ENVIRO-SOLUM CONSULTING

DIGGING DEEPER FOR A BRIGHTER TOMORROW



Soil, Land Use, and Agricultural Walkdown: For the Proposed Powerline Deviation for the Pluto-Mahikeng 400 Kv Powerline within the JB Marks Local Municipality within the North West Province.

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DOCUMENT CONTROL

Report Name	Soil, Land Use, and Agricultural Walkdown: For the Proposed Powerline Deviation for the Pluto-Mahikeng 400 Kv Powerline within the JB Marks Local Municipality within the North West Province.
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Author	Tshiamo Setsipane, (Pr. Sci. Nat)
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EXECUTIVE SUMMARY

An Environmental Authorisation (EA) for the 400 kV Pluto-Mahikeng powerline was received by the National Transmission Company South Africa (NTCSA) for this project on 4 February 2019, valid for 5 years. This EA was extended for 5 more years and is now valid until 4 February 2029. The EMPr must be amended to show final tower positions and submitted to the Department of Forestry, Fisheries and Environment (DFFE) for approval before construction can commence.

Enviro-Solum Consulting was appointed by Vhubo Consultancy CC on behalf of the National Transmission Company South Africa (NTCSA) to carry out a comprehensive soil and agricultural walkdown (tower to tower) survey for the proposed construction of the 238 km 400Kv Pluto-Mahikeng powerline within the Mafikeng Local Municipality, Ditsobotla Local Municipality, JB Marks Local Municipality and Merafong City Local Municipality within the North West and Gauteng Provinces.

The western portion of the study area is characterised by a hot-semi-arid climate with hot summers, mild winters, high evaporation rates, and sparse rainfall. The mean annual rainfall in the western portion of the study area ranges from 401 to 600 mm, which is considered insufficient for dryland cultivation. The eastern portion of the study area falls within the Monsoon-Influenced Humid Subtropical climate, characterised by hot, humid summers, dry winters, and distinct seasonal temperature variations. The western portion of the study area is characterised by rainfall ranging between 601 and 800 mm. This rainfall range is deemed sufficient for dryland cultivation (rain-fed); a wide range of adapted crops can receive good yields if planted on time.

The study area was primarily grassland, with a mixture of woody plants. The land uses primarily include livestock farming and cultivation practices. Signs of soil degradation were observed within the study area. The proposed overhead powerline is unlikely to significantly affect agriculture, as it will not alter the future capacity for agricultural production in the study area. All farming activities can proceed normally beneath the power line. However, there may be minor impacts, such as the placement of electric pylons within cultivated fields, which could restrict the use of certain equipment near them due to safety standards. Additionally, the construction and decommissioning of the power line may cause topsoil loss and land degradation from disturbance. The potential impact of the project can be effectively reduced through the implementation of standard, generic measures built into the project's engineering design, as well as by following best practices for construction sites, all of which are detailed in the Environmental Management Programme (EMPr) included in Part B-Section 1 and 2 of the generic EMPr, along with standards for powerlines and substations. The development of the powerline is expected to result in only a minimal loss of future agricultural potential. Therefore, the agricultural impact of the proposed powerlines is considered to be of very low significance.

The proposed development falls within the Strategic Transmission Corridors (EGI), which identified 5 strategic transmission corridors important for planning electricity transmission and distribution infrastructure in South Africa. These corridors are essential for connecting high-voltage power and aid in strengthening the country's electricity grid. The proposed project is thus deemed critical from a broader perspective of the electricity supply in the country. In addition, the proposed project will create employment opportunities during both the construction phase (short- to medium-term) and the maintenance phase (long-term).

Agricultural protocols require specific evaluations for environmental approval to assess cumulative effects. The cumulative impact of a project is the overall consequence it will have when its effects are combined with the gradual impacts of previous, current, or anticipated future activities that influence the same environment.

The cumulative impacts from the proposed powerline are considered low because agricultural activities can continue below the powerlines. Therefore, no net loss of future agricultural production is anticipated. Disruption of agricultural activities, such as grazing and cultivation, will be limited in scale and duration during the construction period; post-construction, all grazing and cultivation activities will continue under the proposed powerlines. Consequently, there is no expected net loss in future agricultural production resulting from this proposed development and the currently operating developments of a similar nature. Given this analysis, the proposed powerline development is considered for approval.

DECLARATION OF INDEPENDENCE

- I, Tshiamo Setsipane, in my capacity as a specialist consultant, hereby declare that I:
- Act/acted as an independent specialist toVhubvo Consultancy Cc for this project.
- Do not have any personal, business, or financial interest in the project except for financial remuneration for specialist investigations completed in a professional capacity as specified by the Environmental Impact Assessment Regulations, 2014, as amended.
- Will not be affected by the outcome of the environmental process, of which this report forms part.
- Do not have any influence over the decisions made by the governing authorities.
- Do not object to or endorse the proposed developments but aim to present facts and my best scientific and professional opinion about the impacts of the development.
- Undertake to disclose to the relevant authorities any information that has or may have the potential to influence its decision or the objectivity of any report, plan, or document required in terms of the Environmental Impact Assessment Regulations, 2014, as amended.



_____

Tshiamo Setsipane (Pr. Sci. Nat)

13 June 2026

DOCUMENT GUIDE

This report was compiled according to the following information guidelines for a specialist report in terms of the Environmental Impact Assessment (EIA) Sections 24(5)(a) and (h) and 44 of The National Environmental Management (NEMA) Act 1998, as summarised in the Table below.

The table below provides the criteria for the specialist assessment and minimum report content requirements for impacts on agricultural resources for activities requiring environmental authorisation related to Government Notice No. 320 Protocol as published in Government Gazette 43110 dated March 20 2020.

Table A: Document guide according to Government Notice 320.

Theme-Specific Requirements as per Government Notice No. 320 Agricultural Resources Theme – Walkdown Statement		
NO.	**SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS**	**SECTION IN REPORT/NOTES**
3	**Agricultural Walkdown Statement**	
3.1	**The Walkdown statement must be prepared by a soil scientist or agricultural specialist registered with the SACNASP.**	Appendix B
3.2	**The Walkdown statement must:**	
3.2.1	be applicable to the preferred site and proposed development footprint;	Section 1
3.2.2	confirm that the site is of "low" or "medium" sensitivity for agriculture; and	Section 5.2
3.2.3	indicate whether or not the proposed development will have an unacceptable impact on the site's agricultural production capability.	Section 5.2
3.3	The Walkdown statement must contain, as a minimum, the following information:	
3.3.1	contact details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the assessment including a curriculum vitae;	Appendix B
3.3.2	a signed statement of independence;	Declaration Section
3.3.3	a map showing the proposed development footprint (including supporting infrastructure) with a 50m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool;	Section 2.5
3.3.4	confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimise fragmentation and disturbance of agricultural activities;	Section 5.2.2
3.3.5	a substantiated statement from the soil scientist or agricultural specialist on the acceptability, or not, of the proposed development and a recommendation on the approval, or not, of the proposed development;	Section 5.2.1
3.3.6	any conditions to which the statement is subjected;	

3.3.7	in the case of a linear activity, confirmation from the agricultural specialist or soil scientist, that in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase;	Section 5.2.2 and Section 6
3.3.8	where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr; and	Section 6
3.3.9	A description of the assumptions made as well as any uncertainties or gaps in knowledge or data.	Section 1.6
3.4	A signed copy of the Walkdown statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	Declaration Section

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1. INTRODUCTION

An Environmental Authorisation (EA) for the 400 kV Pluto-Mahikeng powerline was received by the National Transmission Company South Africa (NTCSA) for this project on 4 February 2019, valid for 5 years. This EA was extended for 5 more years and is now valid until 4 February 2029. The EMPr must be amended to show final tower positions and submitted to the Department of Forestry, Fisheries and Environment (DFFE) for approval before construction can commence.

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The proposed Strategic Infrastructure Project (SIP) aims to strengthen the electricity transmission network across the North West and Gauteng provinces. These powerlines are designed to facilitate the efficient and reliable transfer of electricity between substations, thereby supporting economic growth, enhancing energy security, and meeting the rising demand for electricity in these regions. The project is important for providing a reliable transmission network that meets customer needs, supports government initiatives, and uplifts communities.

