



**KP2 PIPELINES AUTHORISATION IN WEST RAND
DISTRICT MUNICIPALITY, RAND WEST LOCAL
MUNICIPALITY, GAUTENG PROVINCE**

**Draft Integrated Water and Waste Management
Plan (IWWMP)**

Date: 11 April 2025

DWS Reference No: WU41756

Report Information

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|--------------------------|--|
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Executive Summary

Kongiwe Environmental (Pty) Ltd ('Kongiwe') has been appointed as the independent Environmental Consultant tasked with conducting the Integrated Water Use Licence Application (IWULA), as well as the compilation of the Integrated Water and Waste Management Plan (IWWMP) for the proposed **FWGR KP2 Pipelines Authorisation Project** (hereafter the Proposed Project).

As part of the Water Use Licence Application (WULA) process, a proponent is required to compile an IWWMP for mining related activities. The draft version of the IWWMP was made available to Interested and Affected Parties (I&APs) for a 60-day public commenting period from **Friday, 11 April 2025** until **Tuesday, 17 June 2025**. Following this commenting period, this report will be updated to include all comments received and then will be submitted to the Department of Water and Sanitation (DWS) for consideration.

Project Background

Far West Gold Recoveries (Pty) Limited (hereafter FWGR) has recently received an environmental authorisation (EA) for the optimised pipeline route for FWGR's Tailings Retreatment Projects in the West Rand. It has since been identified that additional water and slurry pipelines are also required. These pipelines will tie into the authorised Regional TSF (RTSF) pipelines and run approximately 2.16 km to the Kloof No. 2 Plant.

Below are the details of the proposed pipelines:

- ❖ Two process water pipelines of 600 mm in diameter; and
- ❖ Four overland slurry pipelines of 550 mm in diameter.

The life of the Proposed Project is expected to be approximately 30 years.

The Proposed Project requires authorisation in terms of the NWA for Section 21 water uses. An IWULA will be prepared and submitted in accordance with the Water Use Licence Application and Appeals Regulations 2017 published in GNR 267 on 24 March 2017.

Purpose and Scope

The purpose of this document is to provide sufficient information that will enable informed decision making through a detailed description of the proposed water use scenario and shortcomings in respect to the relevant water management measures. A list of the general and specific management commitments pertaining to this IWWMP is also included to show FWGR's commitment towards continuous improvement in water management and to reduce the impacts on water resources to as low as reasonably practicable. This IWWMP is also the technical information document in support of the WULA for the relevant water uses under Section 21 of the NWA. This document is based on the

following technical guidelines:

- ❖ Best Practice Guideline 1.1: Integrated Mine Water and Waste Management developed by the Department of Water Affairs (DWAF, 2008);
- ❖ Operational Guideline to assist in the compilation of an Integrated Water and Waste Management Plan, First Edition: February 2010;
- ❖ External Guideline: Generic Water Use Authorisation Application Process, as compiled by the DWA, dated November 2007; and
- ❖ Regulations regarding the procedural requirements for water use licence applications and appeals, Government Notice 267, dated 24 March 2017.

In summary, this IWWMP presents:

- ❖ General information pertaining to the operation and a background description of the activity, description of the property and the specific purpose for the development of the IWWMP;
- ❖ A broad description of the Proposed Project, products, business and corporate policies;
- ❖ Water uses (new, existing, lawful, exemptions and general authorisations);
- ❖ Environmental context (climate, surface water, groundwater and socio-economic environment);
- ❖ Analysis and characterisation of activities (organisational structure, training, awareness, monitoring and control);
- ❖ Risk assessment in relation to stormwater and waste (methodology, potential impacts and significance of risks to the environment);
- ❖ Water and waste management strategies, specifically focussing on process water, stormwater, groundwater and waste; and
- ❖ The regulatory status of water use activities accompanied by the section 27 motivation.

Water Use Activities

A detailed list of water use activities and description of these activities are included in Chapter 3 below. However, the following water use activities will be applied for as part of the Proposed Project.

- ❖ Section 21(c) of the NWA: Impeding or diverting the flow of water in a watercourse; and
- ❖ Section 21(i) of the NWA: Altering the bed, banks, course or characteristics of a watercourse.

Main Water and Waste Related Risks and Mitigation Measures

A detailed risk assessment for the activities of the Project is included in Chapter 5 of this report. The main water uses and waste related risks for the activities are associated with wetland impacts. Mitigation measures are discussed in Chapter 5 of this report.

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Appendices

Appendix A: Wetland Impact Assessment Report

Appendix B: Terrestrial Compliance Statement

Abbreviations

| | |
|-----------------|---|
| AIP | Alien Invasive plant |
| AMD | Acid Mine Drainage |
| BA | Basic Assessment |
| BID | Background Information Document |
| BP | Best Practice |
| CA | Competent Authority |
| CRR | Comments and Responses Report |
| DWS | Department of Water and Sanitation |
| EA | Environmental Authorisation |
| EIA | Environment Impact Assessment |
| EIS | Ecological Importance and Sensitivity |
| ELU | Existing Lawful Water Use |
| EMPr | Environmental Management Plan |
| EMS | Environmental Management System |
| FWGR | Far West Gold Recoveries (Pty) Ltd |
| GN R704 | Government Notice Regulation 704 |
| HGM | Hydrogeomorphic |
| hr | Hour |
| I&AP | Interested and Affected Parties |
| IWULA | Integrated Water Use Licence Application |
| IWWMP | Integrated Water and Waste Management Plan |
| km | Kilometre |
| m | metre |
| mm | Millimetre |
| mamsl | Metres above sea level |
| MAP | Mean Annual Precipitation |
| NEMA | National Environmental Management Act, 1998 (Act no 107 of 1998) |
| NEM:BA | National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004) |
| NEM:WA | National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) |
| NWA | National Water Act, 1998 (Act No 39 of 1998) |
| NWST | National Web-based Screening Tool |
| PPP | Public Participation Process |
| PAOI | Project Area of Influence |
| PES | Present Ecological State |
| RTSF | Regional Tailing Storage Facility |
| RWLM | Rand West Local Municipality |
| SAWS | South African Weather Services |
| SCC | Species of Conservation Concern |
| SEI | Site Ecological Importance |
| SEP | Stakeholder Engagement Plan |

| | |
|--------------|--|
| TSF | Tailing Storage Facility |
| WML | Waste Management Licence |
| WRTRP | West Rand Tailings Retreatment Project |
| WUL | Water Use Licence |
| WULA | Water Use Licence Application |
| WWTW | Waste Water Treatment Works |
| Yr | Year |

1 Introduction

Kongiwe Environmental (Pty) Ltd ('Kongiwe') has been appointed as the independent Environmental Consultant tasked with conducting the Integrated Water Use Licence Application (IWULA), as well as the compilation of the Integrated Water and Waste Management Plan (IWWMP) for the proposed **KP2 Pipelines Authorisation Project** (hereafter the Proposed Project).

1.1. Structure of this Integrated Water and Waste Management Plan

This IWWMP has been compiled in terms of the provisions of Appendix D of the Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals (GNR 267) published in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA). Table 1-1 cross-references the various sections in this report with these requirements.

Table 1-1: Structure of the IWWMP in line with Appendix D of GNR 267.

| GNR 267 Requirement | | Report Section |
|---------------------|--|----------------|
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| 3.6 | Waste management activity (NEMWA) | 3.7 |
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| 4 | Present Environmental Situation | 4 |
| 4.1 | Climate | 4.1 |
| 4.2 | Annual Rainfall | 4.1.1 |

| GNR 267 Requirement | | Report Section |
|---------------------|--|----------------|
| 4.3 | Monthly rainfall | 4.1.1 |
| 4.4 | Daily Rainfall | 4.1.2 |
| 4.5 | Storm Rainfall Depths | 4.2.3 |
| 4.6 | Evaporation | 4.1.5 |
| 4.7 | Topography | 4.2 |
| 4.8 | Geology | 4.3 |
| 4.9 | Soil Classification | 4.4 |
| 4.10 | Land Use | 4.5 |
| 4.11 | Wetland | 4.6 |
| 4.12 | Wetland Classification | 4.6.1 |
| 4.13 | Wetland Ecological Functional Assessment | 4.6.2 |
| 4.14 | The Wetland Health Assessment | 4.6.3 |
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| 5.2 | Water and waste management | 6.1 & 6.2 |
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| 5.4 | Storm water | N/A |
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| 5.15 | Groundwater monitoring | N/A |
| 5.16 | Bio monitoring | N/A |
| 5.17 | Waste monitoring | 5.4 |

| GNR 267 Requirement | | Report Section |
|---------------------|--|----------------|
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1.2. Project Background

Far West Gold Recoveries (Pty) Limited (hereafter FWGR) has recently received an environmental authorisation (EA) for the optimised pipeline route for FWGR's Tailings Retreatment Projects in the West Rand. It has since been identified that additional water and slurry pipelines are also required. These pipelines will tie into the authorised Regional TSF (RTSF) pipelines and run approximately 2.16 km to the Kloof No. 2 Plant.

Below are the details of the proposed pipelines:

- ❖ Two process water pipelines of 600 mm in diameter; and
- ❖ Four overland slurry pipelines of 550 mm in diameter.

The life of the Proposed Project is expected to be approximately 30 years.

The Proposed Project requires authorisation in terms of the NWA for Section 21 water uses. An IWULA is being prepared and will be submitted in accordance with the Water Use Licence Application and Appeals Regulations 2017 published in GNR 267 on 24 March 2017.

1.3. Property Description

The proposed pipeline route runs within the Remaining Extent of the farm Leeudoorn 351 IQ within ward 30 of the RWLM. The pipelines will run southwest of the Kloof No. 2 TSF and directly south of the Kopanang Hostel.

Refer to Table 1-2 for property details and Table 1-3 for the description of the directly affected property.

Table 1-2: Property details

| | |
|---|---|
| Application Area (ha) | The Proposed Project is a linear pipeline route running 2.16 km |
| Magisterial District | Rand West Local Municipality |
| Distance and Direction from Nearest Town | The site is located approximately 9 km northeast of Fochville |

Table 1-3: Description of the directly affected property

| Farm Name | Farm ID | Farm Portion | Farm owner | Infrastructure |
|-------------------------------------|----------------------|--------------|------------------------|----------------|
| Directly Affected Properties | | | | |
| Leeudoorn 351 IQ | T0IQ0000000035100000 | 0 | Sibanye Gold (Pty) Ltd | Pipeline |

1.4. Regional Setting and Location of Activity

The location of the proposed pipeline route is in Westonaria, within Ward 30 of the RWLM as shown in Figure 1-1. The proposed pipelines run southwest of the Kloof No.2 TSF, and directly south of the Kopanang Hostel.

The project area is predominantly surrounded by other Tailing Storage Facilities (TSFs), grassland, water bodies and bare ground. Refer to Figure 1-1 for the Proposed Project’s locality map.

1.5. Purpose of IWWMP

Regulation 267 dated March 2017 under the NWA, regarding the procedural requirements for WULAs requires that an IWWMP must be submitted with the WULA if the purpose of a water use is for industry or mining.

The original intent of an IWWMP was aimed at collating and rationalising the information submitted for WULAs, but subsequently it has also developed to:

- ❖ Provide the regulatory authorities with focused and structured information to meet their general information needs;
- ❖ Articulate the required management measures and actions to achieve the water and waste related performance on an ongoing basis; and
- ❖ Provide direction and guidance to the water user on water and waste management of any activity.

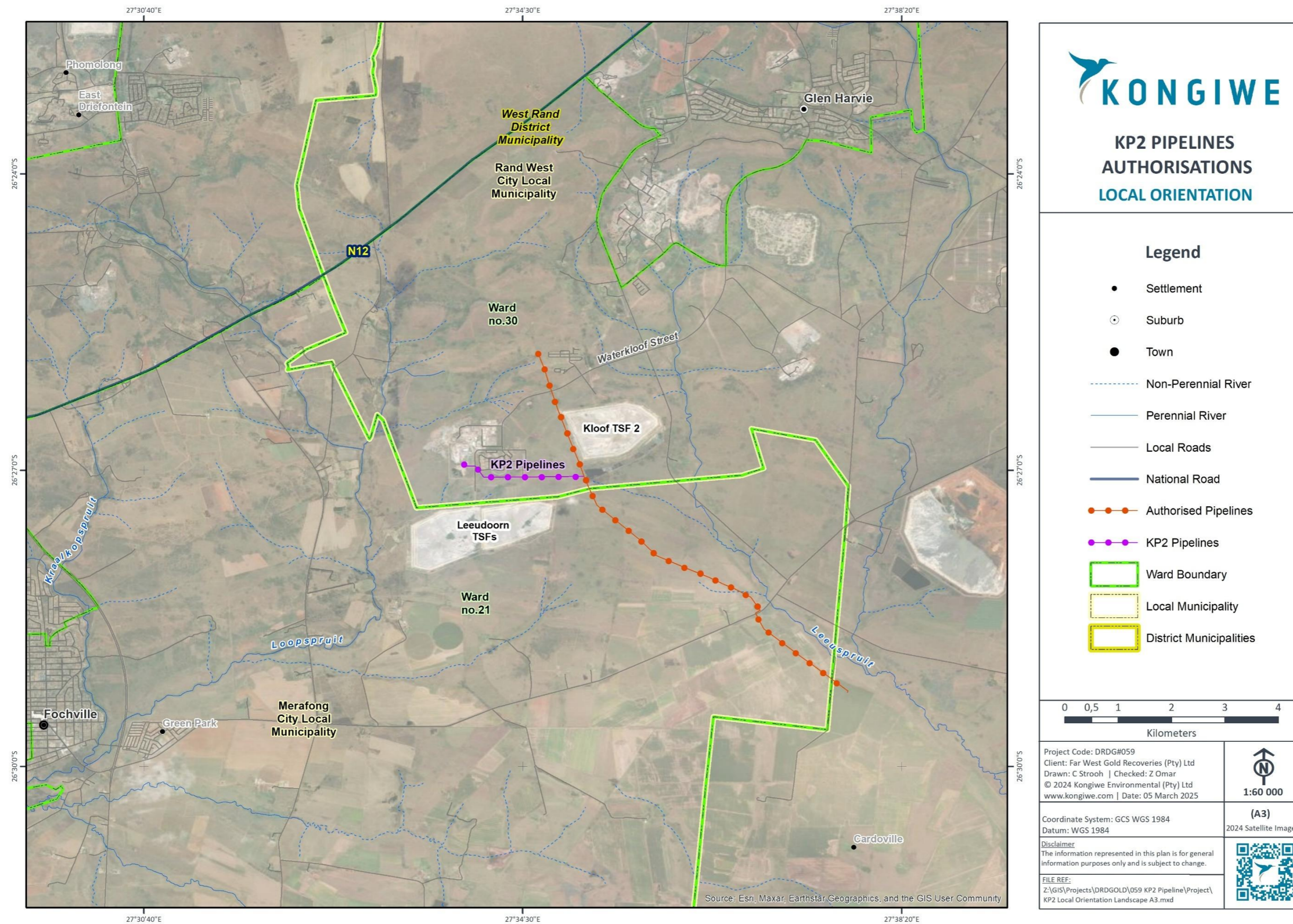


Figure 1-1: Proposed Project locality map

2 Conceptualisation of Activity

This section describes a broad description of the activities, processes and products related to the Proposed Project. It also provides the background information of the organisational structure of the water user i.e., FWGR, and all the business and corporate policies related to the environment.

2.1. Description of Activity

As described in Section 1.2 above, it is FWGR’s intention to construct slurry and process water pipelines. Once the life of operation of the pipelines is completed, the pipelines will be removed and the area will be rehabilitated.

2.2. Extent of Activity

The Proposed Project site covers a linear distance of approximately 2.16 km.

2.3. Activity Life Description

The Proposed Project is divided into a few stages, as shown in Figure 2-1 below.

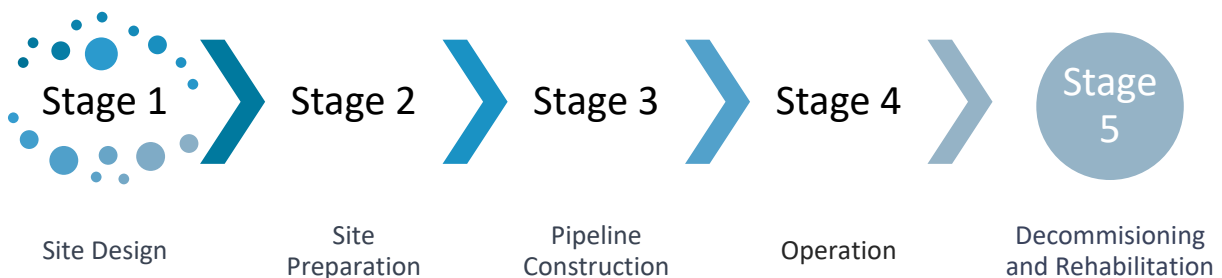


Figure 2-1: Project Process

2.3.1 Estimated Project Timeframes

The anticipated life span of the Project is approximately **30 years** including the construction, operation, decommissioning and rehabilitation phases.

Table 2-1 gives an indication of the estimated timeframes in relation to the implementation of the actions, activities or processes of the phases (construction, operation and decommissioning) for the Proposed Project.

Table 2-1: Estimated timeframes and deadlines of the different phases associated with the Proposed Project

| Phase | Timeframe | Year Start Date |
|--|-----------|-----------------|
| Pre-Construction and Construction | 1 year | 2025-2026 |
| Operation of the pipeline | 28 years | 2026 - 2054 |
| Decommissioning and rehabilitation of pipeline | 1 year | 2054-2055 |

2.3.2 Life-Cycle Phases of the Project

Table 2-2 is a summary of the activities that will occur at the different phases of this project.

Table 2-2: Summary of activities per phase

| Activity | Description |
|---|--|
| Pre-Construction | |
| 1 | Removal of vegetation and site clearance |
| 2 | Preparation of access roads |
| 3 | Employment of workers should this be required (minimal) |
| Construction Phase | |
| 4 | Operation of construction machinery and vehicles |
| 5 | Construction of pipelines |
| 6 | Instatement of traffic signage and access |
| Operational Phase | |
| 7 | Operation of pipelines |
| Decommissioning Phase and Rehabilitation | |
| 8 | Decommissioning of pipelines and rehabilitation of the Project area. |

2.3.2.1 Pre-Construction and construction Phases

Prior to the initiation of construction, vegetation will be cleared from the project area where required. During construction, the pipelines will be installed on site and connected from the authorised RSTF pipelines to the Kloof No. 2 Plant.

2.3.2.2 Operational Phase Activities

During operation, process water will be transported via two 600mm diameter pipelines, and slurry transported via four 550 mm diameter overland slurry pipelines.

2.3.2.3 Decommissioning Phase Activities

At the end of operation of the pipelines, they will be removed and the area will be rehabilitated.

2.4. Activity Infrastructure Description

The following infrastructure will be utilised on site:

- ❖ Two process water pipelines of 600 mm in diameter; and
- ❖ Four overland slurry pipelines of 550 mm in diameter.

Refer to Figure 2-2 for the proposed pipeline route.

2.4.1 Water and Power Supply

No additional power or water will be required for the proposed pipeline.

2.4.2 Access

Waterkloof Street is proposed as the point of access to the Proposed Project area.

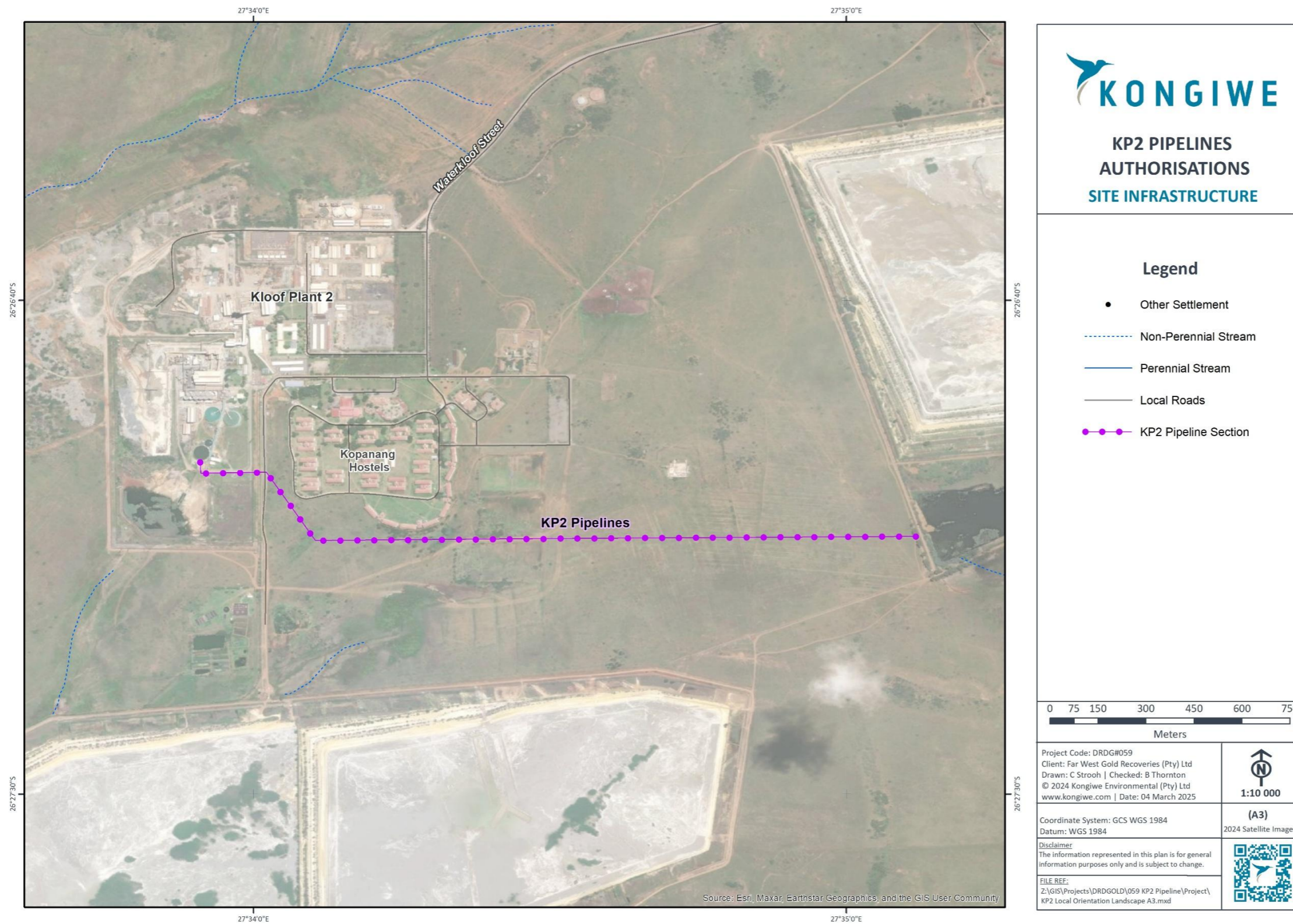


Figure 2-2: Proposed pipeline route

2.5. Organisational Structure of Activity

FWGR has a simple and efficient structure. The organisational structure applicable to the Applicant is shown in Figure 2-3 below. As of January 2020, Sibanye holds a 50.1% interest in DRDGOLD which wholly owns the subsidiaries FWGR and Ergo. The activities subject to this application will be operated under the entity FWGR.

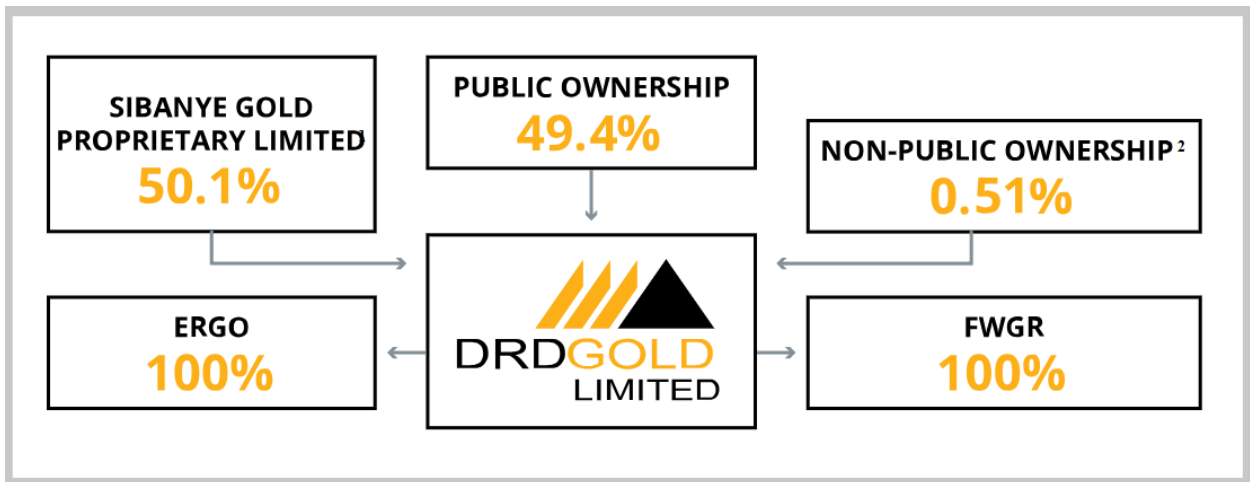


Figure 2-3: DRDGOLD Group Structure

The roles, responsibilities and authority of personnel at FWGR will be assigned to facilitate effective environmental management.

2.6. Business and Corporate Policies

FWGR is a subsidiary of DRDGOLD Limited (“DRDGOLD”). DRDGOLD has a Sustainability Policy in place. The sustainability focus areas which support and are sustained by DRDGOLD’s financial, intellectual and manufactured capital include:

- ❖ Natural capital: water, land and energy;
- ❖ Social and relationship capital: communities and broader society, including government and regulators; and
- ❖ Human capital and intellectual capital: employees – their development and protection.

