# AQUATIC AND WETLAND COMPLIANCE STATEMENT:

# FOR THE PROPOSED INSTALLATION OF SYNCHRONOUS CONDENSERS AT THE KORUSON SUBSTATION NEAR MIDDELBURG IN THE UMSOBOMVU LOCAL MUNICIPALITY, PIXLEY KA SEME DISTRICT MUNICIPALITY, NORTHERN CAPE PROVINCE.

| PRODUCED BY: | INDEPENDENT EAP | PRODUCED FOR: |
|---|---|---|
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**March 2026**

## DECLARATION OF SPECIALIST INDEPENDANCE

- I consider myself bound to the rules and ethics of the South African Council for Natural Scientific Professions (SACNASP);
- At the time of conducting the study and compiling this report I did not have any interest, hidden or otherwise, in the proposed development that this study has reference to, except for financial compensation for work done in a professional capacity;
- Work performed for this study was done in an objective manner. Even if this study results in views and findings that are not favourable to the client/applicant, I will not be affected in any manner by the outcome of any environmental process of which this report may form a part, other than being members of the general public;
- I declare that there are no circumstances that may compromise my objectivity in performing this specialist investigation. I do not necessarily object to or endorse any proposed developments, but aim to present facts, findings and recommendations based on relevant professional experience and scientific data;
- I do not have any influence over decisions made by the governing authorities;
- I undertake to disclose all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by a competent authority to such a relevant authority and the applicant;
- I have the necessary qualifications and guidance from professional experts in conducting specialist reports relevant to this application, including knowledge of the relevant Act, regulations and any guidelines that have relevance to the proposed activity;
- This document and all information contained herein is and will remain the intellectual property of Confluent Environmental. This document, in its entirety or any portion thereof, may not be altered in any manner or form, for any purpose without the specific and written consent of the specialist investigators.
- All the particulars furnished by me in this document are true and correct.

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**06 March 2026**

## INDEMNITY

Although Ntumbuluko Consulting Pty (Ltd) exercises due care and diligence in rendering services and preparing documents, the client takes full responsibility for this report and its implementation in terms of the National Environmental Management Act of 1998, and exempt Ntumbuluko Consulting Pty (Ltd) and its associates and their sub-contractors from any legal responsibility based on the timing of the assessment, the result and the duration thereof, which has an influence on the credibility and accuracy of this report. Ntumbuluko Consulting Pty (Ltd) accepts no liability, and the client indemnifies Ntumbuluko Consulting Pty (Ltd) and its directors, managers, agents, and employees against all actions, claims, demands, losses, liabilities, costs, damages, and expenses arising from or in connection with services rendered, directly or indirectly, by Ntumbuluko Consulting Pty (Ltd) and by the use of this document.

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# 1. INTRODUCTION

Ntumbuluko Consulting (Pty) Ltd has been appointed by QEMS Management and Business Solutions cc on on behalf of the National Transmission Company South Africa (NTCSA) to conduct a wetland delineation and compile an aquatic compliance statement for the proposed installation of new synchronous condensers at the Koruson Substation near Middelburg in the Umsobomvu Local Municipality, Pixley Ka Seme District Municipality, Northern Cape Province. The study aims to determine the site's suitability for constructability from an aquatic biodiversity sensitivity perspective.

## 1.1 Environmental Screening Tool Output

According to the protocols specified in GN 1540 (Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in Terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act, 1998, when Applying for Environmental Authorisation), assessment and reporting requirements for aquatic biodiversity are associated with a level of environmental sensitivity identified by the national web-based environmental screening tool (screening tool). An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of:

- **Very High** sensitivity for aquatic biodiversity, must submit an Aquatic Biodiversity Specialist Assessment; or
- **Low** sensitivity for aquatic biodiversity, must submit an Aquatic Biodiversity Compliance Statement.

The screening tool classified the study area as being of Low aquatic biodiversity. According to the protocol, a site sensitivity verification must however be undertaken to confirm the sensitivity of the site as indicated by the screening tool. In terms of aquatic biodiversity, the sensitivity of a property is typically determined by the presence of a watercourse or the potential impacts to a watercourse located outside of the property boundaries.

## 1.2 Definition of a Watercourse

According to the National Environmental Management Act (NEMA) and the National Water Act (NWA) a watercourse means:

- A river or spring; • A natural channel in which water flows regularly or intermittently;
- A wetland, lake or dam into which, or from which, water flows; and

- Any collection of water which the Minister may, by notice in the Gazette, declare to be watercourse, and
- A reference to a watercourse includes, where relevant, its bed and banks.

For the purposes of this assessment, a wetland area is defined according to the NWA (Act No. 36 of 1998) as:

"Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil".

Wetlands must therefore have one or more of the following attributes to meet the NWA wetland definition (DWAF, 2005):

- A high water table that results in the saturation at or near the surface, leading to anaerobic conditions developing in the top 50 cm of the soil;
- Wetland or hydromorphic soils that display characteristics resulting from prolonged saturation, i.e. mottling or grey soils; and
- The presence of, at least occasionally, hydrophilic plants, i.e. hydrophytes (water loving plants).

## 1.3 OBJECTIVES

The objectives of this assessment include the following:

- To undertake a desktop analysis and site inspection to verify the sensitivity of aquatic biodiversity as Very High or Low; and (if applicable)
- Map aquatic features considered to be of Very High sensitivity.
- Determine the constructability of the proposed development onsite.

## 1.4 BACKGROUND

Eskom SOC Ltd, South Africa's state-owned power company, has historically relied on large coal-fired power stations and peaking plant for electricity generation. Peaking plants were comprised of a mix of gas fired turbines (burning diesel as fuel) and hydro plants to supplant base load electricity generation. The national transmission grid, primarily consisting of a range of 220 kV to 765 kV overhead lines, transmits power across the country. The latter is owned and operated by the National Transmission Company South Africa SOC Ltd (NTCSA), a subsidiary of Eskom SOC Ltd. In addition to the above, NTCSA manages a number of 88kV to 132 kV power lines that are strategic in nature as well.