The proposed powerlines fall within the Strategic Transmission Corridors (Northern corridor and Central corridor). Therefore, the proposed powerlines trigger the NEMA EIA listed activities as contained in Government Notice Regulations (GN R), GN 983, and GNR 985. As such, NTCSA is required to undertake a Basic Assessment (BA) process and obtain Environmental Authorisation (EA) in line with the requirements of the EIA Regulations of 2014 as amended, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).

1.1 PROJECT DESCRIPTION

The NTCSA received an Environmental Authorisation (EA) for this project on 4 February 2019, valid for 5 years. This EA was extended for 5 more years and is now valid until 4 February 2029. The EMPr must be amended to show final tower positions and submitted to the Department of Forestry, Fisheries and Environment (DFFE) for approval before construction can commence.

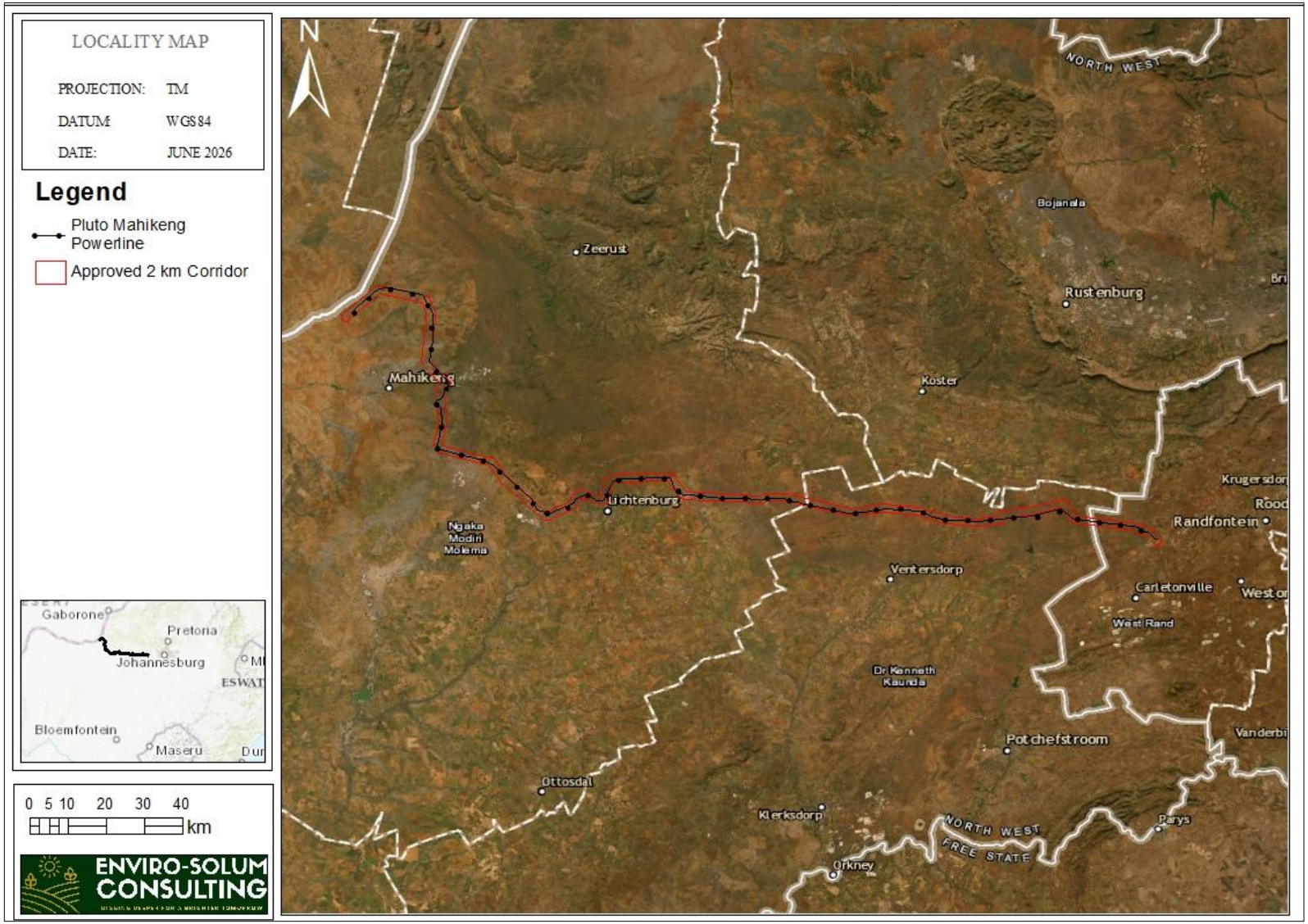


Figure 1: Locality of the study area in relation to the surrounding areas.

1.2 AIMS AND OBJECTIVES OF THE STUDY

The objective of the Soil, Land Use, and Land Capability is to fulfil and align the proposed project with the requirements of the Conservation of Agricultural Resources Act (CARA), 1983 (Act No. 43 of 1983) of South Africa. This act aims to promote the conservation of soil, water sources, and vegetation, as well as the control of weeds and invader plants by managing natural agricultural resources. Thus, the proposed study aims to determine the possible impacts of the proposed development on the soil, land use, land capability, and agricultural potential and identify areas of high sensitivity within the study area. This will be achieved by considering parameters such as soil quality, drainage, topography, climate, and water availability and providing sound input to ensure that land is used sustainably and responsibly. As such, this specialist report has assessed and considered the following:

- The soil forms occurring within the study area;
- The associated land capability and agricultural sensitivity of the soils occurring within the study area;
- Discussion of the land capability and sensitivity in terms of the soils, water availability, surrounding development, and current status of land;
- Discussion of potential and actual impacts as a result of the proposed development; and
- Provide mitigation for the impacts as part of the Environmental Management Programme (EMPr).

1.3 SUITABILITY OF SOILS FOR AGRICULTURAL CULTIVATION

Assessing soil suitability for agricultural cultivation rests primarily on identifying soils suited to crop production. For soils to be classified as being suitable for crop cultivation, they must have the following properties:

- Adequate depth (greater than 60 cm) to accommodate root development for the majority of cultivated crops;
- Good structure, as in water-stable aggregates, which allows for root penetration and water retention;
- Sufficient clay and organic matter to provide nutrients for growing crops;
- Sufficient distribution of high-quality and potential soils within the study area to constitute a viable economic management unit;
- Adequate clay content and deep enough water table to allow for water storage; and
- Good climatic conditions, such as sufficient rainfall and sunlight, increase crop choice variety.

1.4 APPLICABLE LEGISLATION

The most recent South African Environmental Legislation that needs to be considered for any new or expanding development with reference to assessment and management of soil and land use includes:

- The National Environmental Management Act. 1998 (Act 107 of 1998), requires that pollution and degradation of the environment be avoided, or, where it cannot be avoided, be minimised and remedied.
- The Conservation of Agricultural Resources (Act 43 of 1983) states that the degradation of the agricultural potential of soil is illegal.
- The Conservation of Agriculture Resources (Act 43 of 1983) requires the protection of land against soil erosion and the prevention of water logging and salinisation of soils employing suitable soil conservation works to be constructed and maintained. The utilisation of marshes, water sponges, and watercourses is also addressed.

1.5 Terms of Reference

The terms of reference for this study are to fulfil the requirements of the Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

The study area encompasses land classified by the national web-based environmental screening tool as having high sensitivity to impacts on agricultural resources, as illustrated in Figure 3 below for the powerline deviation route. The level of agricultural assessment required in terms of the protocol (and hence in terms of NEMA) is, therefore, an Agricultural Agro-Ecosystem Specialist Assessment. The terms of reference for such an assessment, as stipulated in the protocol, are listed in the **Document Guide**, along with the relevant section numbers of this report, which also fulfils each stipulation. **The protocol also requires that a Site Sensitivity Verification be done.**

The summarised terms of reference applicable to the Soils, Land Capability, and Land Use Study include the following:

- A review of available desktop information about the study area site and compile various maps illustrating the desktop data;
- Discussion of the relevant desktop literature;
- A professional opinion on agricultural issues relating to agriculturally sensitive areas within the servitude and substation areas;
- Serve as background information for the placement of the tower positions within the servitude area relating to the potential disturbance to soils and agricultural production, which may be present;
- Serve as additional soil and agricultural information for ESKOM, the Contractor and Environmental Control Officers involved in the proposed development; and
- Recommendations regarding the moving tower positions within agricultural-sensitive areas.
- Compile soil, land use, and land capability walkdown survey report based on the field-finding data under on-site conditions.