Strategic approach to sustainability

Johannesburg has a unique story and would, but for the discovery and mining of gold, not exist. The mines, however, did not come to the city, rather the city came to the mines. What resulted was poorly regulated urbanisation and hundreds of thousands of people living in close proximity to former mining infrastructure and mine dumps. Conventional environmental and closure standards are proving inadequate at containing the impacts of mining on surrounding communities.



Financial capital



Manufactured and intellectual capital



Human capital



Natural capital



Social and relationship capital

A strategy informed by sustainable development

DRDGOLD's operating footprint spans this legacy in Johannesburg, the East Rand and Far West Rand. An integral part of our mining process is to remedy the negative aspects of that legacy by rehabilitation and land restoration through mining (the recycling of old mine dumps and slimes dams) and by vegetating those that have been a permanent feature of the surrounding landscape.

We take an integrated approach to both social and natural capital. They are inextricably linked, and delivering value in respect of the one, also brings us closer to our goals in respect of the other. Our aim is to leave an enduring legacy by permanently removing many of the old mine dumps scattered around the Witwatersrand basin that were either built where they did not belong in the first place, or had become inappropriately situated because of the movement of people and the establishment of a new urban reality.

We do this by reprocessing the dumps and redepositing the mine-waste onto tailings storage facilities (TSF) that are managed in accordance with contemporary standards of environmental and geo-technical standards, cleaning environmentally sensitive areas in the process and freeing up land for redevelopment. This yields both an environmental dividend as well as a social dividend in improving the quality of life for affected communities, while also creating financial value and allowing sustainable land use to take place in areas previously sterilised. The value delivery is therefore truly integrated and firmly aligned with the principles of sustainable development.

Our process is technologically-driven, requiring a specialised skillset on the part of our employees. Hazardous reagents are used in our metallurgical processes which requires sharp focus on safety and governance, while the prominence of water and electricity consumption requires acute awareness and ongoing development to limit and reduce our impact on

the environment. ESG is key to our commitment to sustainable development and our goals of reversing the environmental legacy of early mining, limiting and reducing our impact on natural resources and improving the quality of life for our affected communities.

With every project we challenge ourselves to ensure that our values, ambitions and actions are aligned.

We ask ourselves:

- Do we provide an inclusive workspace that promotes diversity?
- Do we provide our employees, and women in particular, with a working environment that is both physically and emotionally safe?
- Is our workforce trained and equipped to deal with the ever-changing factors influencing our business and the increasingly prominent role of technology?

- Is our water usage optimal and do we minimise the extent to which we rely on potable water?
- Are we managing effluent effectively and preventing the discharge of pollutants into surrounding water sources?
- Are we doing enough to reduce our reliance on the power utility, Eskom Holdings SOC Limited (Eskom), and thus our reliance on coal-fired electricity and its associated carbon footprint, and promoting sustainability through strategies that soften the impact of Eskom's pricing policy, and the unreliable and erratic nature of electricity supply?
- Is our dust monitoring programme effective in reducing the nuisance to affected communities?
- Do we have the relevant regulatory compliance requirements to address uncertainty?

Strategic approach to sustainability continued

These questions also inform an integrated thinking process in the execution of our overall business strategy by the board of directors (Board) of the Company.

A very prominent part of our business focus is that of TSF safety. We subscribe to the contemporary imperative of greater transparency and enhanced governance in terms of the technical standards, safety and the environmental impact of TSFs, a commitment that has so far led us to implement the following:



A Group-wide review of the TSF management policy to align with best practice



Tailings Performance Management System for dedicated data collection, storage and processing



Quarterly drone and satellite surveillance



Review of various technologies which could be used to enhance TSF observation and monitoring



External Tailings Review Panel

Our strategic focus areas with a direct link to ESG include:

3

Using technology and information to enhance operational performance and to minimise impact on the environment

4

Create a value driven culture of employee safety, empowerment, diversity and inclusivity

5

Improving the quality of life of communities surrounding our operations

Refer to the Strategy and outlook section on [page 26](#) of the Annual Integrated Report 2024.

Sustainability governance

The Board is ultimately responsible for setting the governance standards of the Company to ensure that business is conducted ethically, responsibly and in accordance with principles of good corporate governance. The Social and Ethics Committee assists the Board in executing this responsibility. The Board is satisfied that the chairman of the Social and Ethics Committee has sufficient expertise and experience to oversee sustainability-related issues, as he is a qualified ESG Competent Director and Climate Change Competent Director. In addition to this, the Board resolved that the other two non-executive directors on the committee also have the requisite skills and expertise to serve as members of this committee and on the other Board committees on which they serve.

Key activities of the Social and Ethics Committee include:

- Monitoring the Group's activities with regard to the Ten Principles of the United Nations Global Compact and the Organisation for Economic Co-operation and Development's recommendations regarding corruption; the Global Industry Standards on Tailings Management; the United Nations SDGs; the Employment Equity Act 55 of 1998; and the Broad-Based Black Economic Empowerment Act 53 of 2003
- Monitoring principles governing sponsorship, donations and charity
- Monitoring the impact of the Group's activities on the environment and on public health and safety
- Monitoring labour and employment practices
- Reviewing the Group's Code of Ethics
- Providing guidance on corporate citizenship initiatives
- Reviewing cases of employee conflicts of interests, misconduct or fraud, or any other unethical activity by employees of the Group

The executive committee (Exco) led by the Chief Executive Officer is responsible for executing the ESG strategy and reporting back to the Board.

During the financial year, the Chairman shared regular updates on practices in relation to sustainability matters with Board members as and when they became available. Furthermore, as the whole aspect of ESG and climate change in relation to sustainability reporting is fast evolving, it has become imperative to have a structured approach to sustainability-related issues on our meeting agendas and management reports to ensure that we are incorporating the requisite themes and requirements.



Figure 2-4: DRDGOLD's sustainability policy (DRDGOLD Limited ESG Fact Sheet 2024)

3 Regulatory Water and Waste Management Framework

3.1. Legislative Framework

This chapter provides an overview of the policy and legislative context relevant to the water use activities of the KP2 Pipelines Authorisations Project. It identifies all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to the planned activities and are to be considered in the assessment process which may be applicable or have relevance to the Proposed Project. There are a number of legal and regulatory frameworks which regulate water management and environmental controls in South Africa. A summary of these is provided in Table 3-1.

The foundation for Environmental Preservation is entrenched in the Constitution of South Africa, 1996. Following the birth of democracy in South Africa, legislative and environmental policies and regulations have undergone a large transformation and various laws and policies were promulgated with a strong emphasis on environmental concerns and the need for sustainable development. The Constitution provides environmental rights (contained in the Bill of Rights, Chapter 2 (Section 24)) and includes implications for environmental management. The environmental rights are guaranteed in Section 24 of the Constitution, and state that:

“Everyone has the right –

- ❖ *To an environment that is not harmful to their health or well-being and*
- ❖ *To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:*
 - *Prevent pollution and ecological degradation;*
 - *Promote conservation and*
 - *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”*

To ensure that the various spheres of the social and natural environmental resources are not overlooked, additional legislation and regulations have been promulgated in addition to those contained within the Constitution. The additional legislation and regulations ensure that there remains a key focus on various aspects of the environment and to ensure that the objectives of the Constitution are effectively implemented and upheld on an on-going basis. In terms of Section 7(2) of the Constitution, “The state must respect, protect, promote and fulfil the rights in the Bill of Rights”, which includes the environmental rights set out in Section 24.

Table 3-1: Applicable National Legislation and Guidelines

| Legislation |
|--|
| <p>Constitution of the Republic of South Africa, 1996</p> <p>The Bill of Rights set out in Chapter 2 is the cornerstone of democracy in South Africa, enshrining the rights of all people and affirming the democratic values of human dignity, equality and freedom. Section 24 is directly relevant to environmental law. The Bill of Rights states that everyone has the right to an environment that is not harmful to their health or well-being.</p> |
| <p>National Water Act (Act No. 36 of 1998) (NWA)</p> <p>Section 19 of the NWA sets out the principles for “an owner of land, a person in control of land or a person who occupies or uses land” to:</p> <ul style="list-style-type: none"> • Cease, modify or control any act or process causing pollution; • Comply with any prescribed waste standard or management practice; • Contain or prevent the movement of pollutants; • Eliminate any source of pollution; • Remedy the effects of the pollution; and • Remedy the effects of any disturbance to the bed and banks of a watercourse. <p>It also describes the actions that can be taken by the catchment management agency to enforce the requirements of the NWA.</p> |
| <p>NWA Regulations:</p> <p>Regulation GN R704</p> <p>This regulation enforces the separation of clean and dirty water systems including restrictions on activities within the 1:100 floodline or 100 m from a watercourse.</p> |
| <p>National Environment Management Act (Act No. 107 of 1998) (NEMA)</p> <p>Sections 28 (1) and (3) of NEMA set out the duty of care principle, which is applicable to all types of pollution and must be taken into account in considering any aspects of potential environmental degradation.</p> <p>Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.</p> |
| <p>National Environmental Management Act (NEMA): Environmental Impact Assessment Regulations, 2014 (GN R982 of 8 December 2014, as amended, 7 April 2017 and 21 June 2021)</p> <ul style="list-style-type: none"> • Regulates the procedure and criteria relating to the preparation and processing of applications for environmental authorisations <p>Appendix 6 requirements</p> <p>Minimum content for specialist reports</p> |

Legislation
National Environment Management: Waste Act (Act No. 59 of 2008) (NEM:WA)

Follows the principle that waste generation must be avoided, or if it cannot be avoided, that it is reduced, reused, recycled or recovered, and as a last resort treated and/or safely disposed of. The objectives of this Act are-

- a. to protect health, well-being and the environment by providing reasonable measures for-
 - i. minimising the consumption of natural resources;
 - ii. avoiding and minimising the generation of waste;
 - iii. reducing, re-using, recycling and recovering waste;
 - iv. treating and safely disposing of waste as a last resort;
 - v. preventing pollution and ecological degradation;
 - vi. securing ecologically sustainable development while promoting justifiable economic and social development;
 - vii. promoting and ensuring the effective delivery of waste services;
 - viii. remediating land where contamination presents, or may present, a significant risk of harm to health or the environment; and
 - ix. achieving integrated waste management reporting and planning;
- b. to ensure that people are aware of the impact of waste on their health, well-being and the environment;
- c. to provide for compliance with the measures set out in paragraph (a); and
- d. generally, to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.

The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM:BA)

The Act seeks amongst other things, to manage and conserve biological diversity, to protect certain species and ecosystems, to ensure the sustainable use of biological resources and to promote the fair and equitable sharing of benefits arising from bio-prospecting involving those resources. The NEM:BA includes a Regulation related to the management of threatened and protected species. A similar Regulation is applied to Threatened Ecosystems. NEM:BA has a set of norms and standards for the development of management plans for both species (e.g. Threatened or Migratory Species) and ecosystems (Endangered or Critically Endangered).

3.2. Summary of all Water Uses

Section 21 of the NWA defines water uses which are governed in terms of the Act and for which a WUL is required. In terms of section 40 (1) of the NWA “a person who is required or wishes to obtain a licence to use water must apply to the relevant responsible authority for a licence.” These water uses, in terms of Section 21, are as follows:

- (a) taking water from a water resource;
- (b) storing water;
- (c) impeding or diverting the flow of water in a watercourse;**
- (d) engaging in a stream flow reduction activity contemplated in section 36;
- (e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);

- (f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- (g) disposing of waste in a manner which may detrimentally impact on a water resource;
- (h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- (i) altering the bed, banks, course or characteristic of a watercourse;**
- (j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- (k) using water for recreational purposes.

Section 21 (c) & (i) water uses are applicable to the Proposed Project.

The following infrastructure and associated activities trigger the Section 21 (c) and (i) water uses:

- ❖ Slurry and process water pipelines.

3.3. Existing Lawful Water Uses

Section 32(1) of the NWA defines an Existing Lawful Water Use (ELU) as follows:

“An existing lawful water use means a water use:

- (a) Which has taken place at any time during a period of two years immediately before the date of commencement of this Act and which;*
 - (i) was authorised by or under any law which was in force immediately before the date of commencement of this Act;*
 - (ii) is a stream flow reduction activity contemplated in section 36(1); or*
 - (iii) is a controlled activity contemplated in section 37(1).”*

OR

- (b) Which has been declared an existing lawful water use under section 33.”*

The Proposed Project is a new project and therefore not declared as an ELU.

3.4. Relevant Exemptions

3.4.1 GN 704 Exemption Motivation

Regulations on Use of Water for Mining and Related Activities Aimed at the Protection of Water Resources (GN R704) have been considered for the Proposed Project. Exemption from the GN 704 Regulations is not required for the Proposed Project.

3.5. Generally Authorised Water Uses

No general authorisations are applicable as this application is for a mining project which requires full licensing of water use activities.

It should however be noted that the Section 21 (c) and (i) water uses are triggered by a seep (HGM 1) that has been determined by the wetland specialist to be “Low Risk” as well as a seep (HGM 2) that has been determined to be “Not at Risk”.

3.6. New Water Uses to be Licensed

The new water uses to be licensed for the Proposed Project are listed in Table 3-2 and shown in Figure 3-1.

Table 3-2: Section 21 water uses applicable to the Proposed Project

| Section 21 Water Use | Map Number | Site Name | Description | Purpose of Activity | Materials used to build infrastructure | Dimensions | Farm Portion | Co-ordinates |
|------------------------|------------|---|---|--|--|---|--|---|
| Section 21 (c) and (i) | 1 | Proposed slurry and process water pipelines | The construction, operation, removal and rehabilitation of the proposed pipeline within 500 m of seep wetlands (HGM 1 and HGM 2). | Transportation of slurry and process water | HDPE Steel, fusion bonding and concrete. | Height: 0.6 m Width: 0.6 m Length: 2160 m | Remaining Extent of the farm Leeudoorn 351 IQ | <u>Start:</u> 26°26'55.276"S 27°33'54.582"E <u>End:</u> 26°27'4.065"S 27°34'35.809"E |

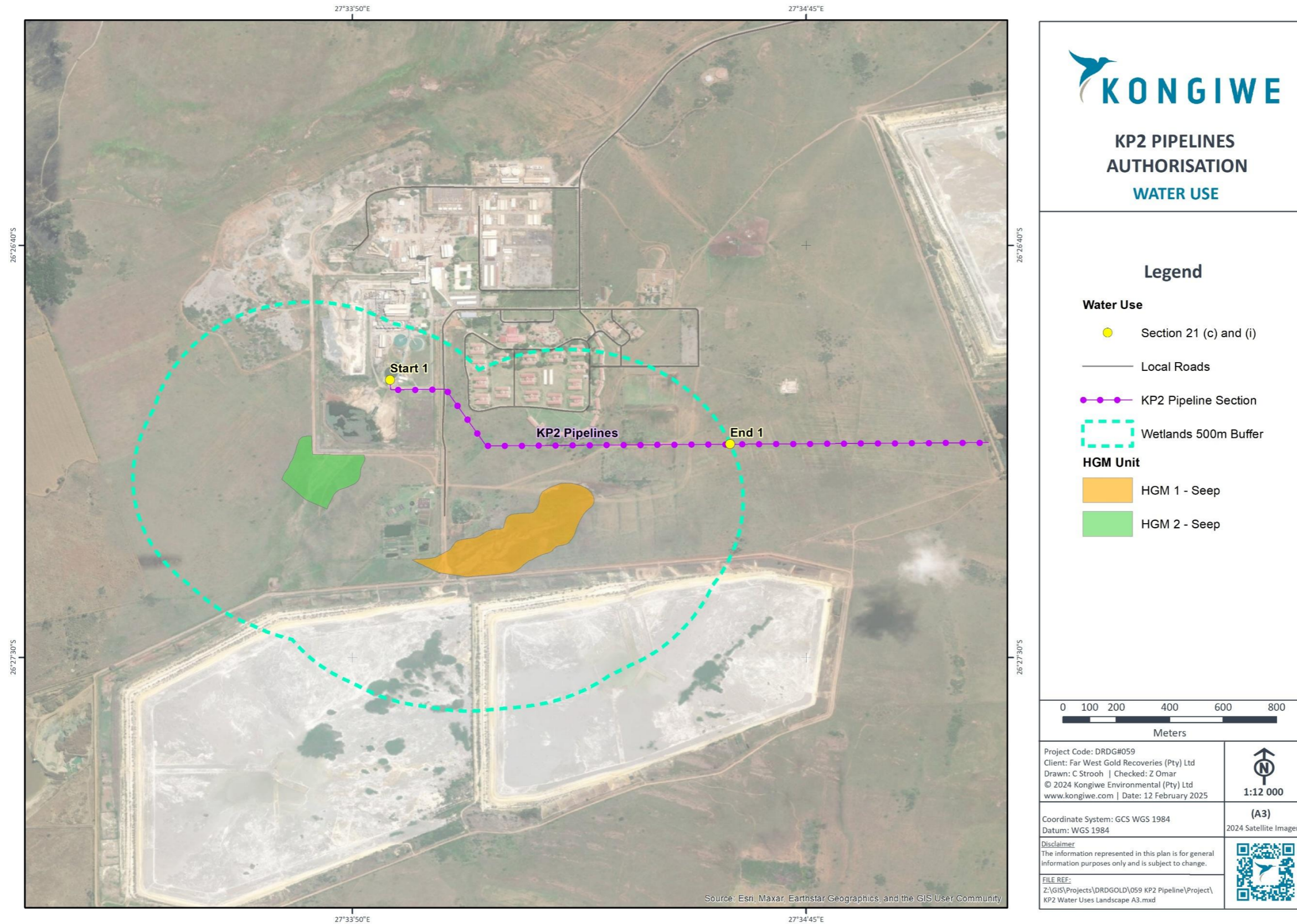


Figure 3-1: Water use map for the Proposed Project

3.7. Waste Management Activity (NEM:WA)

A review of the Activities under Category A and Category B of NEM:WA indicate that a Waste Management Licence (WML) is not required for the Proposed Project.

3.8. Other authorisations (EIAs, EMPs, RODs, Regulations)

FWGR intends to acquire Environmental Authorisation (EA) in terms of NEMA. The Competent Authority (CA) for the EA application is the Department of Mineral Resources and Energy (DMRE). The required EA application has been made to the DMRE.

4 Present Environmental Situation

Information on the status of the environment in which the Proposed Project is situated is contained in this chapter.

4.1. Climate

Rainfall was obtained from the WR2012 study for the South African Weather Service (SAWS) station: Zuurbekom (Station no. C2E007), as well as from Sibanye for the Kloof weather station. The details of the weather stations are summarised in Table 4-1:

Table 4-1: Summary of the details of the rainfall stations

| Station Name | Station Number | Station Location | Rainfall Record | MAP (mm) |
|--------------|----------------|--------------------------------|---------------------|----------|
| Zuurbekom | C2E007 | Southwest of Lenasia | Oct 1958 – Sep 2024 | 686 |
| Kloof | - | Located at the Kloof Operation | Dec 2013 – Feb 2020 | 711 |

4.1.1 Annual Rainfall

The annual rainfall totals for the area are indicated in Figure 4-1. Due to the short record of Kloof weather station, as well as 2014 and 2016 being extremely wet years, the Mean Annual Precipitation (MAP) for the Kloof weather station is skewed and not entirely representative of the long-term conditions in the project area. Rainfall data was therefore obtained from the closest station with the most recent and complete dataset, that being the meteorological station Zuurbekom. The station is located 29 km north-east of the Proposed Project area. The area has a MAP of 686 mm.

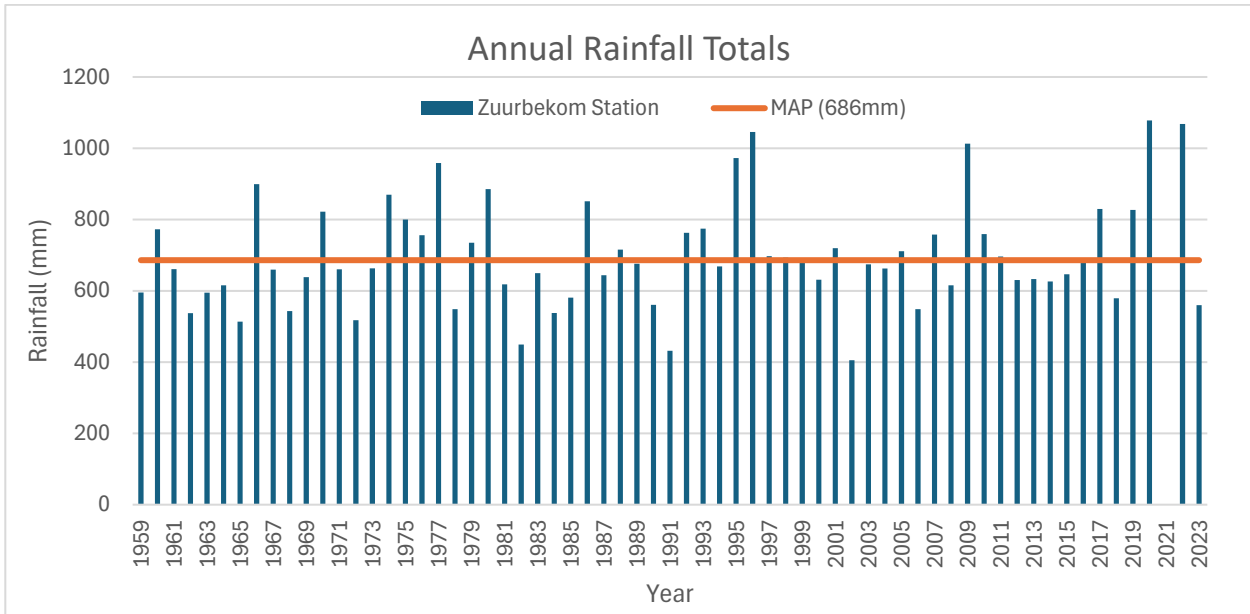


Figure 4-1: Average annual rainfall for the project area

4.1.2 Monthly Rainfall

The mean monthly rainfall for the area is indicated in Figure 4-2. Rainfall is highest over the summer months of October to April, and lowest over the months of May to September. Due to the short record of the Kloof weather station, the Zuurbekom rainfall was adopted to represent the long-term monthly rainfall of the area.

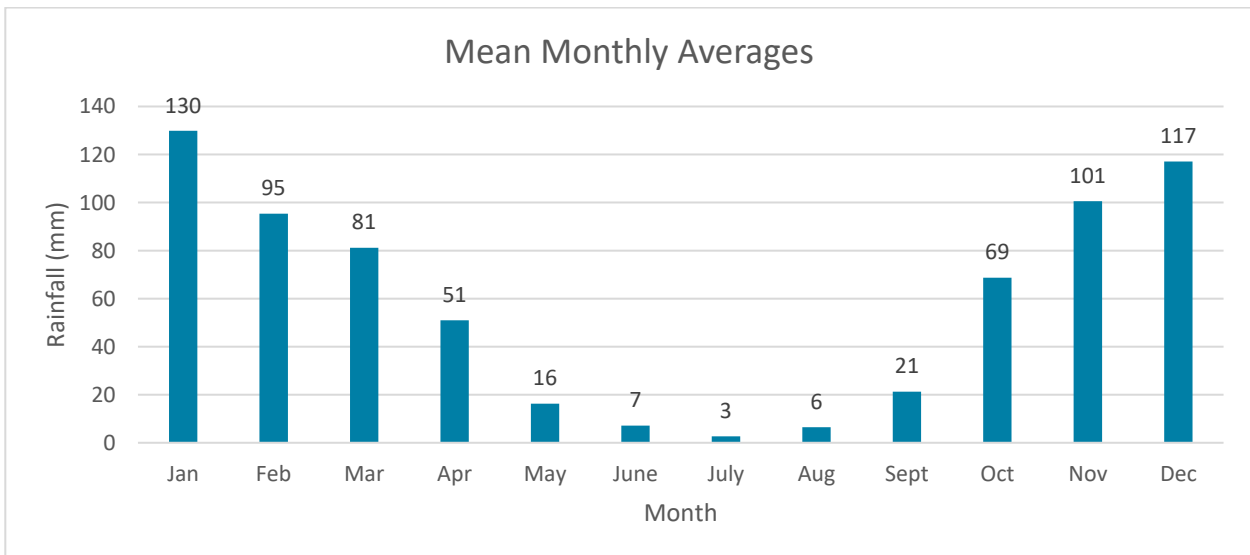


Figure 4-2: Average monthly rainfall totals for the project area.

4.1.3 Daily Rainfall

The daily rainfall measured at the Kloof weather station over the past 6 years is indicated in Figure 4-3. The highest rainfall recorded in a 24-hour period is 123 mm, which occurred on 7 January 2017. Rainfall occurs mostly as thunderstorms, which are often brief and intense.

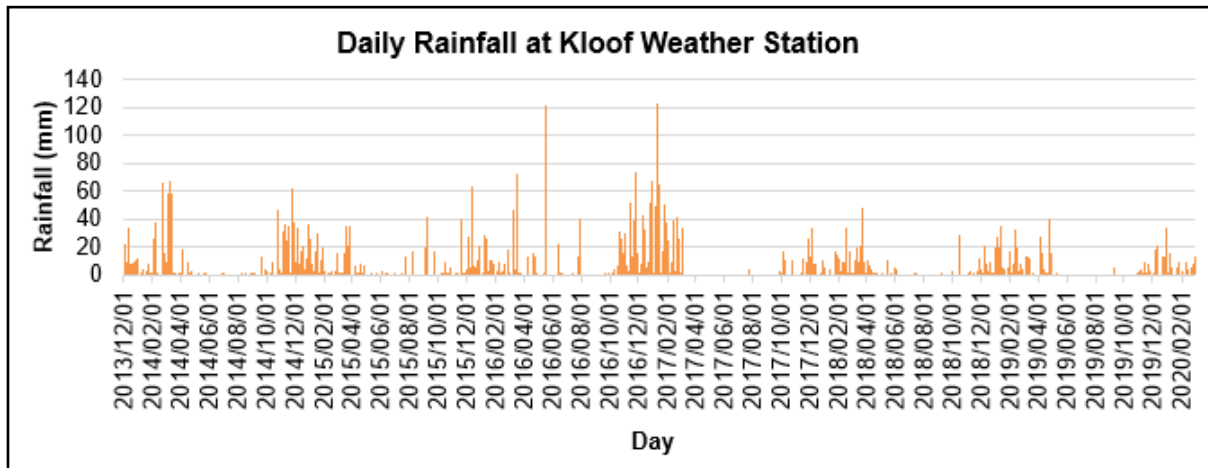


Figure 4-3: Average daily rainfall totals for the project area.