To enhance grid reliability amid growing renewable energy adoption, NTCSA plans to implement Synchronous Condensers (SynCons). SynCons will provide several ancillary energy services, increasing rotating inertia in order to improve grid stability. The SynCons, do not generate power, however through their inertial, rotating mass provide grid stability to the local area of the national transmission grid where they are located. Currently, the only inertial, rotating mass is provided largely by the coal fired power stations, which are stationed in the north-eastern part of the country.

The SynCons are required to be added to the transmission grid by 2028 to address instabilities caused by renewable energy inverter-based technologies. Failure to stabilise the grid within this time period would result in alternative methods such as renewable energy curtailment to be adopted during peak periods of instability. Seven of the NTCSA's substations have been identified for this initiative. Koruson. Substation, located near Middelburg, Eastern Cape, is one of the identified substations due to the large penetration of wind and solar plants implemented or approved for construction in the specific area served by the substation.

To meet the required specification of the national grid at Koruson Substation, there is likely to be at least 3 SynCons which will cover a footprint of approximately between 2.55 to 3.25 hectares, when placed together.

### 1.4.1 General Project Requirements

To achieve the grid code ancillary service requirements, the SynCons need to be integrated onto the 400 kV busbar at the Koruson Substation. In the event that the Koruson Substation does not prove to be a feasible host substation for all or some of the required SynCon capacity a nearby substation may be used. As the SynCons are to be integrated at 400kV they should be located within a reasonable proximity to the 400 kV busbars. SynCons have large heavy components often weighing more than several hundred tons. For constructability and maintainability requirements these components need to be bought onto and off site with reasonable ease. This requires a certain proximity to heavy vehicle access roads with required turning radii.

### 1.4.2 Possible SynCon Layouts

The OE team has developed possible layouts for the SynCons based on the current substation layout. The one has the three SynCons positioned on the northern side of the substation. This is possible by extending the current servitude north- and westwards (Figure1-1).

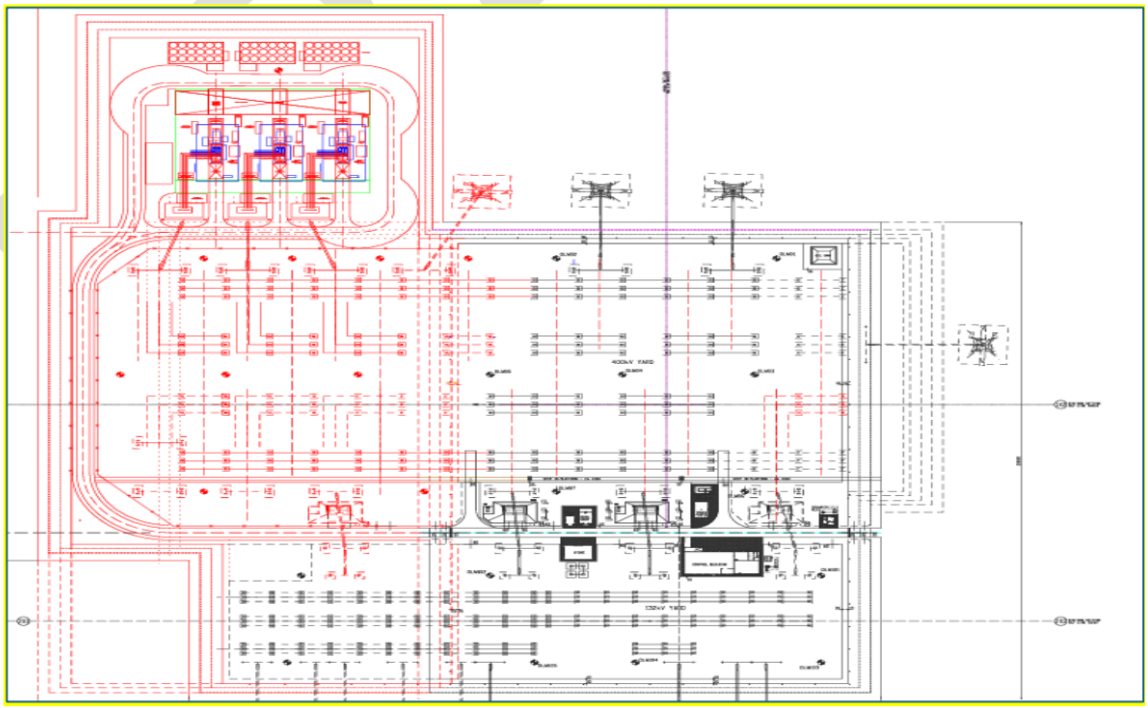

**Figure 1-1: Three SyCons posostioned on the northern side of the substation.**

## 1.5 STUDY AREA

Koruson Substation is situated on portion 8 of Farm Uitzicht No.3. It is bordered by R/E of Farm Elandskloof No.135 on its eastern boundary and encircled by portions 3,4,6 and 7 of Farm Uitzicht No.3 on its north-western boundary. It is located outside Middelburg, Eastern Cape near Noupoort, in the eastern Karoo in Umsobomvu Local Municipality within the Pixley KaSeme District Municipality, Northern Cape (**Figure 1-2**). The central Coordinates of the Substation are as follows: 31°21'16.07"S 24°49'18.42"E.