1.6 ASSUMPTIONS, ASSUMPTIONS UNCERTAINTIES, LIMITATIONS, AND GAPS

The following assumptions, uncertainties, limitations, and gaps were applicable for the soil, land use, and land capability assessment:

- It is assumed that the infrastructure components will remain as indicated on the layout and that the activities for the construction and operation of the infrastructure are limited to that typical for a project of this nature;
- The soil survey was confined to the study area outline with consideration of various land uses outside the assessment area;
- Survey results presented in this report are based on a snapshot investigation of the servitude area and not on detailed investigations of all environmental attributes and the varying degrees of soil diversity that may be present in the servitude area.
- 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 soil and agricultural environment; and
- Soil profiles were observed using a 1.5m hand-held soil auger; thus, a description of the soil characteristics deeper than 1.5m cannot be given.

2. METHODOLOGY

The assessment of the Study Area's agricultural potential was based on a combination of desktop studies to gather general information, site visits for status quo assessment, soil classification and characterisation, and validation of the information generated from the desktop studies.

2.1 Desktop Study and Literature Review

Before beginning the field assessment, a literature review and background study were conducted to gather the study area's predetermined soil, land use, and land capability data. The data was sourced from the Soil and Terrain (SOTER) database and the Natural Agricultural Atlas of South Africa Version 3: (https://ndagis.nda.agric.za/portal/apps/webappviewer/index.html?id=8b72eb2a25c04660a1ab2b562f6ec0bf)

2.2 Site Survey and Sensitivity Verification

A desktop assessment was followed by a walk-down survey during February 2026 to validate the predetermined soil and agricultural results obtained at the desktop level. The aim was to record all agriculturally sensitive areas on and near the servitude area that could influence the locations of the powerline towers. The key objective was to identify sensitive areas within the servitude area that could be impacted by the Project. While electricity supply is an essential service for the country, it is imperative that it does not negatively impact our agricultural resources. Conservation of these resources and food security should be prioritised. The field survey included soil auger tests and observations of agricultural activities. Soils were classified into soil forms according to the Soil Classification System: A Natural and Anthropogenic System for South Africa (2018). It must be noted that the season has no bearing on the soil's morphological properties over a short-term period.

2.3 Land Capability Classification

A land capability class is an interpretive grouping of land units with similar potential and containing limitations or hazards for long-term intensive use of land for rainfed farming determined by the interaction of climate, soil, and terrain. It is a more general term than land suitability and is more conservation-oriented (See Table 1 below). It involves consideration of:

- Varying limitations to land use pertaining to rainfed cultivation and soil properties; and
- The risks of land damage from erosion and other causes.

Eight land capability classes were employed with potential decreases, limitations, and hazards increasing from class 1 to class 8. Classes 1 to 4 are considered arable, whereas Class 5 is considered wet-based soils or watercourses and Classes 6 to 8 are classified as grazing, forestry, or wildlife. This system is based on the Land

Capability Classification system of the United States Department of Agriculture (USDA) Soil Conservation Service by Klingelbiel and Montgomery (1961) as well as by Scotney *et.al* (1987).

Table 1: Soil Capability Classification (after Scontey *et al.*, 1987).

Land Capability Group	Land Capability Class	Intensity of Land Use									
		wildlife	Forestry	Light grazing	Moderate grazing	Intensive grazing	Light cultivation	Moderate cultivation	Intensive cultivation	Very intensive cultivation	Limitations
Arable	I										There are no or few limitations. Very high arable potential. Very low erosion hazard
	II										Slight limitations. High arable potential. Low erosion hazard
	III										Moderate limitations. Some erosion hazards
	IV										Severe limitations. Low arable potential. High erosion hazard.
Grazing	V										Water course and land with wetness limitations
	VI										Limitations preclude cultivation. Suitable for perennial vegetation
	VII										Very severe limitations. Suitable only for natural vegetation
Wildlife	VIII										Extremely severe limitations. Not suitable for grazing or afforestation.

The updated and refined land capability ratings and database for the whole of South Africa were released by the Department of Fishery and Forestry (DAFF) in 2017. These land capability ratings were derived through a spatial evaluation modelling approach and a raster spatial data layer comprising fifteen (15) land capability evaluation values 9 (see Table 2 below). The new land capability describes the categories as 1 being the lowest and 15 being the highest. Values of below 8 are generally not suitable for producing cultivated crops. (DAFF, 2017). Soil agricultural potential is impacted by several factors (see Table 3 below). The soil agricultural potential was evaluated based on the factors mentioned and described in Table 3 by assigning qualitative criteria ratings such as High, Moderate, or Marginal too low to the updated land capability ratings.

Table 2: National Land Capability Values (DAFF, 2017).

Land Capability evaluation value	Land Capability Description
1	Very Low
2	
3	Very Low to Low
4	
5	Low
6	Low to Moderate
7	
8	Moderate
9	Moderate to High
10	
11	High
12	High to Very High
13	
14	Very High
15	

Table 3: Soil Agricultural Potential Criteria

Criteria	Description
Rock Complex	If a soil type has prevalent rocks in the upper sections of the soil, it is a limitingfactor to the soil's agricultural potential.
Flooding Risk	The risk of flooding is determined by the closeness of the soil to water sources.
Erosion Risk	The soil erosion risk is determined by combining the wind and watererosion potentials.
Slope	The slope of the site could potentially limit the agricultural use thereof.
Texture	The texture of the soil can limit its use by being too sandy or too clayey.
Depth	The effective depth of soil is critical for the rooting zone for crops.
Drainage	The capability of soil to drain water is important as most grain crops do nottolerate submergence in water.
Mechanical Limitations	Mechanical limitations are any factors that could prevent the soil from beingtilled or ploughed.
pH	The pH of the soil is important when considering soil nutrients and fertility.
Soil Capability	This section highlights the soil type's capability to sustain agriculture.
Climate Class	The climate class highlights the prevalent climatic conditions that couldinfluence the agricultural use of a site.
Land Capability / Agricultural Potential	The land capability or agricultural potential rating for a site combines the soil capability and the climate class to arrive at the potential of the site to support agriculture.

2.4 DFFE Screening Tool

The Agricultural Agro-Ecosystem Assessment protocol provides the criteria for assessing and reporting impacts on agricultural resources for activities requiring Environmental Authorisation (EA). The assessment requirements of this protocol are associated with a level of environmental sensitivity determined by the national web-based environmental screening tool, which, for agricultural resources, is based on the most recent land capability evaluation values provided by the Department of Forestry, Fisheries, and the Environment (DFFE). The national web-based environmental screening tool can be accessed at: https://screening.environment.gov.za/screeningtool.

The primary purpose of the Agricultural Agro-Ecosystem Assessment is to determine the site's sensitivity considering the proposed land use change (from potential agricultural land to the proposed development is sufficiently considered). The information in this report aims to enable the Competent Authority (CA) to draw sound conclusions and recommendations on the proposed project and its potential impacts with a specific focus on food security.

To meet this objective, the protocol requires that site sensitivity verification be conducted, and subsequent outcomes must meet the following objectives:

- It must confirm or dispute the current land use and the environmental sensitivity as indicated by the National Environmental Screening Tool;
- It must contain proof (e.g., photographs) of the current land use and environmental sensitivity pertaining to the study area;
- All data and conclusions must be submitted together with the main report for the proposed development;
- It must indicate whether the proposed development will have an unacceptable impact on the agricultural production capability of the site, and if it does, whether such a negative impact is outweighed by the positive impact of the proposed development on agricultural resources and
- The report is prepared in accordance with the requirements of the Agricultural specialist protocols

Thus, the report is compiled to meet the minimum report content requirements for the impacts on agricultural resources resulting from the proposed development.

2.5 DFFE Screening Tool

The Screening tool for the powerline route and the Sekhukhune substation is presented in Figure 2 below.