4.1.4 Storm Rainfall Depths

The storm rainfall depths for the area were extracted from the *Design Rainfall Estimation in South Africa* software programme (Smithers and Schulze, 2002) using the closest weather station, which was determined to be Fochville. The programme calculates the storm rainfall depths using the six closest rainfall stations to a user-specified position. The extracted storm rainfall depths for the project are indicated in Table 4-2. The extracted storm rainfall depths for the Project are indicated in Table 4-3.

Table 4-2: Rainfall station used to calculate storm depth for project area

| Station Name | Station No. | Distance from Site (km) | Record (Years) | Latitude | Longitude | MAP (mm) | Altitude (mamsl) |
|--------------------|-------------|-------------------------|----------------|--------------|--------------|----------|------------------|
| Fochville (Pol) | 0474899_W | 9 | 72 | 26° 29" 0' S | 27° 29" 0' E | 611 | 1479 |
| Elandsfontein | 0474749_W | 7.2 | 38 | 26° 29" 0' S | 27° 25" 0' E | 592 | 1462 |
| Leeuwpoot | 0475056_W | 7.6 | 64 | 26° 26" 0' S | 27° 32" 0' E | 644 | 1580 |
| Kloof (GM) | 0475174_W | 14.1 | 33 | 26° 24" 0' S | 27° 35" 0' E | 695 | 1723 |
| Blyvooruitsig (GM) | 0474684_W | 15.3 | 58 | 26° 23" 0' S | 27° 23" 0' E | 689 | 1622 |
| Wonderfontein | 0474680_W | 19.5 | 38 | 26° 20" 0' S | 27° 23" 0' E | 660 | 1495 |

Table 4-3: Storm rainfall depth for the project area

| Storm Duration mm/hr/day | Return Period / Storm Rainfall Depth (mm) | | | | | | |
|-----------------------------|---|-------|--------|--------|--------|---------|---------|
| | 1:2yr | 1:5yr | 1:10yr | 1:20yr | 1:50yr | 1:100yr | 1:200yr |
| 5m | 9 | 12 | 14 | 15.9 | 18.5 | 20.4 | 22.4 |
| 10m | 13 | 17.3 | 20.2 | 23 | 26.7 | 29.5 | 32.3 |
| 15m | 16.1 | 21.5 | 25 | 28.5 | 33.1 | 36.6 | 40.1 |
| 30m | 20.6 | 27.4 | 32 | 36.5 | 42.4 | 46.8 | 51.2 |
| 45m | 23.8 | 31.7 | 37 | 42.2 | 48.9 | 54 | 59.2 |
| 1h | 26.3 | 35.1 | 41 | 46.7 | 54.2 | 59.9 | 65.6 |
| 1,5h | 30.4 | 40.5 | 47.4 | 54 | 62.6 | 69.1 | 75.7 |
| 2h | 33.7 | 44.9 | 52.4 | 59.8 | 69.3 | 76.6 | 83.9 |
| 4h | 40.2 | 53.6 | 62.6 | 71.3 | 82.7 | 91.4 | 100.1 |
| 6h | 44.6 | 59.4 | 69.4 | 79 | 91.7 | 101.3 | 110.9 |
| 8h | 47.9 | 63.9 | 74.6 | 85 | 98.7 | 109 | 119.4 |
| 10h | 50.7 | 67.6 | 79 | 90 | 104.4 | 115.4 | 126.3 |
| 12h | 53.1 | 70.9 | 82.7 | 94.3 | 109.4 | 120.8 | 132.3 |
| 16h | 57.2 | 76.2 | 89 | 101.5 | 117.7 | 130 | 142.4 |
| 20h | 60.5 | 80.7 | 94.2 | 107.4 | 124.6 | 137.6 | 150.7 |
| 24h | 63.4 | 84.5 | 98.7 | 112.5 | 130.5 | 144.1 | 157.9 |
| 1d | 54.9 | 73.2 | 85.5 | 97.5 | 113.1 | 124.9 | 136.8 |
| 2d | 67.6 | 90.2 | 105.3 | 120 | 139.2 | 153.7 | 168.4 |
| 3d | 76.4 | 101.8 | 118.9 | 135.5 | 157.2 | 173.6 | 190.1 |
| 4d | 83 | 110.7 | 129.3 | 147.3 | 170.9 | 188.8 | 206.7 |
| 5d | 88.6 | 118.2 | 138 | 157.2 | 182.4 | 201.5 | 220.6 |
| 6d | 93.4 | 124.6 | 145.5 | 165.8 | 192.4 | 212.5 | 232.7 |
| 7d | 97.7 | 130.3 | 152.2 | 173.4 | 201.2 | 222.2 | 243.4 |

4.1.5 Evaporation

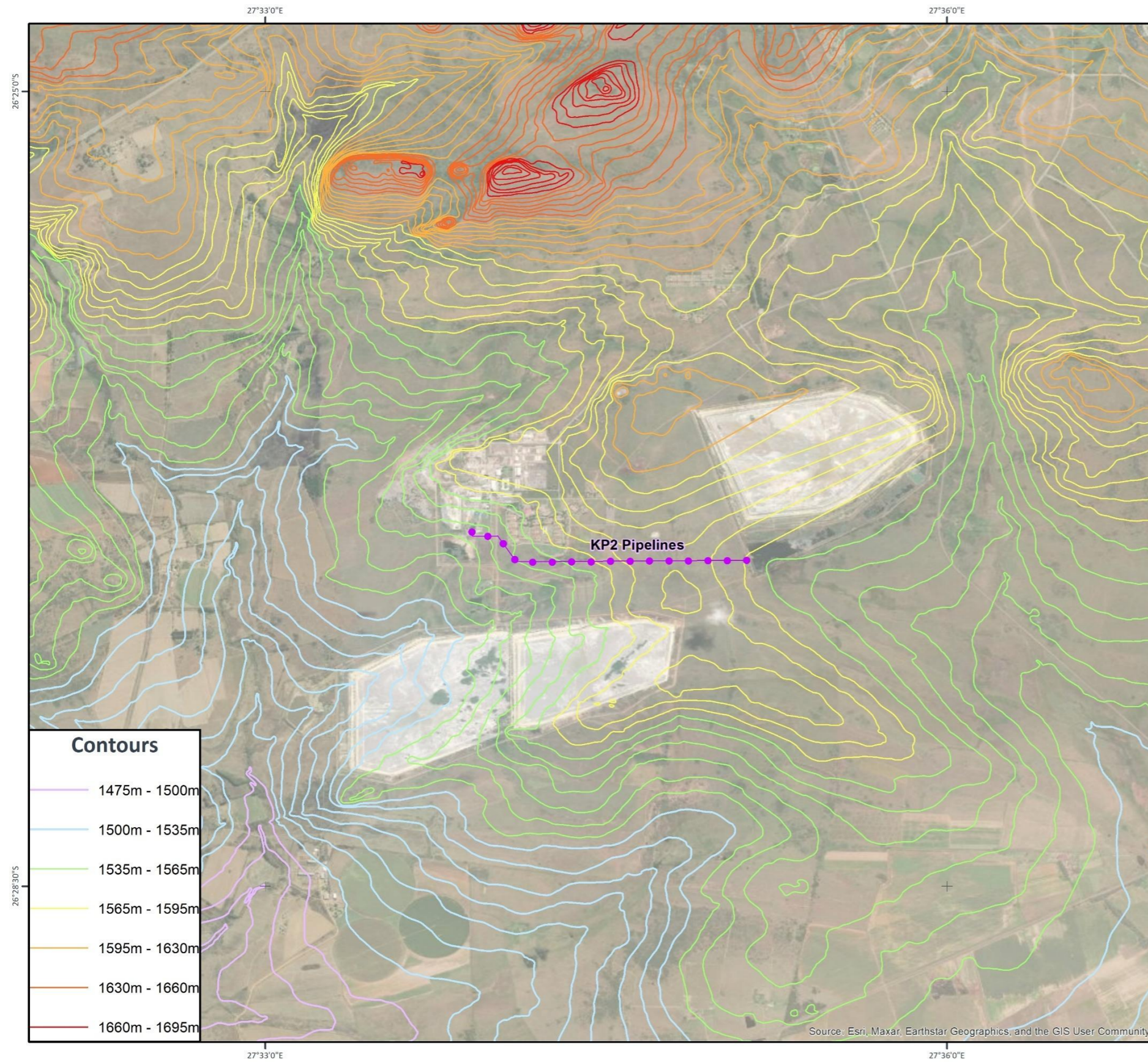
Symons Pan (S-Pan) evaporation data for the area was obtained from the WR2012 study for quaternary catchment C22A. S-Pan evaporation measurements are not a true reflection of evaporation from natural open water bodies, as the water temperatures in the S-Pan are higher, resulting in higher evaporation rates. To convert S-Pan measurements to open water evaporation, monthly open water evaporation conversion factors were used, which were obtained from the WR2012 study. Table 4-4 shows that evaporation is highest over the months of September to March, and lowest over the cooler months of April to August.

Table 4-4: Symons pan and open water evaporation for the project

| Month | Symons Evaporation(mm) | Pan Open Water Evaporation Factor | Open Water Evaporation (mm) |
|--------------|------------------------|-----------------------------------|-----------------------------|
| January | 161 | 0.84 | 135 |
| February | 134 | 0.88 | 118 |
| March | 122 | 0.88 | 107 |
| April | 97 | 0.88 | 85 |
| May | 82 | 0.87 | 71 |
| June | 67 | 0.85 | 57 |
| July | 75 | 0.83 | 62 |
| August | 106 | 0.81 | 86 |
| September | 143 | 0.81 | 116 |
| October | 159 | 0.81 | 129 |
| November | 160 | 0.82 | 131 |
| December | 166 | 0.83 | 138 |
| Total | 1 471 | N/A | 1 351 |

4.2. Topography

The landscape features sloping plains and a series of ridges slightly elevated over undulating surrounding plains. The proposed pipeline route starts at an elevation of 1550 metres above sea level (mamsl) and runs upslope to an elevation of 1565 m mamsl, as indicated in Figure 4-4.



KP2 PIPELINES AUTHORISATIONS TOPOGRAPHY

Legend

●●●●● KP2 Pipelines Section

Kilometers

| | |
|--|---------------------------------------|
| Project Code: DRDG#059 Client: Far West Gold Recoveries (Pty) Ltd Drawn: C Strooh Checked: Z Omar © 2024 Kongiwe Environmental (Pty) Ltd www.kongiwe.com Date: 05 March 2025 | 1:30 000 |
| Coordinate System: GCS WGS 1984 Datum: WGS 1984 | (A3) 2024 Satellite Imagery |
| Disclaimer The information represented in this plan is for general information purposes only and is subject to change. | |
| FILE REF: Z:\GIS\Projects\DRDGOLD\059 KP2 Pipeline\Project\KP2 Local Orientation Landscape A3.mxd | |

Figure 4-4: Topography map

4.3. Geology

The geology map of the area indicates that the project area lies on the Pretoria Group outcrop of the Transvaal Supergroup (see Figure 4-5). The Pretoria Group comprises of several formations including Rooihogte, Timeball Hill, Boshhoek, Hekpoort, Strubenkop, Daspoort and Silverton. This group is predominantly composed of mudrock, sandstone and shale with alternating quartzite layers. The proposed pipeline route falls on the Daspoort, Hekpoort and Boshhoek formations.

4.4. Soil Classification

This site supports the Ba1 land type, which is comprised of a variety of soils but predominantly made up of plinthic catena: upland duplex and marginal soils rare; dystrophic and/or mesotrophic: red soils widespread (Figure 4-6), which is comprised of a variety of soils but predominantly made up of “red”, apedal B-horizon Hutton soils.

4.5. Land Use

The project area is predominantly surrounded by other mining-related activities, such as Kloof Plant 2, or remnants thereof, such as the Leeudoorn TSF to the south and Kloof TSF to the east. Outside of these two TSFs are expanses of agricultural land and grassland as shown in Figure 4-7.

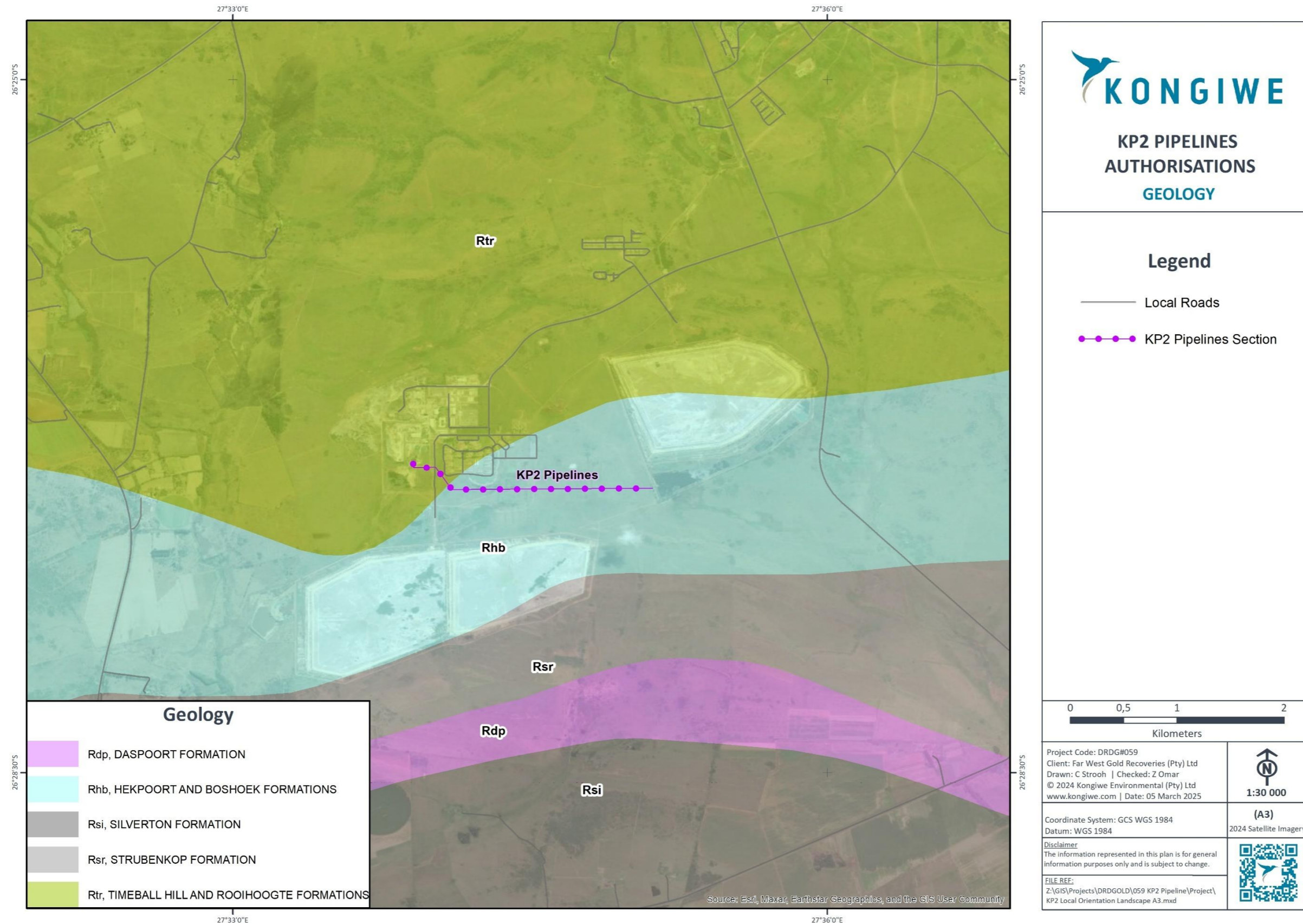


Figure 4-5: Geology of the project area

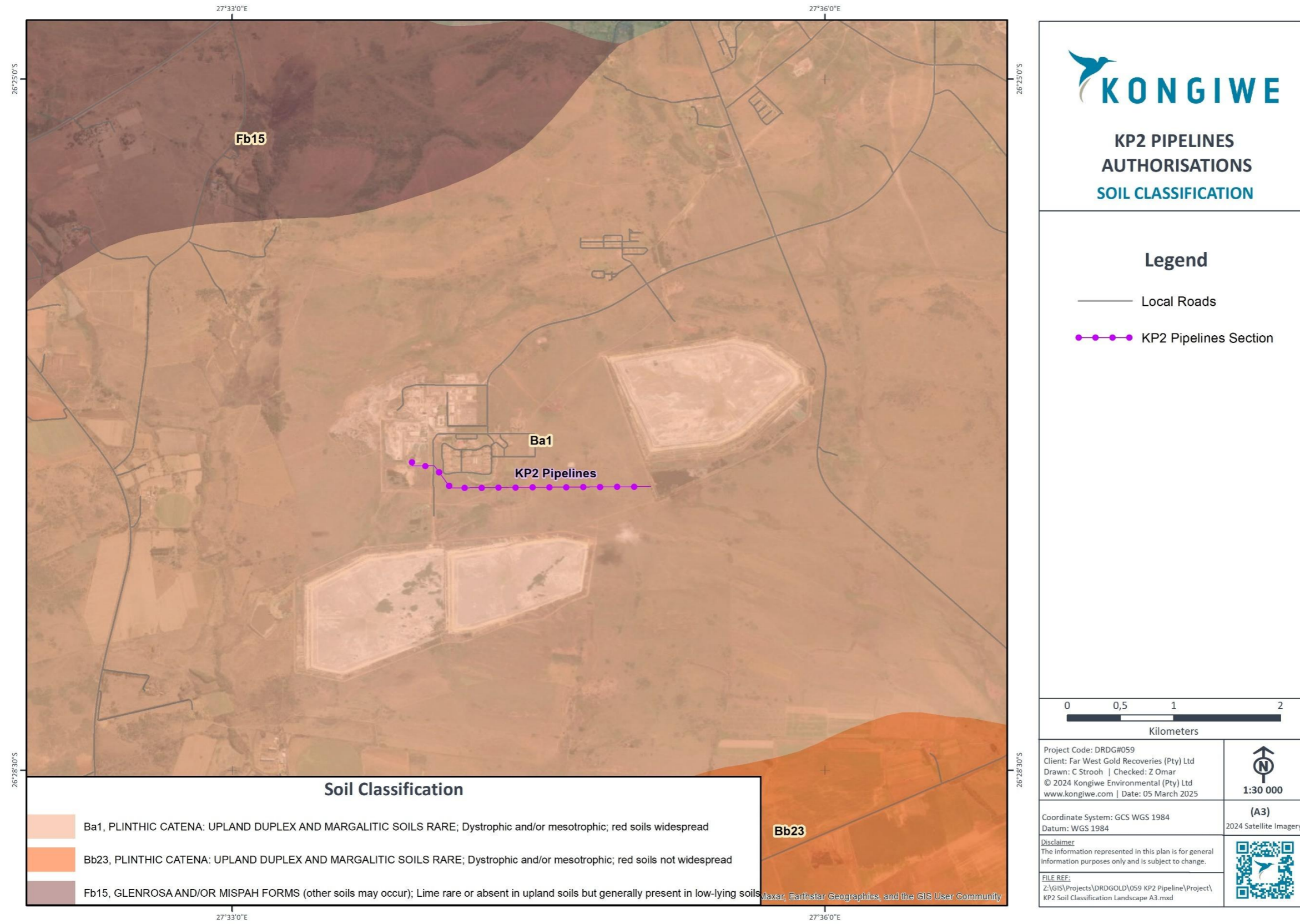


Figure 4-6: Soil Classification of the project area

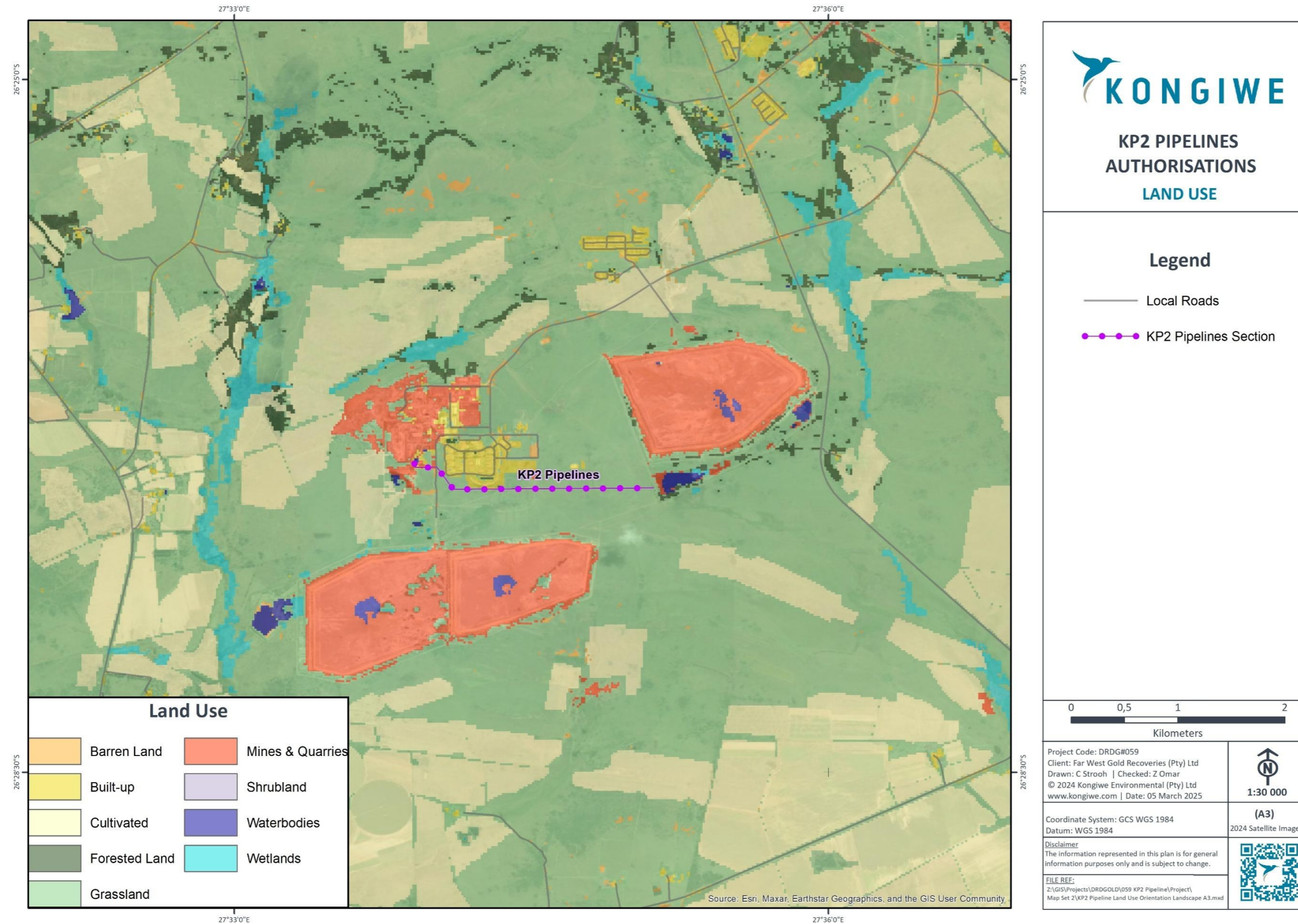


Figure 4-7: Land use map of the project area

4.6. Wetland

Refer to Specialist Study: Appendix A – Wetland Study

4.6.1 Wetland Classification

A field survey of the area was conducted on the 16th of January 2025 (The Biodiversity Company, 2025b).

Two Hydrogeomorphic (HGM) units were identified within the encompassing 500 m project area of influence (PAOI). These were classified as two seeps, HGM 1 and HGM 2. Additionally, numerous artificial wet areas were identified within the surrounding areas, pictured in Figure 4-8. The artificial wet areas include three dams (mining-related), Waste-Water Treatment Works (WWTW) settling/oxidation ponds, a concreted drainage canal, stormwater run-off areas, an excavated pond and an artificial seep.