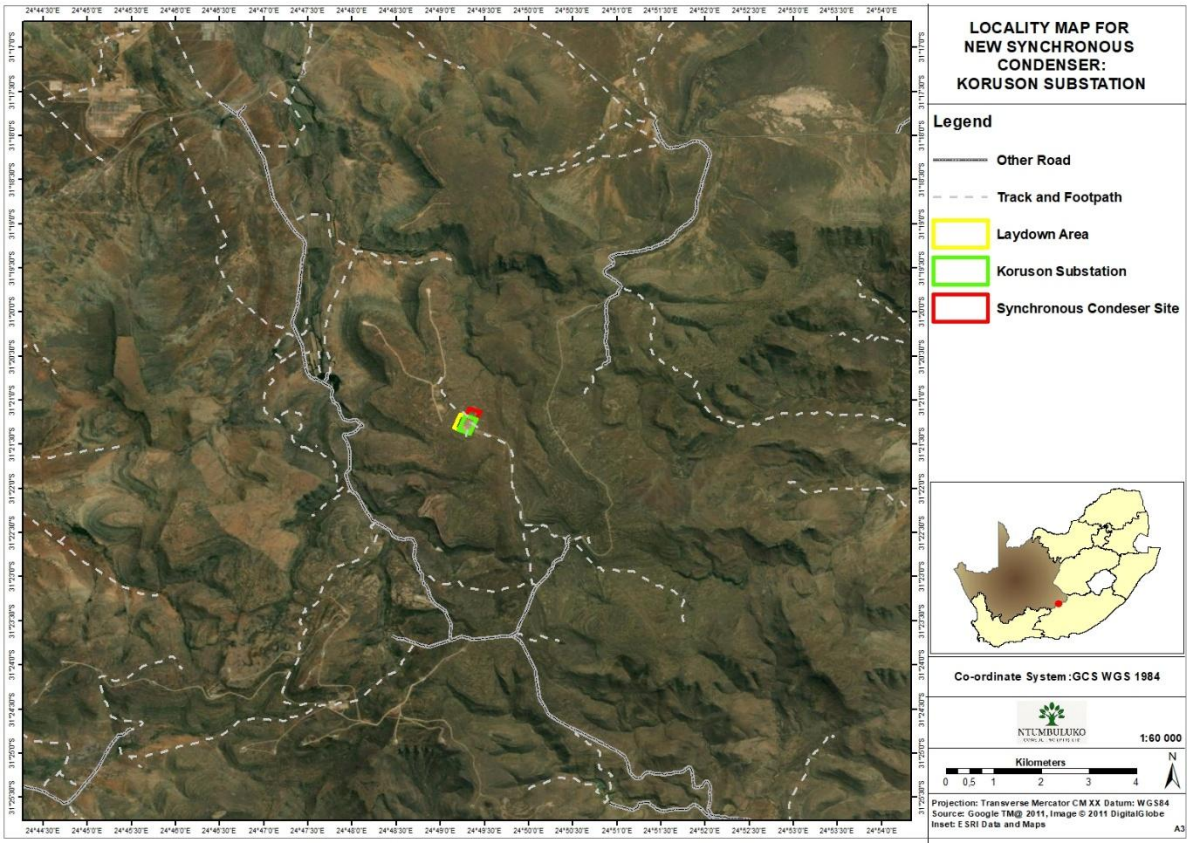


**Figure 1-2:Locality Map.**

# 2. LEGAL FRAMEWORK

## 2.1 National Environmental Management Act (Act No. 107 of 1998)

The EIA Regulations, promulgated under NEMA, focus primarily on creating a framework for co-operative environmental governance. NEMA provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by State Departments and to provide for matters connected therewith.

## 2.2 National Waste Act, 2008 (Act No. 59 of 2008)

The NEMWA aims at promoting sustainable waste management practices through the implementation of "Integrated Waste Management Planning", where "Integrated Waste Management Planning is viewed as a holistic approach of managing waste, aimed at optimising waste management practises to ensure that the implementation thereof yields practical solutions that are environmentally, economically and socially sustainable and acceptable to the public and all relevant spheres of government".

## 2.3 National Water Act, 1998 (Act No. 36 of 1998)

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected as well as integrated management of water resources with the delegation of powers to institutions at the regional or catchment level. The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in responsible ways. Of specific importance to this application is Section 19 of the NWA, which states that an owner of land, a person in control of land or a person who occupies or uses the land which thereby causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring and must therefore comply with any prescribed waste standard or management practices.

Regulations GN 704 dated June 1999 under the NWA, 1998 (Act 36 of 1998) stipulates that no development activities may take place within the 1:100 year floodline of a watercourse, or within 100 m of the watercourse, whichever is the furthest.

Regulations GN 509 dated August 2016 under the Section 21 c and i water uses of the NWA, 1998 (Act No 36 of 1998) stipulates the:

"Extent of a watercourse" as:

(a) The outer edge of the 1 in 100-year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam.

**"Regulated area of a watercourse"** for section 21(c) or (i) of the Act water uses in terms of this Notice means:

(a) The outer edge of the 1 in 100-year flood line and /or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;
(b) In the absence of a determined 1 in 100-year flood line or riparian area the area within 100 m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act); or
(c) A 500 m radius from the delineated boundary (extent) of any wetland or pan.

### 2.4 National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.

### 2.5 National Freshwater Ecosystem Priority Area (NFEPA) Status

The National Freshwater Ecosystem Priority Areas (NFEPA) database forms part of a comprehensive approach to the sustainable and equitable development of South Africa's scarce water resources. This database provides guidance on how many rivers, wetlands and estuaries, and which ones, should remain in a natural or near-natural condition to support the water resource protection goals of the National Water Act (Act 36 of 1998). This directly applies to the National Water Act, which feeds into Catchment Management Strategies, water resource classification, reserve determination, and the setting and monitoring of resource quality objectives (Nel et al. 2011). The NFEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act's biodiversity goals (NEM:BA) (Act 10 of 2004), informing both the listing of threatened freshwater ecosystems and the process of bioregional planning provided for by this Act (Nel et al., 2011).

## 3. ASSUMPTIONS AND LIMITATIONS

It is difficult to apply pure scientific methods within a natural environment without limitations, and consequential assumptions need to be made. The following constraints may have affected this assessment:

- The findings, results, observations, conclusions and recommendations provided in this report are based on the author's best scientific and professional knowledge as well as available information regarding the perceived impacts on the watercourses and biodiversity;
- Data collection in this study relied heavily on data from representative, homogenous wetland sections, as well as general observations, analysis of satellite imagery from the past until the present, generic data and a desktop analysis.
- The specialist responsible for this study reserves the right to amend this report, recommendations and/or conclusions at any stage should any additional or otherwise significant information come to light.