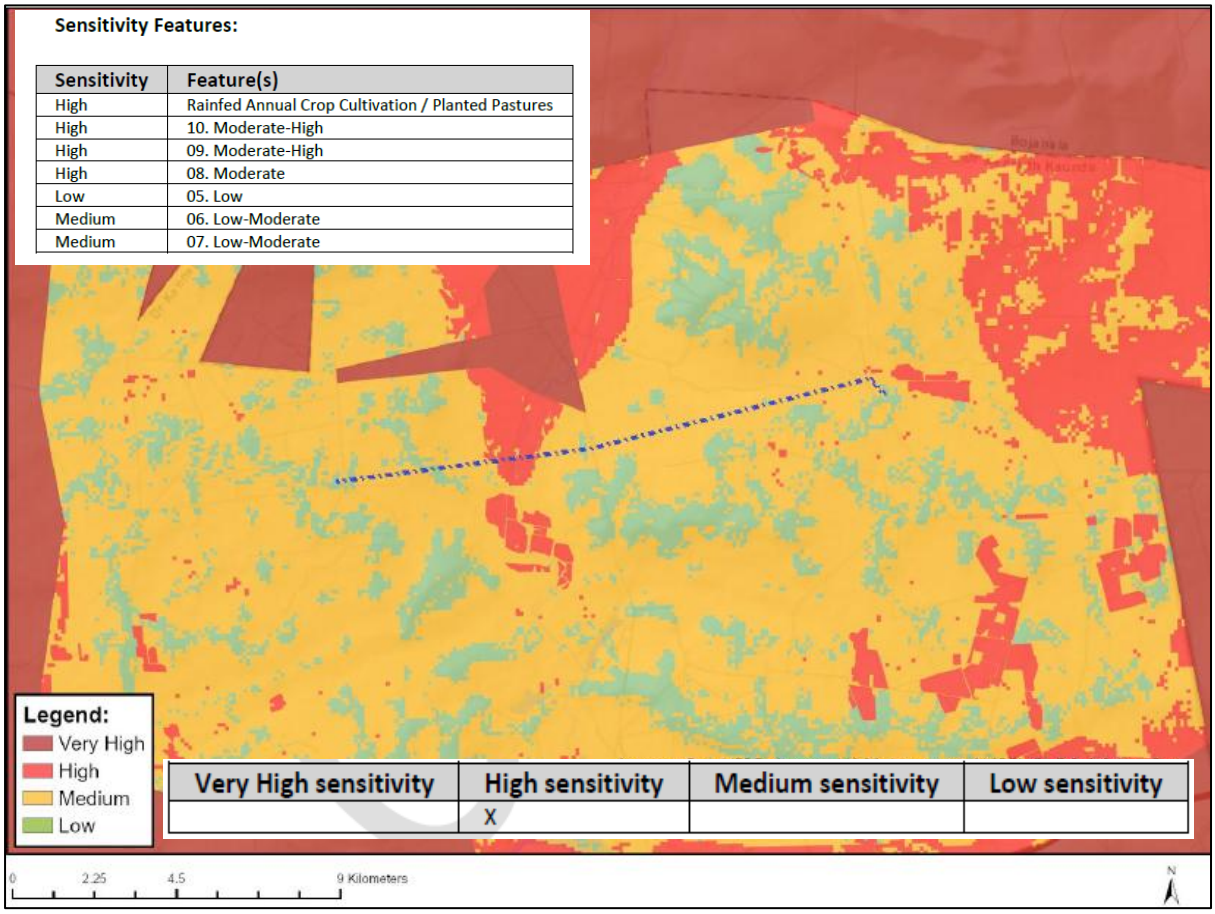


Figure 2: Screening tool sensitivity for the study area.

3. DESKTOP RESULTS AND DISCUSSIONS

3.1 CLIMATIC DATA

The western portion of the study area is characterised by a hot-semi-arid climate with hot summers, mild winters, high evaporation rates, and sparse rainfall. The mean annual rainfall in the western portion of the study area ranges from 401 to 600 mm; this range is considered insufficient for dryland cultivation. The eastern portion of the study area falls within the Monsoon-Influenced Humid Subtropical climate, characterised by hot, humid summers, dry winters, and distinct seasonal temperature variations. The western portion of the study area is characterised by rainfall ranging between 601 and 800 mm. This rainfall range is deemed sufficient for dryland cultivation (rain-fed); a wide range of adapted crops can receive good yields if planted on time. Figure 3 shows the mean annual rainfall associated with the study area.

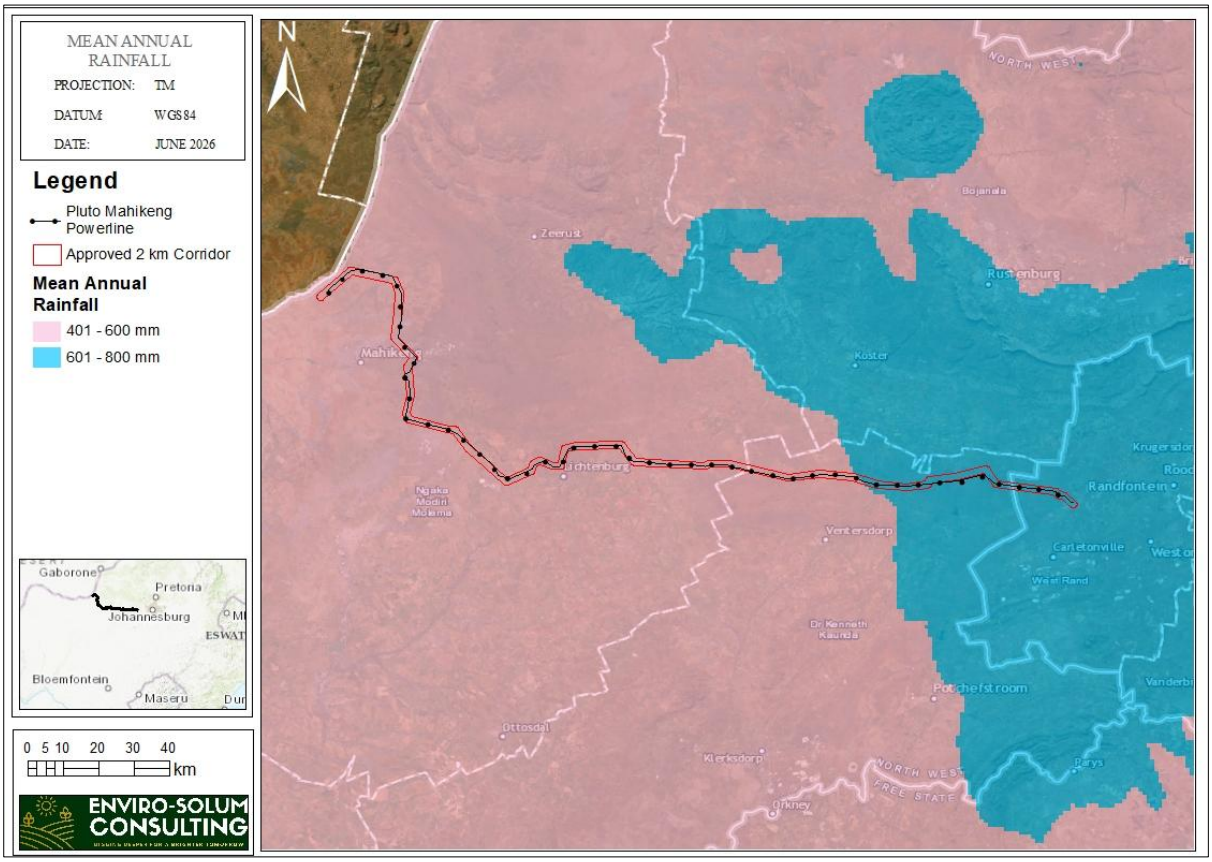


Figure 3: Mean Annual Rainfall associated with the study area.

3.2 Soil pH

The soil pH in the study area ranges from 5.5 to 7.4. Table 4 describes the soil pH associated with the study area, whereas Figure 4 below depicts the soil pH associated with soils occurring within the study area.

Table 4: Soil pH associated with the study area.

Soil pH	Implications
6.5 – 7.4 (Mostly the western portion of the study area)	This soil pH range is considered the ideal sweet spot for most plants. This neutral-to-slightly-alkaline range is perfect because it allows the broadest variety of essential plant nutrients (like nitrogen, phosphorus, and potassium) to become soluble and easily absorbed by root systems.
5.5 – 6.4 (Mostly eastern portion of the study area)	The pH range identified here is classified as acidic. In this state, the soil may require liming to neutralise the acidity, as certain essential nutrients, particularly nitrogen, can become inaccessible to plants. This unavailability can hinder plant growth and overall health, making it crucial to address soil pH for optimal nutrient uptake.