The only features directly traversed by the proposed pipelines are the artificial wet areas related to stormwater management or the lack thereof (Figure 4-9)

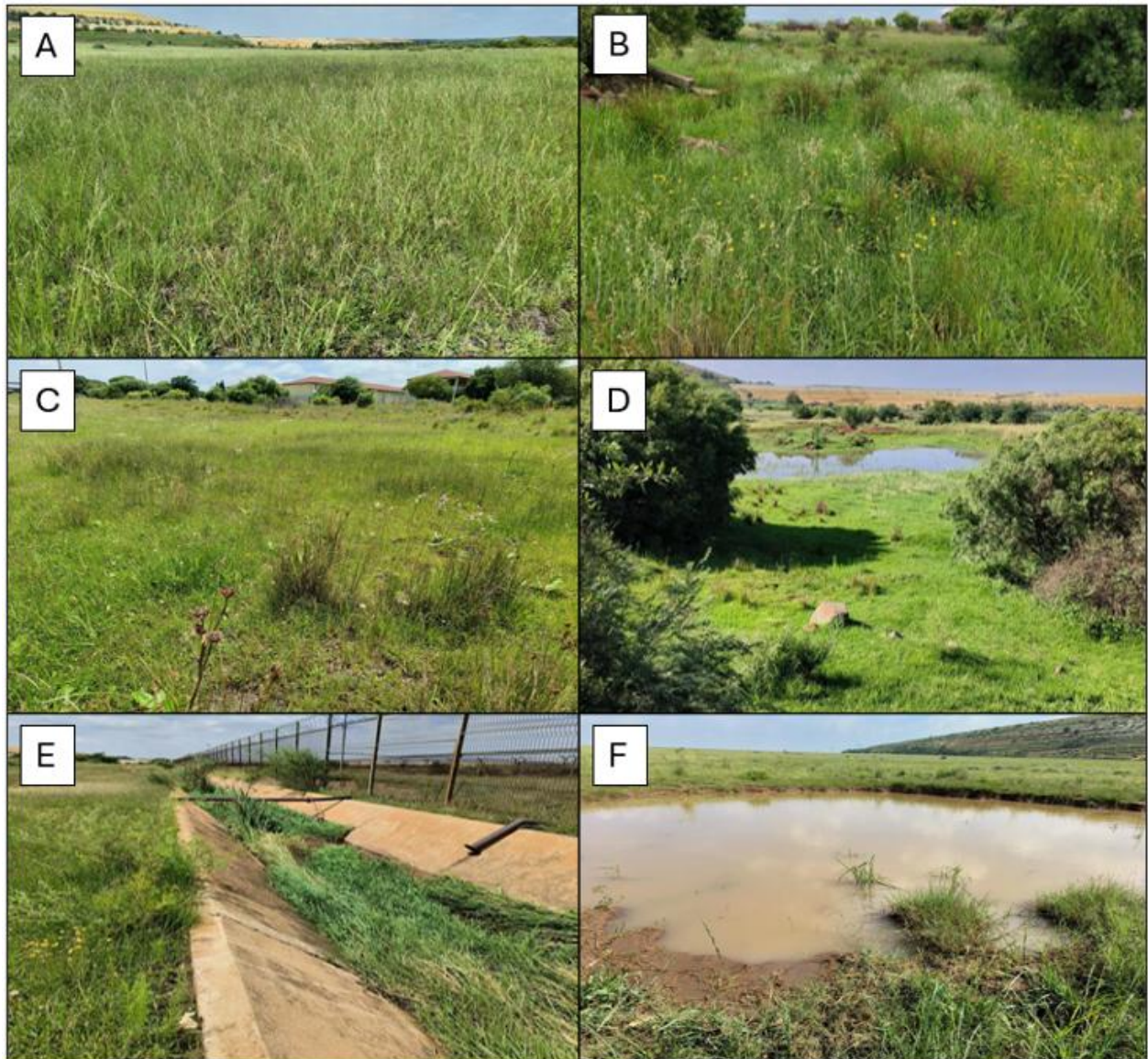


Figure 4-8: Representative photographs of freshwater features within the PAOI

A) HGM 1 – Seep; B & C) Artificial wet area from stormwater; D) Dam (mining-related); E) Drainage canal; and F) Excavated Pond.

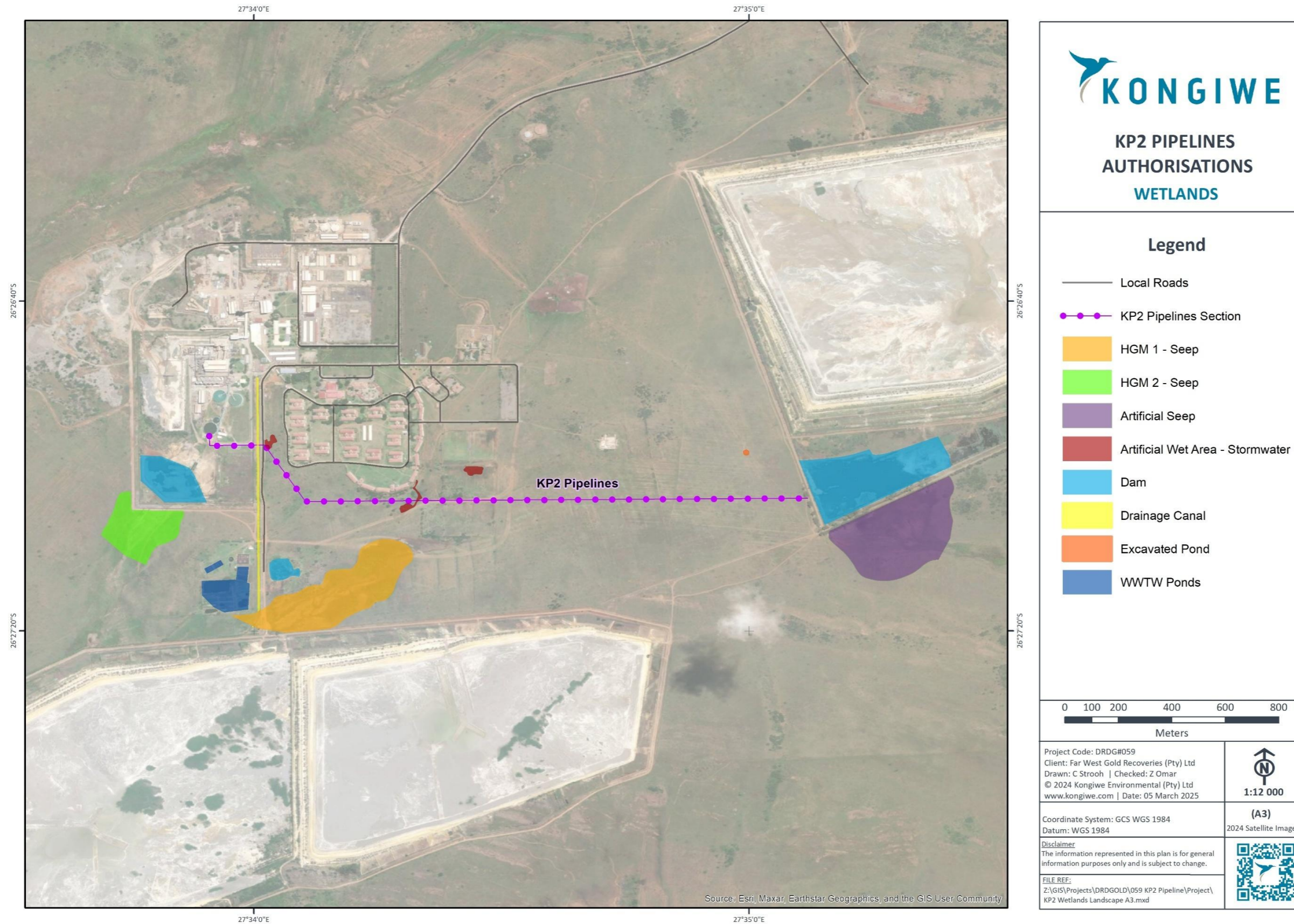


Figure 4-9: Delineated wetlands features identified in the PAOI

4.6.2 Wetland Ecological Functional Assessment

The ecosystem services provided by the wetlands identified on site were assessed and rated using the WET-EcosServices method (Kotze et al. 2008). HGM unit 2 was identified to be “Not at Risk”, as it is physically buffered by existing infrastructure and is located a considerable distance (>250 m) from the proposed development. Therefore, no direct or indirect impacts are anticipated to affect the wetland system.

The ecosystem services score of HGM 1 falls within the “Intermediate” class. Ecosystem services contributing to this score includes flood attenuation, minimal streamflow regulation, sediment trapping, phosphate and nitrate assimilation, moderate toxicant assimilation, provision of water for human use, erosion control, and the maintenance of biodiversity.

4.6.3 The Wetland Health Assessment

The wetland exhibited different degrees of modification resulting from natural physical changes as well as anthropogenically induced impacts at both the local and catchment level. The results are shown in Table 4-5.

Modification to the landscape has altered overland flows and the vegetation structure associated with it. This is evident by the minor erosion present within the wetland. Water quality is also presumed to be negatively affected by the wetland’s proximity to a WWTW and tailings facilities. This has earned it an average Present Ecological State (PES) score within the “D – Largely Modified” class.

Table 4-5: Summary of the scores for the Wetland PES

| HGM Unit | Hydrology | | Geomorphology | | Water Quality | | Vegetation | | Overall PES | |
|----------|------------------------|--------|----------------------|--------|-------------------------|--------|------------------------|--------|----------------------|--------|
| | Score | Rating | Score | Rating | Score | Rating | Score | Rating | Score | Rating |
| HGM 1 | Seriously Modified (E) | 7 | Largely Modified (C) | 3.7 | Moderately Modified (D) | 4.0 | Seriously Modified (D) | 7.9 | Largely Modified (D) | 5.5 |

4.6.4 The Ecological Importance and Sensitivity Assessment

The Ecological Importance and Sensitivity (EIS) assessment was applied to the HGM units in conjunction with the ecosystem service scores in the preceding section, to assess the levels of sensitivity and ecological importance of the wetland. It should be noted that where the dataset did not identify a wetland and one was identified on site, with the closest wetland of the same dataset used to extrapolate the findings. The result of the assessment is shown in Table 4-6, indicating the wetlands EIS score to be in the “C – Moderate” category.

Table 4-6: Aspects considered in the Ecological Importance and Sensitivity assessment

| HGM No. | NFEPA Wetlands | | | NBA Wetlands | | | | EIS Class | |
|---------|--------------------------------|-------------------------|----------------------------|----------------------|------------------------------|----------------------------|------------|---------------|---------------------|
| | Type | Ecosystem Threat Status | Ecosystem Protection Level | Wetland Condition | Ecosystem Threat Status 2018 | Ecosystem Protection Level | SWSA (Y/N) | | CBA/ESA (Y/N) |
| HGM 1 | Mesic Highveld Grassland Group | Least Threatened | Not Protected | Largely Modified (D) | Critically Endangered | Poorly Protected | N | Y (CBA & ESA) | Moderate (C) |

4.6.5 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes for the assessed areas are presented in the Table 4-7 below. A summary explanation for each result is provided as relevant. It should be noted that the National Web-based Screening Tool (NWST) allocates sensitivities to freshwater resources identified through the available national freshwater datasets based on their presence (very high) or absence (low). The specialist-assigned sensitivity ratings presented herein consider the presence of features, their size and the ecological characteristics of the wetlands are mentioned above.

Figure 4-10 presents the delineated systems within the PAOI and the assigned sensitivities.

Table 4-7: Summary of the screening tool vs specialist assigned sensitivities

| Features | Screening Tool theme | Screening Tool | Specialist Findings | Tool Validated or Disputed by Specialist - Reasoning |
|--|----------------------------|----------------|---------------------|--|
| HGM 1 & HGM 2 | Aquatic Biodiversity Theme | Very High | Very High | Validated – Natural wetlands were identified which provide moderate levels of ecological benefit. |
| 32 m Buffer | Aquatic Biodiversity Theme | Very High/Low | Moderate | Disputed – Whilst buffer areas do not represent freshwater features, their conservation is imperative to limiting impact to the wetlands as they form the periphery of the wetlands resulting in spatial connectivity to the wetlands. The sensitivity of the buffer is therefore determined by the landscape and the sensitivity of the features. |
| Artificial Wet Area, Drainage Canal and | Aquatic Biodiversity Theme | Low | Low | Validated – Artificial features do not contain natural ecological sensitivity and would cease to exist if the artificial hydrological inputs are stopped and if the landscape was returned to its pre-disturbed state. Whilst wetland vegetation was observed within the artificial Wet Areas these areas are not considered to have functionality as a fully-fledged natural wetland. |
| Remaining Area | Aquatic Biodiversity Theme | Low | Low | Validated – No natural surface water features were identified within these areas. |

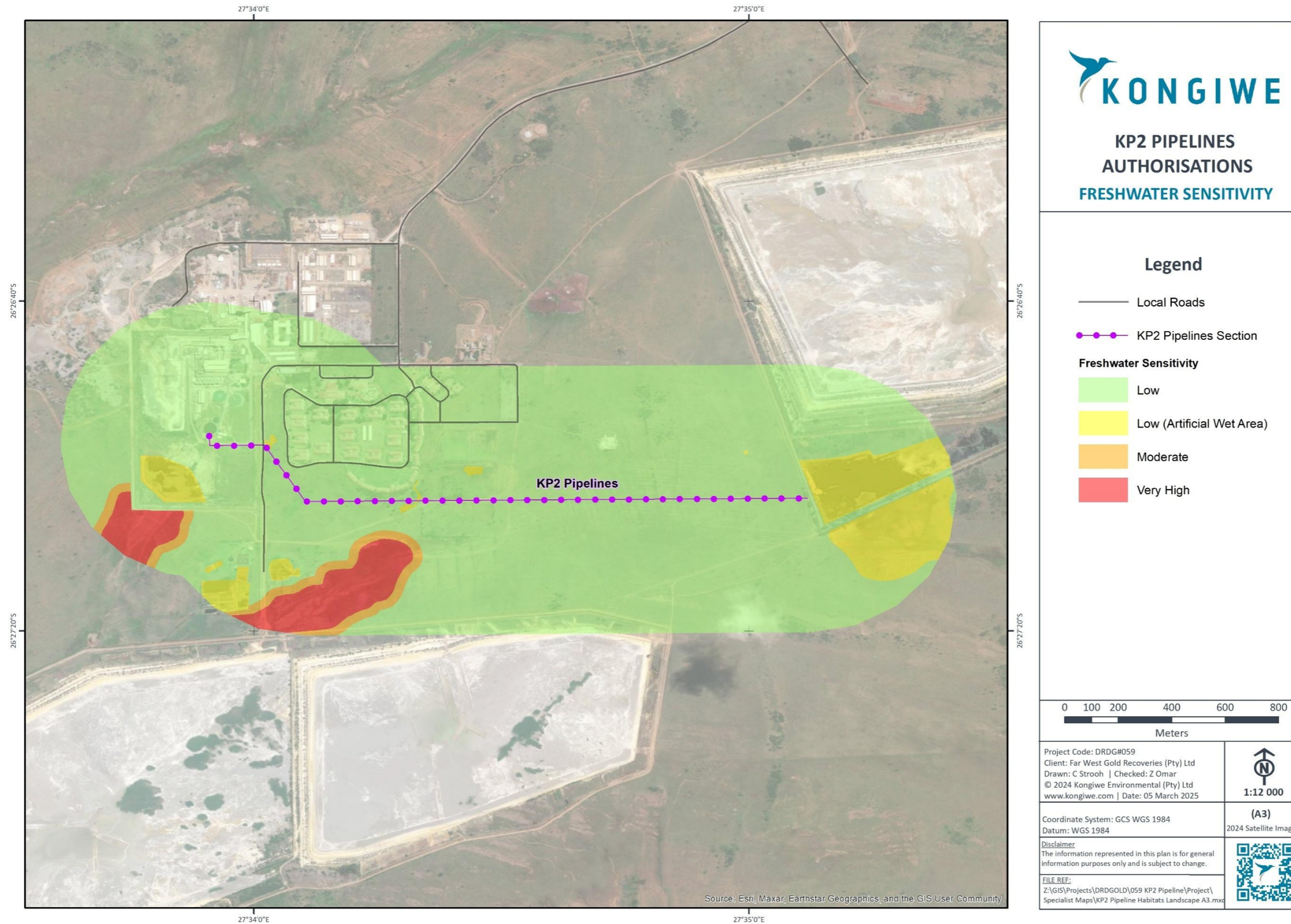


Figure 4-10: Map illustrating the freshwater sensitivity for the PAOI

4.6.6 Buffer Requirements

The buffer requirements were calculated using the Site-Based Tool: Determination of buffer zone requirements for wetland ecosystems (Macfarlane et al., 2014). Although HGM 2 was perceived to be “Not a Risk” from the Proposed Project, it was included in the buffer computation. The recommended buffer zones are presented in Table 4-8 and Figure 4-11.

A 45 m wetland buffer was calculated for the wetlands in the pre-mitigation scenario, which can be reduced to a minimum post-mitigation buffer of 32 m.

Table 4-8: Buffer Requirements for the relevant wetland feature

| Scenario | Buffer Distance (m) |
|-----------------|---------------------|
| Pre-mitigation | 45 |
| Post-mitigation | 32 |

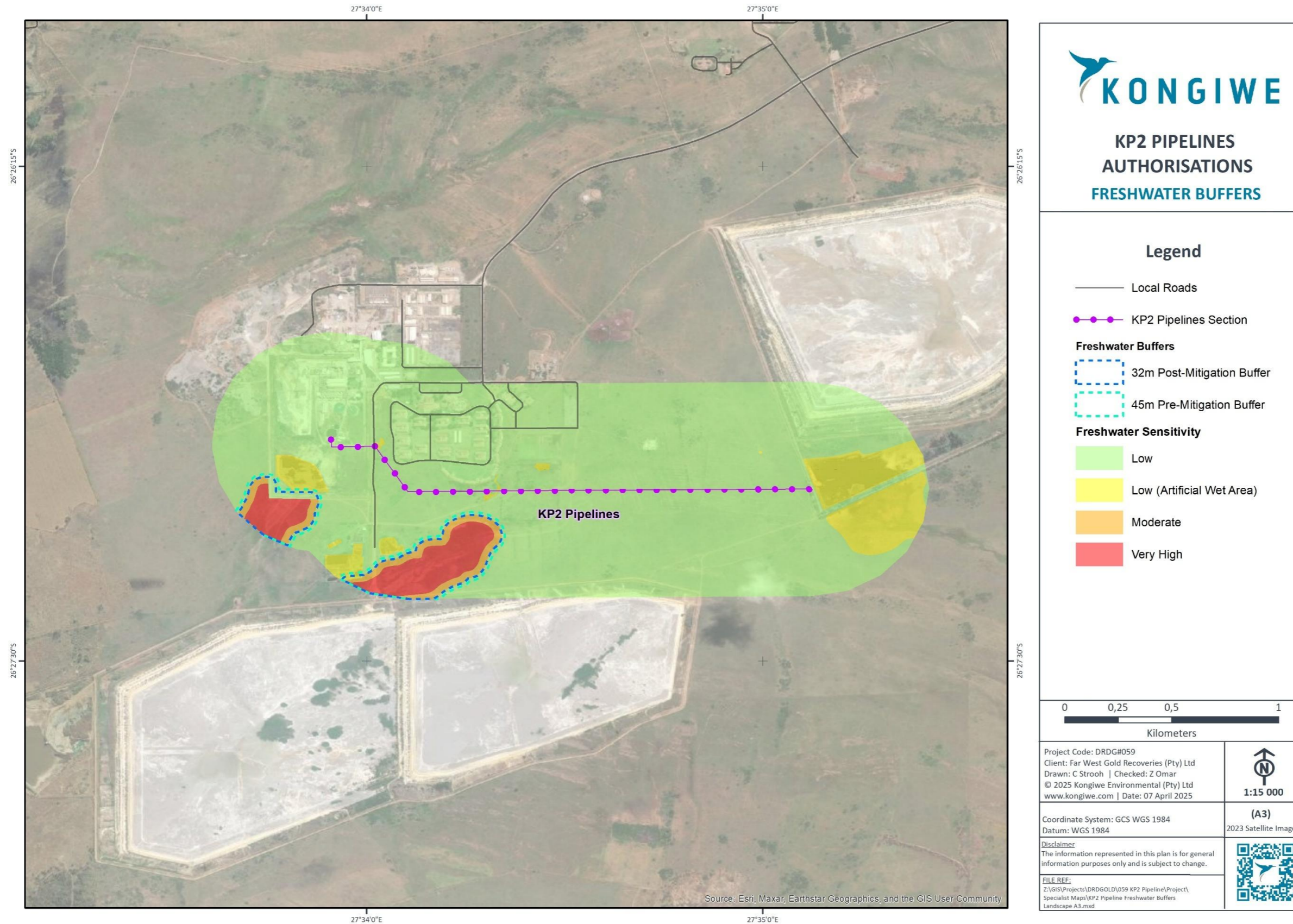


Figure 4-11: Recommended buffers for the assessed wetlands

4.7. Surface Water

4.7.1 Regional Catchment

The DWS has divided South Africa into primary, secondary, tertiary and quaternary catchments. Primary catchments are the largest defined catchments for South Africa, of which there are 22, and are assigned a letter ranging from A – X (excluding O). Secondary catchments are subdivisions of the primary catchments, and are the second largest catchments in South Africa, assigned the primary catchment letter within which they are located and a number e.g. A5 (secondary catchment 5 located within primary catchment A). Similarly, tertiary catchments are subdivisions of secondary catchments, represented for example by A53 (tertiary catchment 3 located within secondary catchment A5). Lastly, quaternary catchments are the smallest defined catchments and are assigned the tertiary catchment number, along with a quaternary catchment letter e.g. A53D (quaternary catchment D located within tertiary catchment A53).

Further to the above, the DWS has divided South Africa into 6 Water Management Areas (WMAs). The 6 WMAs consist of the Breede-Olifants, Mzivumbu-Tsitsikamma, Vaal-Orange, Pongola-Mtamvuna, Limpopo-Olifants, and Imkomati-Usuthi.

The Proposed Project is located in the Vaal-Orange WMA within quaternary catchments C22J and C23J (Figure 4-12).

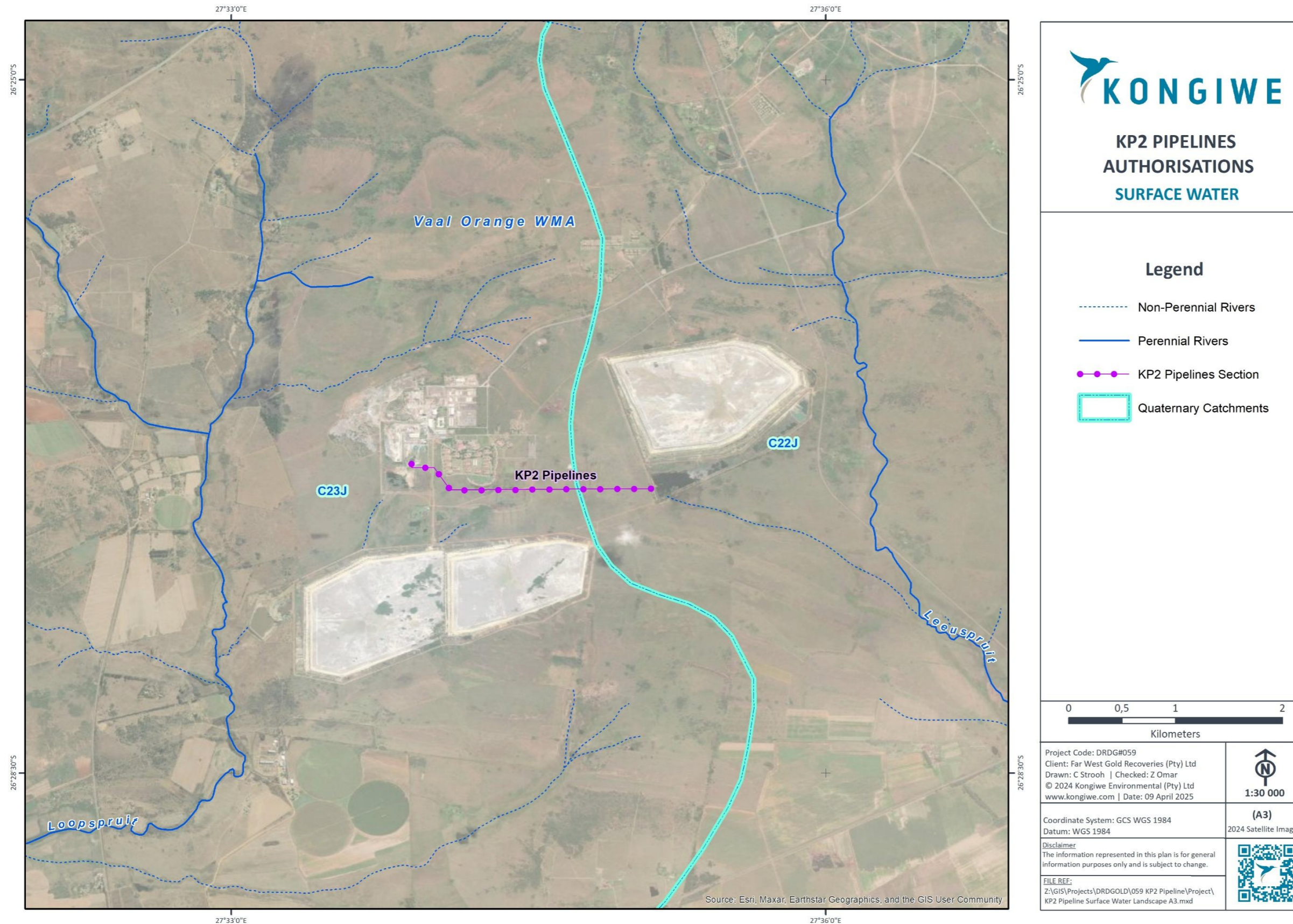


Figure 4-12: Surface Water around the project area.

4.7.2 DWS Classes and Resource Quality Objectives

The NWA specifies that water resources are to be protected and managed through the classification of water resources and Resource Quality Objectives (RQOs) and the setting of the reserve. The Classes and RQOs of Water Resources for Catchments of the Upper Vaal (Government Notice No. 468, 22 April 2016) (DWS, 2016), was consulted to obtain the classes and RQOs for the quaternary catchments within which the Proposed Project is located. However, quaternary catchment C22J and C23J does not have any classes or RQOs set.

4.7.3 Floodline Determination

No project infrastructure is near or within 100 m of a stream/river and the 1:100 / 1:50 year floodlines.

4.7.4 Resource Class and River Health Receiving Water Quality Objectives and Reserve

The Proposed Project is within the Upper Vaal WMA in quaternary catchment C22J and C23J. The Upper Vaal WMA is one of the 19 WMA includes in the Orange/Vaal River basin. The Water Resource Class for the Upper Vaal indicates that Proposed Projected is situated in extensive level of urbanisation and industrialisation and therefore its water resources have been highly developed and utilised.

