be cleared as a result of the development.

Overall, the specialist concluded that the proposed pipeline upgrade is unlikely to result in significant impacts on the surrounding ecological environment, provided that vegetation clearance is restricted to the approved footprint and the recommended ecological mitigation measures are implemented.

Freshwater Assessment:

The Freshwater Assessment was undertaken by The Biodiversity Company in March 2026 and identified the Tongati and Hlawe Rivers within the project area, together with 14 wetland hydrogeomorphic units comprising four(4) unchannelled valley-bottom wetlands, five(5) channelled valley-bottom wetlands, four(4) seep wetlands and one(1) depression wetland, as well as a dam, drainage lines and canals.

The river reaches were assessed as Largely Modified based on both the Index of Habitat Integrity (IHI) and Present Ecological Status (PES), reflecting substantial historical modification and loss of natural habitat, biota and ecosystem functionality due to anthropogenic activities including sand mining, urbanisation, alien and invasive vegetation, water abstraction, impoundments, dumping and channel modification. The sampled river habitats were considered capable of supporting low to moderate macroinvertebrate diversity, with a relatively good diversity recorded at the Tongati River, although several expected taxa were absent.

Wetlands within the study area collectively cover approximately 36.84Ha, of which approximately 0.383Ha (1.04%) will be directly intersected by the proposed development. The wetlands were assessed as ranging from Moderately Modified to Seriously Modified, with Low to Moderate Ecological Importance and Sensitivity (EIS) and ecosystem service scores ranging from Moderately Low to Moderately High.

The specialist recommends post-mitigation buffers of 20m for the Tongati and Hlawe Rivers and channelled and unchannelled valley-bottom wetlands, and 15m for drainage lines, seep wetlands and depression wetlands. The risk assessment determined that all identified freshwater-related risks associated with the proposed development are Low and acceptable, provided that the recommended mitigation measures and buffer requirements are strictly implemented during the construction and operational phases.

Heritage Impact Assessment:

The assessment found that the proposed bulk water pipelines and reservoir extension largely traverses previously disturbed areas and existing servitudes, thereby reducing the potential for impacts to heritage resources. The historic Pioneer Peace Monument was identified 21m from the existing pipeline and 20m west of the proposed Tongaat South pipeline, at the following geographical co-ordinates 29°34'44.23"S; 31° 5'33.71"E. This monument is of high significance and must not be affected. A high visibility buffer/screen must be implemented at least 10m from the monument during the construction phase. In addition, this would need to be photographed as evidence for mitigation and uploaded onto SAHRIS. The specialist concluded that the proposed development may be authorised, provided that the recommended mitigation measures are implemented.

Main findings of the EIA

- Construction and operational phase impacts ranged from High - Low pre-mitigation. All the anticipated impacts can however be significantly reduced through the mitigation measures to Medium - Low and Low levels of impact significance ratings.
- Residual risks are expected to be of short duration and of Low - Minor impact significance, provided that the mitigation measures in this report are implemented. No significant cumulative effects on the environment are anticipated.

TABLE OF CONTENTS

THIS REPORT WAS COMPILED BY WALLACE AND GREEN (PTY) LTD. IN TERMS OF APPENDIX 1 TO GNR 326 (AS AMENDED) 2

DETAILS OF THE PROJECT APPLICANT 2

EXECUTIVE SUMMARY 3

TABLE OF CONTENTS 10

APPENDICES 11

APPENDIX 1: NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 107 OF 1998): ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS 2014 (AS AMENDED) 12

Section 1: DESCRIPTION OF THE PROPOSED ACTIVITY & LOCALITY 14

Section 2: SITE DESCRIPTION OF SURROUNDING LAND USE AS PER SECTION 3(H) (IV) AND (K) ... 42

Section 3: POLICY AND LEGISLATIVE FRAMEWORK 61

Section 4: MOTIVATION, NEED AND DESIRABILITY 64

Section 5: PUBLIC PARTICIPATION 68

Section 6: IMPACT ASSESSMENT 70

APPENDICES

Appendix A: Site Plan(s)
Appendix A1 – Locality Map
Appendix A2 – Overall Sensitivity Map

Appendix B: Site Photographs

Appendix C: Facility illustration(s)
Appendix C1 – Proposed Pipeline Layout
Appendix C2 – Existing Pipeline Layout

Appendix D: Specialist Reports
Appendix D1 – Ecological Assessment
Appendix D2 – Freshwater Assessment
Appendix D3 – Heritage Assessment
Appendix D4 – Engineering Design Report
Appendix D5 – Geotechnical Assessment

Appendix E: Public Participation
Appendix E1 – PPP Summary
Appendix E2 – Site Notice
Appendix E3 – Proof of Site Notice
Appendix E4 – Advertisement
Appendix E5 – Proof of Advertisement
Appendix E6 – BID & Comment Form
Appendix E7 – I&AP Database
Appendix E8 – Issues Trail
Appendix E9 – I&AP Correspondence

Appendix F : Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and Expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information
Appendix J1 – Pre-application Meeting Minutes
Appendix J2 – NEMA Screening Tool Report
Appendix J3 – Proactive Reticulation Maintenance Procedure
Appendix J4 – Leak Tracing Procedure
Appendix J5 – Water Pipe Repair Procedure
Appendix J6 – Property Details
Appendix J7 – EDTEA Acknowledgement of Receipt

APPENDIX 1: NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT NO. 107 OF 1998): ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS 2014 (AS AMENDED)

SECTION OF APPENDIX 1 OF THE EIA REGULATIONS	DESCRIPTION OF THE SECTION	ASSOCIATED SECTION WITHIN THE BAR
3a	Details of the EAP and CV	Page 2
3b	Location of the activity	Section 1.5
3c	A layout plan	Section 1.5
3d	Description of the scope of the proposed activity including the triggered and specified activities, associated structures and infrastructure and the way the proposed development relates to the triggered activities	Section 1.2 and 1.4
3e	Description of the policy and legislative context within which the development is proposed and how is each one applicable to the proposed activity	Section 3
3f	The motivation for the need and desirability (including the development at that specific location)	Section 4
3g	The motivation for the preferred site, activity, and technology alternative	Section 1.5
3h (i)	Details of all the alternatives considered	Section 1.5
3h (ii)	Details of the Public Participation Process (PPP) undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs	Section 5
3h (iii)	A summary of the issues raised by interested and affected parties, and an indication of the way the issues were incorporated, or the reasons for not including them	Section 5
3h (iv)	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	Section 2
3h (v)	The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed, or mitigated;	Section 6.2
3h (vi)	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives	Section 6.1
3h (vii)	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	Section 6.2
3h(viii)	The possible mitigation measures that could be applied and the level of residual risk	Section 6.2
3h(ix)	The outcome of the site selection matrix	Section 6.2
3h(x)	If no alternatives, including alternative locations for the activity, were investigated, the motivation for not considering such	Section 1.5
3h(xi)	A concluding statement indicating the preferred alternatives, including the preferred location of the activity	Sections 4.2 and 6.3
3i	A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including-	Section 6

SECTION OF APPENDIX 1 OF THE EIA REGULATIONS	DESCRIPTION OF THE SECTION	ASSOCIATED SECTION WITHIN THE BAR
	(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue, risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures	
3j	An assessment of each identified potentially significant impact and risk	Section 6.2
3k	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report	Section 2
3l	An environmental impact statement containing a map and a summary of the positive and negative impacts of the proposed development and alternatives	Section 6.3
3m	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr.	Section 6.4
3n	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of the authorisation	Section 6.8
3o	A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed	Section 6.5.
3p	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation	Section 6.8
3q	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post-construction monitoring requirements finalised	Section 6.6
3r	An undertaking under oath or affirmation by the EAP	Refer to Appendix H
3s	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of adverse environmental impacts	Not Applicable

SECTION 1: DESCRIPTION OF THE PROPOSED ACTIVITY & LOCALITY

1.1 PROJECT TITLE

The Proposed Upgrade of the Tongaat Bulk Water Pipelines located within oThongathi, eThekwini Metropolitan Municipality, KZN.

1.2 DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN INCLUDING ASSOCIATED STRUCTURE AND INFRASTRUCTURE AS PER SECTION 3(D) (II)

2014 EIA Regulations (as amended), Appendix 1- 3(d) a description of the scope of the proposed activity, including (ii) a description of the activities to be undertaken including associated structures and infrastructure.

Wallace and Green (Pty) Ltd., were appointed by Naidu Consulting on behalf of eThekwini Municipality: Water and Sanitation Unit to provide Independent Environmental Consulting Services for the Proposed Upgrade of the Tongaat Bulk Water Pipelines, by conducting a Basic Assessment (BA) study in terms of the Environmental Impact Assessment (EIA) Regulations of 2014 (GNR 326 of December 2014 as amended), as promulgated under the National Environmental Management Act (NEMA) (Act No. 107 of 1998).

The applicant, eThekwini Municipality: Water and Sanitation Unit, noted that the existing water pipeline systems which conveys treated potable water from the Tongaat Water Treatment Works (TWTW's) to the four (4) reservoirs, namely: Tongaat South, Hambanathi, Metcalfe, and Belvedere have shown signs of deteriorated structural integrity.

The existing pipeline systems have been compromised due to a combination of factors including aged infrastructure and structural vulnerabilities at the existing river crossings. Furthermore, key operational challenges such as inaccessible routes to the existing pipeline, informal connections, and damaged valves and chambers, results in frequent bursts. This poses an ongoing risk to water security in the region and has significantly disrupted the reliable supply of potable water to Tongaat and surrounding areas.

To address this challenge, the eThekwini Municipality intends to upgrade the TWTW's bulk water pipeline system. **Table 1.6** below outlines the existing and the proposed pipeline infrastructure.

Table 1.6: Existing and proposed pipeline infrastructure

Pipeline	Existing Pipeline	Pipeline Upgrade
Tongaat South	Length: 8.4Km Diameter: 250mmø Material: unplasticized polyvinyl chloride (uPVC)	Length: 8.4Km Diameter: 315mmø Material: High-density Polyethylene (HDPE) Distance from existing pipeline: 0 – 156m
Hambanathi	Length: 2.2Km Diameter: 250mmø and 300mmø Material: Steel and Asbestos Cement	Length: 2.2Km Diameter: 315mmø Material: HDPE Distance from existing pipeline: 0 – 86m
Metcalfe	Length: 3.5Km Diameter: 250mmø Material: uPVC	Length: 3.5Km Diameter: 315mmø Material: HDPE Distance from existing pipeline: 0 – 83m
Belvedere	Length: 8.3Km Diameter: 300mmø and 400mmø Material: Steel	Length: 3.2Km and 5.1Km Diameter: 400mmø and 250mmø Material: HDPE Distance from existing pipeline: 0 – 152m

The proposed pipeline upgrades are located within Wards 58, 61 and 62 of the eThekwini Municipality and at the following geographical coordinates:

Table 1.7: Geographical Co-ordinates of Proposed Upgrade of the Bulk Water Pipelines

Latitude /Longitude	Degrees	Minutes	Seconds
Tongaat South			
Start	29°	32'	42,05"S
	31°	07'	41,90"E
Middle	29°	33'	58,20"S
	31°	06'	42,66"E
End	29°	35'	13,26"S
	31°	05'	59,81"E
Hambanathi			
Start	29°	32'	41,41"S
	31°	07'	42,94"E
Middle	29°	32'	41,51"S
	31°	07'	09,51"E
End	29°	32'	58,59"S
	31°	06'	50,96"E
Metcalfe			
Start	29°	32'	41,76"S
	31°	07'	42,91"E
Middle	29°	33'	13,03"S
	31°	07'	02,96"E
End	29°	33'	44,35"S
	31°	06'	47,81"E
Belvedere			
Start	29°	32'	42,07"S
	31°	07'	41,37"E
Middle	29°	34'	03,09"S
	31°	06'	36,18"E
End	29°	34'	50,24"S
	31°	04'	59,39"E

Once the proposed pipelines and associated tie-in connections are near completion, the existing pipelines will be temporarily isolated to facilitate the changeover. Following successful commissioning of the proposed pipelines, the existing pipelines will be decommissioned and will remain in situ.

An onsite storage reservoir with a capacity of 1 775m^3 exists within the TWTW. As per the Design Report compiled by Naidu Consulting (April, 2026), the capacity analysis for the existing storage is insufficient for the proposed pipeline upgrades as the reservoir capacity only allows for approximately 0.6 hours of operational storage based on all the pumps operating simultaneously to pump water to the various reservoirs. The Design Report noted that the peak operating flow of the TWTW must be managed to mitigate excessively draining the onsite storage as well as limiting down time on the system.

As such, eThekwini Municipality: Water and Sanitation Unit intends on extending the existing reservoir at the TWTW's from a capacity of 1 775m^3 to a capacity of 2 975m^3, together with the structural interface, reservoir pipework, valves, chambers, drainage and associated civil works. The reservoir extension will comprise of a separate storage unit with a capacity of 1 200m^3, to supplement the existing storage unit on site. The storage

units will be linked with pipe work and will not disrupt the existing structure. The reservoir extension will comprise of 30m(L) x 10m(W) x 5m(H) reinforced concrete and is geographically located at the following geographical coordinates: 29°32'40.49"S; 31° 7'41.07"E.

The existing reservoir will remain in service for the greater part of the construction period. The new structure will therefore be constructed to the greatest practical extent before any opening of, or intrusive work to, the existing reservoir is undertaken.

Figure 1.1 illustrates the location of the proposed pipeline upgrade and the reservoir extension and **Table 1.8** provides the property details.

Refer to **Appendix D4** – Engineering Design Report.

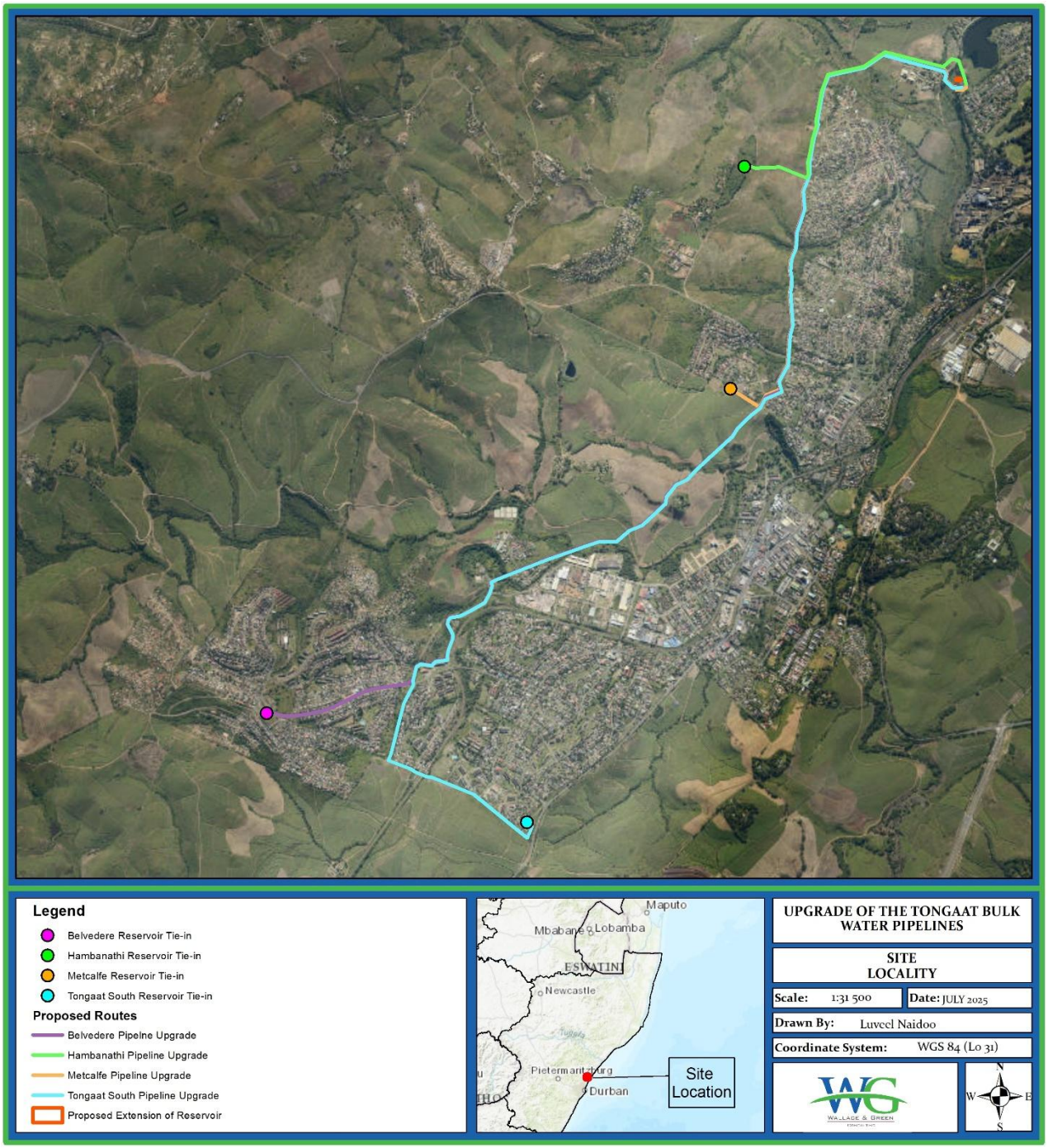


Figure 1.1: Locality Map

Table 1.8: Property Details

Province/s	KwaZulu Natal
Municipality/ies	eThekwini Metropolitan Municipality
Ward number/s	58, 61, 62
Nearest town/s	Tongaat and Hambanathi
Portion number/s	Refer to **Appendix J6** – Property Details

Methodology for the pipeline upgrade

- The existing pipeline system, comprising Asbestos Cement (AC), steel, and unplasticised polyvinyl chloride (uPVC) pipelines, will be upgraded and replaced with High-Density Polyethylene (HDPE) pipelines.
- The proposed HDPE pipelines will be constructed from the Tongaat Water Treatment Works to the respective reservoirs while the existing pipeline system remains fully operational, thereby ensuring continuity of water supply throughout the construction period.
- Once the proposed pipelines and associated tie-in connections are near completion, the existing pipelines will be temporarily isolated to facilitate the final changeover. Following successful commissioning of the proposed pipelines, the existing pipelines will be decommissioned and will remain in situ.

Watercourse crossing methodology

The proposed pipelines and the reservoir extension involves various watercourse crossings as outlined in **Table 1.9** below.

Table 1.9: Watercourse crossings associated with proposed project

Watercourse / Wetland System	Pipeline Crossing	Co-ordinates
HGM 1 – Unchanneled valley-bottom wetland	• Hambanathi • Metcalfe	• 29°32'37.88"S; 31° 7'37.47"E
HGM 4 – Channeled valley-bottom wetland	• Tongaat South • Belvedere • Metcalfe • Reservoir extension	• 29°32'41.58"S; 31° 7'39.25"E • 29°32'40.36"S; 31° 7'40.70"E
HGM 5 – Channeled valley-bottom wetland	• Tongaat South • Belvedere • Metcalfe	• 29°33'21.93"S; 31° 7'1.95"E • 29°33'38.43"S; 31° 7'1.17"E
	• Tongaat South • Belvedere	• 29°33'59.27"S; 31° 6'41.26"E • 29°34'0.77"S; 31° 6'39.54"E
	• Tongaat South	• 29°33'15.11"S; 31° 7'3.07"E
HGM 6 – Channeled valley-bottom wetland	• Tongaat South • Belvedere	• 29°34'25.46"S; 31° 5'51.23"E • 29°34'39.36"S; 31° 5'41.13"E
	• Tongaat South	• 29°35'2.31"S; 31° 5'33.02"E
HGM 7 - Channeled valley-bottom wetland	• Belvedere	• 29°34'40.22"S; 31° 5'38.05"E
	• Tongaat South	• 29°34'51.41"S; 31° 5'30.11"E

		• 29°34'59.30"S; 31° 5'27.80"E
HGM 8 – Seep wetland	• Hambanathi	• 29°32'58.88"S; 31° 7'0.27"E
HGM 9 - Seep	• Tongaat South • Belvedere • Metcalfe	• 29°33'32.70"S; 31° 7'1.65"E
	• Metcalfe	• 29°33'44.72"S; 31° 6'57.41"E • 29°33'47.16"S 31° 6'54.80"E
HGM 10 – Depression wetland	• Tongaat South • Belvedere	• 29°34'22.60"S; 31° 5'54.45"E
Tongati River	• Tongaat South • Belvedere • Metcalfe • Hambanathi	• 29°32'38.54"S; 31° 7'16.12"E
Hlawe River	• Tongaat South • Belvedere	• 29°34'17.23"S; 31° 6'10.55"E
Various drainage lines	• Tongaat South • Belvedere • Metcalfe • Hambanathi	• 29°32'41.64"S; 31° 7'9.57"E • 29°32'42.15"S; 31° 7'9.35"E • 29°32'49.37"S; 31° 7'7.88"E • 29°32'59.70"S; 31° 7'6.05"E
	• Tongaat South • Belvedere • Metcalfe	• 29°33'13.98"S; 31° 7'3.04"E
	• Belvedere • Metcalfe	• 29°33'15.11"S; 31° 7'2.83"E
	• Tongaat South • Belvedere	• 29°33'46.49"S; 31° 6'55.40"E • 29°33'55.95"S; 31° 6'45.37"E • 29°34'9.22"S; 31° 6'30.31"E
	• Tongaat South	• 29°33'33.32"S; 31° 7'1.64"E • 29°33'38.29"S; 31° 7'1.29"E • 29°33'45.96"S; 31° 6'56.08"E
	• Belvedere	• 29°33'33.02"S; 31° 7'1.54"E • 29°33'45.50"S; 31° 6'56.32"E

Installation of the pipelines within the watercourses will involve the following:

Temporary flow diversion

- To avoid disrupting the river flow during construction, the works will be undertaken in two segments using temporary earth berms to divert the flow.
- For Segment 1, an earth berm will be constructed to temporarily divert a portion of the river flow, allowing the pipeline to be laid and encased on one side of the river crossing.
- Upon completion of Segment 1, the earth berm will then be removed and the riverbed will be rehabilitated to the pre-disturbed topography.
- The earth berm will then be reconstructed along the opposite bank to divert the flow to the completed side.
- Segment 2 will be constructed in a similar manner, completing the remaining section of the pipeline encasement.
- Upon completion of Segment 2, the earth berm will then be removed and the riverbed will be rehabilitated to the pre-disturbed topography.