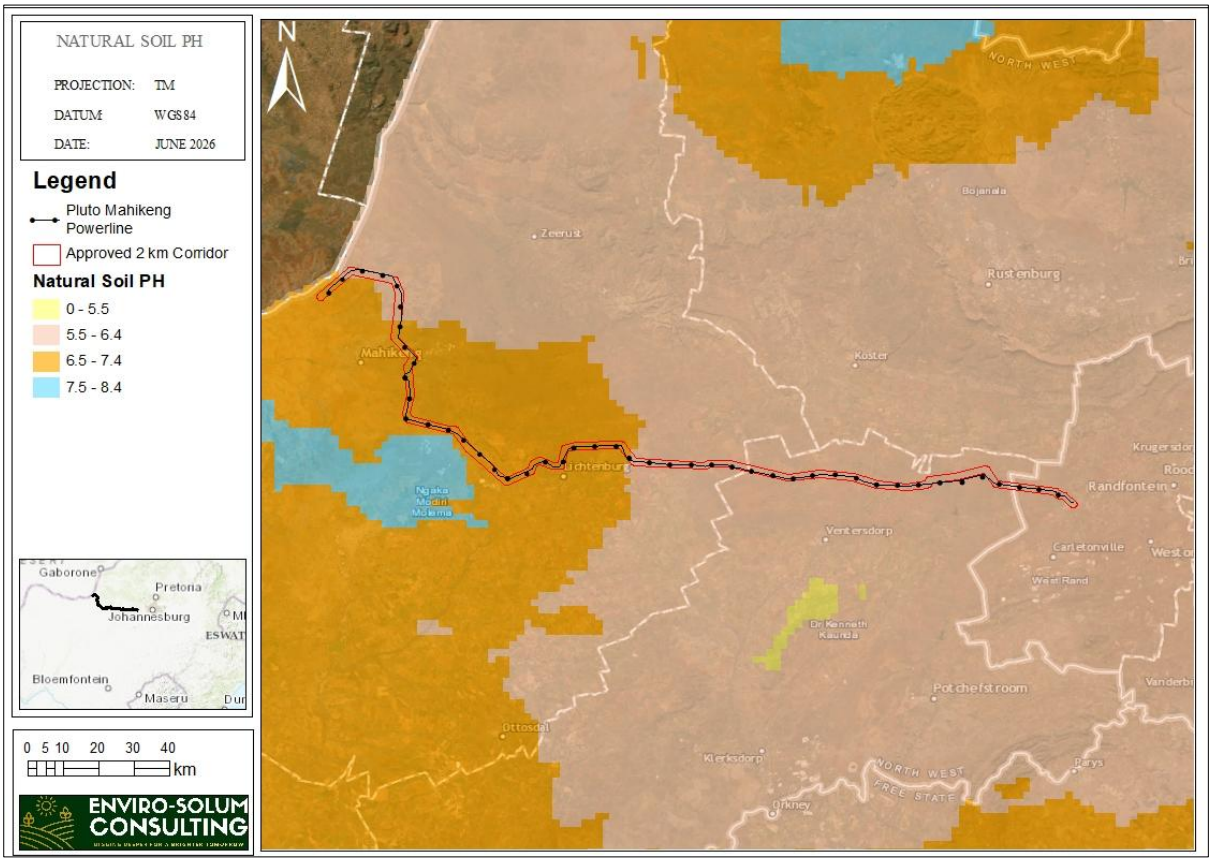


Figure 4: Soil pH associated with the project area.

3.3 Soil and Terrain (SOTER) Dominant Soils

The majority of the study area is largely characterised by the Eutric Leptosols, followed by the Haplic Lixisols, Haplic Acrisols, Ferric Luvisols, Eutric Plinthosols and Plinthic Acrisols. The eutric leptosols are severely limited to agricultural use, with plant roots confined to a small volume of soil that cannot provide adequate anchorage, water and nutrients. These soils with root-restrictive layers can be profitably used for cropping under sustainable and/or intensive management or left for extensive grazing and wood chopping. Ferric luvisols hey are characterised by a subsurface layer of accumulated silicate clay and a significant presence of iron oxides, giving them a distinct reddish or yellowish colour. Depending on the local climate, they support crops like maize, sorghum, and various tuber crops. Eutric Plinthosols are soils featuring a sub-surface layer of iron-rich clay (plinthite) that hardens upon exposure to air and alternating wet/dry cycles. "Eutric" means they have high base saturation, meaning the soil is relatively nutrient-rich and fertile compared to other highly weathered tropical soils. Plinthic Acrisols are highly weathered, acidic tropical soils characterised by a clay-enriched subsoil layer coupled with a plinthic horizon—a subsurface layer containing a dense, iron-rich mixture of clay and quartz that hardens irreversibly into ironstone when repeatedly exposed to wetting and drying. Figure 5 below illustrates the SOTER-dominant soils associated with the study area.

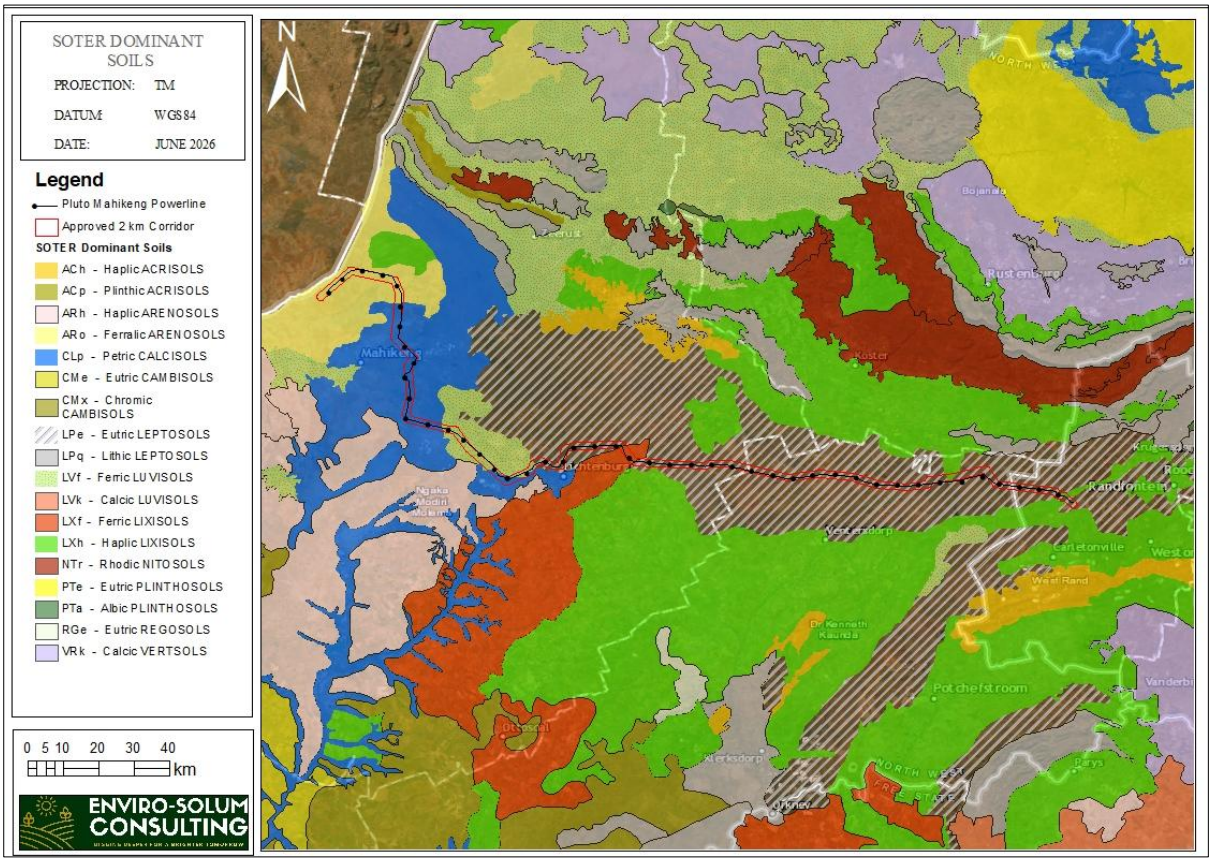


Figure 5: SOTER dominant soils associated with the study area.