The Classes and Resource Quality Objectives of the Upper Vaal report (2016) does not contain information on resources quality objectives for the quaternary catchment C22J and C23J.

The Reserve Determination of Water Resources for the Vaal Management Catchment Area was promulgated on the 21st of September 2020 and the Proposed Project will abide by the guidelines of the reserve determination.

4.8. Biodiversity

Refer to Specialist Study: Appendix B – Biodiversity Study

4.8.1 Habitat Assessment

A single season field survey was undertaken on the 16th of January 2025, which constitutes a dry season survey, to determine the presence of any local Species of Conservation Concern (SCC) and to achieve the delineation of local habitat types and their associated sensitivities (see Figure 4-14) (The Biodiversity Company, 2025a).

Four main habitat types were identified across the PAOI and include:

- ❖ Degraded Grassland;
- ❖ Secondary Grassland;
- ❖ Artificial Water Resources; and
- ❖ Modified areas.

Figure 4-13 shows the habitats the proposed pipeline route will cross. Due to limited rehabilitation efforts and ongoing human disturbances, the PAOI remains largely degraded or in a slow recovery state. Factors such as invasive plant infestation, anthropogenic activities, and the influence of nearby mining activities have further impacted the habitat. Without proactive restoration measures, its condition will continue to decline, as natural recovery is unlikely to occur.



Figure 4-13: Habitat observed within and surrounding project area. a) Secondary Grassland, b) Artificial Water Resource, c) Degraded Grassland, and d) Modified.

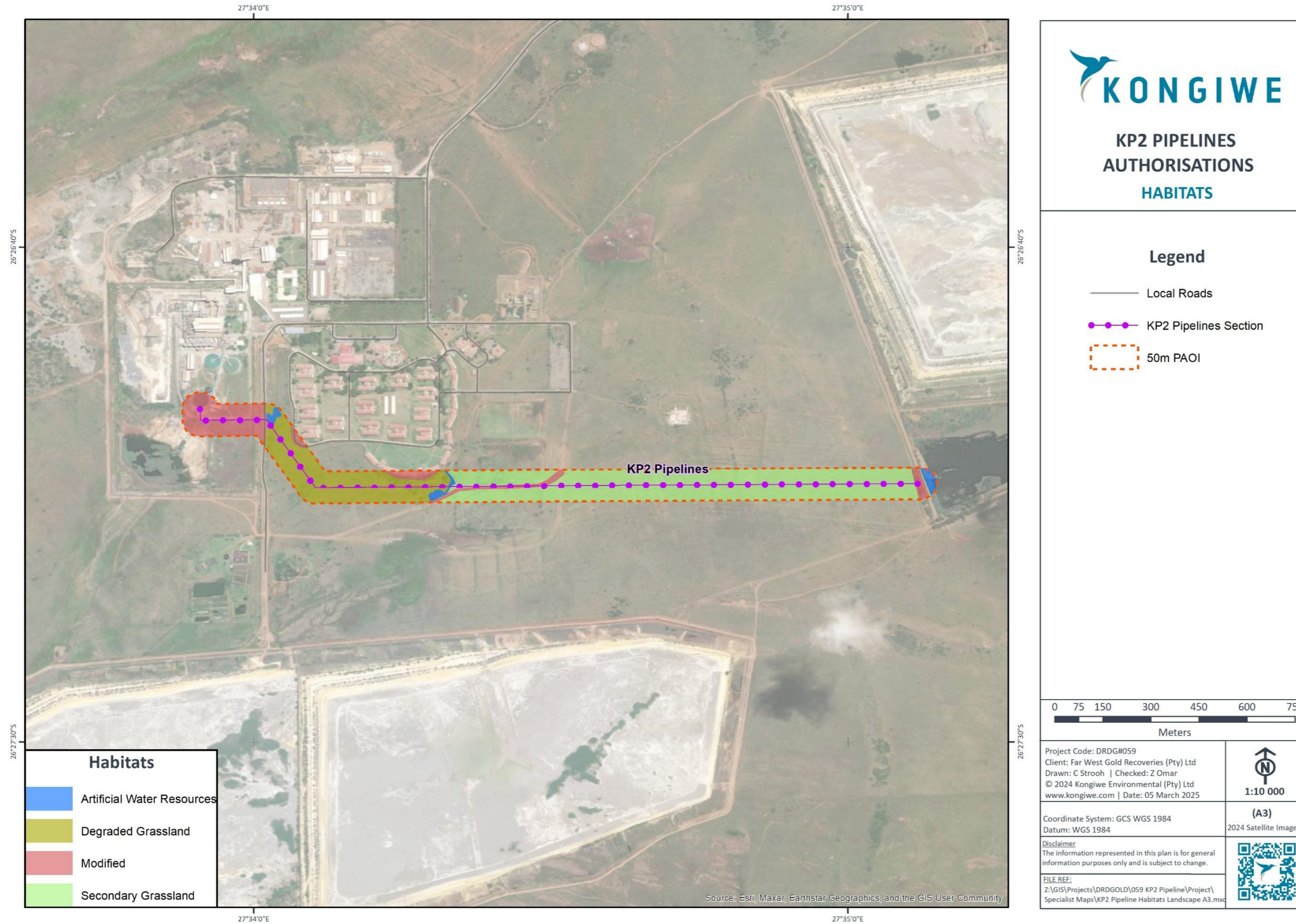


Figure 4-14: Habitats identified within the project area

4.8.2 Flora

4.8.2.1 Rand Highveld Grassland

The Proposed Project traverses the Rand Highveld Grassland. The Rand Highveld grassland vegetation consists of species-rich, wiry, and sour grassland interspersed with low, sour shrubland on rocky outcrops and steeper slopes. The dominant grasses on the plains belong to the genera *Themeda*, *Eragrostis*, *Heteropogon*, and *Elionurus*. A notable feature of the area is its high diversity of herbs, many from the *Asteraceae* family. Rocky hills and ridges support sparse, savanna-like woodlands, primarily composed of *Protea caffra* subsp. *caffra*, *P. welwitschii*, *Senegalia caffra*, and *Celtis africana*, with a diverse understory of shrubs, particularly from the *Rhus* genus, including *R. magalismonata* (Mucina and Rutherford, 2006).

4.8.2.2 Protected Species and Locations

The appearances and localities of the provincially protected flora *Boophone disticha* (Common name oxbane/Poison bulb) and *Gladiolus crassifolius* (Common name Thicketleaf Gladiolus) were recorded during the site assessment (see Figure 4-15).

Note that this is not exhaustive, and it is highly possible that there are more species occurring within the PAOI that were not encountered or may only emerge closer to the time of the construction activities commencing.



Figure 4-15: Provincially protected flora Thicketleaf Gladiolus (*Gladiolus crassifolius*)

4.8.3 Fauna

The screening Tool indicates that five medium sensitivity mammal species, two medium sensitivity invertebrate species, one medium and one high sensitivity avifaunal species could occur in the general area.

None have been confirmed for the site during the site assessment and likelihood of occurrence is considered low.

4.8.4 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the overall PAOI in Table 4-9. A summary explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the Site Ecological Importance (SEI) process followed in the previous section, and considerations is given to an observed or likely presence of SCC species. A map illustrating the overall SEI allocations for the PAOI can be seen in Figure 4-16.

Table 4-9: Summary of the screening Tool vs Specialist assigned sensitivities

| Screening Tool Theme | Screening Tool | Habitat | Specialist | Tool Validated or Disputed by Specialist - Reasoning |
|----------------------|----------------|---------------------|------------|---|
| Animal Theme | Medium | N/A | Low | Disputed – Habitat exists in a largely impacted and in some sections a degraded state with high levels of anthropogenic disturbances, particularly those associated with the TSF, housing, and other mining-related activities on site, as well as historical land clearing. No SCC observed and unlikely to be resident, although some may use the habitats on site for foraging and as a movement corridor. |
| Plant Theme | Medium | N/A | Low | Disputed – Habitat exists in a largely degraded or modified state with high levels of anthropogenic disturbance, particularly those associated with the TSF on site. High numbers of alien and invasive plants. No SCC observed and unlikely to occur. |
| Terrestrial Theme | Very High | Secondary Grassland | Low | <p>Disputed – This habitat has developed on land previously subjected to significant disturbance (TSF, housing, and other mining-related activities) and is in a state of recovery. While it retains some ecological functions and supports a mix of indigenous and non-indigenous species, the presence of invasive species and edge effects from nearby developments are prevalent. The ecological services are improving, but the habitat quality remains sub-standard.</p> <p>Although it acts as a transitional zone supporting the gradual return of indigenous species, the overall ecological value is reduced compared to more intact grassland types, justifying a lower sensitivity rating.</p> <p>The habitat is no longer representative of an ESA or CBA, nor natural Rand Highveld Grassland, but does exhibit some ecological functionality. No SCC noted nor expected.</p> |
| | | Degraded Grassland | Low | Disputed – This habitat has been exposed to various disturbances, such as mining related activities, alien invasive plant (AIP) invasions, and dumping – leading to significant ecological degradation. While it still exhibits some natural grassland characteristics and hosts restricted ecological functions, the overall habitat quality is compromised. |

| Screening Tool Theme | Screening Tool | Habitat | Specialist | Tool Validated or Disputed by Specialist - Reasoning |
|----------------------|----------------|-----------------------------------|------------|--|
| | | | | The limited presence of indigenous vegetation and reduced biodiversity contributes to its low sensitivity rating, reflecting the habitat diminished capacity to support diverse ecological processes and species. No SCC noted and none are expected. |
| | | Artificial Water Resources | Low | <p>These wetlands have formed in historically dug pits and exhibits limited ecological functions and biodiversity. While they provide minimal ecosystem services, such as water filtration and habitat provision, their contribution to the overall ecological landscape is restricted.</p> <p>Due to their artificial origins and low ecological value, these wetlands are appropriately assigned a low sensitivity rating, reflecting their limited role in the landscape’s ecological dynamics.</p> |
| | | Modifies | Low | Disputed – Habitats has been severely altered by anthropogenic activities with limited ecological functions provided to surround ecosystems. |

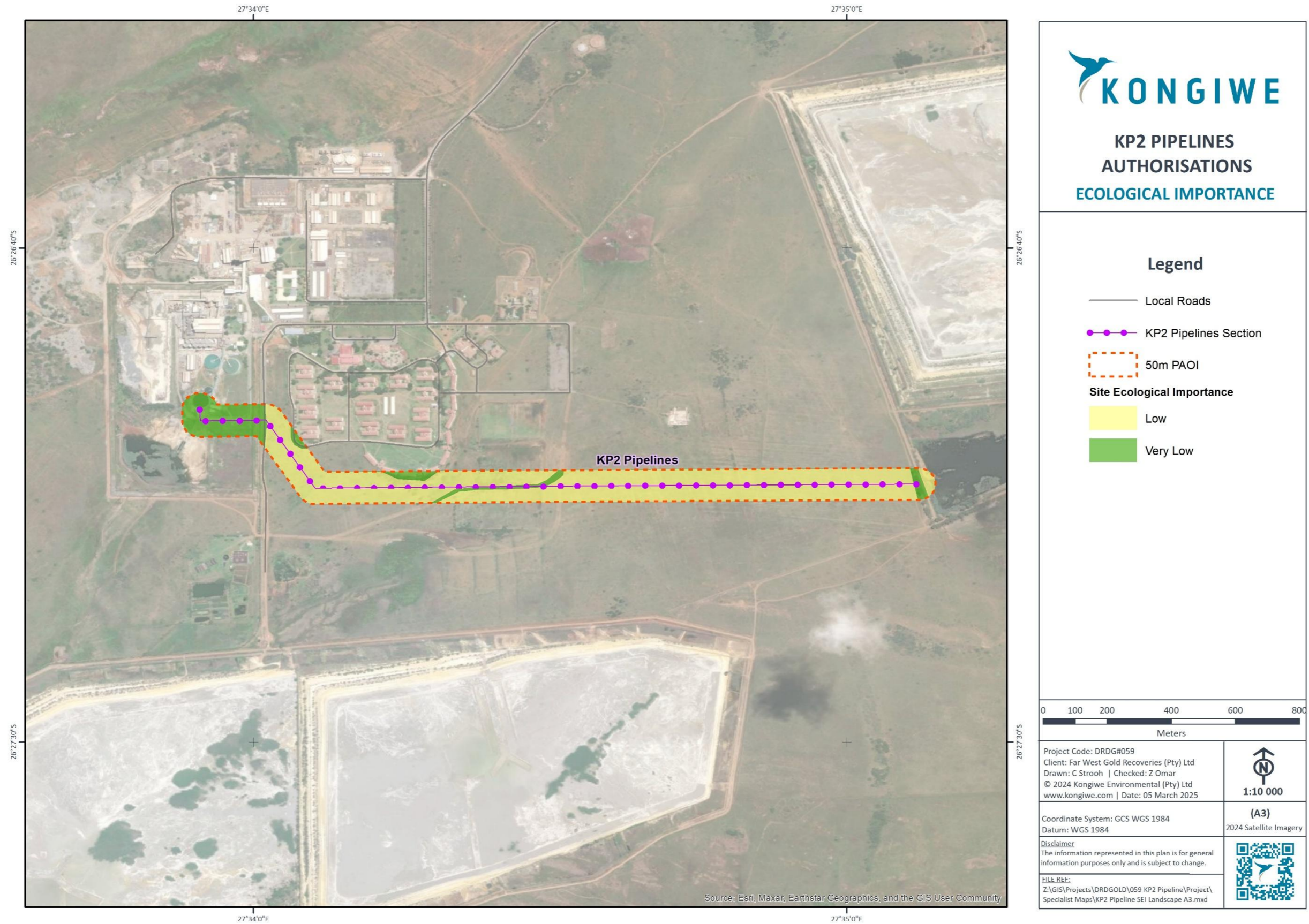


Figure 4-16: Map illustrating the site ecological importance of the project area.

5 Analysis and Characterization of Water Use Activity

5.1. Site Delineation for Characterisation

As previously mentioned, the Proposed Project is situated approximately 9 km northeast of the Fochville, in the RWLM. The project area is predominantly surrounded by other TFSS, grassland, water bodies and bare ground. This is a linear project related to slurry and process water pipelines which are approximately 2.16 km in length.

5.2. Operational Management

5.2.1 Organisational Structure

The organisational structure applicable to the Applicant is shown in Figure 5-1 below. As of January 2020, Sibanye holds a 50.1% interest in DRDGOLD which wholly owns the subsidiaries FWGR and Ergo. **The activities subject to this application will be operated under the entity FWGR.**

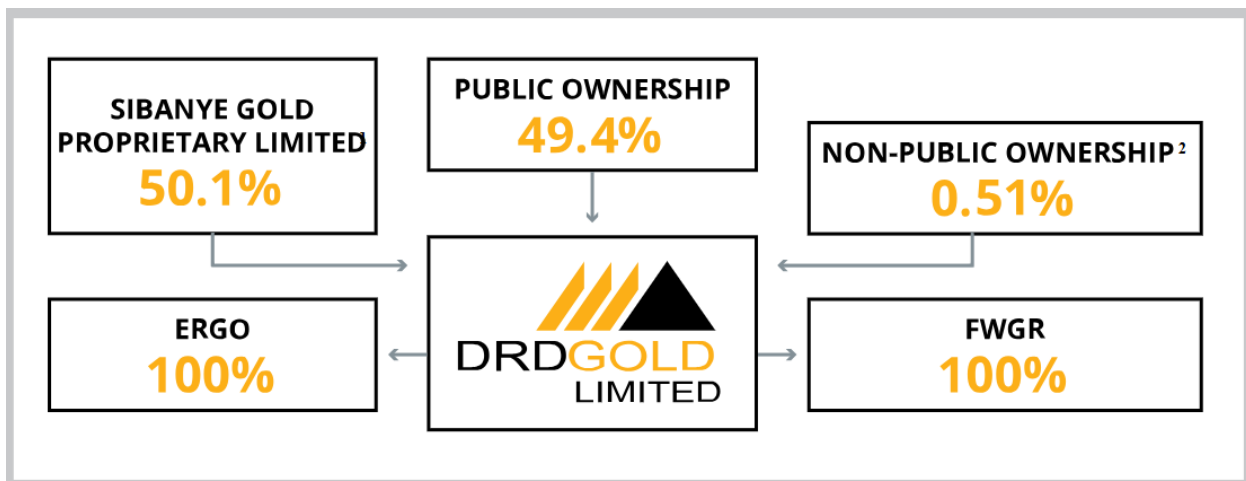


Figure 5-1: Organisational Structure

5.2.2 Environmental Policies and Procedures Relating to the Environment

FWGR has a management procedure and internal communication strategy for identifying environmental training needs and providing awareness and competence training that was developed and successfully implemented as part of the Environmental Management System (EMS) of the mine.

The aim of relative policies and procedures relating to the environment aim to achieve the following:

- ❖ Complying with all applicable legislation as a minimum requirement;
- ❖ Achieving high standards of environmental care;
- ❖ Ensuring proper organisational structure and resources to manage safety, health and environmental matters;
- ❖ Continuous hazard identification and risk assessment;

- ❖ Establishing competence and awareness through training and awareness;
- ❖ Conserving natural resources and reducing environmental burden of waste generation and emissions through re-use and recycling as far as practically possible;
- ❖ Reporting of incidents and implementing correct measures accordingly; and
- ❖ Maintaining a high level of emergency preparedness and response to manage emergencies.

5.2.3 Resources and Competence

DRDGOLD has extensive experience and is solely focussed on the retreatment of surface gold tailings. The Proposed Project is in line with the company's expertise and a continuation of ongoing operations.

FWGR also has a competent Environmental Management Co-ordinator who will be responsible for the environmental management of the site.

5.3. Environmental Communication Strategies

Mine management is required to establish procedures for the internal communication between the various levels and functions of the organisation, and receiving, documenting and responding to environmental risks for each phase of the project. The organisation shall conduct processes for external communication on its significant environmental aspects and record its decision in line with FWGR communication policy as well as conditions stated in any EA or Licence.

5.3.1 Stakeholder Engagement Plan

The Stakeholder Engagement Plan (SEP) needs to provide guidance for engagement with Stakeholders. This SEP has been developed to plan engagement activities for the Proposed Project.

FWGR will follow best practice and provide:

- ❖ A description of the regulatory and other requirements for Stakeholder Engagement;
- ❖ A summary of the applicable South African legislation;
- ❖ A list of potential stakeholders identified for the project;
- ❖ Implementation plan for further consultation during the different phases of the project;
- ❖ A proposed grievance mechanism; and
- ❖ Management functions for the implementation of the SEP and grievance mechanism.

5.3.1.1 Internal Communication

Internal communication is done within the Administrative Sector.

5.3.1.2 External Communication Strategies

The following communication channels and media can be used to communicate environmental issues to individuals who are not employed by FWGR or its subcontractors:

- ❖ **Environmental stakeholder engagement meeting:** An Environmental Stakeholder Engagement Meeting has been established and used as a forum to keep interested and affected parties (I&APs) informed of the significant environmental aspects identified through the Environmental Impact Assessments and Management Plans. This is also the forum where I&APs get the opportunity to raise environmental concerns. Records are kept of all decisions and concerns. The Environmental Stakeholder Engagement Meeting is chaired by the Manager, or another appropriately appointed competent individual.
- ❖ **Publications:** Selected publications should be produced and used to communicate environmental issues to outside parties. Examples include newsletters and Annual Reports.
- ❖ **Communication from External Parties and Employees:** A clear communication point is established within the company through the FWGR communication procedure that determines who is responsible for liaison with the media in respect of any crisis that may arise. A complete procedure for media liaison is available to all employees. Communication from external I&APs may be received by email, fax, telephonically or by mail. Where required, a written response will be sent, on receiving such communication, by the appropriately appointed individual under signature of the Mine Manager, to the respective interested and / or affected party. All telephonic or facsimile correspondence received must be forwarded to the relevant department for action. All events or concerns will be captured and actioned on an existing and / or future database.
- ❖ **E-mail:** E-mail communication received must be stored, with replies, in an appropriate folder on a server. E-mail messages, relevant to environmental management, should be kept for a minimum of two years before deletion.
- ❖ **Mail:** Correspondence received by mail must be filed, along with the response (where relevant), within the relevant department's filing system for a minimum period of two years. Paper correspondence will be archived in this department.
- ❖ **Storage of Correspondence:** All original correspondence must be retained by the Mine Manager for a minimum period of three years.
- ❖ **Environmental Reports:** Copies of relevant specialist study reports and Environmental Impact Assessments (EIAs) will be available on request from an external party approved by the Mine Manager.
- ❖ **Queries from I&APs:** Response to queries about environmental impacts and aspects will be addressed by the relevant department and approved by the Mine Manager.

5.3.2 Evaluation of the Environmental Awareness Plan

The evaluation of the environmental awareness and training plan will be conducted by FWGR's management. This evaluation will entail the auditing of the operation in both the construction and operation phase once activity has commenced. The environmental awareness and training plan described

above is sufficient to make all those involved in the project aware of those risks that may occur as well as the necessary mitigation required to minimize these risks.

The environmental awareness and training plan indicates that FWGR is serious about the well-being of the environment and empowerment of the local people. Environmental issues will be discussed at monthly meetings scheduled at the mine.

5.3.3 Emergency Incident Reporting

Environmental incident reporting is a vital part of communication in the project. Employees are required to report all environmentally related problems, incidents and pollution, so that the appropriate litigator action can be implemented timeously. In the event of an Environmental Incident, the incident must be reported according to the Incident Reporting Procedure.

An Emergency Incident Preparedness and Response Plan needs to be developed.

5.3.4 Induction

All full-time staff and contractors are required to attend an induction session. Employees are inducted when they start on the project. Any contractor, who works on the project is required to undergo FWGR's prescribed induction training. This induction will form part of the health and safety induction.

Environmental issues and aspects related to the project will be addressed in the induction sessions. All environmental impacts and aspects and their mitigatory measures will be discussed, explained and communicated to employees. The induction sessions will be modified according to the level of employee attending the induction session so that all employees gain a suitable understanding of environmental issues and pollution.

The records of all individuals attending induction sessions to be kept; the records to be kept include names, ID, contact details, designation and signature.

5.4. Monitoring and Control

Waste will be generated during the construction and decommissioning phases of the project. Waste will be monitored in accordance with FWGR's Waste Policy.

5.5. Risk Assessment / Best Practice Assessment

5.5.1 Methodology for assessing the significance of Environmental Impact Assessment

The impact significance rating process serves two purposes: firstly, it helps to highlight the critical impacts requiring consideration in the management and approval process; secondly, it shows the primary impact characteristics, as defined above, used to evaluate impact significance. As read within the DWS's Best Practice Guideline: G4 – Impact Prediction, there are three basic components that define an impact (or a

risk). Figure 5-2 represents the relationship between these three components and their influence on the significance of a certain impact of a project.

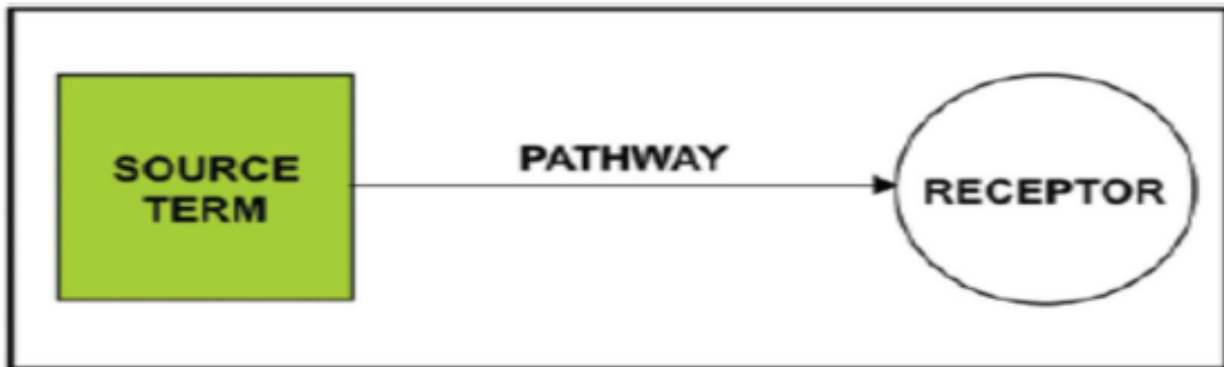


Figure 5-2: Impact prediction model

The impact significance rating system is presented in Table 5-1, Table 5-2, and Table 5-3, and involves three parts:

- ❖ **Part A:** Define impacts consequence using the three primary impacts characteristics of magnitude, spatial scale/population and duration;
- ❖ **Part B:** Use the matrix to determine a rating for impact consequence based on the definitions identified in Part A; and
- ❖ **Part C:** Use the matrix to determine the impact significance rating, which is a function of the impact consequence rating (from **Part B**) and the probability of occurrence.

5.5.2 Part A: Defining Consequences in Terms of Magnitude, Duration and Spatial Scale

Use these definitions to define the consequences in Part B

Table 5-1: Consequences rating definitions

| IMPACT CHARACTERISTICS | DEFINITION | CRITERIA |
|------------------------|------------|---|
| Magnitude | Major - | Substantial deterioration or harm to receptors; receiving environment has an inherent value to stakeholders; receptors of impact are of conservation importance; or identified threshold often exceeded |
| | Moderate - | Moderate/measurable deterioration or harm to receptors; receiving environment moderately sensitive; or identified threshold occasionally exceeded |
| | Minor - | Minor deterioration (nuisance or minor deterioration) or harm to receptors; change to receiving environment not measurable; or identified threshold never exceeded |

| IMPACT CHARACTERISTICS | DEFINITION | CRITERIA |
|-----------------------------|-------------------------|---|
| | Minor + | Minor improvement; change not measurable; or threshold never exceeded |
| | Moderate + | Moderate improvement; within or better than the threshold; or no observed reaction |
| | Major + | Substantial improvement; within or better than the threshold; or favourable publicity |
| Spatial scale or population | Site or local | Site specific or confined to the immediate project area |
| | Regional | May be defined in various ways, e.g. cadastral, catchment, topographic |
| | National/ International | Nationally or beyond |
| Duration | Short term | Up to 18 months. |
| | Medium term | 18 months to 5 years |
| | Long term | Longer than 5 years |

5.5.3 Part B: Determining Consequences Rating

Rate consequence based on definition of magnitude, spatial extent and duration.