- Galvanized dowel bars will be anchored into the bedrock to improve structural stability of the encasement.

Installation of the pipeline within the watercourse

- The watercourse crossing will be excavated down to the competent bedrock and the founding level for pipeline installation will be prepared.
- The HDPE pipeline will be installed at the required line and level.
- A 25MPa reinforced concrete encasement will be constructed around the pipeline to provide protection against erosion, impact and flotation during flood events.
- The concrete encasement will be extended across the full river width and into the riverbanks beyond the anticipated scour zone.
- The riverbed profile will be reinstated to restore the river to its original flow conditions upon completion of the works.
- Once the proposed pipelines and associated tie-in connections are near completion, the existing pipelines will be temporarily isolated to facilitate the final changeover. Following successful commissioning of the proposed pipelines, the existing pipelines will be decommissioned and will remain in situ.

Refer to **Appendix C1** for the proposed pipeline layout and **Appendix C2** for the existing pipeline layout.

Methodology for the reservoir extension

Clearing, Excavation and Work Adjacent to the Existing Reservoir

- Clearing will be limited to the footprint required for the reservoir extension, access and temporary working space.
- Bulk excavation will proceed in stages to the design formation level. Excavation immediately adjacent to the existing reservoir will be undertaken more cautiously than general bulk excavation.
- Where the excavation approaches existing reservoir pipework or other services, mechanical excavation will stop at a safe distance and the service will be exposed by hand.
- The Engineer will inspect the formation once design level is reached. Soft, loose, saturated or otherwise unsuitable material will be removed to the depth instructed and replaced with approved selected material or concrete, depending on the final structural requirement.

Construction of the Reservoir Floor Slab

- The concrete will be compacted with internal vibrators, with care taken around congested reinforcement, waterstops and pipe penetrations.
- The finished slab will be protected and cured immediately after finishing.
- Construction traffic and storage on newly cast concrete will be restricted until sufficient strength has developed.

Reservoir Wall Construction

- Wall construction will commence after the floor slab has achieved the strength required for subsequent loading.
- Wall formwork will be adequately braced to maintain the required dimensions and withstand concrete pressure.
- Defects will be recorded and repaired using an approved repair system prior to water-retention testing. Cosmetic patching will not be used to conceal defects before inspection.

Roof Slab, Access Openings and Permanent Safety Items

- Where the extension includes a reinforced-concrete roof, falsework and formwork will be erected after the walls have developed sufficient strength. The temporary works will be designed to support wet

concrete, reinforcement and construction loading without imposing unintended loads on incomplete portions of the structure.

- Roof reinforcement, access hatches, ventilation openings and other cast-in items will be installed before concrete placement. The roof will be cast, compacted and cured in accordance with the concrete specification. Falsework will remain in place until the required concrete strength has been achieved.
- Permanent ladders, access hatches, handrails, vents and other safety items will be installed after the main structural work, with penetrations sealed to maintain the integrity of the water-retaining structure.

Reservoir Pipework, Valves and Chambers

- New inlet, outlet, scour, overflow and interconnecting pipework will be installed progressively with the civil works.
- External pipe trenches will be excavated to the required line and level and prepared with the specified bedding.
- Pipes will be laid, jointed and supported in accordance with the approved drawings.
- Valves and fittings will be installed so that they remain accessible for operation and maintenance.
- Valve chambers and thrust restraint will be completed before the relevant pipeline is tested or commissioned.
- Pipework that can be installed without interfering with the existing reservoir will be completed before the shutdown of the reservoir.

Backfilling and External Finishes

- Backfilling will commence only after the relevant concrete has achieved sufficient strength and external surfaces, joints and penetrations have been inspected.
- Backfill will be placed in controlled layers and compacted using equipment appropriate to the available space.
- Permanent surface drainage will be completed so that runoff is intercepted and conveyed without ponding against the structure or discharging over disturbed slopes.

Phased Approach

The proposed pipeline upgrade will be conducted in a phased approach consisting of three (3) phases (refer to **Table 1.10** below). The Hambanathi and Tongaat South pipelines will be constructed first, followed by the Metcalfe and Belvedere pipelines.

Table 1.10: Phased approach for the proposed pipeline upgrade

Phase	Description	Pipeline Upgrades	Key Construction Activities	Programme	Duration
Phase 1 – Hambanathi and Tongaat South pipelines, and the reservoir extension	Upgrade of the bulk water pipelines serving the Hambanathi and Tongaat South supply system and the Tongaat WTW reservoir extension.	• Hambanathi Pipeline: ±2.2km with a nominal diameter (DN) of 315mm. • Tongaat South: ±8.4km with a DN of 315mm.	• Construction of new bulk water pipelines and reservoir extensions/upgrades. • Maintenance of existing water supply during construction. • Completion of the tie-in points at the treatment works and reservoir connection points. • Construction of river crossings using concrete-encased pipelines where required. • Temporary flow diversion and reinstatement of affected watercourses following river crossing construction.	Financial Years 2028 - 2029	±24 Months
Phase 2 – Metcalfe	Upgrade of the bulk water pipeline serving the Metcalfe supply system.	• ±3.5km with a DN of 315mm.	• Construction from treatment works towards reservoirs. • Existing pipelines to remain operational during construction. • Tie-ins at treatment works and reservoir connection points upon completion. • River crossing via concrete-encased pipeline. • Two-phase river crossing construction using temporary earth berms and channel reinstatement.	Financial Years 2029 - 2030	±12 Months
Phase 3 – Belvedere	Upgrade of the bulk water pipeline serving the Belvedere supply system.	• ±3.2km with a DN of 400mm. • ±5.1 km with a DN of 250mm.	• Construction from treatment works towards reservoirs. • Existing pipelines to remain operational during construction. • Tie-ins at treatment works and reservoir connection points upon completion. • River crossing via concrete-encased pipeline. • Two-phase river crossing construction using temporary earth berms and channel reinstatement.	Financial Years 2030 - 2031	±18 Months

1.3 Specialist Studies

The following specialist studies were conducted to inform the basic assessment process:

- Ecological Assessment compiled by Wallace and Green (May, 2026).
- Freshwater Assessment compiled by The Biodiversity Company (March, 2026).
- Heritage Impact Assessment compiled by Umlando Archaeological Surveys and Heritage Management (February, 2026).

Ecological Assessment:

The Ecological Assessment was conducted by Wallace and Green (Pty) Ltd (March, 2026). The findings of the assessment are summarised below:

- As per the specialists pre-site investigation, the natural vegetation identified for proposed development area is classified as KwaZulu-Natal Coastal Belt Grassland and Lowveld Riverine Forest.
- The following three (3) vegetation types were identified by the specialist:
    - Grassland vegetation;
    - Riparian vegetation; and
    - Alien dominated vegetation.
- Portions of the pipeline are dominated with sugarcane cultivation.
- It is estimated that the clearance of indigenous vegetation will be approximately 7000m^2.
- The study concluded that a large portion of the project area is dominated by invasive alien species and the species richness and composition are not a good representation of the natural vegetation associated with this area.
- Proposed Bulk Water Pipeline Upgrade:
    - Portions of the pipeline routes traverse Critical Biodiversity Areas (CBA), however the affected area is largely degraded, with approximately 50% of the plant species comprising invasive alien species and not representative of the natural vegetation for the area.
    - The proposed pipelines traverse a Durban Metropolitan Open Space System. The conservation value of the area along the pipeline route is low, the area is dominated by invasive alien plant species. The species richness and composition are not a good representation of the natural vegetation associated with this area. Most of the DMOSS areas are associated with drainage lines and the Tongaat River.
    - The proposed pipeline is characterised by Grassland, Riparian and Alien dominated vegetation.
    - The portion of the pipeline characterised by grassland vegetation consists of good quality grassland vegetation with a ground cover of 60 - 80%. Portions of the grassland vegetation are of moderate sensitivity and should be protected by limiting disturbances to the area and implementing all recommended mitigation measures.
    - The riparian vegetation is characterised by high alien species infestations with little element of the natural vegetation type, Lowveld Riverine Forest.
    - One(1) species of conservation concern (SCC) species were found along the pipeline route, namely: *Hypoxis hemerocallidea*.
        - 29°33'19.88"S, 31° 7'2.08"E
        - 29°32'58.55"S, 31° 6'58.15"E
        - 29°32'58.65"S, 31° 6'56.18"E
    - Two (2) protected tree species were found along the pipeline route, namely:
        - Four (4) *Barringtonia racemosa* (Nationally Protected)
            - 29°35'1.27"S, 31° 5'28.89"E
            - 29°34'21.56"S, 31° 5'56.52"E.
        - Two (2) *Podocarpus falcatus* (Nationally Protected)
            - 29°34'45.32"S, 31° 5'32.90"E.
    - A permit for the Department of Forestry, Fisheries and the Environment will be required if these trees are to be removed, trimmed or relocated.

  - A permit from Ezemvelo KZN Wildlife will be required to relocate, remove or trim the *Barringtonia racemosa* trees.
- Proposed Reservoir Extension:
  - The proposed reservoir extension traverses a Durban Metropolitan Open Space System.
  - The TWTW inclusive of the proposed reservoir extension is characterised by alien dominated vegetation. These areas are highly disturbed with little to no indigenous plant species.
- Habitats within the study area varied from "Very Low" to "High" Site Ecological Importance (SEI).
- Results of the ecological assessment indicated that the proposed upgrade of the Tongaat Bulk Water pipeline will have minimal impacts on the surrounding vegetation, and impacts can be managed through the implementation of the specialist's mitigation measures.

Please refer to **Appendix D1 – Ecological Assessment**

Freshwater Assessment:

A Freshwater Assessment was conducted by The Biodiversity Company (March, 2026). The findings are summarised below:

Riverine Assessment

- Two (2) river systems were identified along the pipeline route, namely; Tongati and Hlawe rivers.
- The in-situ water quality results indicated no water quality perturbations in the Tongati and Hlawe rivers as all measured parameters fell within guideline limits.
- The results for the instream and riparian Index of Habitat Integrity (IHI) assessment for the associated river reaches are presented as Class D – Largely Modified, indicating a large loss of natural habitat, biota, and basic ecosystem function.
- Anthropogenic activities within the local area and catchment that have contributed to the deteriorated state of the system include extensive sand mining, urbanisation, proliferation of alien and invasive vegetation, water abstraction, and instream impoundments leading to inundation and flow modifications, rubbish dumping and channel modifications
- The sampled reaches were considered to have habitat types capable of supporting a low to moderate diversity of macroinvertebrates and the limited flow class diversity may be considered a hindrance to a highly diverse macroinvertebrate assemblage.
- A good diversity of macroinvertebrate communities was sampled at Tongati River. This can be attributed to good water quality at this site (indicated by in-situ results). However, there were multiple expected macroinvertebrate communities that were absent within the watercourse.
- The Present Ecological Status (PES) assessment indicated that the Tongati and Hlawe rivers were in a class D 'Largely Modified' state.
- The recommended post-mitigation buffer for the for the construction and operational phase of the development is 20m for the Tongati and Hlawe Rivers.
- Based on the results of the Risk Assessment Matrix, all identified risks associated with the proposed activities have been calculated as "Low" and are acceptable, provided that the recommended mitigation measures are fully implemented.

Wetland Assessment

- The total wetland area within the project area amounts to 36.84Ha and approximately 0.383Ha of wetland, amounting to 1.040% of the total wetland area, is directly intersected by proposed project.
- The average ecosystem services score for the wetlands fall within between the "Moderately Low" and "Moderately High" classes.
- Present Ecological State (PES) assessments indicate that the wetlands range from "Moderately Modified" to "Seriously Modified", and present an Ecological Importance and Sensitivity (EIS) of "Low" to "Moderate".
- Proposed Bulk Water Pipeline Upgrade:

  - The following fourteen (14) hydrogeomorphic units were identified within along the proposed pipeline route (see Figure 2.6):
    - Four (4) unchannelled valley-bottoms;
    - Five (5) channelled valley-bottoms;
    - Four (4) seeps; and
    - One (1) depression wetland.
  - The study noted that the pipeline upgrades will have a have a “Low” post-mitigation risk on the wetland systems.
  - A dam, various drainage lines and a canals were also identified within the project area.
- Proposed Reservoir Extension:
  - A portion of the proposed reservoir extension traverses a channelled valley-bottom wetland (HGM 4) (see Figure 2.6).
  - The study noted that the construction of the reservoir extension will have a have a “Low” post-mitigation risk on the wetland system.
- It must be noted that the project area has experienced disturbance from previous activities, namely infrastructure, residential, commercial and agricultural practices, as well as an existing pipeline servitude.
- The recommended post-mitigation buffers for the construction and operational phase of the development is 20m for the channelled and unchannelled valley-bottoms wetlands and 15m for the drainage lines, and seep and depression wetlands.
- Based on the results of the Risk Assessment Matrix, all identified risks associated with the proposed activities have been calculated as “Low” and are acceptable, provided that the recommended mitigation measures are fully implemented.

Please refer to **Appendix D2** – Freshwater Assessment

Heritage Impact Assessment:

The Heritage Assessment was conducted by Umlando Archaeological Surveys and Heritage Management, dated February 2026. The findings of the assessment are summarised below:

- The bulk pipeline traverses previously disturbed land or existing servitudes which reduces heritage risks.
- The Desktop Study noted that the Tongaat area is historically rich, with known Stone Age, Iron Age, and sites relating to Indian indentured labour heritage. Historical maps indicate long-term sugarcane cultivation and former farm infrastructure. However, no previously recorded heritage sites fall within 100m of the pipeline footprint.
- The historic Pioneer Peace Monument was identified 21m from the existing pipeline and 20m west of the proposed Tongaat South pipeline, at the following geographical co-ordinates 29°34'44.23"S; 31° 5'33.71"E. This monument is of high significance and must not be affected. A high visibility buffer/screen must be implemented at least 10m from the monument during the construction phase. In addition, this would need to be photographed as evidence for mitigation and uploaded onto SAHRIS.
- A section of the existing pipeline went through an area where workshops from the Farm Aberfoyle occurred. These buildings have been demolished some time age, and likely before the pipeline was established. There is no evidence of these buildings in their original locations.
- Subsequent to the desktop Heritage Assessment, a desktop Paleontological Assessment was conducted by Dr Alan Smith. Paleontological material is unlikely to be encountered however, a “Chance Find Protocol” must be implemented and would need to from part of the EMPr.
- It is the opinion of the Specialist that the activity may be authorised, provided that appropriate mitigation measures are implemented.

Please refer to **Appendix D3** – Heritage Impact Assessment

Table 1.11 below makes reference to specialist studies identified in the NEMA Screening Tool (**Appendix J2**). As per the Screening Tool, it is the responsibility of the EAP to confirm the list and to motivate in the assessment report, the reason for not including any of the identified specialist study.

Table 1.11: Specialist Studies from the NEMA Screening Tool

Specialist Study	Motivation
Landscape/Visual Impact Assessment	This assessment was not undertaken as the proposed project is for an underground pipeline upgrade and a reservoir extension within an existing water treatment works. As such, the proposed development will not have any visual impacts and this assessment is not applicable to the project.
Archaeological and Cultural Heritage Impact Assessment	Please refer to Appendix D3 – Heritage Impact Assessment. The historic Pioneer Peace Monument was identified 21m from the existing pipeline and 20m west of the proposed Tongaat South pipeline, at the following geographical co-ordinates 29°34'44.23"S; 31° 5'33.71"E. This monument is of high significance and must not be affected. A high visibility buffer/screen must be implemented at least 10m from the monument during the construction phase.
Palaeontology Impact Assessment	Please refer to Appendix D3 – Heritage Impact Assessment. The proposed development is in an area of moderate and no palaeontological sensitivity. This project will be constructed within soil formed from the Pietermaritzburg Formations, the Dwyka Group and the Karoo Dolerite. Paleontological material is unlikely to be encountered however a “Chance Find Protocol” has been included.
Terrestrial Biodiversity Impact Assessment	Please refer to Appendix D1 – Ecological Assessment. The study indicated that the Site Ecological Importance varies from High to Very Low due to the 60 – 80% ground cover of the grassland habitat as well as the alien infestations in the riparian and alien dominated habitats. The study noted Low risks associated with the proposed project, with the potential spread of invasive alien species within the grassland habitat and the loss of Species of Conservational Concern being moderate.
Aquatic Biodiversity Impact Assessment	Please refer to Appendix D2 – Freshwater Assessment. The study indicated that the project will pose a “Low” post-mitigation risks, provided that the mitigation measures outlined in the report are strictly adhered to during the construction phase. The specialist is of the opinion that no fatal flaws are evident for the proposed project.
Hydrology Assessment	Please refer to Appendix D2 – Freshwater Assessment. The study indicated that the project will pose a “Low” post-mitigation risks, provided that the mitigation measures outlined in the report are strictly adhered to during the construction phase. The specialist is of the opinion that no fatal flaws are evident for the proposed project.
Socio-Economic Assessment	This assessment was not undertaken as the proposed project will provide a positive socio-economic impact by improving Basic Services (i.e., undisturbed water supply) for the community. In line with the eThekwini Integrated Development Plan (2026/2027), the project gives practical effect to the service delivery and infrastructure objectives by strengthening existing municipal infrastructure, improving water security, supporting communities and economic activities, and enhancing the long-term resilience of the bulk water supply system.
Plant Species Assessment	Please refer to Appendix D1 – Ecological Assessment. The study indicated that the Site Ecological Importance varies from High to Very

	Low due to the 60 – 80% ground cover of the grassland habitat as well as the alien infestations in the riparian and alien dominated habitats.
Animal Species Assessment	Please refer to Appendix D2 – Freshwater Assessment. Portions of the proposed project are located within a watercourse and the study found "Low" post-mitigation risks on aquatic and semi-aquatic fauna. The proposed works are located predominantly within existing road reserves, established service corridors, and previously disturbed areas where natural habitat has already been significantly modified.