3.4 Desktop Land Capability

The desktop land capability associated with the soils within the study area is largely non-arable, grazing, or wildlife land of Class VI capability, followed by moderate potential arable land of Class III capability and marginal potential arable land of Class VI capability. Figure 6 below shows this capability.

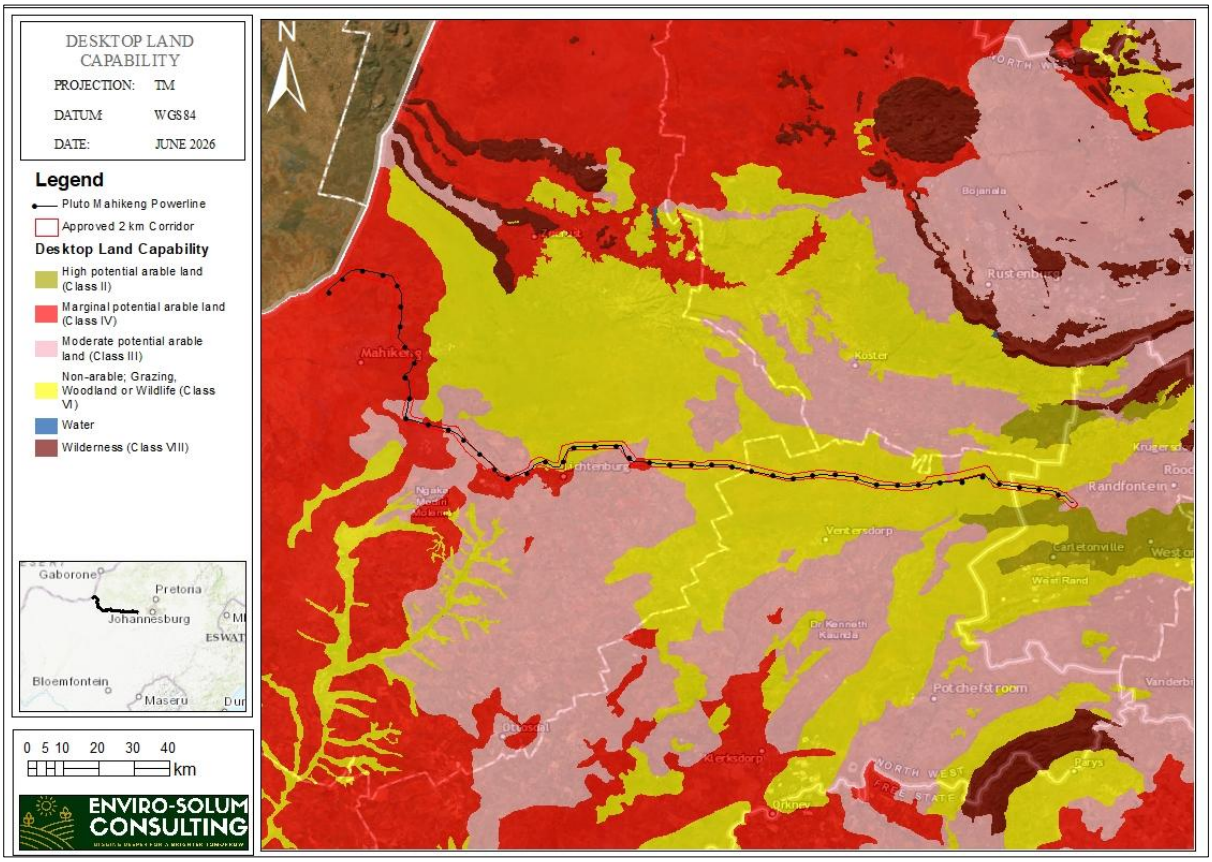


Figure 6: Desktop land capability associated with the study area.

4. WALKDOWN SURVEY FINDINGS

4.1 Land Uses within the Study Area

The study area was primarily grassland, with a mixture of woody plants. The land uses primarily include livestock farming and cultivation practices. Signs of soil degradation were observed within the study area. Figure 7 depicts the different land uses identified within the study area.



Figure 7: Land uses associated with the study area.

4.2 Site Specific Tower Impacts

Table 5 below focuses on the identified soil forms within the assessment area and summarises the route sensitivity for every pylon position.