Table 5-2: Consequences rating methodology

| MAGNITUDE | DURATION | SPATIAL SCALE/ POPULATION | | |
|-----------|-------------|---------------------------|----------|-------------------------|
| | | Site or Local | Regional | National/ International |
| Minor | Long term | Medium | Medium | High |
| | Medium term | Low | Low | Medium |
| | Short term | Low | Low | Medium |
| Moderate | Long term | Medium | High | High |
| | Medium term | Medium | Medium | High |
| | Short term | Low | Medium | Medium |
| Major | Long term | High | High | High |
| | Medium term | Medium | Medium | High |
| | Short term | Medium | Medium | High |

5.5.4 Part C: Determining Significance rating

Rate significance based on consequence and probability.

Table 5-3: Significance rating methodology

| PROBABILITY (OF TO EXPOSURE IMPACTS) | CONSEQUENCE NEGATIVE | | | CONSEQUENCE POSITIVE | | |
|--------------------------------------|----------------------|--------|--------|----------------------|--------|--------|
| | Low | Medium | High | Low | Medium | High |
| Definite | Medium | Medium | High | Medium | Medium | High |
| Possible | Low | Medium | High | Low | Medium | High |
| Unlikely | Low | Low | Medium | Low | Low | Medium |

5.6. Impact and Cumulative Impact identified

This subchapter serves to provide insight on the major positive, negative and cumulative impacts associated with the Proposed Project’s construction phase. The potential impacts are discussed per environmental feature / aspect.

5.6.1 Construction Phase

FWGR will commence with a pre-construction and construction phases for its project in line with its approved environmental authorisations. During the construction phase the following activities will take place on site:

Table 5-4: Summary table of activities associated with the construction phase of the project

| Activity | Description |
|---------------------------|--|
| Pre-Construction | |
| 1 | Removal of vegetation and site clearance |
| 2 | Preparation of access roads should this be required |
| 3 | Start implementing monitoring plans, Authorisation, Licensing and EMPr conditions. |
| Construction phase | |
| 4 | Operation of construction machinery and vehicles |
| 5 | Install proposed pipelines |
| 6 | Instatement of traffic signage and access |

5.6.1.1 Wetlands

The following potential impacts were considered on wetlands during the construction phase:

- ❖ Temporary increase of overland flow from hardened surfaces, potential erosion and sedimentation from increased flows;
- ❖ Introduction and proliferation of alien invasive vegetation from disturbance; and
- ❖ Potential contamination of water from accidental spills and leaks of machinery and equipment used in the construction activities.

The table below shows a summary of the DWS Risk Assessment and its significance (max = 100) in addition to the already mentioned potential impacts above.

Table 5-5: Mitigated summary of the DWS Risk Assessment conducted for the construction phase

| Phase | Activity | Impact | Significance (max = 100) | Risk Rating | Confidence level |
|--------------------|---|--|--------------------------|-------------|------------------|
| CONSTRUCTION PHASE | Construction of slurry pipeline (Including site access and laying and installation of pipeline) | Temporary increase of overland flow from hardened surfaces | 14.4 | L | High |
| | | Potential erosion and sedimentation from increased flows | 7.2 | L | High |
| | | Introduction and proliferation of alien invasive vegetation form disturbance | 3 | L | High |
| | | Potential contamination of water from accidental spills and leaks of machinery and equipment used in the construction activities | 4.8 | L | High |
| | Construction of water pipeline (Including site access and laying and installation of pipeline) | Temporary increase of overland flow from hardened surfaces | 14.4 | L | High |
| | | Potential erosion and sedimentation from increased flows | 7.2 | L | High |
| | | Introduction and proliferation of alien invasive vegetation form disturbance | 3 | L | High |
| | | Potential contamination of water from a pipeline leak | 4.8 | L | High |

Table 5-6: Assessment of significance of potential construction impacts on wetlands

| Impact Name | Wetlands | |
|---------------------------|----------------|-----------------|
| Environmental Risk | | |
| Attribute | Pre-mitigation | Post-mitigation |
| Nature | Negative | Negative |
| Magnitude | Minor - | Minor - |
| Duration | Short Term | Short Term |
| Scale | Site or local | Site or local |
| Probability | Possible | Possible |

| Impact Name | Wetlands |
|---|----------|
| Environmental Risk Significance (Pre-mitigation) | Low - |
| Management Measures: | |
| <ul style="list-style-type: none"> • Implement temporary drainage and stormwater systems to manage surface runoff effectively in a manner that reduces the erosion potential and subsequent sedimentation. • Rehabilitate and revegetate disturbed areas. • Remove temporary drainage structures only after site stabilisation. • Monitor runoff patterns and adjust rehabilitation efforts as needed. • Stabilise exposed soil with vegetation or erosion control mats. • Schedule construction activities during dry seasons to minimise erosion risk. • Ensure that all disturbed areas are stabilised before the onset of rainy seasons. • Conduct post-construction inspections to assess and address erosion issues. • Conduct regular monitoring and removal of invasive species. • Use native plant species for site rehabilitation and landscaping. • A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. <ul style="list-style-type: none"> ○ Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. ○ No servicing of equipment on site unless necessary. ○ All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. ○ Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment. ○ Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting the functioning of the ecosystem. ○ All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the PAOI. • Follow best practices for installation of pipelines to prevent spills. • Ensure all hazardous materials are properly disposed of or recycled. | |
| Environmental Risk Significance (Post-mitigation) | Low - |
| Cumulative Impacts | No |

5.6.1.2 Biodiversity

The following potential impacts were considered on biodiversity (fauna and flora) during the construction phase:

- ❖ Loss and fragmentation of indigenous vegetation communities within the ecosystem in the vicinity of the PAOI

- ❖ Negative fragmentation effects of the development and safe movement of fauna species; and
- ❖ Direct and indirect loss and disturbance of flora and fauna species and communities, including the negative effects associated with the introduction and proliferation of alien and invasive species.

Table 5-7: Assessment of significance of potential construction impacts on vegetation and habitats

| Impact Name | Vegetation and Habitats | |
|--|-------------------------|-----------------|
| Environmental Risk | | |
| Attribute | Pre-mitigation | Post-mitigation |
| Nature | Negative | Negative |
| Magnitude | Minor - | Minor - |
| Duration | Short Term | Short Term |
| Scale | Site or local | Site or local |
| Probability | Possible | Possible |
| Environmental Risk Significance (Pre-mitigation) | | Low - |
| Management Measures: | | |
| <ul style="list-style-type: none"> • Laydown and construction preparation activities must be limited to already modified areas and should take up the smallest footprint possible. • Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further if possible. • All vehicles and personnel must make use of existing roads and walking paths as far as possible, especially construction vehicles. • All laydown areas should be restricted to Low and Very Low SEI areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded. • It must be made an offence for any staff member to remove any protected indigenous plant species from the PAOI or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants. | | |
| Environmental Risk Significance (Post-mitigation) | | Low - |
| Cumulative Impacts | | No |

Table 5-8: Assessment of significance of potential construction impacts on fauna

| Impact Name | Fauna | |
|--|----------------|-----------------|
| Environmental Risk | | |
| Attribute | Pre-mitigation | Post-mitigation |
| Nature | Negative | Negative |
| Magnitude | Minor - | Minor - |
| Duration | Short Term | Short Term |
| Scale | Site or local | Site or local |
| Probability | Possible | Possible |
| Environmental Risk Significance (Pre-mitigation) | | Low - |

| Impact Name | Fauna |
|--|-------|
| Management Measures: | |
| <ul style="list-style-type: none"> Clearing and disturbance activities must be conducted in a progressive linear manner, always outwards and away from the centre of the PAOI, to provide an easy escape route for all small mammals and herpetofauna. The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this. The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance to fauna. Noise must be kept to an absolute minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals. | |
| <i>Environmental Risk Significance (Post-mitigation)</i> | Low - |
| Cumulative Impacts | No |

Table 5-9: Assessment of significance of potential construction impacts related to alien species

| Impact Name | Alien Species | |
|---|-----------------------|------------------------|
| Environmental Risk | | |
| Attribute | Pre-mitigation | Post-mitigation |
| Nature | Negative | Negative |
| Magnitude | Minor - | Minor - |
| Duration | Short Term | Short Term |
| Scale | Site or local | Site or local |
| Probability | Possible | Possible |
| <i>Environmental Risk Significance (Pre-mitigation)</i> | | Low - |
| Management Measures: | | |
| <ul style="list-style-type: none"> The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths. | | |
| <i>Environmental Risk Significance (Post-mitigation)</i> | | Low - |
| Cumulative Impacts | No | |

5.6.2 Operational Phase

The operational phase will entail the transportation of process water and slurry to the Kloof No. 2 Plant via the proposed pipelines.

Table 5-10: Summary table of activities associated with the operation phase of the project

| Activity | Description |
|--------------------------|--------------------|
| Operational Phase | |
| 7 | Operation of pipes |

5.6.2.1 Wetlands

The following potential impacts were considered on wetlands during the operational phase:

- ❖ Temporary alteration of hydrology in the event of a pipeline leak;
- ❖ Potential erosion and sedimentation from increased flows; and
- ❖ Potential contamination of water from a pipeline leak.

The table below shows a summary of the DWS Risk Assessment and its significance (max = 100) in addition to the already mentioned potential impacts above.

Table 5-11: Mitigated summary of the DWS Risk Assessment conducted for the operational phase

| Phase | Activity | Impact | Significance (max = 100) | Risk Rating | Confidence level |
|--------------------|--|---|--------------------------|-------------|------------------|
| OPERATIONAL | Operation of slurry pipeline (Including routine maintenance) | Temporary alteration of hydrology in the event of a pipeline leak | 6.6 | L | High |
| | | Potential erosion and sedimentation form increased flows | 5.4 | L | High |
| | | Potential contamination of water from a pipeline leak | 4.2 | L | High |
| | Operation of water pipeline (Including routine maintenance) | Temporary alteration of hydrology in the event of a pipeline leak | 6.6 | L | High |
| | | Potential erosion and sedimentation from increased flows | 5.4 | L | High |

Table 5-12: Assessment of significance of potential operational impacts on wetlands

| Impact Name | Wetlands | |
|---------------------------|-----------------------|------------------------|
| Environmental Risk | | |
| Attribute | Pre-mitigation | Post-mitigation |
| Nature | Negative | Negative |
| Magnitude | Minor - | Minor - |
| Duration | Short Term | Short Term |
| Scale | Site or local | Site or local |

| Impact Name | Wetlands | |
|--|----------|----------|
| Probability | Possible | Possible |
| Environmental Risk Significance (Pre-mitigation) | | Low - |
| Management Measures: | | |
| <ul style="list-style-type: none"> • Develop a contingency plan for hydrological alterations, including temporary water diversion strategies. • Maintain vegetation cover along the pipeline route to stabilise soil. • Use erosion control measures in vulnerable areas. • Monitor and repair any erosion damage promptly. • Implement a comprehensive monitoring program for the pipeline and ensure maintenance and repairs are undertaken accordingly. • Use corrosion-resistant materials and coatings for pipelines. • Establish emergency response protocols for pipeline leaks. | | |
| Environmental Risk Significance (Post-mitigation) | | Low - |
| Cumulative Impacts | | No |

5.6.2.2 Biodiversity

The following potential impacts were considered on biodiversity (fauna and flora) during the operational phase:

- ❖ Loss of fragmentation of indigenous vegetation and communities within the ecosystem in the vicinity of the PAOI
- ❖ Negative fragmentation effects of the development and safe movement of fauna species; and
- ❖ Direct and indirect loss and disturbance of flora and fauna species and communities, including the negative effects associated with the introduction and proliferation of alien and invasive species.

Table 5-13: Assessment of significance of potential operational impact on vegetation and habitat

| Impact Name | Vegetation and Habitats | |
|--|-------------------------|------------------------|
| Environmental Risk | | |
| Attribute | Pre-mitigation | Post-mitigation |
| Nature | Negative | Negative |
| Magnitude | Minor - | Minor - |
| Duration | Short Term | Short Term |
| Scale | Site or local | Site or local |
| Probability | Possible | Possible |
| Environmental Risk Significance (Pre-mitigation) | | Low - |
| Management Measures: | | |
| <ul style="list-style-type: none"> • Areas that are denuded during construction need to be revegetated with indigenous vegetation, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species. All grazing mammals must be kept out of the areas that have recently been re-planted. | | |

| Impact Name | Vegetation and Habitats | |
|--|---|--|
| | <ul style="list-style-type: none"> All footprints to be rehabilitated after construction is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority. Precautions must be taken against the erosion damage that would be caused by unplanned pipe leaks. A leak warning and detection system must be installed. Dense indigenous pioneer grass seeds should also be planted across all bare earth areas to prevent erosion. | |
| <i>Environmental Risk Significance (Post-mitigation)</i> | Low - | |
| Cumulative Impacts | No | |

Table 5-14: Assessment of significance of potential operational impacts on fauna species

| Impact Name | Fauna | |
|---|-----------------------|------------------------|
| Environmental Risk | | |
| Attribute | Pre-mitigation | Post-mitigation |
| Nature | Negative | Negative |
| Magnitude | Minor - | Minor - |
| Duration | Short Term | Short Term |
| Scale | Site or local | Site or local |
| Probability | Possible | Possible |
| <i>Environmental Risk Significance (Pre-mitigation)</i> | Low - | |
| Management Measures: | | |
| <ul style="list-style-type: none"> All maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited. | | |
| <i>Environmental Risk Significance (Post-mitigation)</i> | Low - | |
| Cumulative Impacts | No | |

Table 5-15: Assessment of significance of potential operational impacts related to alien species

| Impact Name | Alien Species | |
|---|-----------------------|------------------------|
| Environmental Risk | | |
| Attribute | Pre-mitigation | Post-mitigation |
| Nature | Negative | Negative |
| Magnitude | Minor - | Minor - |
| Duration | Short Term | Short Term |
| Scale | Site or local | Site or local |
| Probability | Possible | Possible |
| <i>Environmental Risk Significance (Pre-mitigation)</i> | Low - | |
| Management Measures: | | |

| Impact Name | Alien Species |
|---|---------------|
| <ul style="list-style-type: none"> An AIP Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in AIP composition. | |
| <i>Environmental Risk Significance (Post-mitigation)</i> | Low - |
| Cumulative Impacts | No |

5.6.3 Decommissioning Phase

The decommissioning phase will take place at the end the project life span. This will include the demolishing of pipelines and rehabilitation of the area.

Table 5-16: Summary table of activities associated with the decommissioning phase of the project

| Activity | Description |
|------------------------------|---|
| Decommissioning Phase | |
| 8 | Decommissioning and rehabilitation activities: Demolition of temporary infrastructure such as: pipelines, and Rehabilitation of the Project area. |
| 9 | Closure forum to be established with key stakeholders. |

5.6.3.1 Wetlands

The following potential impacts were considered on wetlands during the decommissioning phase:

- ❖ Potential erosion and sedimentation;
- ❖ Introduction and proliferation of alien invasive vegetation from disturbance; and
- ❖ Potential contamination of water from accidental spills and leaks of machinery and equipment used in the decommissioning activities.

The table below shows a summary of the DWS Risk Assessment and its significance (max = 100) in addition to the already mentioned potential impacts above.

Table 5-17: Mitigated summary of the DWS Risk Assessment conducted for the decommissioning phase

| Phase | Activity | Impact | Significance (max = 100) | Risk Rating | Confidence level |
|-----------------|--|--|--------------------------|-------------|------------------|
| DECOMMISSIONING | Removal of slurry pipeline (Including site access and dismantlement of pipeline) | Temporary increase of overland flow from hardened surfaces | 14.4 | L | High |
| | | Potential erosion and sedimentation form increased flows | 7.2 | L | High |
| | | Introduction and proliferation of alien invasive vegetation form disturbance | 3 | L | High |

| | | | | | |
|--|---|--|------|---|------|
| | | Potential contamination of water from accidental spills and leaks of machinery and equipment used in the construction activities | 4.8 | L | High |
| | Removal of water pipeline (Including site access and dismantlement of pipeline) | Removal of slurry pipeline (Including site access and dismantlement of pipeline) | 14.4 | L | High |
| | | Potential erosion and sedimentation form increased flows | 7.2 | L | High |
| | | Introduction and proliferation of alien invasive vegetation form disturbance | 3 | L | High |
| | | Potential contamination of water from a pipeline leak | 4.8 | L | High |

Table 5-18: Assessment of significance of potential decommissioning impacts on wetland

| Impact Name | Wetlands | |
|---|-----------------------|------------------------|
| Environmental Risk | | |
| Attribute | Pre-mitigation | Post-mitigation |
| Nature | Negative | Negative |
| Magnitude | Minor - | Minor - |
| Duration | Short Term | Short Term |
| Scale | Site or local | Site or local |
| Probability | Possible | Possible |
| Environmental Risk Significance (Pre-mitigation) | | Low - |
| Management Measures: | | |
| <ul style="list-style-type: none"> • Use erosion control measures in vulnerable areas. • Monitor and repair any erosion damage promptly. • Monitor runoff patterns and adjust rehabilitation efforts as needed. • Use drip trays and secondary containment for machinery and equipment. • Use native plant species for site rehabilitation and landscaping. • Regularly inspect and maintain equipment to prevent leaks. • Follow best practices for dismantling and removing equipment to prevent spills. • Conduct a post-decommissioning site assessment to confirm no residual contamination remains. | | |
| Environmental Risk Significance (Post-mitigation) | | Low - |
| Cumulative Impacts | | No |

5.7. Mitigation Measures

5.7.1 Wetland

Considering the potential impacts from proposed activities, the following mitigation measures have been proposed to lower the intensity of the impacts on the ecological integrity of the wetland catchment and its downslope wetland features. The suggested mitigation measures apply mainly to the operational phase of the proposed activities.

The focus of mitigation measures should be to reduce the significance of potential environmental impacts associated with the development and thereby to:

- ❖ Prevent the unnecessary destruction and fragmentation of the vegetation community of wetlands areas; and
- ❖ Limit the construction area to the defined project areas and only impact those areas where it is unavoidable to do so otherwise.

5.7.1.1 Construction and Decommissioning Phase

Table 5-19: Mitigation measures for the construction and decommissioning phase

| Impact | Mitigation |
|--|---|
| Temporary increase of overland flow from hardened surfaces | <ul style="list-style-type: none"> ❖ Implement temporary drainage and stormwater systems to manage surface runoff effectively in a manner that reduces the erosion potential and subsequent sedimentation. ❖ Rehabilitate and revegetation disturbed areas ❖ Remove temporary drainage structures only after site stabilisation. ❖ Monitor runoff patterns and adjust rehabilitation efforts as needed. |
| Potential erosion and sedimentation from increased flows | <ul style="list-style-type: none"> ❖ Stabilise exposed soil with vegetation or erosion control mats. ❖ Schedule construction activities during dry seasons to minimise erosion risk. ❖ Ensure that all disturbed areas are stabilised before the onset of rainy seasons. ❖ Conduct post-decommissioning and post-construction inspections to assess and address erosion issues. |
| Introduction and proliferation of alien invasive vegetation from disturbance | <ul style="list-style-type: none"> ❖ Conduct regular monitoring and removal of invasive species. |

| Impact | Mitigation |
|---|---|
| | <ul style="list-style-type: none"> ❖ Use native plant species for site rehabilitation and landscaping. |
| <p>Potential contamination of water from accidental spills and leaks of machinery and equipment used in the construction activities</p> | <ul style="list-style-type: none"> ❖ Develop and implement a spill response plan, including training for construction personnel. ❖ Use drip trays and secondary containment for machinery and equipment. ❖ Regularly inspect and maintain equipment to prevent leaks. ❖ Follow best practices for installation, dismantling and removing equipment to prevent spills. ❖ Ensure all hazardous materials are properly disposed of or recycled. ❖ Conduct a post-decommissioning and post-construction site assessment to confirm no residual contamination remains. |

5.7.1.2 Operational Phase

Table 5-20: Mitigation measures for operational phase

| Impact | Mitigation |
|--|---|
| <p>Temporary alteration of hydrology in the event of a pipeline leak</p> | <ul style="list-style-type: none"> ❖ Implement temporary drainage and stormwater systems. ❖ Conduct regular maintenance and inspection of the pipeline to ensure integrity. ❖ Develop a contingency plan for hydrological alterations, including temporary water diversion strategies. |
| <p>Potential erosion and sedimentation from increased flows</p> | <ul style="list-style-type: none"> ❖ Maintain vegetation cover along the pipeline route to stabilise soil. ❖ Use erosion control measures in vulnerable areas. ❖ Monitor and repair any erosion damage promptly. |
| <p>Potential contamination of water from pipeline leak</p> | <ul style="list-style-type: none"> ❖ Implement a comprehensive monitoring program for the pipeline and ensure maintenance and repairs are undertaken accordingly |

| Impact | Mitigation |
|--------|---|
| | <ul style="list-style-type: none"> ❖ Use corrosion-resistant materials and coatings for pipelines. ❖ Establish emergency response protocols for pipeline leaks. |

5.7.2 Biodiversity

Considering the potential impacts identified for the Proposed Project, the following mitigation measures have been put in place to reduce the significance of the likely impacts associated with the development, and thereby:

- ❖ Prevent the further loss and fragmentation of indigenous vegetation communities within the ecosystem in the vicinity of the PAOI;
- ❖ Reduce the negative fragmentation effects of the development and enable the safe movement of fauna species;
- ❖ Prevent the direct and indirect loss of disturbance of flora and fauna species and communities, including the negative effects associated with the introduction and proliferation of alien and invasive species; and
- ❖ Adequately follow the guidelines for interpreting the SEI ratings assigned to the PAOI.

5.7.2.1 Pre-construction and construction phases

Table 5-21: Pre-construction and Construction phase mitigation measures

| Affected Environment | Impact | Mitigation |
|-------------------------|---|---|
| Flora | Project design and infrastructure / vehicle placement could result in destruction of sensitive habitat and vegetation | <ul style="list-style-type: none"> ❖ Development activities must as far as possible take place only within the ‘Very-Low’ sensitivity areas. This includes laydown, material storage, earth deposition and storage that will result from the construction activities. ❖ Areas to be developed/disturbed must specifically demarcated so that during the construction/activity phase, only the demarcated areas are to be impacted ❖ A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. |
| Vegetation and habitats | Loss and fragmentation of indigenous vegetation communities within the ecosystem in the vicinity of the project area | <ul style="list-style-type: none"> ❖ Laydown and construction preparation activities must be limited to already modified areas and should take up the smallest footprint possible ❖ Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further if possible. ❖ All vehicle and personnel must make use of existing roads and walking paths as far as possible, especially construction vehicles. ❖ All laydown areas should areas should be restricted to Low and Very Low SEI areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been conducted. ❖ It must be made an offence for any staff member to remove any protected indigenous plant species from the PAOI or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants. |
| | Direct and indirect loss and disturbances of flora species and communities | |

| Affected Environment | Impact | Mitigation |
|----------------------|---|---|
| Fauna | Negative fragmentation effects of the development and safe movement of fauna species | <ul style="list-style-type: none"> ❖ Clearing and disturbance activities must be conducted in a progressive linear manner, always outwards and away from the centre of the PAOI, to provide an easy escape route for all small mammals and herpetofauna ❖ The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this ❖ The duration of the activities should be minimised to as short a term as possible, to reduce the period of disturbance to fauna ❖ Noise must be kept to an absolute minimum during the evenings and at night to minimise all possible disturbances to reptile species and nocturnal mammals. |
| | Direct and indirect loss and disturbance of fauna species and communities, including the negative effects associated with the introduction and proliferation of alien and invasive species. | |
| Alien Species | Direct and indirect loss and disturbance of flora and fauna species and communities, including the negative effects associated with the introduction and proliferation of alien and invasive species. | <ul style="list-style-type: none"> ❖ The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths. |

5.7.2.2 Operational Phase

Table 5-22: Operational phase mitigation measures

| Affected Environment | Impact | Mitigation |
|----------------------|--|---|
| Vegetation | Loss and fragmentation of indigenous vegetation communities within the ecosystem in the vicinity of the project area | <ul style="list-style-type: none"> ❖ Areas that are denuded during construction need to be revegetated with indigenous vegetation, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species. All grazing mammals must be kept out of the areas that have recently been re-planted |
| | Direct and indirect loss and disturbances of flora species and communities | |

| Affected Environment | Impact | Mitigation |
|----------------------|--|---|
| | | <ul style="list-style-type: none"> ❖ All footprints to be rehabilitated after construction is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority. ❖ Precautions must be taken against the erosion damage that would be caused by unplanned pipe leaks. A leak warning and detection system must be installed. Dense indigenous pioneer grass seeds should also be planted across all bare earth areas to prevent erosion. |
| Fauna | <p>Negative fragmentation effects of the development and safe movement of fauna species</p> <p>Direct and indirect loss and disturbance of fauna species and communities, including the negative effects associated with the introduction and proliferation of alien and invasive species.</p> | <ul style="list-style-type: none"> ❖ Maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits and to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion are limited. |
| Alien Species | <p>Direct and indirect loss and disturbance of flora and fauna species and communities, including the negative effects associated with the introduction and proliferation of alien and invasive species.</p> | <ul style="list-style-type: none"> ❖ An AIP Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in AIP composition. |

5.8. Public Participation

The Public Participation Process (PPP) has been developed to ensure compliance with the EIA and the IWULA processes. The PPP offers stakeholders a fair opportunity to be informed about the Proposed Project, to raise issues of concern and to make suggestions for enhanced project benefits. The project team has considered all relevant issues and suggestions during the IWULA process.