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

2014 NEMA EIA Regulations (as amended), Appendix 1- 3(i) all listed and specified activities triggered and being applied for:

Table 1.12: Listed and specified activities triggered and being applied for

GNR	Activity Number	Activity as per legislation	Activity applicability
Listing Notice 1 (Basic Assessment)			
Government Notice Regulation (GNR) No. 327 of the EIA Regulation (2014)	Activity 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* ***(i) a watercourse;*** (ii) the seashore; or *(iii)the littoral active zone, an estuary or a distance of 100 metres* *inland of the high-water mark of the sea or estuary, whichever* *distance is the greater—* *but excluding where such infilling, depositing, dredging, excavation, removal or Moving —* *(a) will occur behind a development setback;* *(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; [or]* *(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;* *(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or* *(e) where such development is related to the development of a port or harbour, in* *which case activity 26 in Listing Notice 2 of 2014 applies.*	**The proposed pipeline upgrades and reservoir extension involves the infilling of 20 625m^3 of material into the following watercourses:** • **Two (2) unchanneled valley-bottom wetlands.** • **Four (4) channelled valley-bottom wetlands.** • **Two (2) seep wetlands** • **One (1) depression wetland.** • **Tongati River** • **Hlawe River**
	Activity 67	*Phased activities for all activities—* ***(i) listed in this Notice, which commenced on or after the effective date of this Notice;*** *or*	**The proposed upgrade triggers Listing Notice 1, Activity 19 and will be conducted in the following phases:**

		(ii) similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices; *where any phase of the activity may be below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold;* *excluding the following activities listed in this Notice-* *17(i)(a-d);* *17(ii)(a-d);* *17(iii)(a-d);* *17(iv)(a-d);* *17(v)(a-d);* *20;* *21;* *22;* *24(i);* *29;* *30;* *31;* *32;* *34;* *54(i)(a-d);* *54(ii)(a-d);* *54(iii)(a-d); 54(iv)(a-d);* *54(v)(a-d);* *55;* *61;* *62;* *64; and* *65* *where any phase of the activity was below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold.*	**<u>Phase 1 – Hambanathi and Tongaat South pipeline upgrade</u>** **(±24 Months)** • **Upgrade of ±2.2km of the DN315 pipeline (Hambanathi).** • **Upgrade of ±8.4km of the DN315 pipeline (Tongaat South).** • **Phase 1 will be conducted within the 2028 and 2029 financial years.** **<u>Phase 2 – Metcalfe pipeline upgrade (±12 Months)</u>** • **Upgrade of ±3.5km of the DN315 pipeline (Metcalfe).** • **Phase 2 will be conducted within the 2029 and 2030 financial year.** **<u>Phase 3 – Belvedere (±18 Months)</u>** • **Upgrade of ±3.2 km of the DN400 pipeline.** • **Upgrade of ±5.1km of the DN250 pipeline.** • **Phase 3 will be conducted within the 2030 and 2031 financial years.**
Listing Notice 3 (Basic Assessment)			
Government Notice Regulation (GNR) No. 324 of the EIA Regulation (2014)	Activity 2	*The development of reservoirs for bulk water supply, excluding dams, with a capacity of more than 250 cubic metres.* ***d. KwaZulu-Natal*** *i. Trans-frontier protected areas managed under international conventions;* *ii. Community Conservation Areas;* *iii. Biodiversity Stewardship Programme Biodiversity Agreement areas;* *iv. World Heritage Sites;* *v. In an estuarine functional zone;*	**The proposed reservoir extension at the Tongaat Water Treatment Works will have a bulk water storage capacity by 1 200m³ and traverses CBA and D'MOSS.** **As per the Ecological Assessment conducted by Wallace and Green (Pty) Ltd (2026), the conservation value of the**

		vi. In a protected area identified in terms of NEMPAA, excluding conservancies; *vii. Sites or areas identified in terms of an international convention;* ***viii. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*** *ix. Core areas in biosphere reserves;* *x. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose;* *xi. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;* *xii. Outside urban areas:* *(aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; or* *(bb) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or* *xiii. Inside urban areas:* ***(aa) Areas zoned for use as public open space;*** *(bb) Areas seawards of the development setback line or within 100 metres from the high-water mark of the sea if no such development setback line is determined; or* *(cc) Within urban protected areas.*	**DMOSS area is low as the area is dominated by invasive alien plant species. The species richness and composition are not a good representation of the natural vegetation associated with this area.** **The site is located within an urban area.** **Refer to Appendix D1 for a full species list.**
Government Notice Regulation (GNR) No. 324 of the EIA Regulation (2014)	Activity 12	*The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* ***d. KwaZulu-Natal*** *i. Trans-frontier protected areas managed under international conventions;* *ii. Community Conservation Areas;* *iii. Biodiversity Stewardship Programme Biodiversity Agreement areas;* *iv. 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,*	**As per the Ecological Assessment conducted by Wallace and Green (Pty) Ltd (2026), sections of the proposed pipeline upgrades intercepts a CBA and will involve the clearance of approximately 7000m^2 of indigenous vegetation (e.g. Sporobolus pyramidalis, Cheilanthes viridis, Cyperus albostriatus, and Cynodon dactylon).**

		within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ***v. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*** *vi. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas;* ***vii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning;*** *viii. A protected area identified in terms of NEMPAA, excluding conservancies;* *ix. World Heritage Sites;* *x. Sites or areas identified in terms of an international convention;* *xi. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;* *xii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; or* *xiii. In an estuarine functional zone.*	**Refer to Appendix D1 for a full species list.**
	Activity 26	*Phased activities for all activities—* ***i. listed in this Notice and as it applies to a specific geographical area, which commenced on or after the effective date of this Notice****; or* *ii. similarly listed in any of the previous NEMA notices, and as it applies to a specific geographical area, which commenced on or after the effective date of such previous NEMA Notices—* *where any phase of the activity may be below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold; —* *excluding the following activities listed in this Notice—* *7;* *8;* *11;* *13;* *17;* *20;* *21; and*	**The proposed upgrade triggers Listing Notice 3, Activities 2 and 12, and will be conducted in the following phases:** **<u>Phase 1 – Hambanathi and Tongaat South pipeline upgrade</u>** **(±24 Months)** • **Upgrade of ±2.2km of the DN315 pipeline (Hambanathi).** • **Upgrade of ±8.4km of the DN315 pipeline (Tongaat South).** • **Phase 1 will be conducted within the 2028 and 2029 financial years.**

		24.	**<u>Phase 2 – Metcalfe pipeline upgrade (±12 Months)</u>** • **Upgrade of ±3.5km of the DN315 pipeline (Metcalfe).** • **Phase 2 will be conducted within the 2029 and 2030 financial year.** **<u>Phase 3 – Belvedere (±18 Months)</u>** • **Upgrade of ±3.2 km of the DN400 pipeline.** • **Upgrade of ±5.1km of the DN250 pipeline.** • **Phase 3 will be conducted within the 2030 and 2031 financial years.**

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

2014 NEMA EIA Regulations (as amended), Appendix 1- 3(H) a full description of the process followed to reach the proposed preferred alternative within the site, including (i), (iv).

*"**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 (Only Site Alternative): Upgrade of the Tongaat Bulk Water Pipelines and Reservoir Extension located within oThongathi, eThekwini Metropolitan Municipality, KwaZulu-Natal. The property details are provided in Table 1.6.

Table 1.13: Property Details

Province/s	KwaZulu Natal
Municipality/ies	eThekwini Metropolitan Municipality
Ward number/s	58, 61, 62
Nearest town/s	Tongaat and Hambanathi
Portion number/s	Refer to **Appendix J6** – Property Details

(b) The type of activity to be undertaken

The eThekwini Municipality intends to upgrade the TWTW's bulk water pipeline system. **Table 1.9** below outlines the existing and the proposed pipeline infrastructure.

Table 1.14: Existing and proposed pipeline infrastructure

Pipeline	Existing Pipeline	Pipeline Upgrade
Tongaat South	Length: 8.4Km Diameter: 250mmø	Length: 8.4Km Diameter: 315mmø

	Material: unplasticized polyvinyl chloride (uPVC)	Material: High-density Polyethylene (HDPE) Distance from existing pipeline: 0 – 156m
Hambanathi	Length: 2.2Km Diameter: 250mm⌀ and 300mm⌀ Material: Steel and Asbestos Cement	Length: 2.2Km Diameter: 315mm⌀ Material: HDPE Distance from existing pipeline: 0 – 86m
Metcalfe	Length: 3.5Km Diameter: 250mm⌀ Material: uPVC	Length: 3.5Km Diameter: 315mm⌀ Material: HDPE Distance from existing pipeline: 0 – 83m
Belvedere	Length: 8.3Km Diameter: 300mm⌀ and 400mm⌀ Material: Steel	Length: 3.2Km and 5.1Km Diameter: 400mm⌀ and 250mm⌀ Material: HDPE Distance from existing pipeline: 0 – 152m

Once the proposed pipelines and associated tie-in connections are near completion, the existing pipelines will be temporarily isolated to facilitate the changeover. Following successful commissioning of the proposed pipelines, the existing pipelines will be decommissioned and will remain in situ.

An onsite storage reservoir with a capacity of 1 775m^3 exists within the TWTW. As per the Design Report compiled by Naidu Consulting (April, 2026), the capacity analysis for the existing storage is insufficient for the proposed pipeline upgrades as the reservoir capacity only allows for approximately 0.6 hours of operational storage based on all the pumps operating simultaneously to pump water to the various reservoirs. The Design Report noted that the peak operating flow of the TWTW must be managed to mitigate excessively draining the onsite storage as well as limiting down time on the system.

As such, eThekwini Municipality: Water and Sanitation Unit intends on extending the existing reservoir at the TWTW's from a capacity of 1 775m^3 to a capacity of 2 975m^3. The reservoir extension will comprise of a separate storage unit with a capacity of 1 200m^3, to supplement the existing storage unit on site. The storage units will be linked with pipe work and will not disrupt the existing structure. The reservoir extension will comprise of 30m(L) x 10m(W) x 5m(H) reinforced concrete.

(c) The design or layout of the activity

Alternative A1 (Only layout alternative): The proposed layout is as per Drawing No. D791-51-5000-A REV. 0 compiled by Naidu Consulting (Pty) Ltd, dated November 2025.

No layout alternatives are applicable as the project is aimed at provided uninterrupted water supply to Tongaat and the surrounding areas. Furthermore, the proposed pipelines are located along the existing pipeline servitude. Refer to **Figures 1.2** and **Appendix C1,** illustrating the proposed pipeline layout and the proposed reservoir extension within the TWTW.

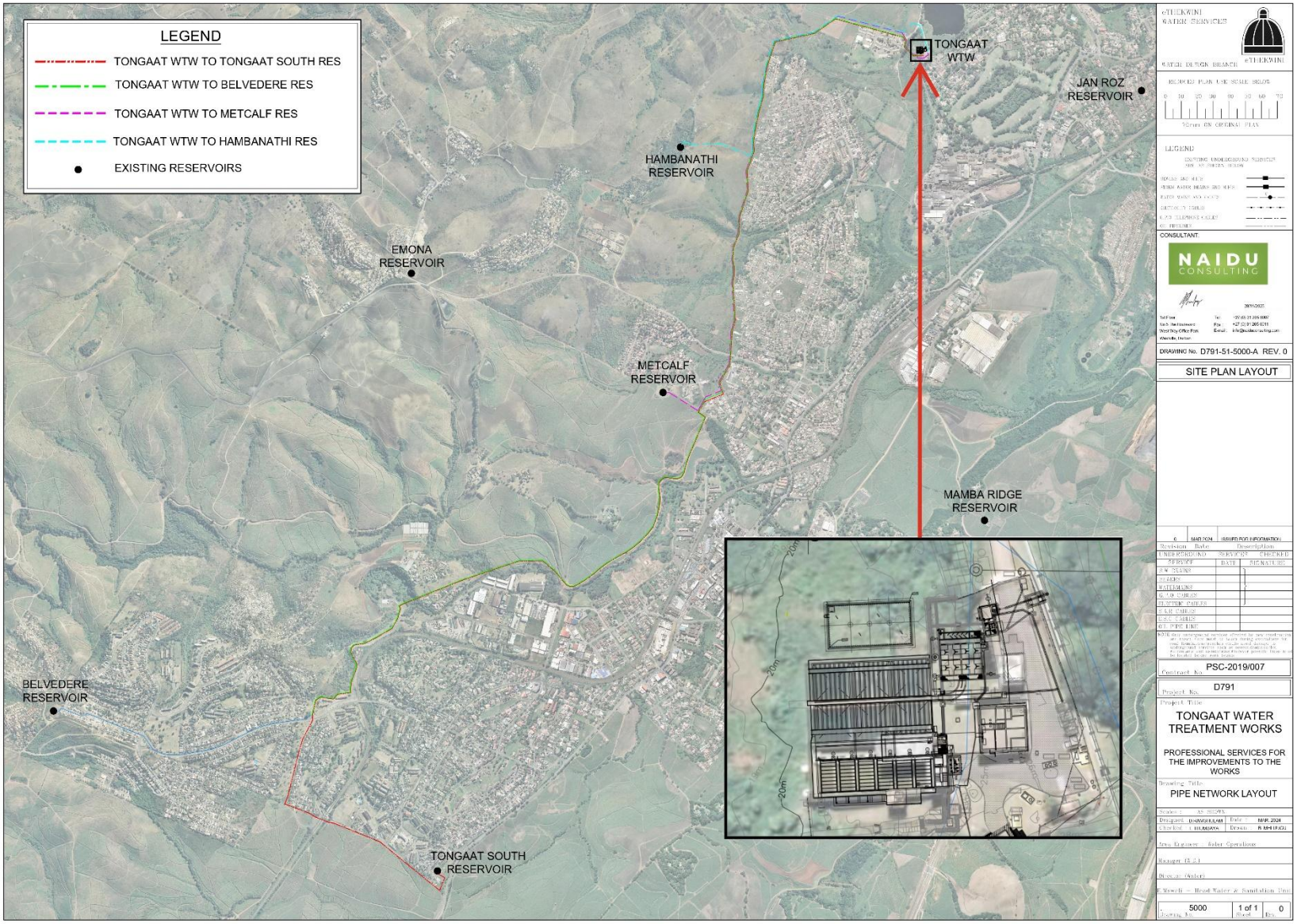


Figure 1.2: Overall layout

(d) The technology to be used in the activity

Two(2) technology alternatives were investigated for the proposed bulk water pipelines and the associated watercourse crossings. The proposed pipelines traverse various watercourses along the route and as such, the feasibility and environmental impact of the different watercourse crossing methodologies were assessed.

- **Technology Alternative T1 (Preferred): The proposed installation of below ground pipelines which will be laid in a trench with a 25MPa reinforced concrete encasement.**

Alternative T1 involves the excavation of the riverbed and the laying of pipeworks below the watercourse, within reinforced concrete encasements. The methodology for Alternative T1 is outlined below:

Temporary flow diversion

- To avoid disrupting the river flow during construction, the works will be undertaken in two segments using temporary earth berms to divert the flow.
- For Segment 1, an earth berm will be constructed to temporarily divert a portion of the river flow, allowing the pipeline to be laid and encased on one side of the river crossing.
- Upon completion of Segment 1, the earth berm will then be removed and the riverbed will be rehabilitated to the pre-disturbed topography.
- The earth berm will then be reconstructed along the opposite bank to divert the flow to the completed side.
- Segment 2 will be constructed in a similar manner, completing the remaining section of the pipeline encasement.
- Upon completion of Segment 2, the earth berm will then be removed and the riverbed will be rehabilitated to the pre-disturbed topography.
- Galvanized dowel bars will be anchored into the bedrock to improve structural stability of the encasement.

Installation of the pipeline within the watercourse

- The watercourse crossing will be excavated down to the competent bedrock and the founding level for pipeline installation will be prepared.
- The HDPE pipeline will be installed at the required line and level.
- A 25MPa reinforced concrete encasement will be constructed around the pipeline to provide protection against erosion, impact and flotation during flood events.
- The concrete encasement will be extended across the full river width and into the riverbanks beyond the anticipated scour zone.
- The riverbed profile will be reinstated to restore the river to its original flow conditions upon completion of the works.

Alternative T1 was ranked as the preferred watercourse crossing method following a detailed assessment of impacts using the mitigation hierarchy. Other aspects as provided below in **Table 1.15** further deemed this alternative as being environmentally and financially suitable.

- **Technology Alternative T2 (Not Supported): Trenchless watercourse crossing using Horizontal Directional Drilling (HDD).**

Alternative T2 involves the installation of the pipeline below ground using a trenchless Horizontal Directional Drilling (HDD). The methodology for the HDD alternative is outlined below:

- The drilling entry and exit points will be established outside the watercourse and, where practicable, beyond the riparian zone.
- Temporary drilling pads will be prepared and the HDD drilling equipment, the drilling fluid management system, and the ancillary plant will be positioned at the entry and exit locations.

- A pilot borehole will be drilled beneath the watercourse along the designed alignment using a steerable drilling system.
- The HDPE pipeline will be thread through the enlarged borehole in a single continuous operation using the HDD rig.
- Drilling fluid circulation must be monitored throughout the drilling process and the appropriate containment and contingency measures must be implemented to manage any inadvertent drilling fluid returns.
- The installed pipeline will then be connected to the remainder of the proposed pipeline network at the entry and exit points.
- All temporary works and drilling equipment will be removed and all disturbed areas will be rehabilitated to pre-disturbed conditions..

Table 1.15 below outlines the advantages and disadvantages of Technology Alternatives T1 and T2.

Table 1.15: Comparative Analysis of Alternative T1 (Preferred) and Alternative T2 (Not Supported)

Technology Alternative T1 (Preferred)	Technology Alternative T2 (Not Supported)
The reinforced concrete encasement provides long-term protection against erosion, scour, impact, and buoyancy during extreme precipitation events.	There is no protection against environmental factors such as erosion and scouring which increases the risk of borehole collapse.
Greater certainty and visualisation of underground conditions.	Technical risks such as borehole instability and deviation from the intended alignment. Inability to visualise the underground pipeline.
Quality control of the pipeworks can be conducted prior to backfilling.	Inability to visualise the underground pipeline.
No risk of inadvertent drilling fluid (frac-outs) polluting the watercourse and/or riparian area.	Potential for inadvertent drilling fluid returns (frac-outs) to pollute the watercourse and/or riparian area.
Does not require highly specialised equipment and expertise.	Requires highly specialised equipment and expertise.
Overall lower construction cost.	Comparatively larger construction cost due to the HDD Drill and Rig, and the skilled contractors required. Additionally, frac-out clean up is expensive.

(e) The operational aspects of the activity

The operational aspects relate to the daily operations of the Tongaat Bulk Water system and the reservoir extension. The management of the Tongaat Bulk Water Pipelines Upgrade and Reservoir extension will be managed in accordance with the following eThekwini Municipality Standard Operating Procedures (SOP's).

Proactive Reticulation Maintenance Procedure

The eThekwini Municipality Proactive Reticulation Maintenance SOP comprises the following:

- The Professional Technologist drafts a maintenance plan for the financial year.
- The Professional Technologist allocates the plan to different resources.
- The Senior Technician receives the plan.
- The Senior Technician prioritise the plan using maintenance matrix.
- The Senior Technician assign the resources to the maintenance plan.
- The Senior Technician request for the job card from Control.
- The Artisan Plumber receives the job card and proceeds to site.
- The Artisan Plumber conducts the pre task risk assessment.
- The Artisan Plumber determines if all risks on site are controllable.
- If not, the Artisan Plumber informs the Technician.
- The Senior Technician investigate and provides feedback to Artisan Plumber.
- If all risks are controllable, the Artisan Plumber determine if all material is available.

- If not, the Artisan Plumber orders the required material.
- The Artisan Plumber determines if all ordered material is available.
- If not, the Artisan Plumber escalates to Senior Technician.
- The Senior Technician escalates to Stores/ Supply Chain Management and provides feedback.
- If the material is available, the Artisan Plumber executes the task.
- The Artisan Plumber completes the checklist form.
- The Artisan Plumber provides the completion code to Senior Technician.
- The Superintendent checks the dashboard from the Faultman system.
- The Superintendent prioritises inspections.
- The Superintendent conducts the site inspections.
- The Superintendent determines if all is in order upon the site inspection
- If not, the Superintendent creates a new task and request a job card from the Senior Technician.
- If all is in order, the Superintendent completes the job on the clipboard.
- The Superintendent sends the checklist for capturing to Senior Technician.
- The Senior Technician captures the checklist on the database.
- The Senior Technician compiles a report.

Refer to **Appendix J3** - Proactive Reticulation Maintenance Procedure

Leak Tracing Procedure

The eThekwini Municipality Leak Tracing SOP comprises the following:

- The Leak Tracer books with the Control Centre.
- The Leak Tracer receives job number from the Control Centre.
- The Leak Tracer proceeds to site.
- The Leak Tracer conducts pre task risk assessment.
- The Leak Tracer determines if all risks are controllable.
- If the risks are not controllable, the Leak Tracer reports to Superintendent.
- The Superintendent reports all risks to the relevant stakeholder.
- The Superintendent receives feedback from stakeholders and provides it to Leak Tracer.
- If the risks are controllable or within the control of the Leak Tracer, the Leak Tracer takes the necessary actions. The Leak Tracer traces the leak after all the risks have been resolved.
- The Leak Tracer determines if the leak is traceable or not.
- If the leak is not traceable, the Leak Tracer notifies the Superintendent and transfers to relevant stakeholder.
- The Superintendent conducts further tracing.
- The Superintendent determines if the leak has been identified or not.
- If the leak is not identified, the Superintendent escalates the fault to Water Services Assessor.
- The Superintendent receives feedback from Water Services Assessor and informs the Leak Tracer.
- If the leak is traceable, the Leak Tracer determines if the leak is on potable water or not.
- If the leak is not on potable water, the Leak Tracer takes the sample and sends it to the Laboratory.
- The Leak Tracer receives the results and sends it to the Superintendent/ Technician.
- The Technician analyses and forwards the results to relevant stakeholder.
- If the leak is on the potable water, the Leak Tracer reports to Controller for repairs.

Refer to **Appendix J4** – Leak Tracing Procedure

Water Pipe Repair Procedure

The eThekwini Municipality Water Pipe Repair SOP comprises the following:

- The Artisan Plumber receives jobs from the Faultman system.
- The Artisan Plumber book by informing Control.
- The Artisan Plumber determines if the supply of water has been isolated.
- If not, the Artisan Plumber conducts the isolation by ensuring that all valves closest to the burst have been isolated.
- If the supply is isolated, the Artisan Plumber conducts a pre task risk assessment.
- The Artisan Plumber determines if all risks are controllable.
- If not, the Artisan Plumber escalates to Superintendent.
- The Superintendent coordinates necessary support and provides feedback to Artisan Plumber.

- The Artisan Plumber determines if plant support is required or not.
- If yes, the Artisan Plumber informs the Work Scheduler.
- The Artisan Plumber requests for plant support.
- The Artisan Plumber determine if the plant is available.
- If the plant is not available, the Artisan Plumber escalates the matter to management and provides feedback.
- If the plant support is not required, the Artisan Plumber determines if shoring is required.
- If yes, the Artisan Plumber request for support from the Superintendent.
- If not, the Artisan Plumber determines the material required for the job.
- The Artisan Plumber orders required material.
- The Artisan Plumber determines if all material required for the job is available.
- If not, the Artisan Plumber defers the job until all material is available.
- If no material is required or all material required is available, the Artisan Plumber conduct the repairs.
- The Artisan Plumber determines if assistance is required.
- If yes, the Artisan Plumber escalates to the Superintendent.
- The Superintendent receives the job and proceeds to site.
- The Superintendent provides technical assistance and the Artisan Plumber completes the job.
- If no assistance is required, the Artisan Plumber determines if re-instatement is required.
- If yes, Artisan Plumber request a backfill and provides an hourly update.
- The Artisan Plumber scour and charge the line.
- The Artisan Plumber determines if the repairs were completed successfully.
- If not, the Artisan Plumber informs the Superintendent.
- The Superintendent assesses and makes a decision.
- The Superintendent escalates the job to relevant department.
- If there's no need for re-instatement and repairs were successfully completed, the Artisan Plumber completes the job.
- The Artisan Plumber updates the Control Centre with completion codes.