Table 5: Tower positions sensitivities.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
Gantry	Sandy soils with scattered trees and shrubs, and dominated by grassy plains.	Moderate	Sandy soils are highly prone to erosion, especially during gantry construction. Soils in stockpiles can be easily washed away during heavy rain, leading to the loss of valuable topsoil. Soil compaction is also anticipated due to heavy machinery movement as well as soil contamination from accidental spills of hydrocarbons.	During construction mitigation measures, such as silt fencing, retaining walls or geotextiles, apply organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T1-T15	Sandy soils with scattered trees and shrubs, and dominated by grassy plains, are utilised for grazing purposes.	Moderate	Sandy soils are highly prone to erosion, especially during the bulk earthworks and electrical pylon installations. Soils in stockpiles can be easily washed away during heavy rains, leading to the loss of valuable topsoil material. Soil compaction is also anticipated due to heavy machinery movement as well as soil contamination from accidental spills of hydrocarbons.	During construction mitigation measures, such as silt fencing, retaining walls or geotextiles, apply organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T16 – T25	Sandy soils with groundnuts and sunflowers planted under dryland conditions.	High	Direct impacts on groundnuts and sunflower plantations, which may cause localised fragmentation of farmland. Due to the sandy nature of the soils, potential for sedimentation of the Ramatlabama river, as these soils are prone to wind and water erosion if not properly mitigated.	Construction activities should be scheduled for the fallow season, a time when agricultural land lies dormant, and cultivation is paused. This approach not only minimises disruption to farming practices but also allows for effective environmental management. Also, mitigation measures such as silt fencing, retaining walls, and applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T26 – T50	Sandy soils with pasture plantation and natural grassland veld are utilised for grazing purposes.	Moderate	Sandy soils are highly prone to erosion, especially during the bulk earthworks and electrical pylon installations. Soils in stockpiles can be easily washed away during heavy rains, leading to the loss of valuable topsoil material. Soil compaction is also anticipated due to heavy machinery movement as well as soil contamination from accidental spills of hydrocarbons.	During construction mitigation measures, such as silt fencing, retaining walls or geotextiles, apply organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.
T51 – T132	Shallow soils with natural veld, planted fodder, with grazing activities taking place.	Low	Possible loss of topsoil, increased soil compaction due to heavy machinery and increased potential of wind and water erosion.	During construction, mitigation measures such as silt fencing, retaining walls, and applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T133 -T137	Shallow soils with natural veld, planted fodder, with grazing activities taking place.	Low	Possible loss of topsoil, increased soil compaction due to heavy machinery and increased potential of wind and water erosion.	During construction, mitigation measures such as silt fencing, retaining walls, and applying organic mulch while soils are in stockpile, to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T138 – T161	Sandy soils with sunflowers planted under dryland conditions.	High	Direct impacts on the sunflower plantation, which may cause localised fragmentation of farmland. Due to the sandy nature of the soils, they are prone to wind and water erosion if not properly mitigated.	Construction activities should be scheduled for the fallow season, a time when agricultural land lies dormant, and cultivation is paused. This approach not only minimises disruption to farming practices but also allows for effective environmental management. Also, mitigation measures such as silt fencing, retaining walls, and applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T162 – T170	Shallow soils with natural veld, planted fodder with grazing activities taking place.	Low	Possible loss of topsoil, increased soil compaction due to heavy machinery and increased potential of wind and water erosion.	During construction, mitigation measures such as silt fencing, retaining walls, and applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T171 – T179	Sandy soils with pasture plantation and natural grassland veld are utilised for grazing purposes.	Moderate	Sandy soils are highly prone to erosion, especially during the bulk earthworks and electrical pylon installations. Soils in stockpiles can be easily washed away during heavy rains, leading to the loss of valuable topsoil material. Soil compaction is also anticipated due to heavy machinery movement as well as soil contamination from accidental spills of hydrocarbons.	During construction mitigation measures, such as silt fencing, retaining walls or geotextiles, apply organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T180	This is a depressional area which acts as a zone of accumulation and high in clay, leading to the formation of soil morphological signatures which indicate prolonged saturation.	Low	These soils are high in clay and more prone to compaction and potential sedimentation of the pan, which disrupts the ecological functioning.	Move the pylon out of the regulated area to prevent structural degradation from waterlogging during heavy rainfall. Schedule earthworks for dry periods and avoid handling clay when it is excessively wet to prevent it from becoming a slurry.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T181 - 196	Sandy soils wilth fodder cultivation intertwined with natural grasslands	Moderate	Sandy soils are highly prone to erosion, especially during the bulk earthworks and electrical pylon installations. Soils in stockpiles can be easily washed away during heavy rains, leading to the loss of valuable topsoil material. Soil compaction is also anticipated due to heavy machinery movement as well as soil contamination from accidental spills of hydrocarbons.	During construction mitigation measures, such as silt fencing, retaining walls or geotextiles, apply organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T197 -T215	Sandy soils under maize and soya bean cultivation under dryland conditions	High	Direct impacts on the sunflower and soybean plantation, which may cause localised fragmentation of farmland. Due to the sandy nature of the soils, they are prone to wind and water erosion if not properly mitigated.	Construction activities should be scheduled for the fallow season, a time when agricultural land lies dormant, and cultivation is paused. This approach not only minimises disruption to farming practices but also allows for effective environmental management. Also, mitigation measures such as silt fencing, retaining walls, and applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T216 – T221	Likely old excavation areas, which have been severly disturbed	Very Low	No direct impacts on agriculture anticipated.	Construction activities should prevent further loss of top soil material by executing bulk works during the periods when no rain is expected.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T222 – T237	Sandy soils under maize and sunflower cultivation under dryland conditions	High	Direct impacts on the maize and sunflower plantation, which may cause localised fragmentation of farmland. Due to the sandy nature of the soils, the potential for sedimentation in the Ramatlabama River, as these soils are prone to wind and water erosion if not properly mitigated.	Construction activities should be scheduled for the fallow season, a time when agricultural land lies dormant, and cultivation is paused. This approach not only minimises disruption to farming practices but also allows for effective environmental management. Also, mitigation measures such as silt fencing, retaining walls, and applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T238 – T304	Shallow soils with natural veld, planted fodder with grazing activities taking place	Low	Possible loss of topsoil, increased soil compaction due to heavy machinery and increased potential of wind and water erosion.	During construction, mitigation measures such as silt fencing, retaining walls, and applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T305- T317	Sandy soils under maize and sunflower cultivation under dryland conditions	High	Direct impacts on the maize plantation, potentially causing localised fragmentation of farmland. Due to the sandy nature of the soils, they are prone to wind and water erosion if not properly mitigated.	Construction activities should be scheduled for the fallow season, a time when agricultural land lies dormant, and cultivation is paused. This approach not only minimises disruption to farming practices but also allows for effective environmental management. Also mitigation measures such as silt fencing, retaining walls, applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T318 – T360	Shallow soils with natural veld, planted fodder with grazing activities taking place	Low	Possible loss of topsoil, increased soil compaction due to heavy machinery and increased potential of wind and water erosion.	During construction, mitigation measures such as silt fencing, retaining walls, and applying organic mulch while soils are in stockpile, to stabilise the soils and create windbreaks to reduce soil loss.
T361 – T362	The pylons are located in proximity to the centre pivot with maize cultivation	Very High	Possible impacts on the irrigation equipment, possible topsoil loss and fragmentation of the irrigated cultivation area	Pylons should be moved further away from the centre pivot area to avoid disrupting the irrigation equipment.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T363 – T446	Shallow soils with natural veld, with grazing activities taking place	Low	Possible loss of topsoil, increased soil compaction due to heavy machinery and increased potential of wind and water erosion.	During construction, mitigation measures such as silt fencing, retaining walls, and applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T447	Sandy soils under maize cultivation under dryland conditions	High	Direct impacts on the maize plantation, which may cause localised fragmentation of farmland. Due to the sandy nature of the soils, they are prone to wind and water erosion if not properly mitigated.	Construction activities should be scheduled for the fallow season, a time when agricultural land lies dormant and cultivation is paused. This approach not only minimizes disruption to farming practices but also allows for effective environmental management. . Also mitigation measures such as silt fencing, retaining walls, applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T448 – T450	Shallow soils with natural veld, with grazing activities taking place	Low	Possible loss of topsoil, increased soil compaction due to heavy machinery and increased potential of wind and water erosion.	During construction mitigation measures such as silt fencing, retaining walls, applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T451- T452	Sandy soils under maize cultivation under dryland conditions	High	Direct impacts on the maize plantation, which may cause localised fragmentation of farmland. Due to the sandy nature of the soils, they are prone to wind and water erosion if not properly mitigated.	Construction activities should be scheduled for the fallow season, a time when agricultural land lies dormant and cultivation is paused. This approach not only minimizes disruption to farming practices but also allows for effective environmental management. . Also mitigation measures such as silt fencing, retaining walls, applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T453 – T500	Sandy soils with natural veld, with grazing activities taking place	Low	Possible loss of topsoil, increased soil compaction due to heavy machinery and increased potential of wind and water erosion.	During construction mitigation measures such as silt fencing, retaining walls, applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T501 – T502	Sandy soils under maize cultivation under dryland conditions	High	Direct impacts on the maize plantation, which may cause localised fragmentation of farmland. Due to the sandy nature of the soils, they are prone to wind and water erosion if not properly mitigated.	Construction activities should be scheduled for the fallow season, a time when agricultural land lies dormant and cultivation is paused. This approach not only minimizes disruption to farming practices but also allows for effective environmental management. . Also mitigation measures such as silt fencing, retaining walls, applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T503 – T552	Shallow soils with natural veld, with grazing activities taking place	Low	Possible loss of topsoil, increased soil compaction due to heavy machinery and increased potential of wind and water erosion.	During construction mitigation measures such as silt fencing, retaining walls, applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T553 – T560	Sandy soils under maize cultivation under dryland conditions	High	Direct impacts on the maize plantation, which may cause localised fragmentation of farmland. Due to the sandy nature of the soils, they are prone to wind and water erosion if not properly mitigated.	Construction activities should be scheduled for the fallow season, a time when agricultural land lies dormant and cultivation is paused. This approach not only minimizes disruption to farming practices but also allows for effective environmental management. . Also mitigation measures such as silt fencing, retaining walls, applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T561 – T565	Shallow soils with natural veld, with grazing activities taking place	Low	Possible loss of topsoil, increased soil compaction due to heavy machinery and increased potential of wind and water erosion.	During construction mitigation measures such as silt fencing, retaining walls, applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T566	Sandy soils under maize cultivation under dryland conditions	High	Direct impacts on the maize plantation, which may cause localised fragmentation of farmland. Due to the sandy nature of the soils, they are prone to wind and water erosion if not properly mitigated.	Construction activities should be scheduled for the fallow season, a time when agricultural land lies dormant and cultivation is paused. This approach not only minimizes disruption to farming practices but also allows for effective environmental management. . Also mitigation measures such as silt fencing, retaining walls, applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T567 – T571	Shallow soils with natural veld, with grazing activities taking place	Low	Possible loss of topsoil, increased soil compaction due to heavy machinery and increased potential of wind and water erosion.	During construction mitigation measures such as silt fencing, retaining walls, applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T572 – T574	Sandy soils under maize cultivation under dryland conditions	High	Direct impacts on the maize plantation, which may cause localised fragmentation of farmland. Due to the sandy nature of the soils, they are prone to wind and water erosion if not properly mitigated.	Construction activities should be scheduled for the fallow season, a time when agricultural land lies dormant and cultivation is paused. This approach not only minimizes disruption to farming practices but also allows for effective environmental management. . Also mitigation measures such as silt fencing, retaining walls, applying organic mulch while soils are in stockpile to stabilise the soils and create windbreaks to reduce soil loss.