# 4. METHODOLOGY

The following approach was adopted to determine the sensitivity of aquatic biodiversity of the property:

- Interrogation of available desktop resources including:
    - DWS spatial layers; o National Freshwater Ecosystem Priority Areas (NFEPA) spatial layers (Nel et al., 2011);
    - National Wetland Map 5 and Confidence Map (CSIR, 2018) – the latest national wetland inventory map for South Africa;
    - Northern Cape Biodiversity and Spatial Plan.
- A site visit was undertaken, during which time the following activities were undertaken:
    - Identification and classification of watercourses within the footprint of the site according to methods detailed in Ollis et al. (2013); and
    - Identification of hydrophilic plant species that may indicate the presence of wetland plant species (if applicable).

The presence of wetlands was verified in accordance with DWAF (2005) guidelines which considers the following four specific indicators:

- The Terrain Unit Indicator: Identifies those parts of the landscape where wetlands are more likely to occur; • The Soil Form Indicator: Identifies the soil forms, as defined by the Soil Classification Working Group (1991), which are associated with prolonged and frequent saturation; • The Soil Wetness Indicator: Identifies the morphological "signatures" developed in the soil profile as a result of prolonged and frequent saturation (i.e. mottling and gleying within 50 cm of the soil surface); and
- The Vegetation Indicator: Identifies hydrophilic vegetation associated with frequently saturated soils.

The following soil wetness indicators were used to identify/confrim zones of saturation in any suspected wetland areas:

- Temporary Zone: Short periods of saturation (less than three months per annum) characterised by few high chroma mottles and minimal grey matrix (< 10 %).
- Seasonal Zone: Significant periods of wetness (at least three months per annum) characterised by many low chroma mottles and a grey matrix.

- Permanent Zone: Wetness all year round characterised by a prominent grey matrix and few to no high chroma mottles.

# 5. DESKTOP SURVEY

## 5.1 GEOLOGY & SOILS

The area consists of Dolerite koppies and sills embedded within Karoo Supergroup sediments. The dolerite dykes and sills are igneous intrusions that are the result of extensive volcanic activity, which accompanied the break-up of Gondwana in the Jurassic. In places the slopes of mesas and butts carrying this vegetation type have a mixed geology where dolerites occur together with sandstones and mudstones of the Ecca and Beaufort Groups. Fb land type covers almost 60% of the area, followed by Ib.

## 5.2 CLIMATE

Due to the large extent of the area, the rainfall pattern differs slightly from west to east. Seasonal summer rainfall prevails when the patches are found embedded within other units of the Grassland Biome, but the southern and southwestern regions show hints of bimodal climate patterns typical of the Nama-Karoo. Far more importantly, despite an overall MAP of almost 400 mm, MAP ranges from about 280 mm in the west (De Aar) to more than double, 580 mm, in the east (Edenburg). Much of the rainfall is of convectional origin. MAT 15°C. See also climate diagram for Gh 4 Besemkaree Koppies Shrubland (**Figure 5-1**).

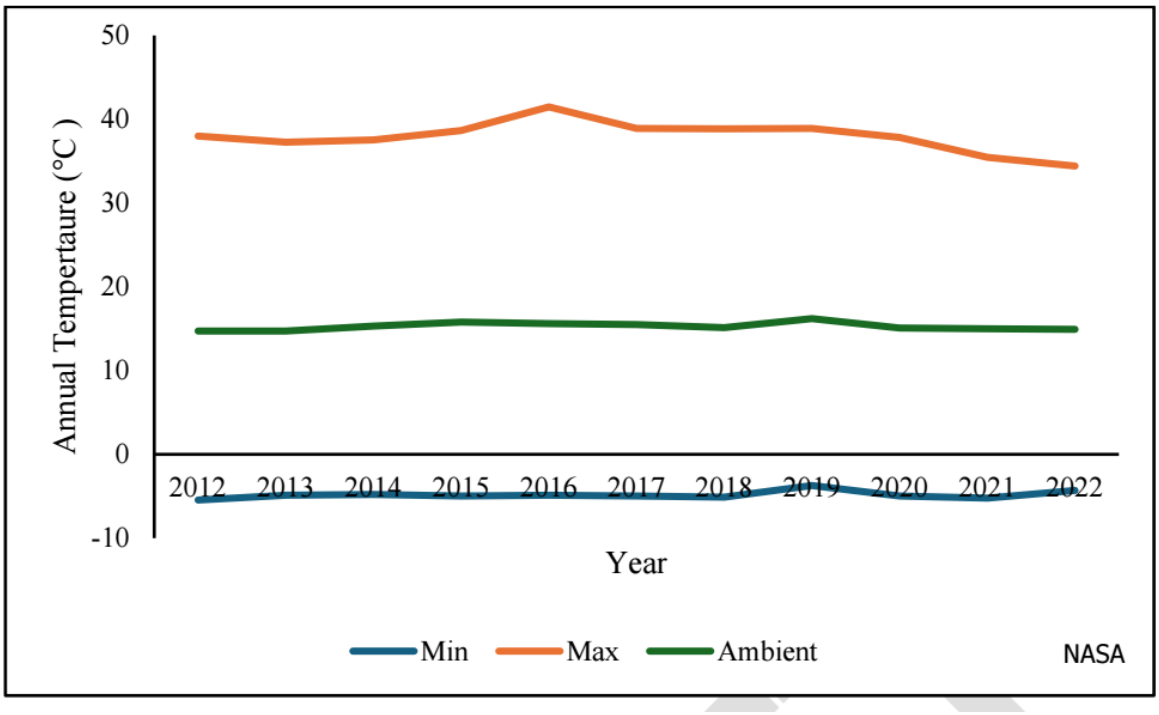


**Figure 5-1: Gamma Substation site temperatures between 2012 and 2022 (Source:QEMS, 2025)**

## 5.3 2024 NORTHERN CAPE BIODIVERSITY SPATIAL PLAN

According to the Northern Cape Critical Biodiversity Areas (CBA) Map, the preferred site including the existing substation is situated within a Critical Biodiversity Area (**Figure 5-2**). Critical Biodiversity Areas (CBAs) represent portions of the landscape that are essential for safeguarding biodiversity pattern and ecological processes. These areas are identified through systematic biodiversity planning and are prioritised to ensure the long-term persistence of species, ecosystems, and ecological functioning. CBAs are therefore regarded as irreplaceable or highly significant for maintaining regional biodiversity targets and ecological resilience.