Refer to **Appendix J5** – Water Pipe Repair Procedure

(f) The option of not implementing the activity

The no-go alternative involves not undertaking the proposed bulk water pipeline upgrade and reservoir extension, resulting in the continued operation of the existing ageing water supply infrastructure and the inadequate water storage capacity for the growing beneficiaries. While this option would avoid the short-term construction-related impacts associated with the proposed works, it would not address the existing infrastructure deficiencies or improve the long-term reliability and capacity of the bulk water supply network.

From a social perspective, the no-go alternative is not preferred as it would increase the risk of water supply interruptions, reduced service reliability, and inadequate infrastructure to meet current and future water demands. A reliable potable water supply is essential for supporting residential communities, public institutions, and commercial and industrial users. Failure to upgrade the existing infrastructure could result in more frequent pipe failures, prolonged service disruptions, and reduced resilience of the water supply system, ultimately affecting the quality of life and public health of the communities served by the network.

From a socioeconomic perspective, retaining the existing infrastructure would likely lead to increased maintenance and repair costs associated with ageing pipelines and excessive draining of the existing storage reservoir, as well as the financial implications of emergency repairs and unplanned service outages. Water losses resulting from leaks and pipe failures would continue to reduce the operational efficiency of the bulk water system, increasing operating costs and placing additional pressure on municipal resources. Furthermore, an unreliable water supply could constrain future residential, commercial, and industrial development within the area, thereby limiting opportunities for economic growth and investment.

From an environmental perspective, while the no-go alternative would avoid the temporary construction-related disturbance to watercourses, vegetation, and surrounding habitats, it would not eliminate the ongoing

environmental risks associated with deteriorating infrastructure. Continued leakage from ageing pipelines would result in unnecessary water losses from an already constrained resource, reducing the efficiency of water resource utilisation. In addition, pipeline failures could lead to uncontrolled erosion, sedimentation, and localised disturbance to surrounding environments where emergency repairs become necessary. The planned infrastructure upgrades allow environmental impacts to be anticipated, assessed, and mitigated through the implementation of appropriate environmental management measures, whereas emergency repairs are often undertaken under urgent conditions with limited opportunity for environmental planning.

Overall, although the no-go alternative avoids the immediate impacts associated with the construction phase, it fails to meet the project's objectives of improving the reliability, capacity, and resilience of the bulk water supply system. Considering the long-term socioeconomic and environmental consequences of maintaining the existing infrastructure, the no-go alternative is not considered a feasible or sustainable option.

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

2014 EIA Regulations, Appendix 1- 3(b) the location of the activity, including: (i) the 21 Surveyor General code of each cadastral land parcel.

Table 1.16: Location of the Proposed Activity

Province/s	KwaZulu-Natal
Municipality/ies	eThekwini Metropolitan Municipality
Ward number/s	58, 61, 62
Nearest town/s	Tongaat and Hambanathi
Portion number/s	Refer to **Appendix J6** – Property Details

Site Alternative (Only site alternative)

Alternative S1:	Size of the Activity	Co-ordinates (start and end)	
Pipeline Footprint	**Tongaat South** Size – 2 646m^2 Length – 8.4km Diameter – 315mmØ	Start: 29°32'42,05"S; 31°07'41,90"E	End: 29°35'13,26"S; 31°05'59,81"E
	Hambanathi Size – 693m^2 Length – 2.2km Diameter – 315mmØ	Start: 29°32'41,41"S; 31°07'42,94"E	End: 29°32'58,59"S; 31°06'50,96"E
	Metcalfe Size – 1 102.5m^2 Length – 3.5km Diameter – 315mmØ	Start: 29°32'41,76"S; 31°07'42,91"E	End: 29°33'44,35"S; 31°06'47,81"E
	Belvedere Size – 2 555m^2 Length – 8.3km Diameter – 400mmØ (3.2km) and 250mmØ (5.1km)	Start: 29°32'42,07"S; 31°07'41,37"E	End: 29°34'50,24"S; 31°04'59,39"E
Reservoir Extension	Capacity – 1 200m^3 Length – 30m Width – 10m Depth – 5m	Centre point: 29°32'40.45"S; 31°7'41.13'E	

Design or Layout Alternative

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

Pipeline:	Size of the site/servitude (m^3):	
	Alternative A1 (Preferred)	Alternative A2 (Not Supported)
Bulk Water Pipelines	Size – 6 620m^3	Size – 6 620m^3

1.7 Site Access

Does access to the site exist?	**YES**	■
If NO, what is the distance over which a new access road will be built	**N/A**	
Describe the type of access road planned: As per **Figure 1.3** below, informal temporary access roads will be established along the northern portion of the proposed pipeline and will avoid any environmental sensitivities. The disturbed areas will be rehabilitated following the completion of construction.		

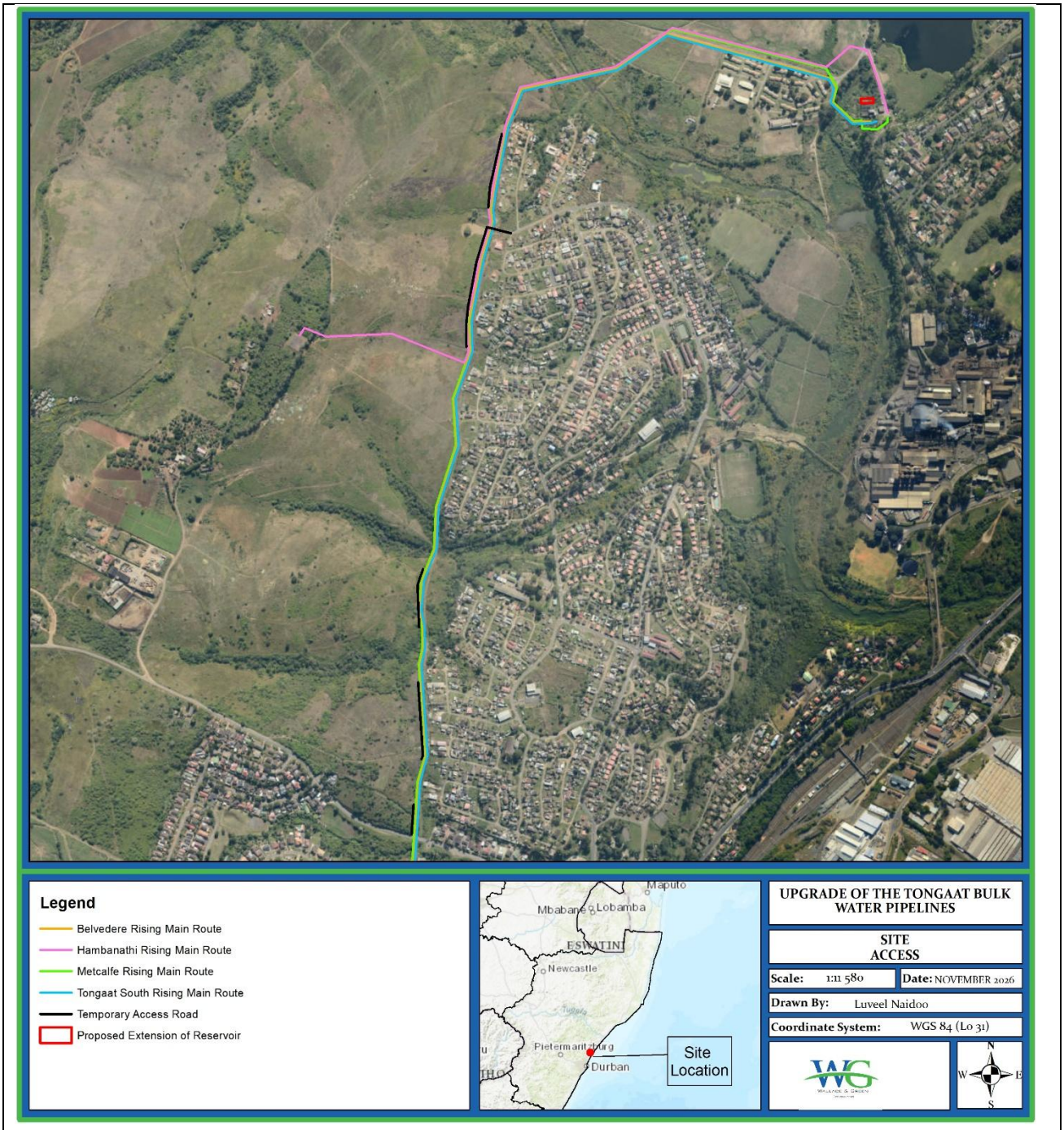


Figure 1.3: Temporary access roads (indicated in black)

1.8 Zoning and Land Use Rights

What is the land currently zoned for?	Refer to **Appendix J6** – Property Details	
Will any person's rights be negatively affected by the proposed activity/ies?	[redacted]	**NO**
Will the activity be in line with the following?		
The Provincial and Local Spatial Development Framework	**YES**	[redacted]
The Provincial and Local Integrated Development Framework	**YES**	[redacted]

eThekwini Municipality Integrated Development Plan (IDP) – 2026/2027

The project is also strongly aligned with the 2026/27 eThekwini Integrated Development Plan (IDP) as it prioritises improved service delivery, infrastructure investment, inclusive economic growth and improved quality of life.

The proposed pipeline upgrade directly supports the IDP's focus on reliable basic services by addressing ageing and deteriorating water infrastructure. Replacing the existing pipelines will reduce the risk of frequent bursts and interruptions to potable water supply, while the additional reservoir capacity will improve operational storage and resilience. The project also supports the Municipality's infrastructure-renewal priorities. The 2026/27 municipal planning and budget processes specifically identify water infrastructure, ageing infrastructure, service reliability and infrastructure upgrades as important areas of investment. Strategic Focus Area 3A specifically aims to ‘meet infrastructure and household service needs and backlogs’ through investment in water infrastructure and improved service delivery. The IDP further highlights the need to improve water supply systems, reduce water losses, and ensure efficient and sustainable service provision.

Furthermore, reliable water infrastructure provides an essential foundation for residential development, economic activity and improved living conditions. By strengthening the existing bulk water network, the project contributes to the Municipality's objective of creating a more inclusive, resilient and liveable city.

Overall, the project gives practical effect to the service delivery and infrastructure objectives of the IDP by strengthening existing municipal infrastructure, improving water security, supporting communities and economic activities, and enhancing the long-term resilience of the bulk water supply system.

eThekwini Municipal Spatial Development Framework (SDF) – 2026/2027

The proposed project is strongly aligned with the objectives of the latest eThekwini Municipal Spatial Development Framework (MSDF), which guides spatial development, infrastructure investment and sustainable land-use management across the Municipality. The 2026/27 MSDF places emphasis on spatial transformation, improved access to services, sustainable land management, climate resilience and the alignment of municipal investment with development priorities.

The project supports these objectives by upgrading ageing bulk water infrastructure and improving the reliability of potable water supply to the Tongaat South, Hambanathi, Metcalfe and Belvedere reservoirs. It represents investment in existing infrastructure rather than promoting inefficient outward expansion, thereby supporting the optimal use and continued functioning of established areas.

The replacement of deteriorated pipelines and reservoir expansion will improve water security, infrastructure resilience and access to reliable basic services. This is particularly important given the existing vulnerability of the pipelines to bursts and damaged infrastructure. The project therefore contributes to the MSDF objective of creating more resilient and sustainable communities while supporting future development through adequate municipal infrastructure.

Furthermore, the MSDF promotes the alignment of infrastructure planning with environmental and developmental goals, which is achieved through the upgrading of existing infrastructure rather than the development of new, potentially disruptive corridors.

KwaZulu-Natal Provincial Spatial Development Framework (PSDF) – 2021

The proposed project is strongly aligned with the KwaZulu-Natal Provincial Spatial Development Framework (KZN PSDF, 2021), particularly its objectives relating to sustainable infrastructure, equitable access to basic services, water security, spatial integration and resilient development. The project will improve the reliability and security of potable water supply as well as promotes efficient use of existing infrastructure, as it primarily upgrades the existing pipeline network rather than creating a completely new service system. This supports more sustainable and coordinated spatial development.

By addressing vulnerabilities associated with ageing infrastructure, the project will improve infrastructure resilience and reduce the risk of disruptions to water supply. It therefore contributes to the PSDF's emphasis on building resilient communities and infrastructure capable of responding to environmental and operational risks.

Overall, the project supports inclusive and sustainable development by ensuring that existing communities have reliable access to a fundamental municipal service. Reliable water infrastructure also provides an essential foundation for residential, commercial and economic development in eThekwini Municipality.

1.9 Water Use and Bulk Service Availability

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

Water required for construction activities will be sourced from the municipal supply.

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.

N/A

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. The WULA reference number is as follows: WU50173.

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? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as an Appendix).

N/A

1.10 Energy Efficiency

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

In terms of energy efficiency, the proposed pipeline upgrade and reservoir extension should be conducted during regular working hours to reduce the use of artificial lighting, if need be. Additionally, the contractor will be advised to transport all construction materials on-site at the same time wherever possible; the collection of waste material must be conducted simultaneously with other activities to reduce the amount of fuel usage for such transportation. Waste management methods (i.e., recycling and reusing), as well as water conservation measures are recommended and included in the EMPr (see **Appendix G**).

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

N/A

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

2014 NEMA EIA Regulations (as amended), Appendix 1- 3(H) a full description of the process followed to reach the proposed preferred alternative within the site, including (iv) and 3 (K) a summary of findings and impact management measures identified in any specialist report complying with Appendix 6 to these regulations and an indication as to how these findings and recommendations have been included in this report.

2.1. Climate

The dominant vegetation type associated within the project area is the KwaZulu-Natal (KZN) Coastal Belt. The KZN Coastal Belt vegetation type is predominantly characterised by summer rainfall, with some rainfall also occurring in winter. High air humidity, and no incidences of frost occur within the landscape. The maximum monthly temperature is 32.6 ºC in January and the minimum temperature is 5.8 ºC in July (Source: Mucina, L and Rutherford, M.C. (eds) 2006). Figure 2.1 below illustrates the climate diagram associated with the KZN Coastal Belt.

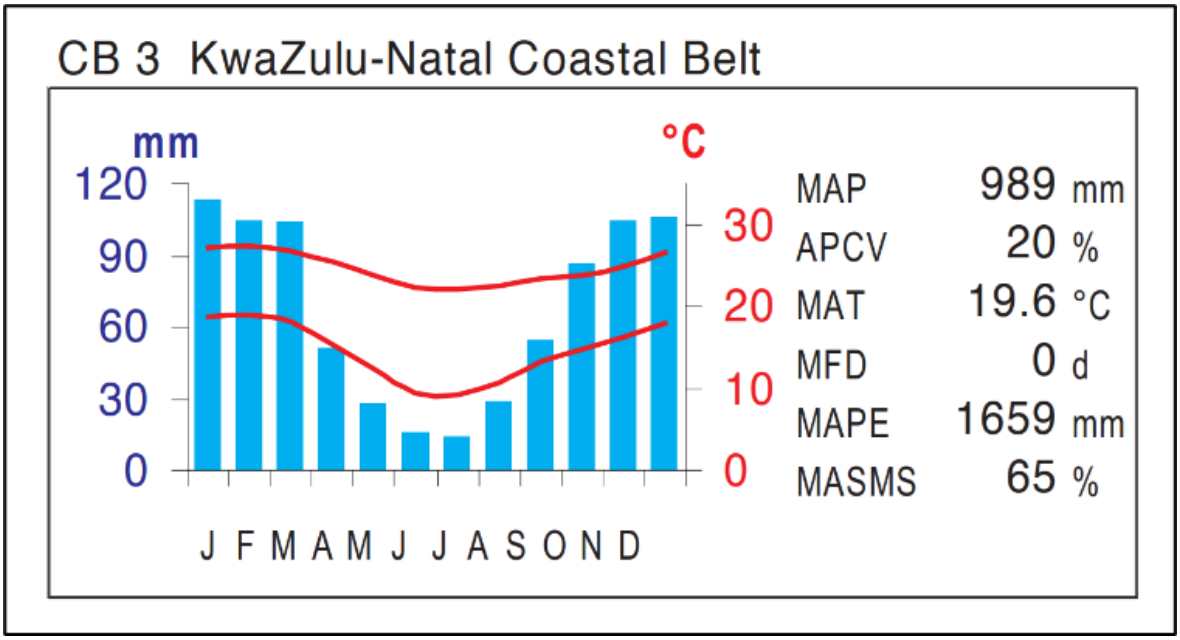


Figure 2.1: Climate diagram for the Kwa-Zulu Natal Coastal Belt vegetation type (Mucina & Rutherford, 2006)

2.2. Geology and Soils

As per the Geotechnical Assessment (Geosure, March 2026), the following was noted:

- The general area of the site is underlain by alluvium deposits of the Quaternary age and shale of the Pietermaritzburg formation, Ecca Group (Permian age).
- The site is underlain by extensive thicknesses of fill, comprising a mantle of mostly select and compacted granular materials, formed on highly compressible in-situ soft clays and clayey sands, with cobble and boulder inclusion.
- The site was observed to be underlain by the following soil and rock units listed below in stratigraphic order:
    - Fill (man-made earth);
    - Alluvium (transported water-borne deposits);
    - Colluvium (transported fine hillwash);

  - Ferricrete (chemical deposits / pedocretes);
  - Residual Dolerite (fully decomposed former dolerite rock);
  - Residual Siltstone (fully decomposed siltstone rock);
  - Residual Sandston (fully decomposed sandstone rock); and
  - Weathered Shale-Siltstone Rock (Ecca Group).
- The pedocritic and silty/sandy residual soils encountered on site are susceptible to erosion in response to uncontrolled/unchanneled surface water runoff and could result in major erosion-related damage.
- There are no signs of inherent gross ground instability such as slip scars, tension cracks, sinkholes, or major sloughing within the mantle of soils profiled.
- The site is considered stable and suitable from a geotechnical perspective for the proposed project, provided the recommendations included in the geotechnical assessment are implemented.
- The unconsolidated soils (i.e., alluvium colluvium) encountered on site classify as “potentially stable” but can rapidly become unstable at any time during excavations in perched groundwater conditions.
- The pedocritic and silty/sandy residual soils encountered on site are susceptible to significant erosion in response to uncontrolled/channelled surface runoff.
- The subsurface profile of the site for the reservoir extension is characterised by compressible fill and alluvia soils overlying weathered shale and dolerite rock.
- Despite the above-mentioned subsurface characteristics, there are no signs of inherent gross ground instability such as slip scars, tension cracks, sinkholes or major sloughing were evident.
- In terms of pipeline trench stability, the trenches excavated are classified as “potentially unstable” and will require temporary lateral support of battering of slopes to stable temporary angles as provided in the assessment (refer to **Appendix C5**).
- It is recommended that excavations are carried out in the dry season.
- Accordingly, the site is considered stable and suitable from a geotechnical perspective for the proposed upgrades, provided that the measures included in the Geotechnical Assessment are implemented and certified by the design Engineer in consultation with a geotechnical specialist.

Refer to **Appendix D5** – Geotechnical Assessment

2.3. Topography and Biophysical Environment

The proposed study area is located within the Indian Ocean Coastal Belt and Forest Biome (Scott-Shaw & Escott, 2011). According to the National Vegetation Map of Southern Africa (2018), the surrounding vegetation associated with the study area is of the KwaZulu-Natal Coastal Belt Grassland with small section in the Lowveld Riverine Forest.

As per the Geotechnical Assessment, dated March 2026, the proposed pipeline route is characterised by mildly to moderately undulating terrain, comprising predominately of hillslopes. Local Valley head terrain and minor drainage channels are encountered within the mid-section of the route between the Hambanathi and Gandhi’s Hill areas. The proposed pipelines cross several shallow drainage depressions and locally eroded slopes. Towards the south extent near Chelmsford Heights, the terrain transitions to very mild gradient.

The proposed reservoir extension is located adjacent to a tributary within a low-lying area resembling a floodplain, characterised by a generally mild topography.