TOWER POSITION	OBSERVED CHARACTERISTICS & DESCRIPTION	AGRICULTURAL SENSITIVITY	ANTICIPATED IMPACTS	MITIGATION
T575 – T583	This is a depressional area which acts as a zone of accumulation and is high in clay, leading to the formation of soil morphological signatures which indicate prolonged saturation	Low	These soils are high in clay and more prone to compaction and potential sedimentation of the pan, which disrupts the ecological functioning.	Move the pylon out if the regulated area to avoid structural degradation during high rainfall due to waterlogging. Schedule earthworks for dry periods and avoid handling clay when it is excessively wet to prevent it from becoming a slurry.
Gantry	Within the Pluto substation, and already disturbed	Very Low	No direct impacts on agriculture are anticipated as the pylon is located within the substation.	During construction, mitigation measures such as silt fencing, retaining walls, and the application of organic mulch while soils are in stockpile are used to stabilise soils and create windbreaks to reduce soil loss.

4.3 Proposed Deviation Towers

From an agricultural perspective, total avoidance of encroachment on cultivated areas is not feasible; the impact on such areas will be short-lived during the construction phase, and thereafter, all cultivation practices can continue unhindered below the powerline during the operational phase. Due to possible edge effects, care must be taken between pylons 361 and 362. During site clearing and the establishment of foundations, existing cultivated crops could be uprooted, which may disrupt the carefully laid irrigation pipes and equipment essential for farming operations. Therefore, it is crucial to consult with the landowner prior to beginning construction to identify and safeguard any sensitive irrigation infrastructure that may be affected.

5. MICRO SITING AND CONFIRMATION OF LINEAR ACTIVITY

The agricultural protocol requires verification of the implementation of all practical measures through micro-siting to reduce fragmentation and disturbance of agricultural activities. This involves carefully planning the location and layout of agricultural infrastructure and operations to minimise negative impacts on surrounding agricultural activities. Micro-siting within the powerline development footprint will not significantly impact agriculture and disturbance, as previously discussed. However, it is recommended that the pylon infrastructure be sited as far as practicable from irrigated agricultural land.

The agricultural protocol also mandates that, for activities carried out in a linear fashion, the land must be restored to its original state within two years of the construction phase being completed. This requirement only applies to the overhead power line within the project. It has been verified that the land under the overhead power line, not occupied by other infrastructure, can be returned to its original agricultural productivity within two years of construction. However, it should be noted that the pylons will remain in place throughout the operational lifetime of the powerline.

6 INTEGRATED MITIGATION MEASURES

The following points should all be included within the EMPR:

- Undertake vegetation clearing during the dry season where necessary;
- Stockpile areas will be decided and approved by the Project Manager and appointed ECO before construction commences on site, and should not be located within cultivated areas, as well as sloping areas, to avoid the washdown of soil to downgradient areas;
- Construction impacts must be contained within the footprint of the pylon structures and /or the servitude routes of the powerline;
- Use existing access roads as far as possible;
- Store fuels and chemicals in an impermeable bunded area to avoid soil contamination;
- No servicing or repair of vehicles on site (unless absolutely necessary);
- Apply the appropriate erosion protection measures where erosion is identified;
- Improve the access of the identified access roads to ensure suitable passage for equipment, erosion control and maintenance of proper drainage; and
- Contaminated soil must be removed and disposed of at an appropriate registered landfill site.

7 CONCLUSION

An Environmental Authorisation (EA) for the 400 kV Pluto-Mahikeng powerline was received by the National Transmission Company South Africa (NTCSA) for this project on 4 February 2019, valid for 5 years. This EA was extended for 5 more years and is now valid until 4 February 2029. The EMPr must be amended to show final tower positions and submitted to the Department of Forestry, Fisheries and Environment (DFFE) for approval before construction can commence.

Enviro-Solum Consulting was appointed by Vhubo Consultancy CC on behalf of the National Transmission Company South Africa (NTCSA) to carry out a comprehensive soil and agricultural walkdown (tower to tower) survey for the proposed construction of the 238 km 400Kv Pluto-Mahikeng powerline within the Mafikeng Local Municipality, Ditsobotla Local Municipality, JB Marks Local Municipality and Merafong City Local Municipality within the North West and Gauteng Provinces.

The proposed overhead powerline is unlikely to significantly affect agriculture, as it will not alter the future capacity for agricultural production in the study area. All farming activities can proceed normally beneath the power line. However, there may be minor impacts, such as the placement of electric pylons within cultivated fields, which could restrict the use of certain equipment near them due to safety standards. Additionally, the construction and decommissioning of the power line may cause topsoil loss and land degradation from disturbance. The potential impact of the project can be effectively reduced through the implementation of standard, generic measures built into the project's engineering design, as well as by following best practices for construction sites, all of which are detailed in the Environmental Management Programme (EMPr) included in Part B-Section 1 and 2 of the generic EMPr, along with standards for powerlines and substations. The development of the powerline is expected to result in only a minimal loss of future agricultural potential. Therefore, the agricultural impact of the proposed powerlines is considered to be of very low significance.

8 REFERENCES

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APPENDIX A: INDEMNITY

- This report is based on survey and assessment techniques limited by time and budgetary constraints relevant to the type and level of investigation undertaken.
- This report is based on a desktop investigation using available information and data related to the site to be affected, *in situ* fieldwork, surveys, and assessments, and the specialist's best scientific and professional knowledge.
- The Precautionary Principle has been applied throughout this investigation.
- The findings, results, observations, conclusions, and recommendations given in this report are based on the specialist's best scientific and professional knowledge as well as information available at the time of the study.
- Additional information may become known or available later in the process for which no allowance could have been made at the time of this report.
- The specialist reserves the right to modify this report, recommendations, and conclusions at any stage must additional information become available.
- Information and recommendations in this report cannot be applied to any other area without proper investigation.
- This report, in its entirety or any portion thereof, may not be altered in any manner or form or for any purpose without the specific and written consent of the specialist as specified above.
- Acceptance of this report, in any physical or digital form, serves to confirm acknowledgment of these terms and liabilities.



Tshiamo Setsipane

07 June 2026

APPENDIX B: CURRICULUM VITAE OF SPECIALISTS

CURRICULUM VITAE OF TSHIAMO SETSIPANE

PROFESSIONAL EXPERIENCE

Soil Science Consultant

- Conducting Soil, Land Use and Land Capability Assessments:
  - Assess existing information for rainfall data and current land uses.
  - Conduct a desktop assessment within the study area using the digital satellite imagery and other suitable digital aids.
  - A soil classification survey and agricultural potential will be conducted within the proposed development area.
  - A soil classification survey and agricultural potential will be conducted within the proposed development area.
  - Provide recommended mitigation measures to implement to manage the anticipated impacts and to comply with the applicable legislations.
  - Compile a report on the findings of the assessment and presented in an electronic format.
- Conducting Hydropedological Impact Surveys:
  - Identify dominant hillslopes (from crest to stream) of the project area using terrain analysis.
  - Conduct a transect soil survey on each of the identified hillslope.
  - Hydrological behaviour of the identified hillslope described according to the identified hydropedological groups;
  - Graphical representation of the dominant and sub-dominant flowpaths at hillslope scale prior to development and post development.
  - The impact of the proposed development on the hydropedological behaviour described in a report format.
  - Quantification of hydropedological fluxes using the Soil and Water Analysis Tool (SWAT+) to determine the losses to the wetland systems though the proposed project
- Conducting Land Contamination Assessments and Soil Monitoring Assessments:
  - Assessments of historic and current storage of hazardous waste and materials on soils.
  - Topsoil stockpile quality assessment for future usage.
  - Monitoring programme to determine the dust suppression impact on soil chemical parameters.

EDUCATION

- M.Sc. (Agric): Soil Science 01/2016– 03/2019
  - Dissertation: Characterisation of hydropedological processes and properties of a sandstone and a tillite hillslope, Kwa-Zulu Natal, South Africa.
  - Graduated *Cum-Laude*.
- B.Sc. (Agric) Honours: Soil Science 01/2014 – 11/2014
  - Majored in soil fertility, soil physics, soil geography and soil chemistry.
  - Research Project: Soil as an indicator of soil water regime.
- B.Sc. (Agric): Soil Science and Agrometeorology 2010 – 11/2013
  - Majored in soil science and agrometeorology.
  - Minored in agronomy and plant pathology.

PROFESSIONAL MEMBERSHIP AND AFFILIATION

- Professional Natural Scientist with South African Council for Natural Scientific Professions (SACNASP) Registered, 11/2015 – Current
- Member of the Soil Science Society of South Africa (SSSSA)
- Member, South African Soil Surveyors Organization (SASSO)
- Member of the South African Wetland Society (SAWS