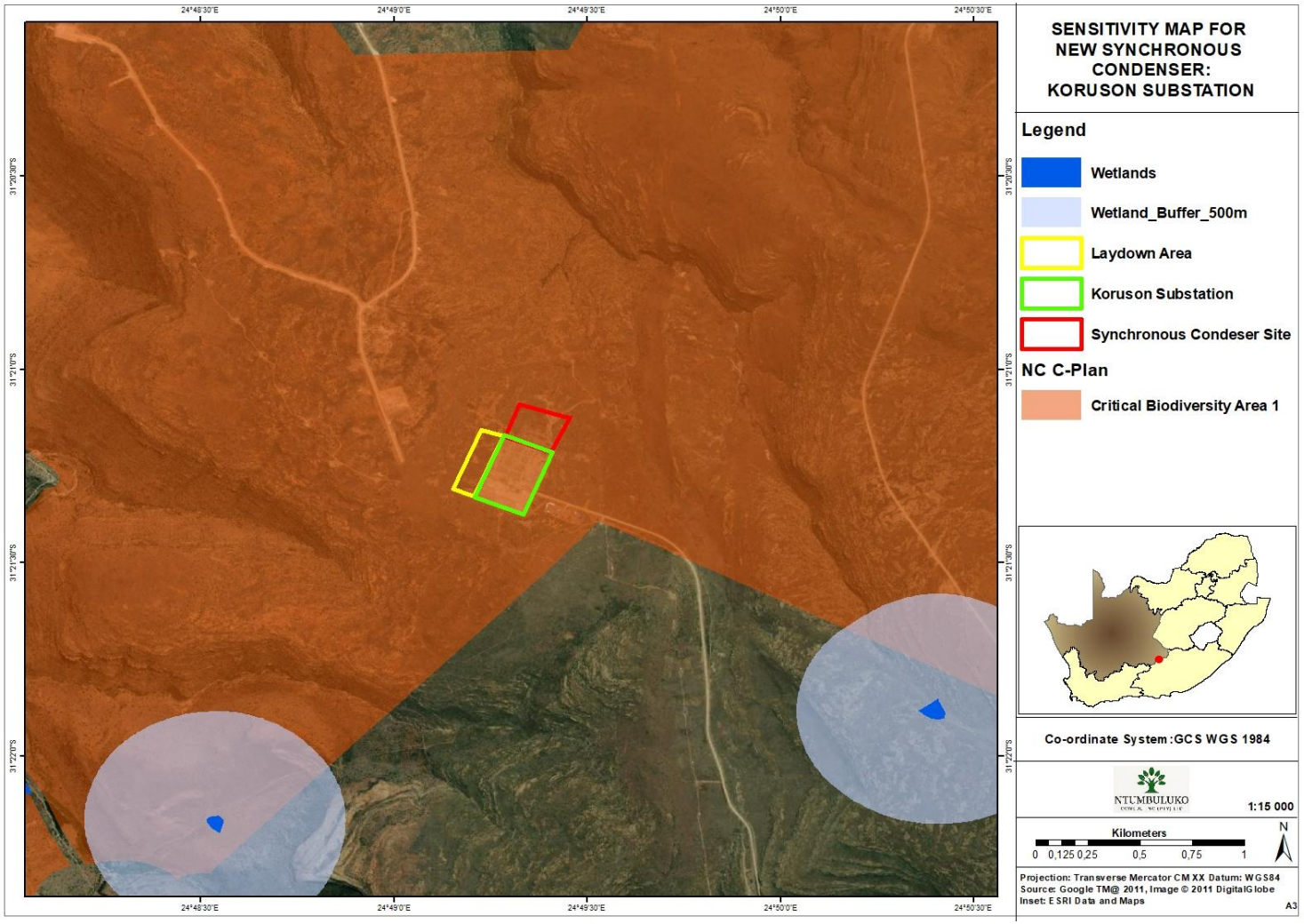


**Figure 5-2: Sensitivity Map.**

## 5.4 SURFACE HYDROLOGY

The National Screening Report identifies the aquatic sensitivity of the proposed development site as Low, indicating that the immediate project footprint is unlikely to contain high-value freshwater features such as wetlands, riparian zones, or sensitive aquatic habitats. This classification suggests a reduced likelihood of direct ecological constraints; however, it still necessitates consideration of indirect hydrological impacts, stormwater dynamics, and cumulative effects within the broader catchment.

The site is located within the Upper Orange Water Management Area (WMA), a major hydrological unit forming part of South Africa's national water resource planning and allocation framework. This WMA encompasses the upper reaches of the Orange River system and supports a combination of agricultural, industrial, ecological, and domestic water demands. Its regional hydrology is characterised by variable rainfall, episodic runoff, and a strong dependence on regulated river systems and storage infrastructure. Understanding the site's position within this WMA provides the broader context for assessing cumulative pressures on water resources, catchment-scale flow dynamics, and compliance requirements under the National Water Act.

At a finer spatial scale, the site falls within Quaternary Catchment D32C, a hydrological unit used for detailed surface-water resource assessment and modelling. This catchment delineation defines the immediate drainage network, local runoff pathways, and hydrological connectivity to downstream aquatic ecosystems. The catchment is typically characterised by semi-arid to dry climatic conditions, with runoff events driven primarily by seasonal rainfall patterns and localised storm events. Surface-water features within D32C are often ephemeral or seasonal, with flow regimes influenced by topography, soil infiltration capacity, and land-use practices.

Key hydrological processes within the catchment include limited baseflow contributions, rapid runoff responses following high-intensity rainfall, and high evapotranspiration rates that reduce the persistence of surface water. These characteristics shape the sensitivity of downstream systems to alterations in flow,

sediment transport, and water quality. The site's position within D32C therefore provides the primary basis for evaluating potential hydrological impacts associated with proposed activities, including changes to stormwater generation, erosion potential, and connectivity to regulated or natural watercourses.