Refer to **Appendix D5** – Geotechnical Assessment

2.4. Ecological Assessment

The Ecological Assessment was conducted by Wallace and Green (Pty) Ltd, dated March 2026. The findings of the assessment are summarised below:

- As per the specialists pre-site investigation, the natural vegetation identified for proposed development area is classified as KwaZulu-Natal Coastal Belt Grassland and Lowveld Riverine Forest.
- The following three (3) vegetation types were identified by the specialist:

  - Grassland vegetation;
  - Riparian vegetation; and
  - Alien dominated vegetation.
- Portions of the pipeline are dominated with sugarcane cultivation.
- It is estimated that the clearance of indigenous vegetation will be approximately 7000m^2.
- The study concluded that a large portion of the project area is dominated by invasive alien species and the species richness and composition are not a good representation of the natural vegetation associated with this area.
- Proposed Bulk Water Pipeline Upgrade:
  - Portions of the pipeline routes traverse Critical Biodiversity Areas (CBA), however the affected area is largely degraded, with approximately 50% of the plant species comprising invasive alien species and not representative of the natural vegetation for the area.
  - The proposed pipelines traverse a Durban Metropolitan Open Space System. The conservation value of the area along the pipeline route is low, the area is dominated by invasive alien plant species. The species richness and composition are not a good representation of the natural vegetation associated with this area. Most of the DMOSS areas are associated with drainage lines and the Tongaat River.
  - The proposed pipeline is characterised by Grassland, Riparian and Alien dominated vegetation.
  - The portion of the pipeline characterised by grassland vegetation consists of good quality grassland vegetation with a ground cover of 60 - 80%. Portions of the grassland vegetation are of moderate sensitivity and should be protected by limiting disturbances to the area and implementing all recommended mitigation measures.
  - The riparian vegetation is characterised by high alien species infestations with little element of the natural vegetation type, Lowveld Riverine Forest.
  - One(1) species of conservation concern (SCC) species were found along the pipeline route, namely: *Hypoxis hemerocallidea*.
    - 29°33'19.88"S, 31° 7'2.08"E
    - 29°32'58.55"S, 31° 6'58.15"E
    - 29°32'58.65"S, 31° 6'56.18"E
  - Two (2) protected tree species were found along the pipeline route, namely:
    - Four (4) *Barringtonia racemosa* (Nationally Protected)
      - 29°35'1.27"S, 31° 5'28.89"E
      - 29°34'21.56"S, 31° 5'56.52"E.
    - Two (2) *Podocarpus falcatus* (Nationally Protected)
      - 29°34'45.32"S, 31° 5'32.90"E.
  - A permit for the Department of Forestry, Fisheries and the Environment will be required if these trees are to be removed, trimmed or relocated.
  - A permit from Ezemvelo KZN Wildlife will be required to relocate, remove or trim the *Barringtonia racemosa* trees.
- Proposed Reservoir Extension:
  - The proposed reservoir extension traverses a Durban Metropolitan Open Space System.
  - The TWTW inclusive of the proposed reservoir extension is characterised by alien dominated vegetation. These areas are highly disturbed with little to no indigenous plant species.
- Habitats within the study area varied from “Very Low” to “High” Site Ecological Importance (SEI).
- Results of the ecological assessment indicated that the proposed upgrade of the Tongaat Bulk Water pipeline will have minimal impacts on the surrounding vegetation, and impacts can be managed through the implementation of the specialist’s mitigation measures.

Please refer to **Appendix D1** - Ecological Assessment

Figure 2.2 illustrates the CBA areas associated with the project area and **Figures 2.3 – 2.5** below illustrate the vegetation types along the pipeline route.

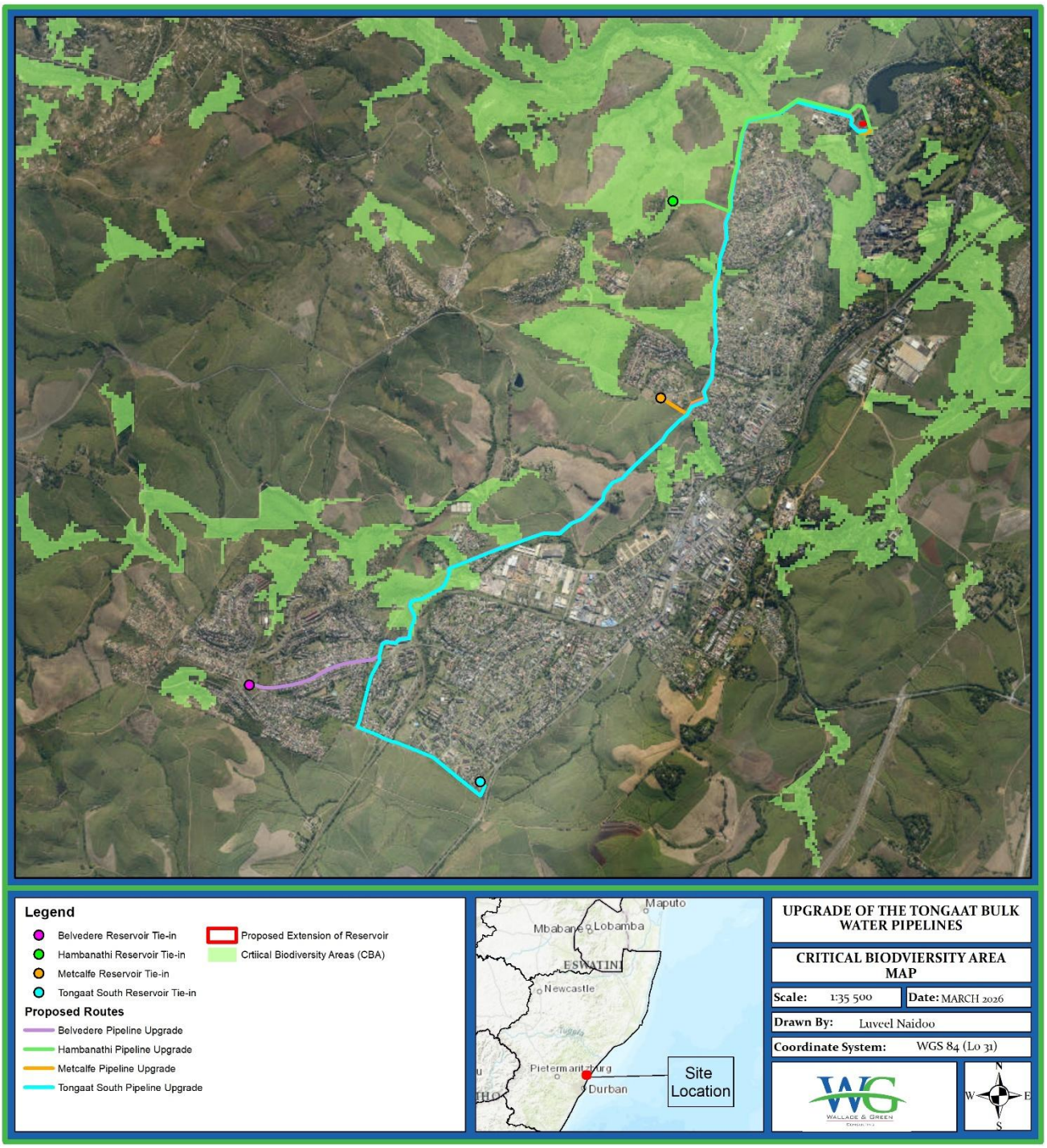


Figure 2.2: CBA Map

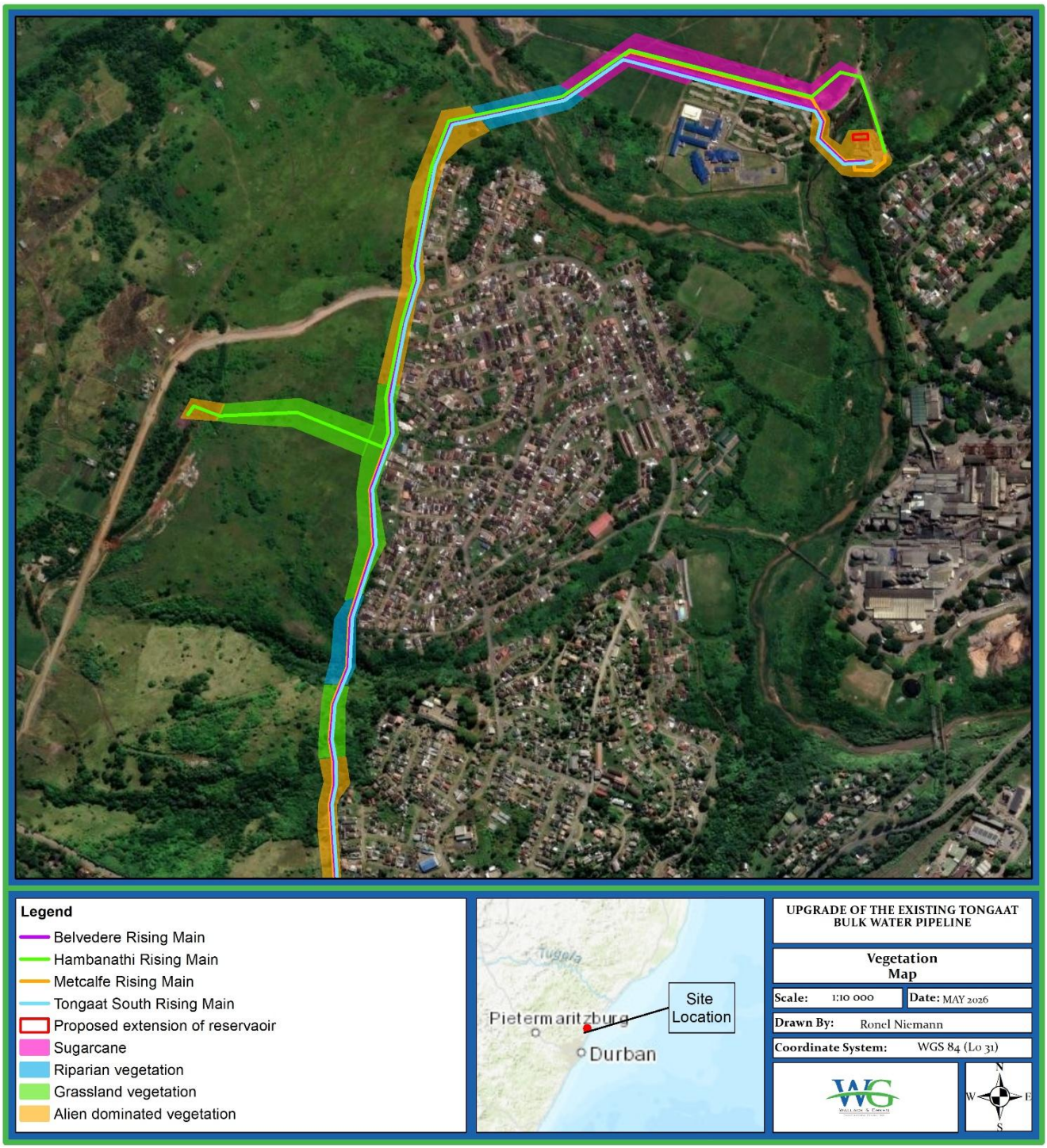


Figure 2.3: Vegetation assessment map for the northern portion of the pipeline route

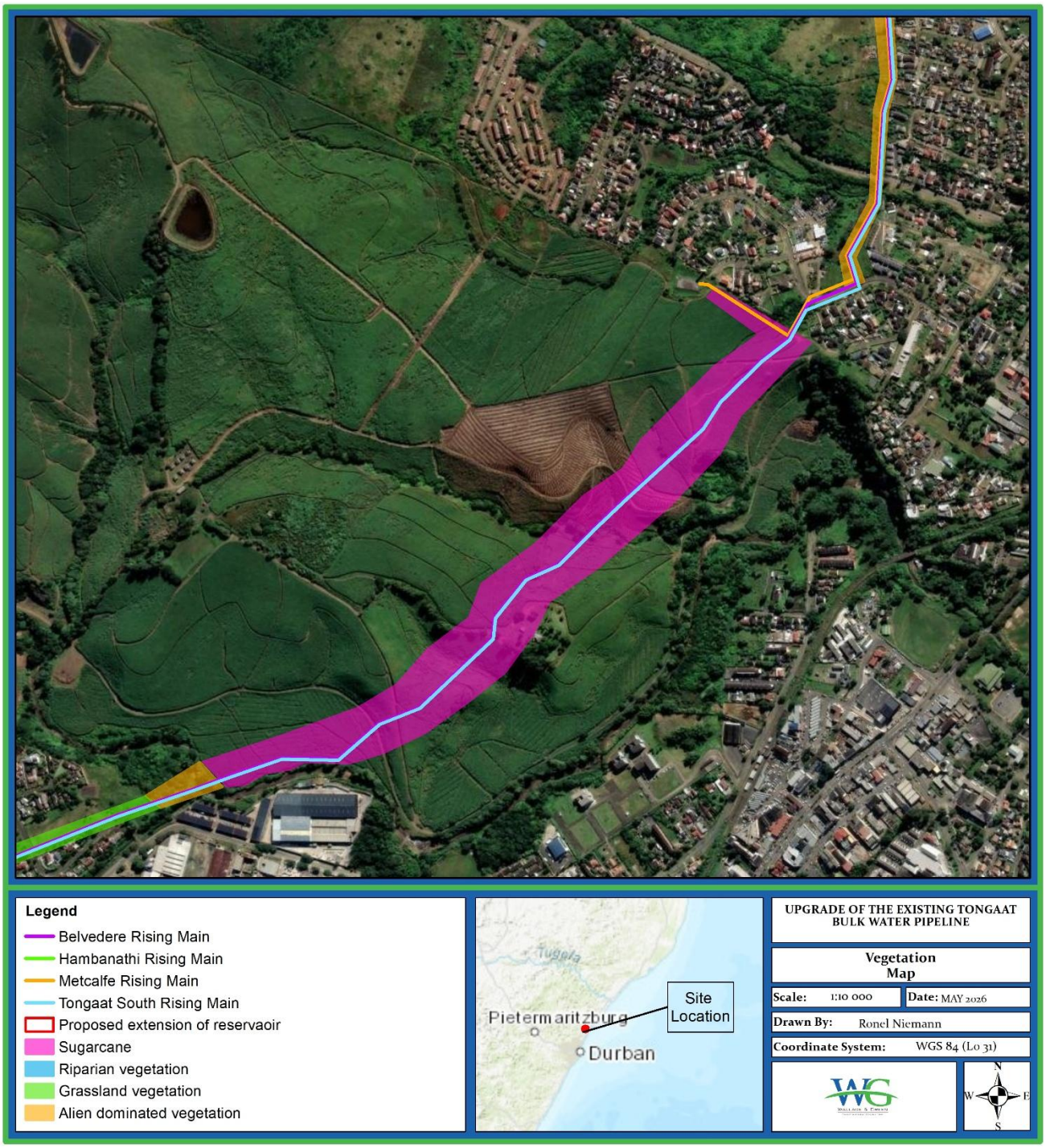


Figure 2.4: Vegetation assessment map for the middle portion of the pipeline route

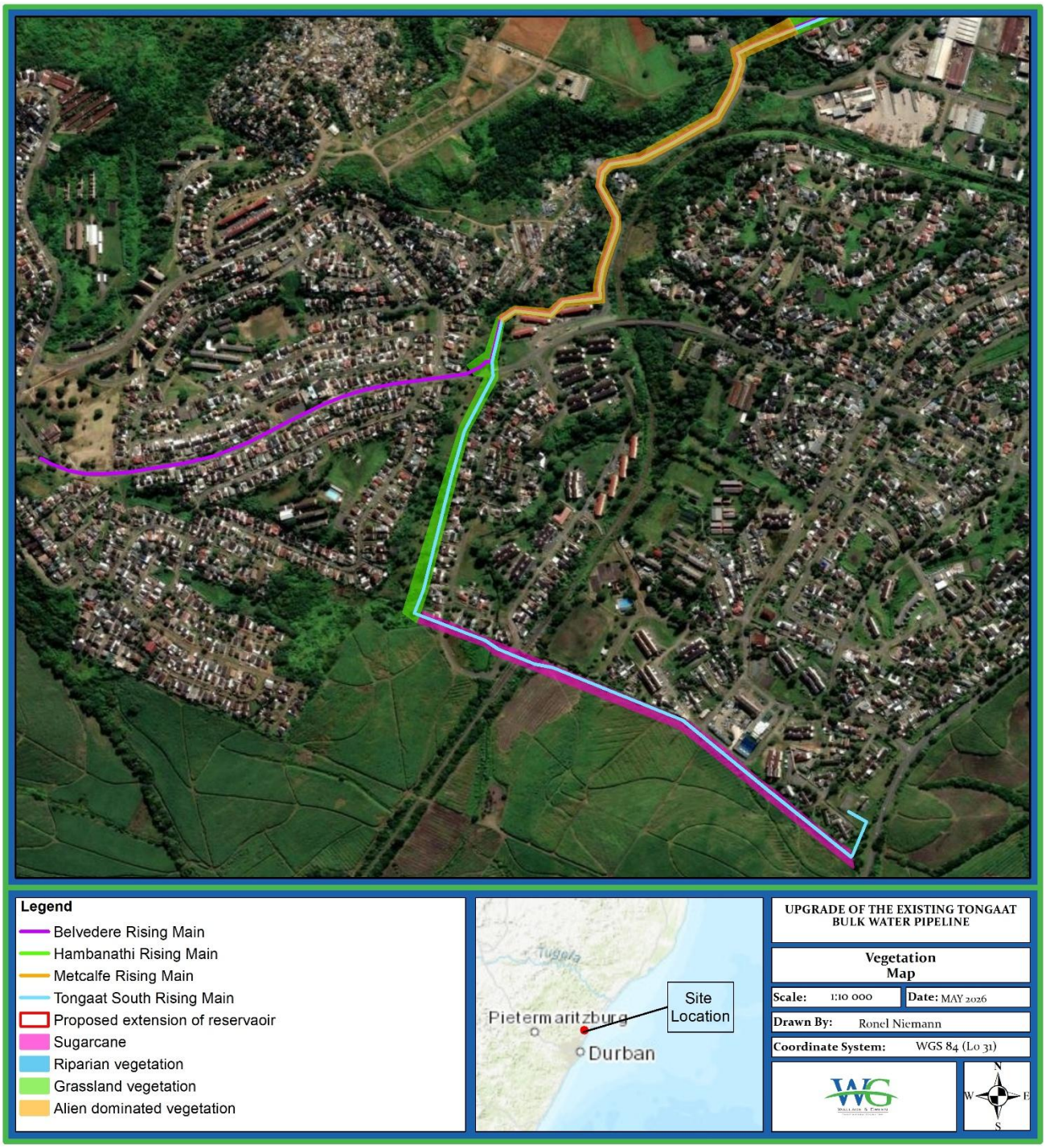


Figure 2.5: Vegetation assessment map for the southern portion of the pipeline route

2.6. Freshwater Assessment

The Biodiversity Company conducted a Freshwater Assessment, dated March 2026. The findings are summarised below:

Riverine Assessment

- Two(2) river systems were identified within the project area, namely; Tongati and Hlawe rivers (see **Figure 2.6**).
- The in-situ water quality results indicated no water quality perturbations in the Tongati and Hlawe rivers as all measured parameters fell within guideline limits.

- The results for the instream and riparian Index of Habitat Integrity (IHI) assessment for the associated river reaches are presented as Class D – Largely Modified, indicating a large loss of natural habitat, biota, and basic ecosystem function.
- Anthropogenic activities within the local area and catchment that have contributed to the deteriorated state of the system include extensive sand mining, urbanisation, proliferation of alien and invasive vegetation, water abstraction, and instream impoundments leading to inundation and flow modifications, rubbish dumping and channel modifications
- The sampled reaches were considered to have habitat types capable of supporting a low to moderate diversity of macroinvertebrates and the limited flow class diversity may be considered a hindrance to a highly diverse macroinvertebrate assemblage.
- A good diversity of macroinvertebrate communities was sampled at Tongati River. This can be attributed to good water quality at this site (indicated by in-situ results). However, there were multiple expected macroinvertebrate communities that were absent within the watercourse.
- The Present Ecological Status (PES) assessment indicated that the Tongati and Hlawe rivers were in a class D 'Largely Modified' state.
- The recommended post-mitigation buffer for the for the construction and operational phase of the development is 20m for the Tongati and Hlawe Rivers.
- Based on the results of the Risk Assessment Matrix, all identified risks associated with the proposed activities have been calculated as "Low" and are acceptable, provided that the recommended mitigation measures are fully implemented.

Wetland Assessment

- The total wetland area within the project area amounts to 36.84Ha and approximately 0.383Ha of wetland, amounting to 1.040% of the total wetland area, is directly intersected by proposed project.
- The average ecosystem services score for the wetlands fall within between the "Moderately Low" and "Moderately High" classes.
- Present Ecological State (PES) assessments indicate that the wetlands range from "Moderately Modified" to "Seriously Modified", and present an Ecological Importance and Sensitivity (EIS) of "Low" to "Moderate".
- Proposed Bulk Water Pipeline Upgrade:
    - The following fourteen (14) hydrogeomorphic units were identified within along the proposed pipeline route (see Figure 2.6):
        - Four (4) unchannelled valley-bottoms;
        - Five (5) channelled valley-bottoms;
        - Four (4) seeps; and
        - One (1) depression wetland.
    - The study noted that the pipeline upgrades will have a have a "Low" post-mitigation risk on the wetland systems.
    - A dam, various drainage lines and a canals were also identified within the project area.
- Proposed Reservoir Extension:
    - A portion of the proposed reservoir extension traverses a channelled valley-bottom wetland (HGM 4) (see Figure 2.6).
    - The study noted that the construction of the reservoir extension will have a have a "Low" post-mitigation risk on the wetland system.
- It must be noted that the project area has experienced disturbance from previous activities, namely infrastructure, residential, commercial and agricultural practices, as well as an existing pipeline servitude.
- The recommended post-mitigation buffers for the construction and operational phase of the development is 20m for the channelled and unchannelled valley-bottoms wetlands and 15m for the drainage lines, and seep and depression wetlands.

- Based on the results of the Risk Assessment Matrix, all identified risks associated with the proposed activities have been calculated as “Low” and are acceptable, provided that the recommended mitigation measures are fully implemented.