The primary objectives of the PPP include:

- ❖ Meaningful and timeous participation of I&APs;
- ❖ Identification of issues and concerns of key stakeholders and I&APs with regards to the proposed development, i.e. focus on important issues;
- ❖ Promotion of transparency and an understanding of the Proposed Project and its potential environmental (social and biophysical) impacts;
- ❖ Accountability for information used for decision-making;
- ❖ Serving as a structure for liaison and communication with I&APs;
- ❖ Assisting in identifying potential environmental (social and biophysical) impacts associated with the proposed development; and
- ❖ Inclusivity (the needs, interests and values of I&APs must be considered in the decision-making process).

The PPP for this Proposed Project is being undertaken and the final Public Participation Report will be included in the final IWWMP and will be submitted to the DWS. Issues and responses documented during the public consultation process will be included in the Comments and Responses Report (CRR) which will be an appendix of the Public Participation Report.

5.9. Assessment of Level and Confidence of Information

Detailed specialist studies have been conducted as part of the impact assessment for the Proposed Project development and the level of confidence of the information provided is medium to high level. More detailed information on the wetland and terrestrial impacts can only be determined once the project is operational, with real time data monitoring and information being interpreted.

5.10. Master Layout Plan

The master layout plan inclusive of the proposed water uses and regulated areas and associated buffers is shown in Figure 5-3.

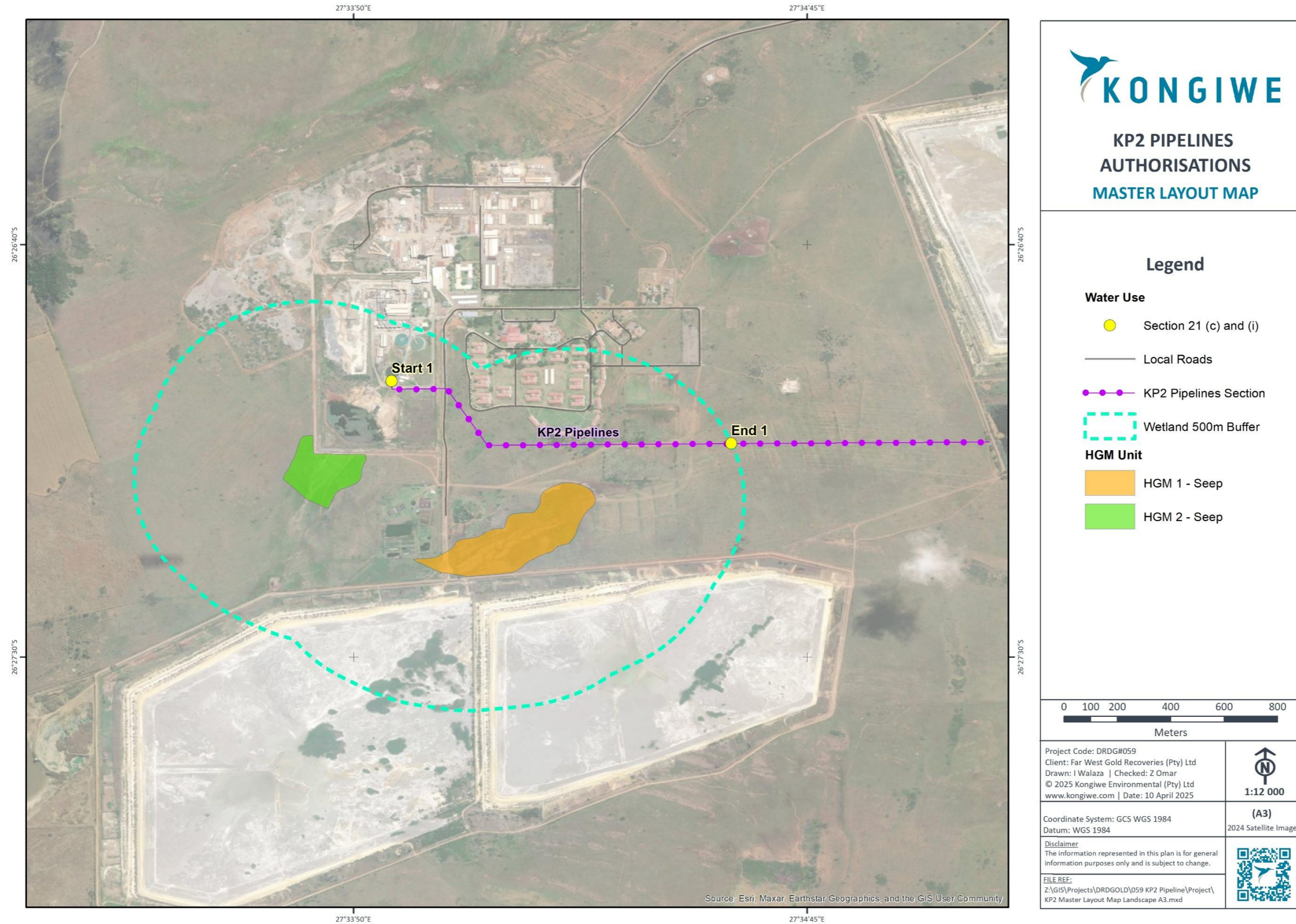


Figure 5-3: Master Layout Plan

6 Water and Waste Management

6.1. Water and Waste Management Philosophy (Process Water Stormwater, Groundwater and Waste)

The water and waste management philosophy for the Proposed Project is based upon both FWGR and the Department of Water Affairs and Forestry (DWAF) (now the DWS) principles and guidelines for water and waste management.

BPGs have been provided by the DWAF for the management of water within the mining sector based on international guidelines for the sustainable use of water. The principles contained in the Constitution of South Africa, 1996 govern the BPG. These principles aim at achieving the right to equitable water access, sustainable water use as well as effective and efficient water use for ideal social and economic development. Furthermore, the National Water Policy and National Water Resource Strategy guide the principles and guidelines contained in the BPG. The BPG is a series that currently consists of three separate sections made up of the following groupings: water management hierarchy, general water management strategies and specific water management activities and aspects. The guidelines are based on the precautionary principle aiming at first preventing pollution and/or water use, then minimising water use and/or impacts and finally if the first two cannot be achieved the use, discharge and disposal of waste and/or wastewater. The Integrated Water Resource Management strategy was introduced in the NWA to ensure that all aspects of the water resource is maintained in a sustainable manner. This includes the use of both resource and source directed methods. These strategies aid as a guideline for the planning of the EMPr and WUL, the development and implementation of the IWWMP as well as the post mining closure strategy. Any water use and/or pollution must take into consideration the RQOs, site-specific, regional and national impacts.

FWGR's water and waste management philosophy and practices are embedded in the commitments outlined in DRDGOLD's Sustainability Policy. The policy makes a commitment to actively pursue the best practical environmental practice for each activity that may potentially negatively affect the environment and concerned communities. With respect to efficient use of natural water resources, it stipulates:

"... we are committed to reducing reliance on potable water and securing a sustainable supply of recycled water from sewage works and [Acid Mine Drainage] (AMD) treatment facilities."

And further,

"We are committed to effective pollution control and water management; and will be responsible custodians of the land we manage."

Based on these commitments and underpinning principles for natural resource management, water and waste management practices for the project is aimed at efficient pollution control and responsible waste generation and management.

FWGR is committed to the following regarding the Proposed Project:

- ❖ To plan, design, construct, operate, decommission and close the proposed projects in a responsible manner, and in accordance with its policies, strategies and all applicable legislative requirements;
- ❖ To minimise the impacts on the receiving environment by limiting the extent of the project footprint and by properly implementing engineered barriers, where possible, to prevent seepage of contaminants.
- ❖ To the implementation of long-term water management measures and to conduct the required monitoring during all phases of the project; and
- ❖ To implement technically proven and acceptable rehabilitation measures during the operational, decommissioning and closure phases.

6.2. Strategies

To give effect to the water and waste management philosophies discussed in the previous chapters, the following strategy will be implemented:

6.2.1 Waste

It is important to note that the Proposed Project will not produce significant waste during operation due to the nature of the Project. However, the following will be implemented where required during the different Phases of the Project:

- ❖ Implement waste separation; and
- ❖ Dispose of waste on authorised waste disposal facilities in accordance with legal requirements.

6.3. Performance Objectives

The overall objective of water and waste management is to reduce or mitigate negative environmental consequences resulting from the project and to limit negative impacts as far as possible. The environmental objectives are to ensure that all necessary steps will be taken to ensure the following with regard to the identified Proposed Project impacts:

- ❖ That appropriate pollution control and other environmental protection measures are taken by the applicant, in accordance with all applicable laws and regulations;
- ❖ That the applicant will not degrade the degree of environmental setting beyond existing environmental conditions; and
- ❖ That socio-economic and bio-physical conditions will be addressed to ensure that negative impacts associated with the project are kept to a minimum.

The following specific performance objectives have been identified for the project:

- ❖ Contain dirty storm water;
- ❖ Prevent erosion; and
- ❖ Monitor the wetland areas.

6.4. Measures to Achieve and Sustain Performance Objectives

Management activities and mitigation measures will be implemented during construction, operation and decommissioning/closure phases at both project sites in to achieve the required performance objectives.

The following measures have been identified to achieve the set performance objectives:

Table 6-1: Performance objectives relevant to the Proposed Project

| Performance Objectives | Management Measure |
|--|---|
| Sensitive Landscapes | |
| Minimise impact on the wetlands and sensitive areas in and around the project boundary | Implement a wetland monitoring programme to assess the ongoing impacts on the wetlands in and around the project area to determine changes. |

6.5. Option Analyses and Motivation for Implementation of Preferred Options

In accordance with the requirements outlined in Appendix 2 of the EIA 2014 Regulations, as amended, a consideration of reasonable and feasible alternatives, including site and technology alternatives and the “do-nothing” alternative must be undertaken. Each alternative is to be accompanied by a description and comparative assessment of the advantages and disadvantages that such development and activities will pose on the environment and socio-economy

The EIA 2014 Regulations, as amended, define alternatives as the different means of meeting the general purpose and requirements of the activity, which may include alternatives to:

- ❖ The property on which or location where it is proposed to undertake the activity;
- ❖ The type of activity to be undertaken;
- ❖ The design or layout of the activity;
- ❖ The technology to be used in the activity;
- ❖ The operational aspects of the activity; and
- ❖ The option of not implementing the activity.

Although a collection of alternatives may exist for the Proposed Project, only feasible alternatives have been considered for this IWWMP and are discussed in greater detail below. Kongiwe strives to seek alternatives that maximise efficient and sustainable resource utilisation and minimise environmental impacts.

6.5.1 The Property on which or Location where the Activity is Proposed to be Undertaken

The pipelines will form part of FWGR's Tailings Retreatment Projects and will tie into the authorised RTSF pipelines and run to the existing Kloof No. 2 Plant. Therefore, the location of the proposed pipelines has been determined by the location of the aforementioned infrastructure. The proposed pipeline route is also suitable due to the low sensitivity areas that it traverses. It is not anticipated that the proposed pipeline will affect the continuation of any long-term land uses.

6.5.2 The Type of Activity to be Undertaken

The only optional activity is for FWGR to transport water and slurry via pipelines. Due to the nature and benefits of the proposed activity, no assessment of alternative activities was undertaken.

6.5.3 Design and Layout of the Activity

The current layout plan for the Proposed Project is considered the preferred layout plan. This proposed area will also not require any additional roads or access routes to be constructed thus minimising the overall impact to the local environment. The layout has been designed for optimum performance and as such there are no design or layout alternatives.

6.5.4 The Technology to be Used in the Activity

Process alternatives imply the investigation of alternative processes or technologies that can be used to achieve the same goal. This includes using environmentally friendly designs or materials. No alternative technologies were considered in this assessment as the proposed technology is considered the standard practice for a process water and a slurry pipeline in the area, and the usage of other material for the construction of the pipeline would not change the level of significance of the identified impacts.

6.5.5 The Operational Aspects of the Activity

No alternatives were considered in terms of the operational aspects of the activity. Process water and slurry will be transported via the proposed pipelines which will traverse areas of low environmental sensitivity.

6.5.6 The "No-Go" Option

The option of the Proposed Project not proceeding would mean that the environmental impact and social status would remain the same as current. This implies that both negative and positive impacts would not take place, and FWGR would only use the approved RTSF pipelines. Subsequently, FWGR would not be able to tie into the Kloof No. 2 Plant and make use of the facility.

At present, there are no activities on the Proposed Project site and therefore no negative impacts. The 'No-Go' alternative has not been considered due to the anticipated benefits of the proposed pipeline route

6.6. IWWMP Action Plan (Priority Actions and Other Short, Medium and Long Term Actions)

Table 6-2: Proposed Project's action plan

| Performance Objectives | Management Measure | Responsible Department | Timeframe |
|---|---|--------------------------|-----------|
| Sensitive Landscapes | | | |
| Minimise impact on the wetlands and sensitive areas in and around the Project area. | Implement a wetland monitoring programme to assess the ongoing impacts on the wetlands in and around the Project area to determine changes. | Management/Environmental | Ongoing |

6.7. Control and Monitoring

6.7.1 Monitoring of change in Baseline information

Reports of the updated Baseline information (for the project) will be submitted to the appropriate government departments as required and other formal institutions as stipulated by management objectives, conformance targets and applicable legislation and other legal requirements. All of these results will be shared with the DWS.

6.7.2 Audit and Report on Performance of Measures

The IWWMP action plan will be reviewed and updated annually or alternatively as required in terms of the WUL.

6.7.3 Audit and Report on Relevance of Action Plan

An audit on the IWWMP action plan should be conducted at least once annually by an independent external auditor, while internal audits should be conducted bi-annually.

7 Conclusion

7.1. Specialist Studies and Conclusions and Recommendations

7.1.1 Wetlands

A risk assessment was conducted for the Proposed Project. The post-mitigation risks for the project presented within the “Low” significance category attributed to the direct avoidance of the natural wetlands and the limited probability for indirect impacts to reach the system attributed to the distance between the proposed pipeline route and the natural wetland features.

It is deemed acceptable for the pipeline to traverse the artificial wet areas resulting from stormwater management, as these have been identified as low sensitivity features that do not have significant biodiversity attributes and do not have spatial connectivity to the natural wetlands within the larger PAOI.

It is the opinion of the specialists that the environment can return to its natural (pre-construction) state within two years of project completion, given that the best practice engineering methods will be implemented during the construction phase of the project. The project may be favourably considered for approval, and the CA must consider the prescribed mitigation measures for the authorisation.

7.1.2 Biodiversity

The location, state and size of the ecosystem suggests that it is unlikely that any functional habitat or SCCs will be lost as a result of the impacts arising from the proposed activities. However, these assumptions pertain to the terrestrial habitat within the PAOI only and the recommendations and mitigations presented in the accompanying freshwater assessment must be strictly adhered to.

It is the opinion of the specialist that the proposed development is favourable only if all mitigation measures provided in this and other specialist reports are implemented, as well as the following:

- ❖ A final site walkthrough must be conducted prior to construction to ensure all protected plants species are marked and relocated to a similar habitat nearby which will not be affected by construction activities (in case some arise which were not present during this survey. Protected flora species must be relocated away from the development footprint and if these are relocated within the property boundary (not off site), a permit is not required;
- ❖ An AIP management plan must be compiled and implemented; and
- ❖ A rehabilitation plan must be compiled and implemented for all areas of the PAOI impacted by the project activities.

7.1.3 Summary of Specialist Reports

The PAOI comprises degraded and modified habitats, including grasslands and artificial water resources, with ongoing human disturbances such as invasive plant infestations, vehicle intrusion, and nearby mining

activities limiting natural recovery. A biodiversity screening identified several medium- to high-sensitivity faunal species, though a field survey found no confirmed presence and a low likelihood of occurrence. Two provincially protected species were identified throughout the PAOI. Two hydrogeomorphic seeps and multiple artificial wet areas were identified, with the pipeline intersecting only stormwater-related areas. The wetland has been significantly altered by human activities, resulting in minor erosion and potential water quality degradation due to its proximity to a wastewater treatment facility. It has been classified as “Largely Modified” in terms of ecological condition, with a moderate ecological importance and sensitivity score. If all the suggested mitigation measures in this report and the EMPr are implemented, negative impacts can be mitigated or minimised to acceptable levels. The nature of the Proposed Project has a low likelihood that it will result in any major environmental harm.

7.2. Regulatory Status of Activity

This is a new development, and the activities applied for are new water uses requiring authorisation. Activities will only commence once approval of all the relevant authorities has been granted. The proposed water uses are set out in Section 3.2.

7.3. Statement of Water Uses Requiring Authorisation, Dispensing with Licensing Requirement and Possible Exemption from Regulation

This is a new application and the water uses requiring authorisation are listed in Table 3-2.

There is no requirement for exemption from the GN 704 Regulations.

7.4. Key Commitments

FWGR is committed to the correct implementation of the IWWMP and the water use licence conditions that will be stipulated in the WUL once issued.

8 References

Kotze, D.C., Marneweck, G.C., Batchelor, A.L., Lindley, D.C., and Collins, N.B. 2009. A Technique for rapidly assessing ecosystem services supplied by wetlands, Mondi Wetland Project.

Macfarlane, D.M., Bredin, I.P., Adams, J.B., Zungu, M.M., Bate, G.C. and Dickens, C.W.S. 2014. Preliminary guideline for the determination of buffer zones for rivers, wetlands and estuaries. Final Consolidated Report. WRC Report No TT 610/14, Water Research Commission, Pretoria.

Mucina, L. & Rutherford, M.C. (Eds.). (2006). The vegetation of South Africa, Lesotho and Swaziland. Strelizia 19. South African National Biodiversity Institute, Pretoria South African.

The Biodiversity Company. 2025a. Terrestrial Biodiversity Compliance Statement for the Proposed Far West Gold Recoveries (FWGR) KP2 Pipelines Project

The Biodiversity Company. 2025b. Wetland Functional and Impact Assessment for the Proposed Far West Gold Recoveries (FWGR) KP2 Pipelines Project.

Smithers, J.C. and Schulze, R.E., 2002. Design rainfall and flood estimation in South Africa. WRC Project No. K5/1060. Draft final report (Project K5/1060) to Water Research Commission, Pretoria, RSA. 155 pp.

Appendix A:

Wetland Impact Assessment Report

Appendix B:

Terrestrial Compliance Statement



**Wetland Functional and Impact Assessment for the
proposed Far West Gold Recoveries (FWGR) KP2
Pipelines Project**

**Rand West City Local Municipality, West Rand
District Municipality, Gauteng Province, South
Africa**

19/02/2025

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| | | |
|--|---|---|
| Report Name | Wetland Functional and Impact Assessment for the proposed Far West Gold Recoveries (FWGR) KP2 Pipelines Project | |
| Specialist Theme | Aquatic Theme – Wetland Baseline and Impact Assessment | |
| Project Reference | FWGR KP2 Pipeline | |
| Report Version | 19/02/2025 | |
| Environmental Assessment Practitioner |  | |
| Fieldwork & Report Writer | Namitha Singh (SACNASP Pr. Sci. Nat .157927) |  |
| Reviewer | Rowan Buhrmann (SACNASP Pr. Sci. Nat. 136853) |  |
| Declaration | <p>The Biodiversity Company and its associates operate as independent consultants under the auspices of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations (2014), as amended. We have no conflicting interests in the undertaking of this activity and have no interest in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.</p> | |

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1 Introduction

1.1 Background

The Biodiversity Company was commissioned to conduct a wetland baseline and impact assessment in support of the environmental and water use authorisation procedures for the Far West Gold Recoveries KP2 Pipeline Project (The Project). The Project is near Westonaria within the Rand West City Local Municipality, West Rand District Municipality, within Gauteng Province, South Africa (Figure 1-1). A 500 m radius has been demarcated to facilitate the identification of wetlands proximal to the Project; this area is referred to as the Project Area of Influence (PAOI).

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations (2014) (amended by GNR 326, 7 April 2017 and GNR. 517, 11 June 2021) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of. Government Notices (GN) 320 (20 March 2020) and GN 1150 (30 October 2020) in terms of NEMA, dated 20 March and 30 October 2020: “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” (Reporting Criteria).

This assessment has been completed in accordance with the requirements of the published Government Notice (GN) 4167 by the Department of Water and Sanitation (DWS) (previously GN 509 of 2016 and GN 3139 of 2023). The said notice was published in the Government Gazette (no. 49833) under Section 39 of the National Water Act (Act no. 36 of 1998) in December 2023, for a Water Use Licence (WUL) in terms of Section 21(c) & (i) water uses. The GN 4167 process provides an allowance to apply for a WUL for Section 21(c) & (i) under a General Authorisation (GA), as opposed to a full Water Use Licence Application (WULA). A water use (or potential) qualifies for a GA under GN 4167 when the proposed water use/activity is subjected to analysis using the DWS Risk Assessment Matrix (RAM), provided the identified risks are all considered a low risk, and the applicant is listed under Appendix D1 or Appendix D2 of the same notice. This assessment will implement the RAM and provide a specialist opinion on the favourability for a water use authorisation.

1.2 Scope of Work

The following tasks were completed in fulfilment of the terms of reference for this assessment:

- A desktop assessment of available and related datasets to provide context of the freshwater biodiversity of the project area and to indicate potential wetland areas;
- The delineation, classification and assessment of wetlands within 500 m of the project area;
- An assessment of the related impacts using the Risk Assessment (DWS, 2023);
- The provision of recommendations relevant to associated impacts; and
- Report compilation detailing the baseline findings.

1.3 Project Description

The following information was provided by Kongiwe Environmental (Pty) Ltd (2025) and relates to the details for the KP2 Pipeline Project.

Table 1-1 Project details

| Aspect | Description |
|---|---|
| Project Description | <p>Far West Gold Recoveries (Pty) Limited (hereafter FWGR) has recently received an environmental authorisation (EA) for the optimised pipeline route for FWGR's Tailings Retreatment Projects in the West Rand. It has since been identified that additional water and slurry pipelines are required. These pipelines will tie into the authorised Regional TSF (RTSF) pipelines and run approximately 2.16 km to the Kloof No. 2 Plant.</p> <p>The Proposed Project requires the following authorisations:</p> <ul style="list-style-type: none"> • Environmental Authorisation (EA) in terms of the National Environmental Management Act No. 1998 (Act No. 107 of 1998) (NEMA), which will follow a Basic Assessment (BA) process in terms of the EIA 2014 Regulations, as amended; and • General Authorisation (GA) in terms of the National Water Act (Act No. 36 of 1998) (NWA) for Section 21 (c) and (i) water uses, before it can commence. |
| Locality | <p>The proposed location of the proposed pipeline route is in Westonaria, within Ward 25 of the Rand West Local Municipality (RWLM) as shown in Figure 1-1. The pipelines run southwest of the Kloof No. 2 TSF, and directly south of the Kopanang Hostel. The project area is predominantly surrounded by other TSFs, grasslands, water bodies and bare ground. Please refer to Figure 1-1 for the Proposed Project's locality map.</p> |
| Infrastructure Proposed for the Project | <p>The following infrastructure is proposed:</p> <ul style="list-style-type: none"> • Two process water pipelines of 600 mm in diameter; and • Four overland slurry pipelines of 550 mm in diameter. <p>The proposed pipelines will tie into the authorised RTSF pipeline route and run approximately 2.16 km to the Kloof No.2 Plant.</p> |
| Life of Operation | <p>The life of the Proposed Project is expected to be approximately 30 years.</p> |

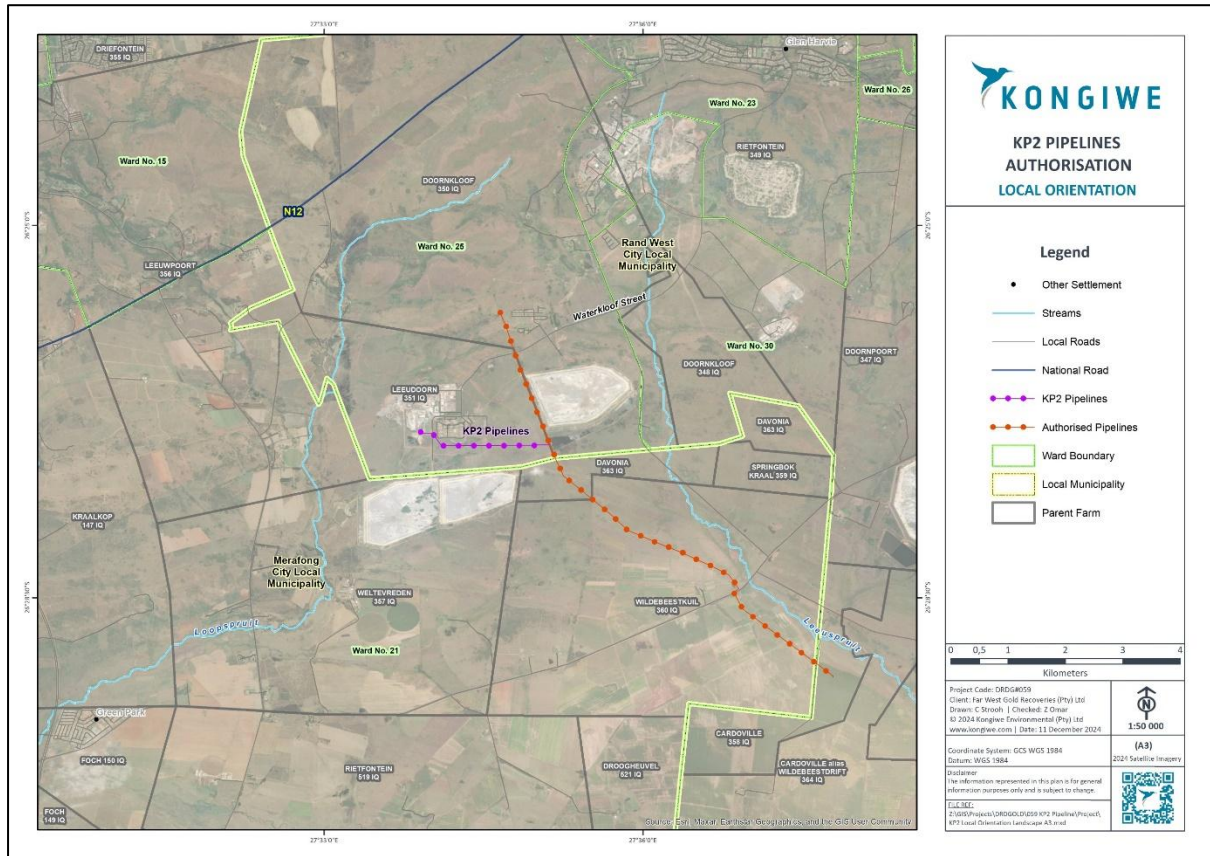


Figure 1-1 Location of the project (Kongwe, 2025)

The assessment area comprising of the proposed pipeline route (referred to herein as the “Project Site”) and a 500 m radius (referred to herein as the “500 m PAOI”) around the Project Site for the identification and delineation of water resources is indicated in Figure 1-2.