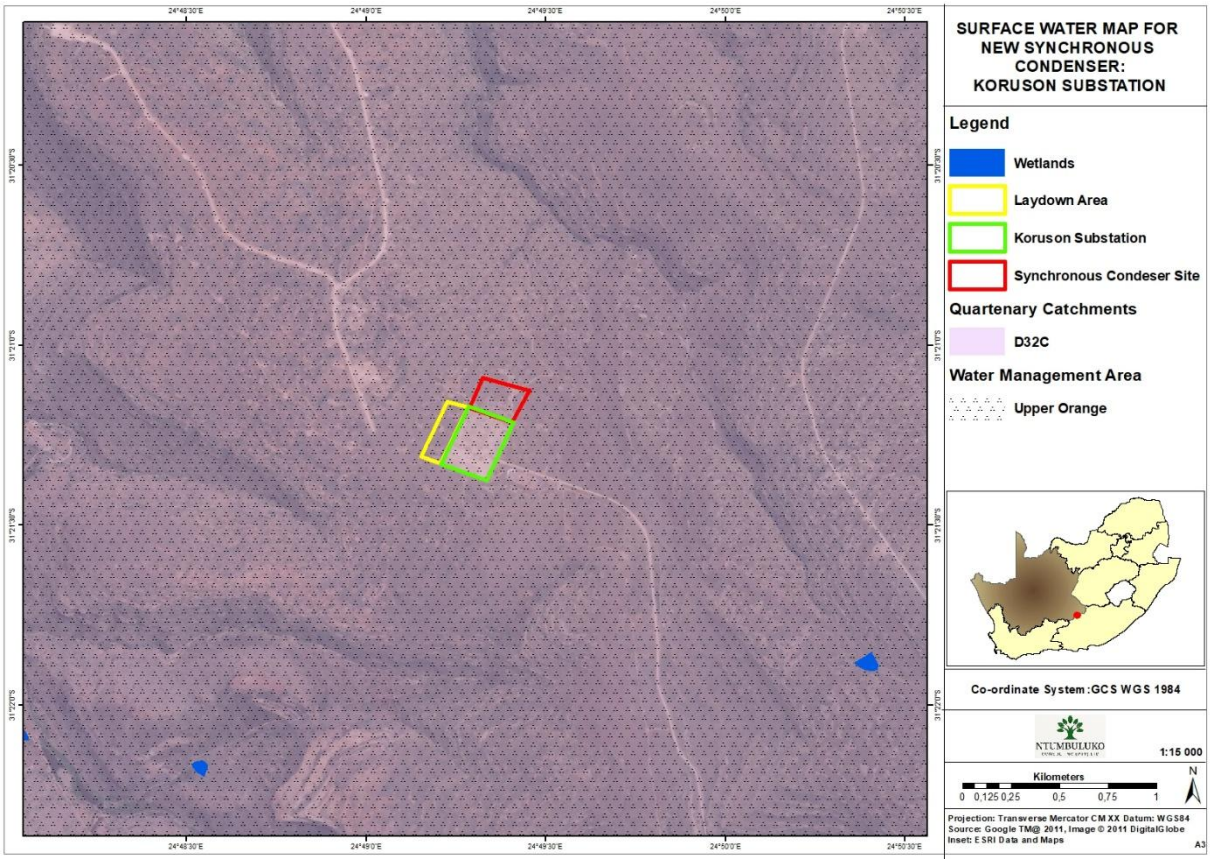


**Figure 5-3: Surface Water Map.**

**The study area lies more than 500 m from any river reach or wetland identified as a National Freshwater Ecosystem Priority Area (NFEPA). While no priority freshwater features occur on or immediately next to the site, the surrounding landscape is still hydrologically linked to regional drainage systems and downstream aquatic habitats. This connectivity means that development could indirectly influence ecological processes through changes in runoff patterns, sediment loads, pollution pathways, or downstream water quality, and may affect nearby non-NFEPA wetlands or drainage features that remain sensitive to altered hydrological inputs.**

# 6. RESULTS

## 6.1 FIELD SURVEY

A comprehensive field survey was conducted on 23 January 2026, during which the entire study site was systematically traversed on foot to ensure full spatial coverage and ecological observation (refer to **Figure *6-1***).