Please refer to **Appendix D2** – Freshwater Assessment

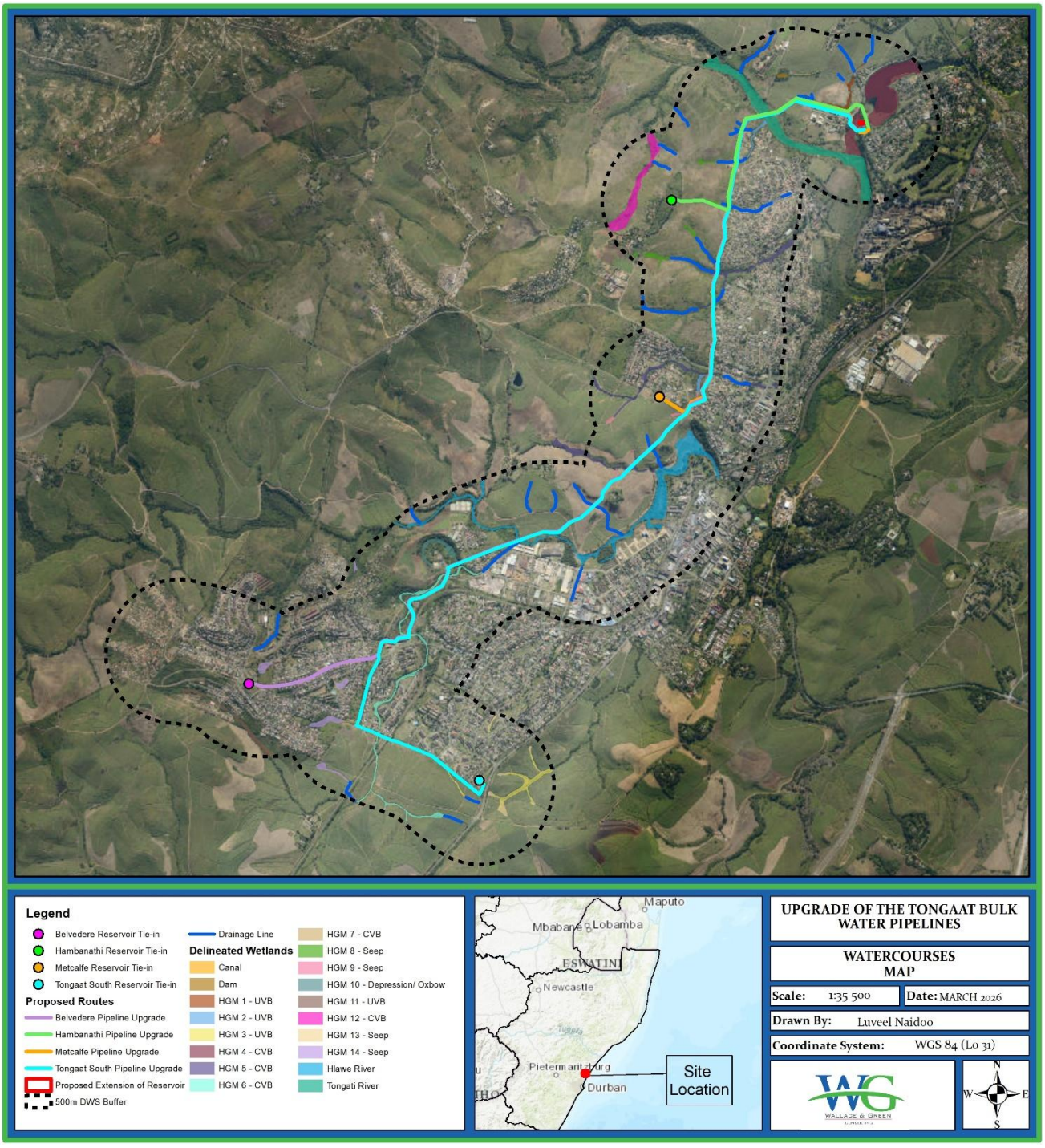


Figure 2.6: Watercourses Map

2.7. Heritage Impact Assessment

A Heritage Impact Assessment was conducted by Umlando Archaeological Surveys and Heritage Management, dated February 2026. The findings of the assessment are summarised below:

- The proposed reservoir extension and the proposed bulk water pipeline traverses previously disturbed land or existing servitudes which reduces heritage risks.
- The study noted that the Tongaat area is historically rich, with known Stone Age, Iron Age, and sites relating to Indian indentured labour heritage. Historical maps indicate long-term sugarcane cultivation and former farm infrastructure. However, no previously recorded heritage sites fall within 100 m of the pipeline footprint.
- The historic Pioneer Peace Monument was identified 21m from the existing pipeline and 20m west of the proposed Tongaat South pipeline, at the following geographical co-ordinates 29°34'44.23"S; 31° 5'33.71"E (refer to **Figure 2.7**). This monument is of high significance and must not be affected. A high visibility buffer/screen must be implemented at least 10m from the monument during the construction phase. In addition, this would need to be photographed as evidence for mitigation and uploaded onto SAHRIS.
- A section of the existing pipeline went through an area where workshops from the Farm Aberfoyle occurred. These buildings have been demolished some time age, and likely before the pipeline was established. There is no evidence of these buildings in their original locations.
- Subsequent to the desktop Heritage Assessment, a desktop Paleontological Assessment was conducted by Dr Alan Smith. Paleontological material is unlikely to be encountered however, a “Chance Find Protocol” must be implemented and would need to from part of the EMPr.
- It is the opinion of the Specialist that the activity may be authorised, provided that appropriate mitigation measures are implemented.

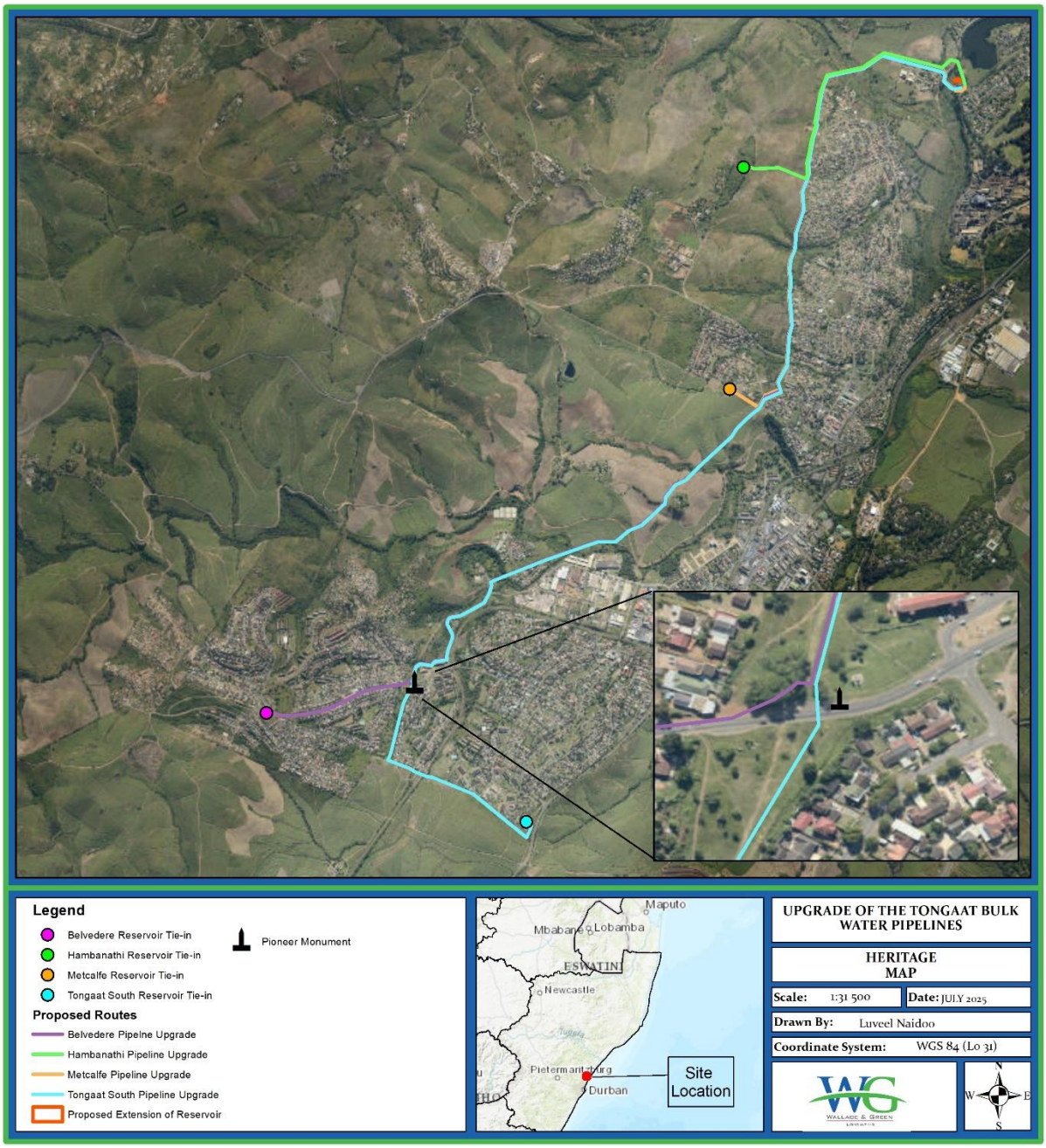


Figure 2.7: Pioneer Peace Monument

Please refer to **Appendix D3 –** Heritage Impact Assessment

2.7. Climate Change Considerations

Climate change is already a measurable reality and along with other developing countries, South Africa is especially vulnerable to its impacts. The National Climate Change Response Plan White Paper (2011) presents the South African Government's vision for an effective climate change response and the long-term, just transition to a climate-resilient and lower-carbon economy and society. South Africa's response to climate change has the following two objectives:

- Effectively manage inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity.
- Make a fair contribution to the global effort to stabilise greenhouse gas (GHG) concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within

a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.

This response is guided by the Draft Guideline for Consideration of Climate Change Implications in applications for Environmental Authorisations, Waste Management Licenses and Atmospheric Emission Licenses (2021).

The proposed development has the potential to contribute to climate change through direct and indirect greenhouse gas (GHG) emissions associated primarily with vegetation clearance, soil disturbance, construction activities and the operation of construction plant and vehicles. The clearance of approximately 7000m² of indigenous vegetation within the proposed development footprint will result in the temporary or permanent loss of vegetation biomass and associated carbon sequestration capacity.

Vegetation and associated organic matter represent carbon stores, and their removal may result in the release of stored carbon, particularly where vegetation is cleared and soils are disturbed during trenching, excavation and construction activities. The reduction in vegetative cover may also temporarily reduce the capacity of the affected areas to sequester atmospheric carbon dioxide. These impacts are, however, expected to be limited given the relatively small and linear footprint of the proposed pipeline infrastructure and the already transformed condition of substantial portions of the study area, where invasive alien vegetation and other forms of anthropogenic disturbance are prevalent.

Additional GHG emissions will be generated during the construction phase through the combustion of fossil fuels by excavation equipment, construction vehicles and other mobile and stationary machinery. These emissions are expected to be temporary and localised and are unlikely to constitute a significant contribution to regional or global GHG emissions. However, the proposed development may influence the climate resilience and functioning of local ecological systems where construction activities occur within or adjacent to riparian areas, wetlands and other natural habitats. The freshwater assessment identified wetlands covering approximately 36.84Ha, of which approximately 0.383Ha (1.04%) will be directly intersected by the proposed development. Wetlands, riparian areas and indigenous vegetation provide ecosystem services including carbon storage, water regulation, erosion control and attenuation of climate-related hydrological impacts. Uncontrolled disturbance or degradation of these systems could therefore reduce their capacity to provide such ecosystem services and increase their vulnerability to climate-related changes.

The potential climate change impacts associated with the development can be minimised through the implementation of the ecological and freshwater assessments' mitigation measures, including restricting vegetation clearance to the approved development footprint, avoiding unnecessary disturbance to areas of higher ecological sensitivity, maintaining the recommended buffers where applicable, and progressively rehabilitating disturbed areas following completion of construction. Indigenous vegetation should be retained wherever practicable, and disturbed areas must be rehabilitated using appropriate locally indigenous species.

Furthermore, construction equipment should be properly maintained. Unnecessary idling of vehicles and machinery should be avoided, and efficient construction practices should be implemented to reduce fuel consumption and associated GHG emissions. Through the implementation of these measures and the site-specific EMPr (**Appendix G**), the potential contribution of the proposed development to climate change and its potential effects on climate-sensitive ecological systems are expected to remain low and manageable.

2.8. 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 paleontological sites, on or within 20m of the site?	**YES**	■

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 D3** – Heritage Impact Assessment			
Briefly explain the recommendations of the specialist:	**The Heritage Impact Assessment (February 2026) noted the historic Pioneer Peace Monument 15m from the existing pipeline at the following geographical co-ordinates 29°34'44.23"S; 31° 5'33.71"E. A high visibility buffer/screen at least 10m from the monument is recommended during construction.**		
Will any building or structure older than 60 years be affected in any way?		[redacted]	**NO**
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?		[redacted]	**NO**
If YES, please submit the necessary application to AMAFA and attach proof thereof to this report. **N/A**			

2.9. Socio-economic Environment

Anticipated CAPEX value of the project on completion	**R 380,000,000.00**
Expected annual turnover to be generated by or as a result of the project	**R 45,000,000.00 – R 60,000,000.00 per annum**
New skilled employment opportunities created in the **construction** phase of the project	**25 – 40 jobs**
New skilled employment opportunities created in the **operational** phase of the project	**8 – 15 jobs**
New un-skilled employment opportunities created in the **construction** phase of the project	**120 – 180 jobs**
New un-skilled employment opportunities created in the **operational** phase of the project	**10 – 20 jobs**
Expected value of the employment opportunities during the operational and construction phase	**R 114,000,000.00**

2.10. 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:

The study area for this project includes the area which will be directly impacted by the project footprint of the proposed bulk water pipeline upgrade.

Land use character	YES or NO		Description
Natural area	YES	[redacted]	The area encompasses a KwaZulu-Natal Coastal Belt Grassland and a small section of a Lowveld Riverine Forest.
Low-density residential	[redacted]	NO	
Medium-density residential	[redacted]	NO	

Land use character	YES or NO		Description
High density residential	YES	[redacted]	High-density residential zones occur within a 5 - 500m from the proposed pipeline route and 100m from the proposed reservoir extension.
Informal residential	[redacted]	NO	
Retail commercial & warehousing	[redacted]	NO	
High Impact Industrial	[redacted]	NO	
Power station	[redacted]	NO	
Office/consulting room	YES	[redacted]	The following offices and consulting rooms are situated within 500m of the proposed project: • Accu Turn Engineering Services (40m). • NN Maintenance Contractors (72m) . • Ramachul Mahilal Developments (82m). • Zap It Pest Control (196m). • Department of Home Affairs Office Tongaat (413m).
Military or police base/station/compound	[redacted]	NO	
Spoil heap or slimes dam	[redacted]	NO	
Quarry, sand or borrow pit	[redacted]	NO	
Dam or reservoir	YES	[redacted]	The project involves the upgrade of 4 existing bulk water pipelines, namely Tongaat South, Hambanathi, Metcalfe and Belvedere. These pipelines tie into corresponding reservoirs. Furthermore, the following pipelines and corresponding reservoirs form part of the Tongaat bulk water reticulation system: • Jan Roz pipeline and reservoir. • Emona pipeline and reservoir. • Mamba Ridge pipeline and reservoir.
Hospital/Medical Centre	YES	[redacted]	The following facilities are situated within 500m of the proposed project: • Access Dialysis Centre (182m). • Subroyen Strinivasan (193m). • The Tongaat Medical Centre (365m). • Dr. K. Maistry (377m). • Dr Shalin Moodley (379m). • Dr. R.Maharaj (439m). • Ramsumer S.K. (452m).

Land use character	YES or NO		Description
			• Grace Medical Family Doctor (481m). • Augustine's Medical Centre (490m).
School/ crèche	YES	[redacted]	The following schools are situated within 500m of the proposed project: • Tongaat Special School (93m). • Flambel Primary School (159m). • Belverton Secondary School (215m). • Mbonisweni Primary School (235m). • Shrimati Pre School (243m) • Hillbilly Pre Primary School (336m). • Trubel Primary School (384m). • Buffelsdale Primary School (460m).
Tertiary education facility	[redacted]	NO	
Church	YES	[redacted]	The following places of worship are situated within 500m of the proposed project: • Chinna Thirupathi Venkataswara Devasthanam (15m). • Musjid Mehro Raza (89m). • Tongaat Christian Center (104m). • Buffelsdale Musallah (154m). • Tongaat Baptist Church (220m). • Tongaat South Methodist Church (262m). • Belvedere Mosque (304m). • Green Pastures Ministries International (332m). • New Covinant Fellowship (339m). • Lystra Full Gospel Church (347m). • True North Church (372m). • Uthongathi Lutheran Church (377m). • Belvedere Assembly Church (378m). • Bible Mission Church (395m). • Hilltop Worship and Community Centre (404m). • Church of the Holy Ghost Tongaat (411m). • Shree Veeraboga Emperumal Temple (443m).

Land use character	YES or NO		Description
Old age home	[redacted]	**NO**	
Sewage treatment plant	[redacted]	**NO**	
Train station or shunting yard	[redacted]	**NO**	
Railway line	[redacted]	**NO**	
Major road (4 lanes or more)	**YES**	[redacted]	The main R102 is situated 467m east of the proposed project.
Airport	[redacted]	**NO**	
Harbour	[redacted]	**NO**	
Sport facilities	**YES**	[redacted]	The following sport facilities are located within 500m of the proposed project: • MyPadelSA (49m). • Buffelsdale Sports field (190m).
Golf course	**YES**	[redacted]	Maidstone Golf Club is situated 462m east of the proposed pipeline upgrade.
Polo fields	[redacted]	**NO**	
Filling station	**YES**	[redacted]	The following filling station facilities are situated within 500m of the project site: • BP Garage (115m). • TotalEnergies Buffelskloof Service (326m).
Landfill or waste treatment site	[redacted]	**NO**	
Plantation	**YES**	[redacted]	The project area is located along sugarcane and timber plantations.
Agriculture	**YES**	[redacted]	The project area is located along sugarcane and timber plantations.
River, stream, or wetland	**YES**	[redacted]	The following watercourses are situated within 500m of the project site: • Four (4) unchannelled valley-bottoms; • Five (5) channelled valley-bottoms; • Four (4) seeps; • One (1) depression wetland; • Tongati River; and • Hlawe River.
Nature conservation area	**YES**	[redacted]	Portions of the pipeline route are situated in a Critical Biodiversity area.
Mountain, hill, or ridge	[redacted]	**NO**	
Museum	[redacted]	**NO**	
Historical building	**YES**	[redacted]	The Pioneer Peace Monument occurs 15m from the proposed pipeline upgrade.
Protected Area	[redacted]	**NO**	
Graveyard	**YES**	[redacted]	Tongaat Cemetery is situated 373m east of the proposed project.
Archaeological site	[redacted]	**NO**	

Land use character	YES or NO		Description
Other land uses (describe)	[redacted]	**NO**	Not Applicable.

2.11. Nuisance Considerations

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	**YES**	[redacted]
If yes, what estimated quantity will be produced per month?	**Approximately 5m^3**	
How will the construction solid waste be disposed of? (describe)		
❖ **Waste hierarchy would be applied when managing construction waste. The first objective will be to reuse and recycle as much waste as possible and whatever cannot be reused or recycled will be disposed of at one of the registered licensed landfills.** ❖ **Waste skips/bins will be provided in a designated area with separate skips/bins made available for construction debris and solid waste. The waste will be recycled or reused whenever possible, and the rest disposed to the registered waste. 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 EMPr for the relevant phases of the project. Refer to Appendix G – Environmental Management Programme**		
Where will the construction solid waste be disposed of? (Provide details of landfill site) ❖ **Solid Waste will be disposed of at a registered licensed landfill site. In the unlikely event that hazardous waste is produced it will be collected by a competent waste handling contractor (e.g., Drizit Environmental) and disposed of at the nearest licensed general waste disposal facility which is the closest to the site (i.e., Buffelsdraai Landfill).**		
Will the activity produce solid waste during its operational phase?	[redacted]	**NO**
If yes, what estimated quantity would be produced per month?	**N/A**	
How will the solid waste be disposed of in the operational phase? (Provide details of landfill site)	**N/A**	
If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine the further requirements of the application.		
Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?	[redacted]	**NO**
If yes, contact the competent authority to obtain clarity regarding the process requirements for your application.		
Is the activity that is being applied for a solid waste handling or treatment facility?	[redacted]	**NO**
If yes, contact the competent authority to obtain clarity regarding the process requirements for your application.		

Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	[redacted]	**NO**
If yes, what estimated quantity will be produced per month?	**N/A**	
Will the activity produce any effluent that will be treated and/or disposed of on-site?	[redacted]	**NO**

If yes, contact the competent authority to obtain clarity regarding the process requirements for your application.			
Will the activity produce effluent that will be treated and/or disposed of at another facility?			**NO**
If yes, provide the particulars of the facility: -			**N/A**
Facility name:	**N/A**		
Contact person:	**N/A**		
Postal address:	**N/A**		
Postal code:	**N/A**		
Telephone:	**N/A**	Cell:	**N/A**
E-mail:	**N/A**	Fax:	**N/A**
Describe the measures that will be taken to ensure the optimal reuse or recycling of wastewater, if any:			
N/A			

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?		**NO**
If yes, is it controlled by any legislation of any sphere of government?		**NO**
If yes, contact the competent authority to obtain clarity regarding the process requirements for your application.	**N/A**	
If no, describe the emissions in terms of type and concentration:		

During the construction phase of the proposed works, limited and temporary atmospheric emissions are anticipated. These emissions will primarily be associated with the transport of construction materials and the movement of construction vehicles associated with site clearance, excavation and trenching activities, stockpiling of excavated material, and the operation of construction plant and equipment. The principal emission types are expected to include dust and greenhouse gases such as exhaust emissions from diesel-powered construction machinery and vehicles.

The intensity of dust generation will depend on prevailing weather conditions, particularly wind speed, soil moisture content, the nature of the exposed material, and the frequency of vehicle movement. Dust emissions are expected to be localised, intermittent and of relatively low concentration, provided that appropriate dust-control measures are implemented. Refer to Appendix G – Environmental Management Programme for dust suppression measures.

Exhaust emissions will be generated by diesel-powered construction equipment and vehicles, including tipper trucks, TLBs, excavators, graders, water trucks and other construction plant. CO_2 emissions will constitute the principal greenhouse gas emission associated with the combustion of diesel fuel. Given the nature of the project, the emissions are expected to be limited to the construction period and localised to the areas where construction activities and vehicle movements occur. Emission concentrations are anticipated to be low and are not expected to result in significant deterioration of ambient air quality, provided that construction activities are appropriately managed.

To minimise exhaust emissions, all construction vehicles and equipment must be well-maintained and serviced in accordance with the manufacturer's specifications. Unnecessary idling of vehicles and machinery should be avoided, and equipment that is visibly emitting excessive smoke should be removed from site until appropriately repaired or maintained. Where reasonably practicable, modern, fuel-efficient equipment should be used.

Dust emissions will be controlled through the implementation of appropriate dust-suppression and good housekeeping measures. These measures should include regular wetting or water spraying of exposed and frequently trafficked areas, the use of suitable dust suppressants where appropriate, maintaining construction access roads in good condition, covering or appropriately managing loads containing fine materials, and limiting the extent of exposed soil. The area cleared for construction should be restricted to the minimum footprint required for the works, and disturbed areas should be stabilised and rehabilitated as soon as practicable following completion of construction activities. Stockpiles should be appropriately positioned and managed to minimise wind erosion, particularly where fine-grained materials are stored.

The speed of construction vehicles and other vehicles operating within the site must be strictly controlled to reduce the generation of fugitive dust. Vehicles should comply with the applicable site-specific speed limits and requirements contained in the Environmental Management Programme (EMPr) (i.e., 40Km/hr). Construction activities should also be managed with due consideration of prevailing weather conditions, particularly during periods of strong winds and prolonged dry conditions, when additional dust-suppression measures may be required.

Overall, the anticipated atmospheric emissions associated with the proposed construction activities are expected to be temporary, localised and of low concentration. With the implementation of the mitigation measures specified in the EMPr, significant impacts on ambient air quality are not anticipated. Refer to Appendix G – Environmental Management Programme for the detailed management measures applicable to construction-related dust generation and suppression.

Generation of noise

Will the activity generate noise?	[redacted]	**NO**
If yes, is it controlled by any legislation of any sphere of government?	[redacted]	**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.	**N/A**	
If no, describe the noise in terms of type and level:		

- **During the construction phase noise associated with normal construction activities, i.e., vehicles, generators and plant equipment will be used on the site.**
- **Noise associated with the construction activities will be limited to regular working hours (i.e., Mondays to Saturdays between 07h00 – 18h00).**
- **Noise levels are to be kept within the legislated limits for the area, following the requirements of the relevant national and local noise control statutes.**
- **Where feasible, machinery must be equipped with silencing measures.**
- **Other noise disruptions could potentially be experienced during the construction phase through activities such as drilling.**
- **Measures to minimise noise generation during construction are contained in the EMPr.**

SECTION 3: POLICY AND LEGISLATIVE FRAMEWORK

2014 NEMA EIA Regulations (as amended), appendix 1- 3(e) a description of the policy and legislative context within which the development is proposed including – (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report (ii)

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 Applicant 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) **Threatened or protected species (GN 388)** **Lists of species that are threatened or protected (GN 389)** **Alien and invasive species regulations (GNR 506)** **Publication of exempted alien species (GNR 509)** **Publication of National list of invasive species (GNR 507)** **Publication of prohibited alien species (GNR 508)**		Provides for the management and conservation of biodiversity, protection of species and ecosystems, and sustainable use of indigenous biological resources – provisions re alien and invasive species?
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)		The Objectives of this Act are to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by combating and preventing of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of

		weeds and invader plants. Section 5 details measures for the prohibition of the spreading of weeds.
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 that 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 markers 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
National Veld & Forest Fire Act		Provides for a variety of institutions, methods, and practices to prevent and combat veld, forest, and mountain fires.
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.
KZN Nature Conservation Ordinance (Ordinance No. 15 of 1974)		Protected indigenous plants, in general, are controlled under the relevant provincial Ordinances or Acts dealing with nature conservation. In KwaZulu-Natal, the relevant statute is the 1974 Provincial Nature Conservation Ordinance. In terms of this Ordinance, a permit must be obtained from Ezemvelo KZN Wildlife to remove or destroy any plants listed in the Ordinance.
KwaZulu Natal Heritage Act (Act 4 of 2008)		To provide for the conservation, protection, and administration of both the physical and the living or intangible heritage resources of the Province of KwaZulu-Natal; to establish a statutory Council to administer heritage conservation in the province.
Climate Change Act (Act No. 22 of 2024)		To enable the development of an effective climate change response and a long-term, just transition to a low-carbon and climate-resilient economy and society for South Africa in the context of sustainable development; and to provide for matters connected therewith.

Table 3.1: Current Environmental Legislation

Regulations and Guidelines
Environmental Impact Assessment Regulations, 2014 (as amended).
Internal Guideline: Generic Water Use Authorisation Application Process, August 2007 by DWA.
The General Policy on Environmental Conservation (January 1994).
DEA (2017), Guideline on Need and Desirability, Department of Environmental Affairs (DEA), Pretoria, South Africa.
Department of Environmental Affairs (2017), Public Participation guideline in terms of NEMA EIA Regulations, Department of Environmental Affairs, Pretoria, South Africa.
Disaster Management Act (57/2002): Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to National Environmental Management Permits and Licences

Table 3.2: Current Municipal By-Laws

By-Laws
eThekwini Municipality: Nuisance and Behaviour in public places by-law, 2015
eThekwini Municipality: Stormwater management by-law, 2020
eThekwini Municipality: Planning and Land Use Management Second Amendment By-law, 2021
eThekwini Municipality: Waste removal by-law, 2016
eThekwini Municipality: Air Quality management by-law, 2018
eThekwini Municipality: Water By-Law, 2021
eThekwini Municipality: Fire Safety By-Law, 2021

SECTION 4: MOTIVATION, NEED AND DESIRABILITY

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

Bulk Water Pipeline Upgrades

The existing bulk water pipelines servicing the Tongaat area have been significantly compromised as a result of extreme weather events, including the April and May 2022 flood events, as well as subsequent storm and tornado activity. These events caused substantial damage to pipeline infrastructure, particularly at river crossings, resulting in temporary repairs to restore water supply. However, the integrity of the system has since deteriorated due to ageing infrastructure and continued exposure to climate-related impacts. Since November 2022, approximately 21 pipeline bursts have been recorded, indicating an increasing risk of system failure.

The ongoing deterioration of the pipelines poses a risk not only to water security but also to the receiving environment. Repeated leaks and bursts may result in localised erosion, increased sedimentation, and potential impacts on nearby watercourses and associated ecological systems. If left unaddressed, the continued failure of the system may lead to further environmental degradation and inefficient use of water resources.

From a socio-economic perspective, the Tongaat area supports a population of approximately 90,000 residents who are dependent on a reliable supply of potable water. Disruptions to water supply have direct implications for public health, sanitation, and overall quality of life. Furthermore, unreliable water infrastructure places strain on local economic activities, businesses, and community services that depend on consistent water provision. Continued system failures may exacerbate service delivery challenges and reduce community resilience, particularly in the context of increasing climate variability.

The proposed upgrade of the bulk water pipelines is therefore required to ensure the long-term reliability and resilience of water supply infrastructure. The replacement of ageing Asbestos Cement (AC), steel, and uPVC pipelines with High-Density Polyethylene (HDPE) will improve the structural integrity and flexibility of the system, particularly at vulnerable river crossings. This will reduce the frequency of pipeline failures, minimise maintenance requirements, and enhance the ability of the eThekwini Metropolitan Municipality to provide uninterrupted water services. In this regard, the project represents a proactive intervention aimed at addressing existing infrastructure constraints and mitigating future risks.

The proposed development aligns with the objectives of the eThekwini Municipal Spatial Development Framework, which emphasises the importance of maintaining and upgrading bulk infrastructure to support existing urban settlements and ensure sustainable service delivery. The Tongaat area is identified as an established residential node where reliable access to basic services, including potable water, is essential for sustainable development. This is further supported by the eThekwini Metropolitan Municipality Integrated Development Plan, which prioritises the reduction of infrastructure backlogs and the provision of reliable water services to improve quality of life.

At a regional level, the proposed pipeline upgrade is consistent with the North Spatial Development Plan and the Tongaat-Dube TradePort Local Area Plan, both of which identify the need to strengthen bulk infrastructure and improve service delivery within the northern development corridor. In addition, the development aligns with the KwaZulu-Natal Provincial Spatial Development Framework, which promotes strategic infrastructure investment, improved access to basic services, and climate-resilient development. The proposed pipeline upgrade therefore supports integrated spatial planning objectives across local and provincial levels by reinforcing existing infrastructure within a serviced urban area and enhancing long-term infrastructure resilience.

The proposed development further gives effect to the principles of sustainable development as outlined in Section 2 of the National Environmental Management Act, as it seeks to prevent environmental degradation associated with failing infrastructure, promote the efficient use of natural resources, and safeguard human health and well-being through the provision of reliable water services. Furthermore, the project contributes to climate change adaptation by improving the resilience of critical infrastructure to extreme weather events.

The proposed Tongaat Bulk Water Pipeline Upgrade and Reservoir Extension is therefore considered necessary and desirable from an environmental, socio-economic, and municipal planning perspective, as it will enhance water security, improve infrastructure resilience, minimise environmental risks, and align with strategic spatial planning and environmental management objectives.

Reservoir Extension

The proposed extension of the existing onsite storage reservoir at the TWTW is required to provide adequate operational storage capacity to support the proposed upgrades of the Tongaat bulk water pipeline system.

The existing reservoir has a storage capacity of approximately 1 775 m³, which was established for the existing pipeline configuration and operating requirements. However, the capacity assessment undertaken as part of the design of the proposed pipeline upgrades indicates that the existing storage capacity is insufficient to effectively accommodate the proposed upgraded system.

The increased conveyance capacity and operational requirements of the upgraded pipeline systems place greater demands on the onsite storage reservoir at the TWTW. Based on the capacity analysis contained in the Geotechnical Design Report (Naidu Consulting, April 2026) the existing 1 775 m³ reservoir only provides approximately 0.6 hours of operational storage when the pumps supplying the various reservoirs are operating simultaneously.

The limited storage duration presents an operational constraint to the proposed upgraded system. In the absence of additional storage, the simultaneous operation of the pumps could rapidly deplete the available onsite storage, requiring careful management of the peak operating flows of the TWTW and potentially increasing the risk of operational interruptions.

The additional storage capacity will strengthen the ability of the municipality to manage operational fluctuations and minimise the potential for interruptions to downstream water supply. This is particularly important where existing infrastructure has experienced repeated failures and where the proposed pipeline upgrades are intended to provide a long-term improvement in system reliability.

The proposed reservoir extension will also contribute to the efficient use of water resources. Inadequate storage capacity can result in operational restrictions, including the need to closely regulate pumping and treatment flows to prevent excessive depletion of the onsite storage.

From a municipal planning perspective, the reservoir extension supports the objectives of maintaining and strengthening existing bulk infrastructure to meet the needs of established urban areas. The proposed infrastructure does not represent the establishment of an entirely new water supply system, rather, it is an extension of an existing municipal water treatment and storage facility to ensure that the facility has sufficient operational capacity to support the upgraded bulk water pipeline network. The development therefore supports the efficient utilisation and optimisation of existing municipal infrastructure and service delivery systems.

The proposed reservoir extension is consequently considered both necessary and desirable as an integral component of the Tongaat Bulk Water Pipeline Upgrade. The additional 1 200 m³ of storage will address the identified shortfall in onsite operational storage, improve the reliability of the TWTW's operations, support the effective functioning of the upgraded pipeline system, strengthen resilience to operational and climate-related disruptions, and contribute to the long-term security of potable water supply to Tongaat and surrounding areas.

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

The applicant, eThekwini Municipality: Water and Sanitation Unit, noted that the existing water pipeline systems which conveys treated potable water from the Tongaat Water Treatment Works (TWTW's) to the four (4) reservoirs, namely: Tongaat South, Hambanathi, Metcalfe, and Belvedere has shown signs of deteriorated structural integrity.

The existing pipeline systems have been compromised due to a combination of factors including aged infrastructure and structural vulnerabilities at river crossings. Furthermore, key operational challenges such as inaccessible routes, informal connections, and damaged valves and chambers, results in frequent bursts. This poses an ongoing risk to water security in the region and may significantly disrupt the reliable supply of potable water.

To address this challenge, the eThekwini Municipality intends to upgrade the TWTW pipeline system. The upgrade will include the construction of new bulk water pipelines to the following reservoirs:

- Tongaat South Pipeline - Upgrade of approximately 8.4km of pipeline with an internal diameter of 315mm.
- Hambanathi Pipeline – Upgrade of approximately 2.2km of pipeline with an internal diameter of 315mm.
- Metcalfe Pipeline - Upgrade of approximately 3.5km of pipeline with an internal diameter of 315mm.
- Belvedere Pipeline - Upgrade of approximately 3.2km of pipeline with a nominal diameter of 400 mm, and 5.1km with a nominal diameter of 250 mm.

The following Preferred Technology alternative was carried through the assessment:

- **Technology Alternative T1 (Preferred): The proposed installation of below ground pipelines which will be laid in a trench with a 25MPa reinforced concrete encasement.**

Alternative T1 involves the excavation of the riverbed and the laying of pipeworks below the watercourse, within reinforced concrete encasements. The methodology for Alternative T1 is outlined below:

Temporary flow diversion

- To avoid disrupting the river flow during construction, the works will be undertaken in two segments using temporary earth berms to divert the flow.
  - For Segment 1, an earth berm will be constructed to temporarily divert a portion of the river flow, allowing the pipeline to be laid and encased on one side of the river crossing.
  - Upon completion of Segment 1, the earth berm will then be removed and the riverbed will be rehabilitated to the pre-disturbed topography.
  - The earth berm will then be reconstructed along the opposite bank to divert the flow to the completed side.
  - Segment 2 will be constructed in a similar manner, completing the remaining section of the pipeline encasement.
  - Upon completion of Segment 2, the earth berm will then be removed and the riverbed will be rehabilitated to the pre-disturbed topography.
  - Galvanized dowel bars will be anchored into the bedrock to improve structural stability of the encasement.

Installation of the pipeline within the watercourse

- The watercourse crossing will be excavated down to the competent bedrock and the founding level for pipeline installation will be prepared.
- The HDPE pipeline will be installed at the required line and level.
- A 25MPa reinforced concrete encasement will be constructed around the pipeline to provide protection against erosion, impact and flotation during flood events.
- The concrete encasement will be extended across the full river width and into the riverbanks beyond the anticipated scour zone.
- The riverbed profile will be reinstated to restore the river to its original flow conditions upon completion of the works.

Alternative T1 was ranked as the preferred watercourse crossing method following a detailed assessment of impacts using the mitigation hierarchy. Furthermore, the reinforced concrete encasement provides long-term protection against erosion, scour, impact, and buoyancy during flood events, while the phased construction methodology using temporary flow diversions enables the works to be conducted in a controlled manner. Although trenching activities results in temporary disturbance to the watercourse, these impacts are short-term, confined to the construction phase, and can be effectively mitigated through phased construction, temporary flow diversions, and the implementation of appropriate environmental management and rehabilitation measures

SECTION 5: PUBLIC PARTICIPATION

Notification of Interested and Affected Parties (I&APs)

(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.

Three (3) site notices were placed on the 3rd of July 2026 and strategically placed at the following locations:

1. **Notice 1: 29°32'41.06"S; 31° 7'42.74"E**
2. **Notice 2: 29°32'50.97"S; 31° 7'7.94"E**
3. **Notice 3: 29°32'39.9"S 31°07'42.5"E**

The site notice detailed the proposed activity and invited stakeholders and I&APs to register. Refer to Appendix E2 for a copy of the site notice and Appendix E3 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;

Stakeholders and I&APs were notified about the Environmental Process, through the distribution of the Background Information Document (BID) via email on the 22nd of April 2026. With regards to authority communications, all relevant authorities have been notified of the application.

Refer to Appendix E6 – Background Information Document.

(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);

An advertisement was placed in the Metro Ezasegagasini Newspaper on the 3rd of July 2026 in English and IsiZulu. The advert provides information on the project dates and requested for potential I&APs to register themselves in order to get further information on the project and the Basic Assessment process.

Refer to Appendix E5 - Proof of the Advertisement.

Authority Notification

A Pre-application meeting was held with the KZN EDTEA on the 29th of April 2026.

Refer to **Appendix J1** for the Pre-application meeting minutes.

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.

Refer to **Appendix E7** – I&AP database

Draft Basic Assessment Report

The Draft Basic Assessment was distributed to all relevant stakeholders and I&APs for the regulated 30-day comment period. The comment period commenced from the 5th November and ends on the 4th December 2026.

Comments and Responses Report

(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 sub-regulation 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 and questions (collectively referred to as "issues") have been documented and responded to adequately in a Comment and Response Report, attached as Appendix E8.

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)

2014 NEMA EIA Regulations (As Amended), Appendix 1- 3(H) (vi) the methodology used in determining and ranking the nature, significance, consequence, extent, duration and probability of potential environmental impacts and risks associated with the alternatives, (v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be reversed, may cause irreplaceable loss of resources and can be avoided, managed and mitigated. Appendix 1- 3 (I) A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity- (i)- (ii). Appendix 1- 3 (J) an assessment of each identified potentially significant impact and risk (i)- (vii)

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
Overall Consequence = (Severity + Duration + Extent) / 3	
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
Overall Likelihood = (Frequency + Probability) / 2	
Overall Environmental Significance = Overall Consequence * Overall Likelihood	
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

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 Appendix F – Impact Assessment

6.3. Environmental Impact Statement as per Section 3(1)

Alternative S1 (Preferred site) – Upgrade of the Tongaat Bulk Water Pipelines and Reservoir Extension located within oThongathi, eThekwini Metropolitan Municipality, KwaZulu-Natal (only site Alternative) and Alternative A1 (only layout Alternative): The proposed layout is as per Drawing No. D791-51-5000-A REV. 0 compiled by Naidu Consulting (Pty) Ltd, dated November 2025.

The Basic Assessment considered relevant environmental aspects and impacts from the proposed development and proposed mitigation during the planning, construction and operational phases.

- **Alternative S1 (Preferred site) – The route for the Tongaat bulk water pipeline upgrades and the reservoir extension (only site Alternative)**

The proposed reservoir extension at Tongaat Water Treatment Works and the pipeline upgrades are located within Wards 58, 61 and 62 of the eThekwini Municipality. The pipeline route starts at the Tongaat Water Treatment Works and connects to the following reservoirs:

- **Tongaat South;**
- **Hambanathi;**
- **Metcalfe; and**
- **Belvedere.**

- **Alternative A1 (Only layout Alternative): The proposed layout is as per Drawing No. D791-51-5000-A REV. 0 compiled by Naidu Consulting (Pty) Ltd, dated November 2025.**

No layout alternatives are applicable as the project is aimed at provided uninterrupted water supply to Tongaat and the surrounding areas. Furthermore, the proposed pipelines are located along the existing pipeline servitude.

The applicant, eThekwini Municipality: Water and Sanitation Unit, noted that the existing water pipeline systems which conveys treated potable water from the Tongaat Water Treatment Works (TWTW's) to the four (4) reservoirs, namely: Tongaat South, Hambanathi, Metcalfe, and Belvedere have shown signs of deteriorated structural integrity.

The existing pipeline systems have been compromised due to a combination of factors including aged infrastructure and structural vulnerabilities at the existing river crossings. Furthermore, key operational challenges such as inaccessible routes to the existing pipeline, informal connections, and damaged valves and chambers, results in frequent bursts. This poses an ongoing risk to water security in the region and has significantly disrupted the reliable supply of potable water to Tongaat and surrounding areas.

To address this challenge, the eThekwini Municipality intends to upgrade the TWTW's bulk water pipeline system.

An onsite storage reservoir with a capacity of 1 775m^3 exists within the TWTW. As per the Design Report compiled by Naidu Consulting (April, 2026), the capacity analysis for the existing storage is insufficient for the proposed pipeline upgrades.

As such, eThekwini Municipality: Water and Sanitation Unit intends on extending the existing reservoir at the TWTW's from a capacity of 1 775m^3 to a capacity of 2 975m^3, together with the structural interface, reservoir pipework, valves, chambers, drainage and associated civil works. The

reservoir extension will comprise of a separate storage unit with a capacity of 1 200m^3, to supplement the existing storage unit on site. The storage units will be linked with pipe work and will not disrupt the existing structure. The reservoir extension will comprise of 30m(L) x 10m(W) x 5m(H) reinforced concrete.

A summary of the impacts associated with the alternatives are outlined below:

Phase	Activity	Impact
Construction Phase – Tongaat Bulk Water Pipeline Upgrade and Reservoir Extension	Site establishment, servitude clearing, topsoil stripping, earthworks and vehicle movement	Altered hydrology due to compaction, reduced infiltration and concentration/diversion of surface runoff toward wetlands and river channels.
		Erosion of exposed soils and sediment deposition within wetlands and rivers from disturbed surfaces, stockpiles and access routes.
		Pollution of wetlands and rivers by hydrocarbon leaks, cement residues, chemicals or litter associated with construction plant and materials.
		Introduction and spread of alien invasive plants in disturbed wetland and riparian habitat.
	Trenching, pipe laying, bedding, backfilling and compaction at wetland and river crossings	Direct disturbance of wetland soils, alluvial substrates and riverbanks, altering local hydrological connectivity and geomorphic stability.
		Increased suspended sediment and turbidity downstream during excavation, dewatering, backfilling and reinstatement at crossings.
		Loss or damage of indigenous wetland and riparian vegetation, with associated reduction in bank stability and habitat integrity.
		Temporary disturbance and displacement of aquatic and semi-aquatic fauna at watercourse crossings.