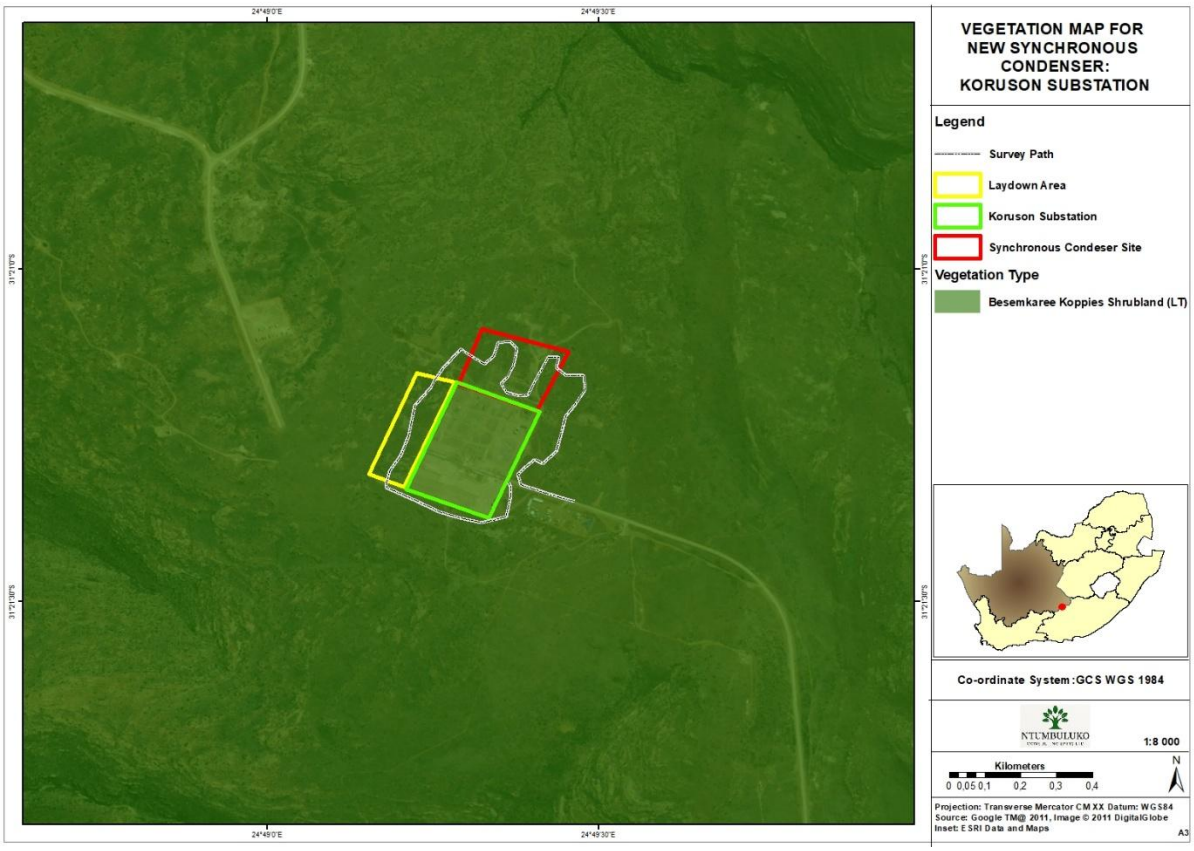


**Figure 6-1: Survey Path.**

### 6.1.1 Non-Perennial Water Line

The site exhibits low and largely reversible disturbance, primarily linked to routine substation maintenance, stormwater infrastructure, game grazing, and use of the existing access road. These activities have resulted in only minor, localised impacts, with no evidence of persistent ecological degradation, loss of vegetation integrity, or alteration of habitat structure.

Field assessment confirmed the absence of watercourses, wetlands, and any associated aquatic habitat indicators within the delineated project footprint (Figure 6-2), except for drainage lines.

**Figure 6-2: Drainage line and associated stormwater management infrastructure observed onsite.**

No hydrophilic vegetation, hydric soils, or signs of sustained surface water were observed. This lack of hydrological and ecological indicators supports the classification of the area as having low aquatic sensitivity, reflecting a landscape that does not currently support wetland or riparian processes.

Given these conditions, the proposed development is expected to pose minimal risk of hydrological disruption, as no direct surface-water features occur within or adjacent to the footprint. The broader landscape context further supports this conclusion: the nearest active watercourse lies more than 3 km from the site, the closest wetland is approximately 1.11 km away, and the nearest non-perennial watercourse occurs 0.7 km from the project boundary (**Figure 6-3**). These distances indicate that the project footprint is well-removed from sensitive aquatic systems, reducing the likelihood of indirect impacts.

**Figure 6-3: Stream or tributary observed more than 3km from the development footprint.**

### 6.1.2 SENSITIVITY MAPPING

The drainage feature, while not a formal watercourse, conveys intermittent runoff during rainfall events and therefore fulfils an important hydrological function. Disturbance of this area combined with the steep surrounding slopes and the anticipated increase in stormwater from the proposed development, creates a heightened risk of erosion. For this reason, the feature is regarded as hydrologically sensitive and warrants protection.

Applying the Macfarlane and Bredin (2017) buffer zone guidelines, and considering the development type, local environmental conditions, ecological sensitivity, and assumed mitigation measures, the drainage feature was classified as a low-importance, non-perennial system. The tool recommends a 32 m buffer on either side of the drainage line (**Figure 6-4**). No wetlands fall within any regulated zones.