	Temporary stormwater controls, trench dewatering and portable ablutions	Concentrated discharge or uncontrolled runoff causing scour, incision, erosion or localised inundation within wetlands and river margins.
		Nutrient, pathogen or wastewater contamination of watercourses due to leakage or overflow from portable sanitation facilities.
	Storage, handling and disposal of construction waste, spoil and domestic waste	Entry of litter, spoil or hazardous substances into wetlands and rivers, degrading habitat quality and water quality.
	Construction of new reservoir: site clearing, topsoil stripping, bulk earthworks, excavation, compaction, stockpiling and vehicle movement	Altered local hydrology and drainage due to compaction, cut/fill, reduced infiltration and concentration/diversion of surface runoff toward adjacent wetlands and drainage lines.
		Erosion of exposed soils and sediment deposition within wetlands and drainage features from excavation faces, spoil stockpiles, haul routes and disturbed reservoir footprint areas.
		Pollution of wetlands and rivers by cement wash water, concrete residues, hydrocarbons, chemicals or turbid dewatering effluent associated with reservoir construction.
		Loss or degradation of indigenous wetland / riparian vegetation and freshwater habitat integrity where the reservoir footprint, associated hardstand areas or stormwater controls encroach on sensitive habitat.
Operational Phase – Tongaat Bulk Water Pipeline Upgrade and Reservoir Extension	Operation of buried bulk water pipeline and periodic inspection/maintenance	Persistent local alteration of shallow subsurface flow and wetland hydrodynamics along the reinstated servitude.

		Leak or rupture of pipeline causing localised saturation, erosion and indirect disturbance to adjacent wetland or riparian habitat.
		Establishment and spread of alien invasive plants along the disturbed servitude due to inadequate rehabilitation follow-up.
		Localised erosion at maintenance access points and inadequately stabilised crossing reinstatement areas.
	Operation of new reservoir, associated stormwater infrastructure and periodic inspection / maintenance	Persistent alteration of local runoff pathways, shallow subsurface flow and wetland hydrodynamics due to the permanent reservoir footprint, embankments and associated hard surfaces.
		Leakage, overflow or failure of reservoir causing localised saturation, erosion, sediment mobilisation and indirect disturbance to adjacent wetland or riparian habitat.
		Poor vegetation recovery or alien invasive plant establishment on reservoir embankments, disturbed margins and stormwater discharge areas due to inadequate rehabilitation and maintenance.

Construction and operational phase impacts ranged from High - Low pre-mitigation. All the anticipated impacts can however be significantly reduced through the mitigation measures provided to Low to Medium-Low levels of impact significance ratings.

Residual risks are expected to be of Low - Minor impact significance, provided that the mitigation measures in this report are implemented. No significant cumulate effects on the environment (i.e., sensitive terrestrial habitats and species) are anticipated.

The proposed development aligns with the objectives of the eThekwini Municipal Spatial Development Framework, which emphasises the importance of maintaining and upgrading bulk infrastructure to support existing urban settlements and ensure sustainable service delivery. This is further supported by the eThekwini Metropolitan Municipality Integrated Development Plan, which prioritises the reduction of infrastructure backlogs and the provision of reliable water services to improve quality of life.

In addition, the development aligns with the KwaZulu-Natal Provincial Spatial Development Framework, which promotes strategic infrastructure investment, improved access to basic services, and climate-resilient development. The proposed pipeline upgrade therefore supports integrated spatial planning objectives across local and provincial levels by reinforcing existing infrastructure within a serviced urban area and enhancing long-term infrastructure resilience.

Alternative S2 (Not Applicable) – An alternative site is NOT APPLICABLE
Alternative A2 (Not Applicable) – An alternate layout is NOT APPLICABLE

Alternative T1 (Preferred Alternative) – Bulk Water Pipelines laid in trenches beneath watercourses with 25 MPa reinforced concrete encasements

The Basic Assessment considered relevant environmental aspects and impacts from the proposed development and proposed mitigation during the planning, construction, and operational phases.

- **Technology Alternative T1 involves the excavation of the riverbed and the laying of pipeworks below the watercourse, within reinforced concrete encasements. The methodology for Alternative T1 is outlined below:**
  - **Excavate the watercourse crossing down to competent bedrock and prepare the founding level for pipeline installation.**
  - **Install the HDPE pipeline at the required line and level.**
  - **Construct a 25MPa reinforced concrete encasement around the pipeline to protect against erosion, impact and flotation during flood events.**
  - **To avoid disrupting the full river flow during construction, the works will be undertaken in two segments using temporary earth berm diversions.**
  - **For Segment 1, construct an earth berm to divert a portion of the river flow, allowing the pipeline to be laid and encased on one side of the river crossing.**
  - **Upon completion of Segment 1, reconstruct the berm along the opposite bank to divert the flow to the completed side.**
  - **Construct Segment 2 in a similar manner, completing the remaining section of the pipeline encasement.**
  - **Install galvanized dowel bars anchored into the bedrock to improve structural stability of the encasement.**
  - **Extend the concrete encasement across the full river width and into the riverbanks beyond the anticipated scour zone.**
  - **Reinstate the riverbed profile and restore the river to its original flow conditions upon completion of the works.**

A summary of the impacts associated with the alternatives are outlined below:

Phase	Activity	Impact
Construction Phase – Tongaat Bulk Water Pipeline Upgrade	Site establishment, servitude clearing, topsoil stripping, earthworks and vehicle movement	Altered hydrology due to compaction, reduced infiltration and concentration/diversion of surface runoff toward wetlands and river channels
		Erosion of exposed soils and sediment deposition within wetlands and rivers from disturbed surfaces, stockpiles and access routes

		Pollution of wetlands and rivers by hydrocarbon leaks, cement residues, chemicals or litter associated with construction plant and materials
		Introduction and spread of alien invasive plants in disturbed wetland and riparian habitat
	Trenching, pipe laying, bedding, backfilling and compaction at wetland and river crossings	Direct disturbance of wetland soils, alluvial substrates and riverbanks, altering local hydrological connectivity and geomorphic stability
		Increased suspended sediment and turbidity downstream during excavation, dewatering, backfilling and reinstatement at crossings
		Loss or damage of indigenous wetland and riparian vegetation, with associated reduction in bank stability and habitat integrity
		Temporary disturbance and displacement of aquatic and semi-aquatic fauna at watercourse crossings
	Temporary stormwater controls, trench dewatering and portable ablutions	Concentrated discharge or uncontrolled runoff causing scour, incision, erosion or localised inundation within wetlands and river margins
		Nutrient, pathogen or wastewater contamination of watercourses due to leakage or overflow from portable sanitation facilities
	Storage, handling and disposal of construction waste, spoil and domestic waste	Entry of litter, spoil or hazardous substances into wetlands and rivers, degrading habitat quality and water quality
	Reinforced concrete encasement crossing: staged berm diversion, excavation to bedrock, pipe installation, dowel anchoring and concrete encasement within the	Direct short-term disturbance of the active channel, banks and riparian/wetland habitat during excavation, staged berm diversion and concrete encasement

	Tongati River and associated wetland	Increased sediment mobilisation, turbidity and water quality deterioration during excavation, dewatering and staged diversion of flow
		Localised alteration of flow dynamics, scour or channel/bank instability if the concrete encasement and reinstatement are inadequately designed or stabilised
	Construction of new reservoir: site clearing, topsoil stripping, bulk earthworks, excavation, compaction, stockpiling and vehicle movement	Altered local hydrology and drainage due to compaction, cut/fill, reduced infiltration and concentration/diversion of surface runoff toward adjacent wetlands and drainage lines
		Erosion of exposed soils and sediment deposition within wetlands and drainage features from excavation faces, spoil stockpiles, haul routes and disturbed reservoir footprint areas
		Pollution of wetlands and rivers by cement wash water, concrete residues, hydrocarbons, chemicals or turbid dewatering effluent associated with reservoir construction
		Loss or degradation of indigenous wetland / riparian vegetation and freshwater habitat integrity where the reservoir footprint, associated hardstand areas or stormwater controls encroach on sensitive habitat
Operational Phase – Tongaat Bulk Water Pipeline Upgrade and Reservoir Extension	Operation of buried bulk water pipeline and periodic inspection/maintenance	Persistent local alteration of shallow subsurface flow and wetland hydrodynamics along the reinstated servitude
		Leak or rupture of pipeline causing localised saturation, erosion and indirect disturbance to adjacent wetland or riparian habitat

		Establishment and spread of alien invasive plants along the disturbed servitude due to inadequate rehabilitation follow-up
		Localised erosion at maintenance access points and inadequately stabilised crossing reinstatement areas
	Reinforced concrete encasement crossing: operation of buried encased crossing and periodic inspection/maintenance	Persistent minor alteration of local hydraulics or localised scour/instability at the encased crossing and reinstated banks if poorly maintained
		Poor vegetation recovery or invasive plant establishment at rehabilitated diversion berm, bank and wetland disturbance areas
	Operation of new reservoir, associated stormwater infrastructure and periodic inspection / maintenance	Persistent alteration of local runoff pathways, shallow subsurface flow and wetland hydrodynamics due to the permanent reservoir footprint, embankments and associated hard surfaces
		Leakage, overflow or failure of reservoir causing localised saturation, erosion, sediment mobilisation and indirect disturbance to adjacent wetland or riparian habitat
		Poor vegetation recovery or alien invasive plant establishment on reservoir embankments, disturbed margins and stormwater discharge areas due to inadequate rehabilitation and maintenance

Construction and operational phase impacts ranged from High - Low pre-mitigation. All the anticipated impacts can however be significantly reduced through the mitigation measures provided to Low to Medium-Low levels of impact significance ratings.

Residual risks are expected to be of Low - Minor impact significance, provided that the mitigation measures in this report are implemented. No significant cumulate effects on the environment (i.e., sensitive terrestrial habitats and species) are anticipated.

Alternative T2 (Not Supported) – Trenchless watercourse crossing using Horizontal Directional Drilling (HDD).

The Basic Assessment considered relevant environmental aspects and impacts from the proposed development and proposed mitigation during the planning, construction, and operational phases.

- **Technology Alternative T2 (Not Supported): Trenchless watercourse crossing using Horizontal Directional Drilling (HDD).**

Alternative T2 involves the installation of the pipeline beneath the watercourse using trenchless Horizontal Directional Drilling (HDD). The methodology for the HDD alternative is outlined below:

- **Establish the drilling entry and exit points outside the watercourse and, where practicable, beyond the riparian zone.**
- **Prepare temporary drilling pads and position the HDD drilling equipment, drilling fluid management system, and ancillary plant at the entry and exit locations.**
- **Drill a bore beneath the watercourse along the designed alignment using a steerable drilling system.**
- **Pull the HDPE pipeline through the enlarged borehole in a single continuous operation using the HDD rig.**
- **Monitor drilling fluid circulation throughout the drilling process and implement appropriate containment and contingency measures to manage any inadvertent drilling fluid returns.**
- **Connect the installed pipeline to the remainder of the proposed pipeline network at the entry and exit points.**
- **Remove all temporary works and drilling equipment, rehabilitate disturbed areas, and reinstate the entry and exit sites to their pre-construction condition.**

This option was not supported due to its substantially higher construction costs as HDD requires specialised drilling equipment, highly skilled contractors, extensive site preparation, and continuous drilling fluid management. In addition to the higher capital cost, HDD introduces technical risks such as borehole instability, deviation from the intended alignment, and the potential for inadvertent drilling fluid returns (frac-outs), which could affect the surrounding environment if not effectively managed.

No-go Alternative (compulsory)

The no-go alternative involves not undertaking the proposed bulk water pipeline upgrade and reservoir extension, resulting in the continued operation of the existing ageing water supply infrastructure and the inadequate water storage capacity for the growing beneficiaries. While this option would avoid the short-term construction-related impacts associated with the proposed works, it would not address the existing infrastructure deficiencies or improve the long-term reliability and capacity of the bulk water supply network.

From a social perspective, the no-go alternative is not preferred as it would increase the risk of water supply interruptions, reduced service reliability, and inadequate infrastructure to meet current and future water demands. A reliable potable water supply is essential for supporting residential communities, public institutions, and commercial and industrial users. Failure to upgrade the existing infrastructure could result in more frequent pipe failures, prolonged service disruptions, and reduced resilience of the water supply system, ultimately affecting the quality of life and public health of the communities served by the network.

From a socioeconomic perspective, retaining the existing infrastructure would likely lead to increased maintenance and repair costs associated with ageing pipelines and excessive draining of the existing storage reservoir, as well as the financial implications of emergency repairs and unplanned service outages. Water losses resulting from leaks and pipe failures would continue to reduce the operational efficiency of the bulk water system, increasing operating costs and placing

additional pressure on municipal resources. Furthermore, an unreliable water supply could constrain future residential, commercial, and industrial development within the area, thereby limiting opportunities for economic growth and investment.

From an environmental perspective, while the no-go alternative would avoid the temporary construction-related disturbance to watercourses, vegetation, and surrounding habitats, it would not eliminate the ongoing environmental risks associated with deteriorating infrastructure. Continued leakage from ageing pipelines would result in unnecessary water losses from an already constrained resource, reducing the efficiency of water resource utilisation. In addition, pipeline failures could lead to uncontrolled erosion, sedimentation, and localised disturbance to surrounding environments where emergency repairs become necessary. The planned infrastructure upgrades allow environmental impacts to be anticipated, assessed, and mitigated through the implementation of appropriate environmental management measures, whereas emergency repairs are often undertaken under urgent conditions with limited opportunity for environmental planning.

Overall, although the no-go alternative avoids the immediate impacts associated with the construction phase, it fails to meet the project's objectives of improving the reliability, capacity, and resilience of the bulk water supply system. Considering the long-term socioeconomic and environmental consequences of maintaining the existing infrastructure, the no-go alternative is not considered a feasible or sustainable option.

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

2014 NEMA EIA Regulations (as amended), Appendix 1- 3(M) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr.

The following outcomes must be considered as per the Ecological Assessment:

- Permits must be obtained from the Department of Foresty, Fisheries and the Environment (DFFE) prior to the commencement of construction activities, should the following Nationally protected species be trimmed, cut, removed, destroyed and/or translocated:
  - *Barringtonia racemosa*
  - *Podocarpus falcatus*
- An invasive alien control programme must be implemented to eradicate the existing alien invasive plants/trees and to prevent the introduction and spread of these species. There must be ongoing control and elimination of all alien invasive species throughout the life-span of this development;
- Erosion control measures must be implemented in areas sensitive to erosion such as edges of slopes, exposed soil etc. These measures include but are not limited to - the use of sand bags, hessian sheets or replacement of vegetation;
- This site must be rehabilitated under the supervision of a suitably qualified ecologist/botanist;
- Disturbed areas must be rehabilitated by planting appropriate indigenous plant species;
- Restrict all activities to authorised footprint areas only; and
- Rehabilitated areas must be monitored for a period of 12 months to ensure the establishment of re-vegetated areas so as to ensure a ground cover of 85%.

Refer to **Appendix D1** – Ecological Assessment

The following outcomes must be considered as per the Freshwater Assessment:

- Prevent the unnecessary destruction and fragmentation of the vegetation community of the wetland areas and the wetlands catchment;
- Limit the construction or working areas to the defined portions and only impact those areas where it is unavoidable to do so otherwise;

- Ensure temporary and permanent drainage at crossing areas does not concentrate or divert flow in a manner that causes scour or altered wetland drainage;
- Prevent preferential flow along the trench line through wetlands by implementing appropriate reinstatement and flow-control measures;
- Do not place spoil, excavated material, or fill within wetlands, river channels, riparian habitat, or any area where it can be washed into the Tongati River, Hlawe River, or associated wetlands;
- Reinstate all wetland and river crossings to pre-construction contours immediately after pipe installation;
- Stabilise crossing areas immediately after reinstatement to prevent erosion, sedimentation, and channel instability;
- Do not discharge turbid or contaminated water directly into wetlands, the Tongati River, or the Hlawe River;
- Manage all water generated during trenching, dewatering, or construction so that sediment and contaminant inputs to delineated watercourses are prevented;
- Ensure that construction-related activities do not degrade water quality within wetlands, riparian zones, or river channels;
- Rehabilitate all disturbed wetland and riparian areas with site-appropriate indigenous vegetation as soon as practicable after construction;
- Continue rehabilitation until disturbed areas are stable and adequately vegetated;
- Reinstate affected habitat in a manner that supports recovery of bank stability and wetland/riparian ecological function;
- Implement alien invasive plant control at all disturbed wetland and river crossing areas;
- Continue follow-up alien invasive plant management until invasive species are controlled and indigenous vegetation is established;
- Prevent disturbed watercourse areas from becoming long-term sources of invasion into adjacent wetland and riparian habitat;
- Monitor reinstated wetland and river crossing areas for altered drainage, subsidence, erosion, or instability;
- Correct any reinstatement failure that affects hydrology, bank stability, or wetland condition promptly; and
- Maintain crossing areas so that wetland and river function is not progressively degraded during operation.

Refer to **Appendix D2** – Freshwater Assessment

The following outcomes must be considered as per the Heritage Impact Assessment:

- The specialist recommends a Chance Find Protocol be initiated and form part of the EMPr.
- The Pioneer monument must be protected from construction-related impacts, with a high-visibility buffer/screen established at least 10m from the monument during construction.

Refer to **Appendix D3** – Heritage Impact Assessment

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 the findings of several specialists' studies. The layouts and engineering drawings of the proposed pipeline upgrade have been provided to the EAP by Naidu Consulting (Pty) Ltd. The following assumptions and limitations relating to this assessment were identified by specialists:

Ecological Assessment:

- The site survey took place during summer on 4 – 5 February 2026. Seasonal constrains play a role in limiting the findings of an ecological specialist report. Many plant species flower seasonally and are difficult to identify outside of the flowering season. The optimal time to conduct a botanical survey in this region is during the spring-summer flowering season.

- ❖ Whilst every effort was made to cover as much of the project area as possible, representative sampling was completed.
- ❖ This assessment has not assessed any temporal trends for the project.

Freshwater Assessment

- ❖ Whilst every effort was made to cover as much of the project area as possible, representative sampling was completed.
- ❖ This assessment has not assessed any temporal trends for the project.

Heritage Impact Assessment

- ❖ The survey cannot locate subsurface features that do not leave visible marks observable from aerial photographs.

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

2014 NEMA EIA Regulations (As Amended), Appendix 1- 3(Q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post-construction monitoring requirements finalised.

Based on the time required for the applicant to undertake all necessary planning processes governing the establishment of the proposed slope stabilisation; an estimated construction period of four (4) years, and rehabilitation and post-construction monitoring period of one month, it is recommended that the environmental authorisation is granted for a period of ten (10) years, which will also take into account any unexpected events.

Given the nature of this project, external environmental audits of the activity and implementation of the EMPr will be undertaken by the independent ECO. The findings and outcomes of these audits will be recorded in the ECO Reports and filed in the Environmental file. The environmental audits and associated reports must be conducted and submitted to the CA (i.e., KZN EDTEA) at intervals as indicated in the EA.

The EMPr (**Appendix G**) details the post-construction, rehabilitation, and closure, which will be monitored by the ECO and compliance authorities. One post-construction audit should be conducted once construction is complete. Thereafter an annual audit should be conducted for two years in order to ensure that the post-construction and rehabilitation outcomes have been achieved.

6.7. Financial Provisions as per Section 3(s)

2014 NEMA EIA Regulations (as amended), Appendix 1- 3(S) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts*.*

N/A

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)

2014 NEMA EIA Regulations (as amended), Appendix 1- 3(N) any aspects which were conditional to the findings of the assessment either by EAP or specialist which are to be included as conditions of authorisation and (P) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.

It is the opinion of the EAP, that the proposed development be approved as:

- The impact assessment conducted for this site shows that all identified impacts associated with the proposed project can be mitigated to acceptable levels provided that the site specific EMPr and specialist recommendations are strictly adhered to. These measures have been incorporated into the

EMPr, which also makes provision for the monitoring and auditing thereof, as well as environmental awareness training for all persons who will be conducting the activity.
- Once construction is complete, rehabilitation and landscaping must be undertaken with indigenous vegetation.

It is thus the EAP's opinion that the activity for which environmental authorisation is being sought, is authorised provided that it is undertaken in accordance with Alternative T1 for the watercourse crosisngs, on the Preferred site (Alternative S1).

Properties and Infrastructure:

- Signage must be placed prior to the commencement of construction 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 damage 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 plastic sheeting, 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.

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 access routes.

Dust and Erosion Control:

- The liberation of dust into the surrounding environment must be effectively controlled by the use of water sprays, water carts, fabric containment or curtains, where required.
- Suitable erosion control measures must be implemented in areas sensitive to erosion, i.e., stormwater discharge points, exposed areas and embankments.
- All exposed surfaces must be re-vegetated and stabilised as soon as is practically possible.

Monitoring and Auditing:

- The EMPr (**Appendix G**) and conditions thereto must 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 Independent ECO on a frequency as to be determined by the competent authority.