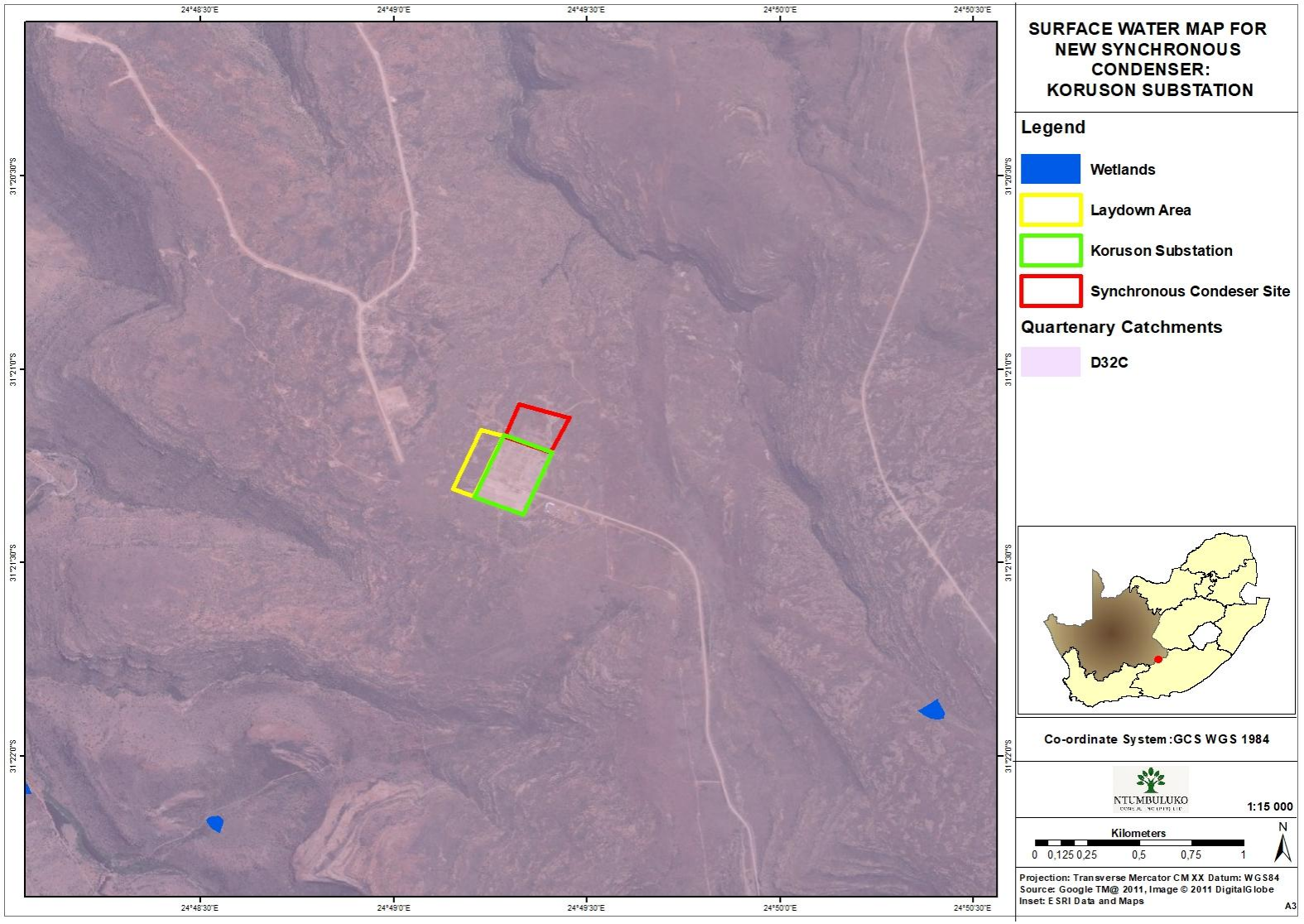


**Figure 6-4: Overview of the site.**

### 6.1.3 Terrain indicator

The topography of an area is generally a good practical indicator for identifying those parts in the landscape where wetlands are likely to occur. Generally, wetlands occur as a valley bottom unit however wetlands can also occur on steep to mid slopes where groundwater discharge is taking place through seeps (DWAF, 2005). In order to classify a wetland system, the localised landscape setting must be taken into consideration through ground-truthing of the study site after initial desktop investigations (Ollis et al., 2014). The study site is generally flat (**Figure 6-5**).

**Figure 6-5:General Slope of the study area.**

### 6.1.4 Soil wetness and soil form indicator

As previously noted, no wetlands or watercourses were identified within the boundaries of the proposed development site during the field survey. Wetland areas are typically delineated based on the presence of hydric soils, which are indicative of prolonged and repeated saturation. Hydric soils exhibit redoximorphic features distinctive characteristics formed under anaerobic conditions due to waterlogging. These features include:

- Mottling: the presence of bright, insoluble manganese (Mn) and iron (Fe) compounds dispersed within the soil matrix
- Gleyed matrix: a greyish-blue coloration resulting from reduced iron in saturated conditions

- Mn/Fe concretions: hardened nodules formed by the accumulation of manganese and iron oxides

Upon inspection, the soils observed on site do not exhibit any of these hydric indicators, and are therefore not characteristic of an aquatic or wetland environment. This supports the conclusion that the site does not meet the criteria for wetland delineation under current national guidelines. (**Figure 6-6**).

**Figure 6-6:Soil Observed onsite.**

### 6.1.5 Vegetation indicator

According to DWAF (2005), vegetation is regarded as a key component to be used in the delineation procedure for wetlands. Vegetation also forms a central part of the wetland definition in the National Water Act, Act 36 of 1998. However, using vegetation as a primary wetland indicator requires an undisturbed condition (DWAF, 2005).

**During the site inspection, no aquatic or semi-aquatic vegetation was observed within the project area. This absence of hydrophytic plant species further supports the conclusion that the site does not exhibit characteristics typical of wetland or watercourse habitats. The lack of aquatic vegetation aligns with the observed soil conditions and confirms the site's low aquatic sensitivity** (**Figure 6-7**).

**Figure 6-7: Vegetation observed onsite.**

# 7. FINAL COMMENTS

Based on the site inspection and supporting desktop analysis, the proposed development area demonstrates low aquatic ecological sensitivity, with no wetlands, hydrophytic vegetation, or regulated watercourses present within the project footprint aside from a non-perennial drainage line. The site does not intersect any NFEPA-mapped priority freshwater features and lies outside the 500-metre regulatory buffer of nearby rivers, substantially reducing the likelihood of direct hydrological impacts.

Although minor anthropogenic disturbances such as grazing and small-scale cultivation were noted, these are limited, reversible, and do not compromise the ecological suitability of the site. With the application of standard environmental management measures to control runoff, sedimentation, and pollution risks, the site is considered suitable for development from an aquatic perspective, and no significant aquatic constraints are expected to influence the project's feasibility. From a constructability standpoint, the absence of saturated soils, wetlands, or hydrophytic vegetation indicates favourable ground conditions for construction activities, provided that stormwater is appropriately managed during earthworks to prevent erosion along the drainage feature.

# 8. MANAGEMENT RECOMMENDATIONS

## 8.1 Stormwater Management

A key consideration for the installation of Synchroniser condensers within an existing substation is the increase in stormwater runoff generated by additional impermeable surfaces such as concrete plinths, equipment bases, access routes, and associated hardstand areas. Elevated runoff volumes and higher flow velocities can concentrate stormwater within the substation platform and its discharge points. When this water is conveyed downslope into nearby drainage features, the resulting high-energy flows may accelerate erosion of the channel bed and banks. Given the steep slopes surrounding the substation, the non-perennial drainage line, although located outside the development footprint remains vulnerable to stormwater impacts arising from construction and operational activities. Effective stormwater attenuation, dispersion, and energy-dissipation measures will therefore be essential to prevent erosion and maintain the stability of the drainage feature. It is therefore important that stormwater generated on site should be managed according to Sustainable Drainage System (SuDS) principles.

Erosion Management

- Ensure that construction activities do not cause any preferential flow paths and concentrated surface runoff during rainfall events.
- Clearly demarcate the construction area and ensure that heavy machinery does not compact soil or disturb vegetation outside of these demarcated areas.
- Reduce transport of sediment through use of structures such as silt fences and biodegradable coir logs placed along a contour below the development footprint.

# 9. REFERENCES

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