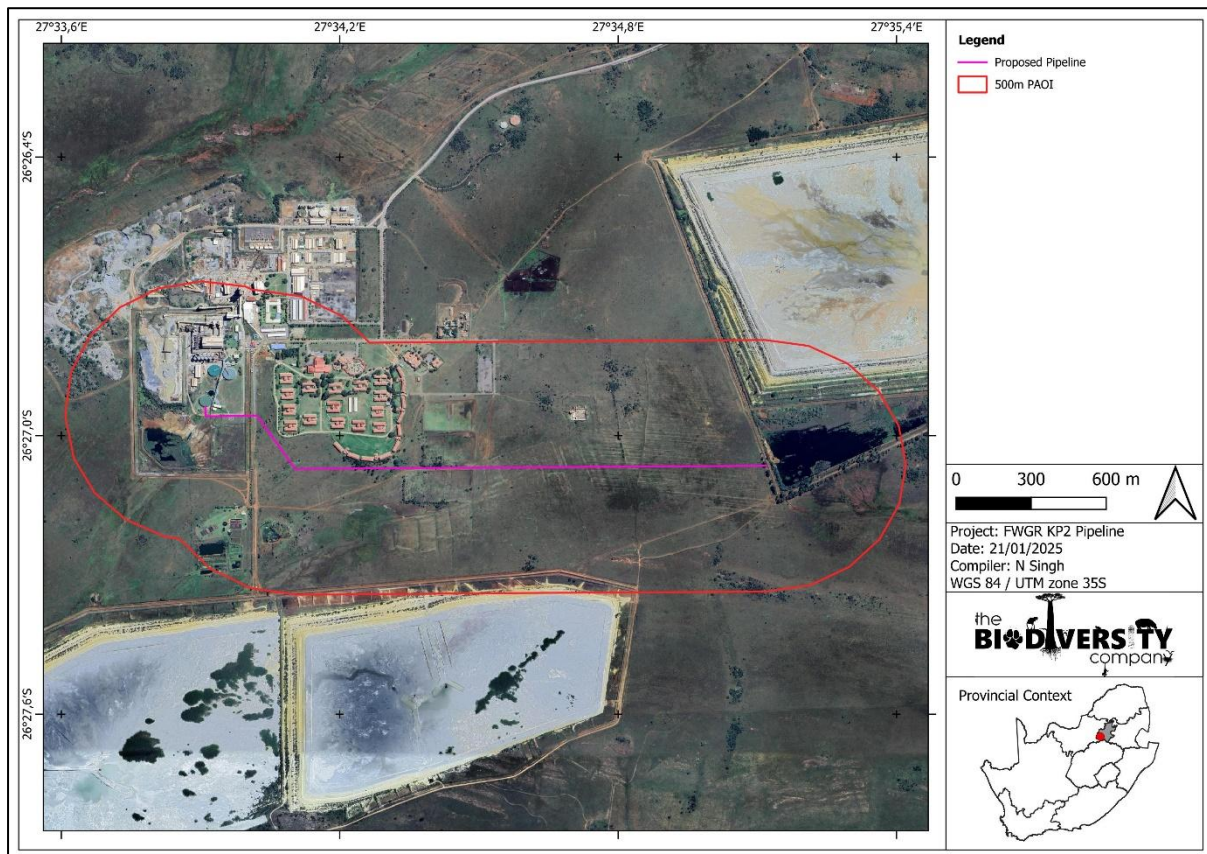


Figure 1-2 Proposed pipeline route and project area of influence

1.4 Assumptions and Limitations

The following aspects were considered as limitations:

- It has been assumed that the spatial files provided to the specialist are accurate;
- Apart from the “Pipeline Route” location, no other relevant spatial information in terms of the structure design was provided in relation to the proposed development at the time of survey and report preparation;
- Areas characterised by external wetland attributes were the focus for this assessment, where wetlands were thereafter confirmed by soil form indicators;
- Areas within the 500 m PAOI were delineated and assessed via desktop where inaccessible. Only natural features presumed to be at potential risk from the proposed activities were assessed in terms of their ecological characteristics;
- Only Section 21(c) and 21(i) water uses are applicable to the use of the DWS Risk Assessment Matrix (2023); and
- The GPS used for water resource delineations is accurate to within five metres. Therefore, the wetland delineation plotted digitally may be offset by a maximum of five metres to either side.

1.5 Key Legislative Requirements

The legislation, policies and guidelines listed below in Table 1-2 are applicable to the current project. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Table 1-2 A list of key legislative requirements

| Region | Legislation / Guideline | Comment |
|------------|--|---|
| National | National Environmental Management Act (Act No. 107 of 1998) (NEMA) | To provide for the effective protection and controlled utilisation of the environment and for matters incidental thereto. |
| | NEMA: Environmental Impact Assessment Regulations (2014) (GNR 982 of 8 December 2014, as amended in 2017 and 2021), Appendix 6 requirements | Minimum content for specialist reports. |
| | NEMA: Government Notices (GN) 320 (20 March 2020) and GN 1150 (30 October 2020) | The minimum criteria for reporting. Protocol for the specialist assessment and minimum report content requirements. |
| | The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA), Threatened or Protected Species Regulations | The protection of species and ecosystems that warrant protection. |
| | National Environmental Management: Waste Act (Act No. 59 of 2008) | The regulation of waste management to protect the environment. |
| | National Water Act (Act No. 36 of 1998) (NWA) | To provide for the regulation of water uses. |
| | NWA: Government Notice (GN) 4167 (previously GN 509 of 2016 and GN 3139 of 2023) | Water Use Licence (WUL) in terms of Section 21(c) & (i) water uses and the provision to apply for a General Authorisation subject to usage and outcome of the Risk Assessment Matrix. |
| | NEMBA: Alien and Invasive Species Regulations (2014) (GNR R598, 1 August 2014) NEMBA: Alien and Invasive Species Lists (2020) (GN 1003, September 2020) | The regulation and management of alien invasive species. |
| Provincial | Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA) | To provide for control over the utilisation of the natural agricultural resources, including the vegetation and the combating of weeds and invader plants. |
| | Transvaal Nature Conservation Ordinance (Act No. 12 of 1983) | To consolidate and amend the laws relating to nature conservation and to provide matters incidental thereto. |
| | Gauteng Conservation Plan (2024) | The spatial designation of conservation areas and targets within the province. |

1.5.1 National Water Act, 1998 (NWA)

The DWS is the custodian of South Africa's water resources and therefore assumes public trusteeship of water resources, which includes watercourses, surface water, estuaries, or aquifers. The National Water Act (Act No. 36 of 1998) (NWA) allows for the protection of water resources, which includes:

- The maintenance of the quality of the water resource to the extent that the water resources may be used in an ecologically sustainable way;
- The prevention of the degradation of the water resource; and
- The rehabilitation of the water resource.

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 a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

The NWA recognises that the entire ecosystem, not just the water itself, constitutes a water resource and as such needs to be conserved. No activity may therefore take place within a watercourse unless it is authorised by the DWS. Any area within a wetland or riparian zone is therefore excluded from development unless authorisation is obtained from the DWS in terms of Section 21 (c) and (i).

1.5.2 National Environmental Management Act, 1998 (NEMA)

The National Environmental Management Act (NEMA) (Act 107 of 1998) and the associated Regulations as amended in April 2017 and June 2021, states that prior to any development taking place within a wetland or riparian area, an environmental authorisation process needs to be followed. This could follow either the Basic Assessment Report (BAR) process or the Environmental Impact Assessment (EIA) process depending on the scale of the impact.

1.6 Legislative Framework

In line with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on freshwater biodiversity, as per Government Notice 320 published in terms of NEMA, dated 20 March 2020: “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” – the following has been assumed:

An applicant intending to undertake an activity identified in the scope of this protocol on a site identified on the screening tool as being of:

- “Low sensitivity” for aquatic biodiversity, must submit an Aquatic Biodiversity Compliance Statement.

An Aquatic / Freshwater Biodiversity an Aquatic Biodiversity Compliance Statement must contain the information as presented in Table 1-3 below.

Table 1-3 Aquatic Biodiversity Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report

| Information to be Included (as per GN 320, 20 March 2020) | Report Section |
|--|----------------|
| Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae | 7.4 |
| A signed statement of independence by the specialist | 7.3 |
| A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment | 2 |
| A baseline profile description of biodiversity and ecosystems of the site | 3 |
| The methodology used to verify the sensitivities of the aquatic biodiversity features on the site including the equipment and modelling used where relevant; | 7.1 |
| In the case of a linear activity, confirmation from the aquatic biodiversity specialist 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 | 5.1.1 |
| Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr | 4.3 |
| A description of the assumptions made as well as any uncertainties or gaps in knowledge or data | 1.4 |
| Any conditions to which this statement is subjected | 5.2 |

2 Fieldwork

A field survey for the area was undertaken on the 16th of January 2025, which is a wet-season survey, to identify the presence of freshwater features (wetlands) and to delineate their spatial extents. The seasonality is not considered to be a limiting factor to the assessment and the results of this assessment are conclusive.

3 Results & Discussion

3.1 Desktop Dataset Assessment

3.1.1 Climate

The climate attributes for the area are based on the climate data for the Rand Highveld Grassland vegetation type, which the PAOI occurs in. The climate for the PAOI is characterised by a summer rainfall with a Mean Annual Precipitation (MAP) of 654 mm (Figure 3-1). The area is known to have warm-temperate conditions with dry winters. The incidence of frost ranges from 30 to 40 days.

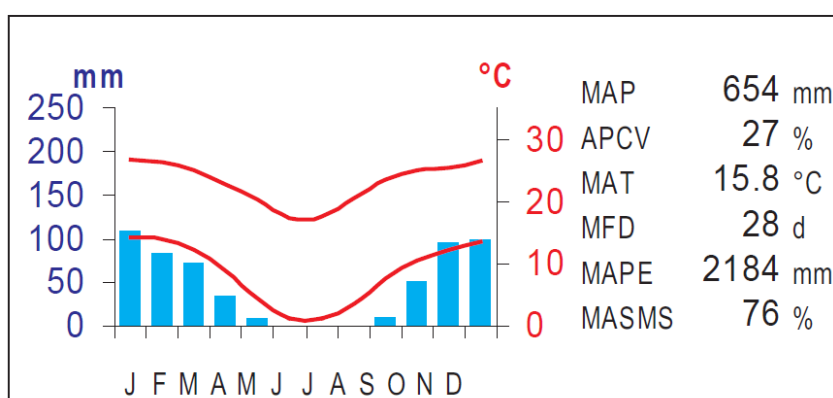


Figure 3-1 Climate for the project area based on the Rand Highveld Grassland vegetation type (Mucina & Rutherford, 2006)

3.1.2 Soils and Geology

According to Mucina and Rutherford (2006) the geology of the Rand Highveld Grassland and vegetation type is characterised by the Pretoria group and the Witwatersrand Subgroup's quartzite ridges as well as the Rooiberg Group's Selons River Formation which is from the Transvaal Supergroup. The parent geology from this vegetation type supports shallow soils like Glenrosa and Mispah which typically forms on slopes and ridges where topsoil is likely to wash off.

According to the land type database (Land Type Survey Staff, 1972 - 2006), the PAOI is characterised by the Ba 1 land type. The Ba land type is characterised by plinthic catena with the presence of dystrophic and/or mesotrophic soils; upland duplex and marginalitic soils are rare, while red soils are not considered to be widespread.

3.1.3 Hydrological Characteristics

The PAOI falls within the Highveld Ecoregion, within the Vaal-Orange Water Management Area (WMA). At a finer scale, within the C22H quaternary catchment. The fine scale hydrological features are presented in the following section.

3.1.3.1 Topographical River Lines and Inland Water Areas

The topographical inland and river line data for the "2627" dataset indicated inland water areas which were classified as large reservoirs within a sewerage plant located in the south western PAOI and, two dams located in the eastern and western PAOI (Figure 3-2). Furthermore, three non-perennial

topographic drainage features were identified, one located within the south eastern PAOI and two within the south western PAOI (Figure 3-2).

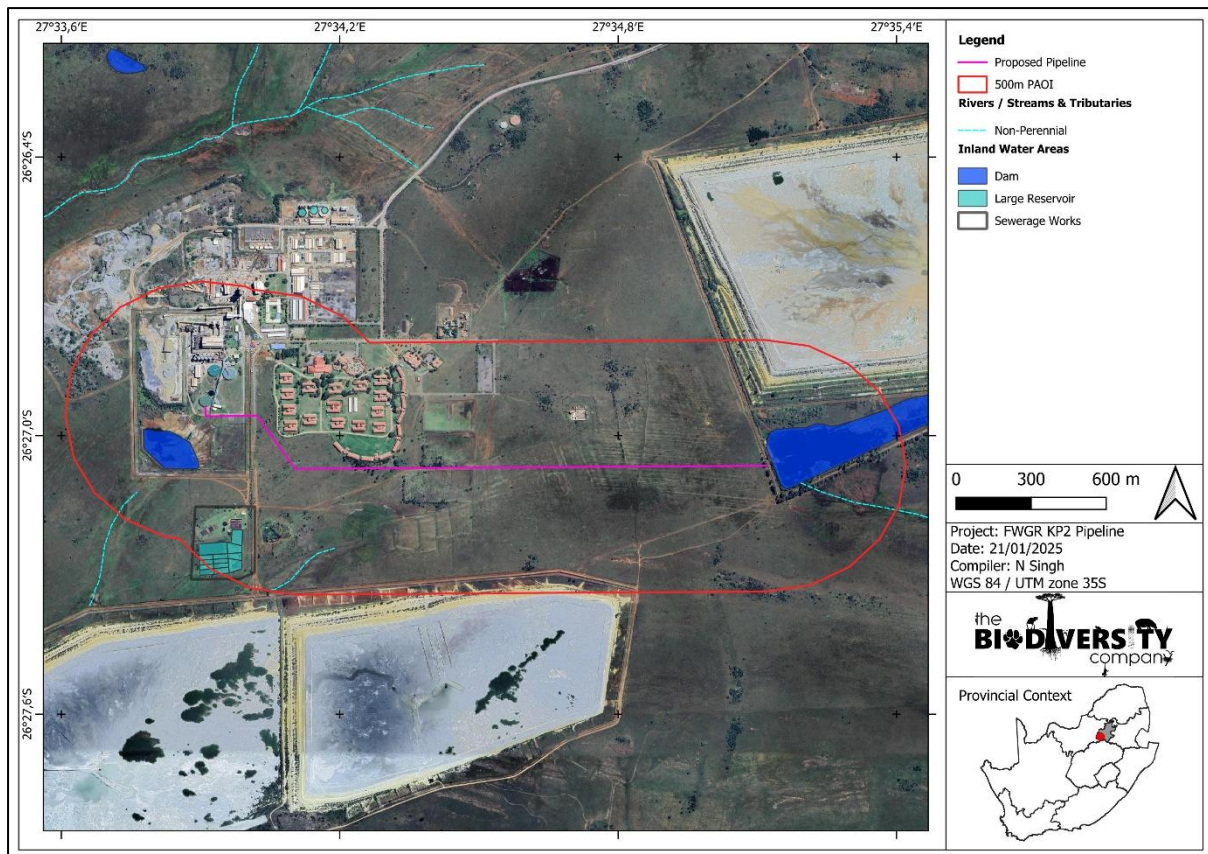


Figure 3-2 Topographical Inland Water Areas and River Lines that intersect the Project Area of Influence

3.1.4 Ecologically Important Landscape Features

The GIS analysis pertaining to the relevance of the proposed project to ecologically important landscape features is summarised in Table 3-1. Only features that were identified to be relevant to the proposed project were further discussed.

Table 3-1 Summary of relevance of the proposed project to ecologically important landscape features

| Desktop Information Considered | Relevant/Irrelevant | Section |
|---|--|---------|
| South African Inventory of Inland Aquatic Ecosystems (SAIIAE) | Relevant – PAOI overlaps with SAIIAE wetlands. | 3.1.4.1 |
| National Freshwater Priority Area | Relevant – PAOI overlaps with NFEPA wetlands. | 3.1.4.2 |
| Provincial Conservation Plan | Relevant – PAOI overlaps with CBA and ESA areas. | 3.1.4.3 |
| Strategic Water Source Areas | Irrelevant – PAOI does not overlap with a SWSA. | - |

3.1.4.1 South African Inventory of Inland Aquatic Ecosystems

Two wetlands were identified within the south western PAOI, using the South African Inland Inventory of Aquatic Ecosystems (SAIIAE; NBA, 2018) dataset. The wetlands were classified as one seep and one unchannelled valley-bottom wetland system (Figure 3-4). The seep wetlands condition was classified as being “A/B – Largely Natural” whereas the valley-bottoms condition was classified as being “D/E/F - Largely/Seriously/Critically Modified”. Furthermore, the wetland features were classified as

being “Critically Engendered” with regard to Ecosystem Threat Status. The Ecosystem Protection Level was classified as “Not Protected” and “Poorly Protected” for the seep and valley-bottom, respectively.

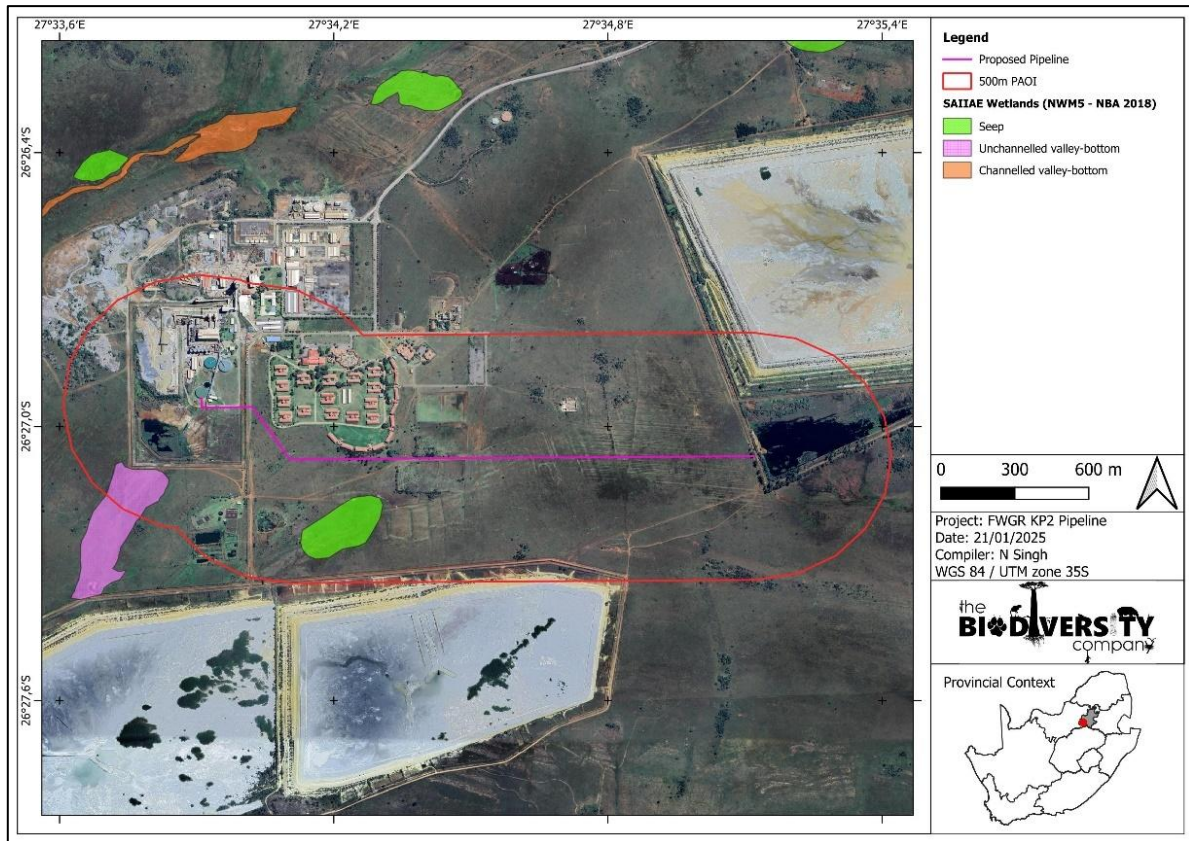


Figure 3-3 Wetland features identified within the Project Area of Influence according to the South African Inventory of Inland Aquatic Ecosystems dataset

3.1.4.2 National Freshwater Ecosystem Priority Areas

According to the National Freshwater Ecosystem Priority Areas (NFEPA), three seep wetlands have been identified within the PAOI, all classified as “Non-Priority” artificial systems (Figure 3-4).

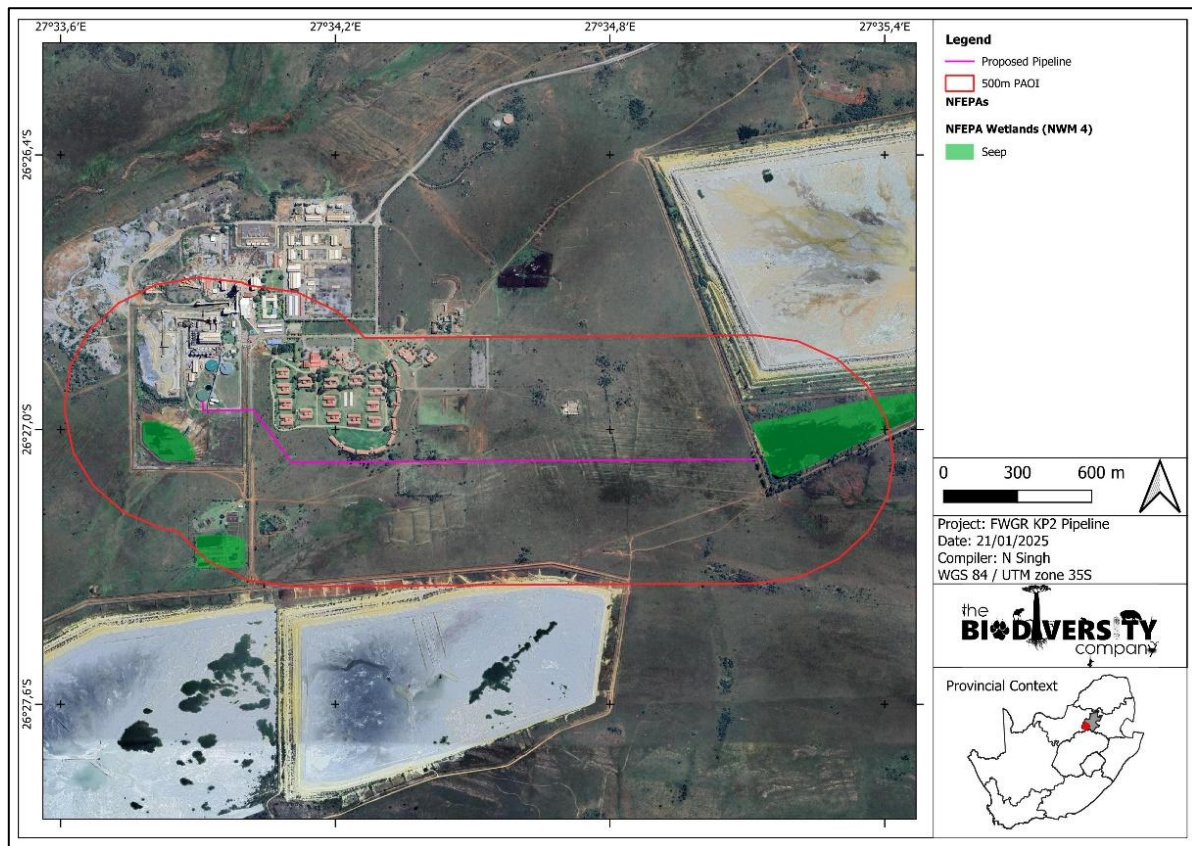


Figure 3-4 Wetland features identified within the Project Area of Influence according to the National Freshwater Ecosystem Priority Areas dataset

3.1.4.3 Gauteng Conservation Plan

The Gauteng C-Plan v4 is based on the systematic conservation planning approach described by Margules & Pressey (2000). The key characteristics of a systematic conservation plan are representation, persistence, quantitative targets, and efficiency and conflict avoidance (DEAT, 2009).

According to the Gauteng Conservation Plan (2024; Figure 3-5), the PAOI intersects the following map categories:

- Critical Biodiversity Areas (1 & 2); and
- Ecological Support Areas (1 & 2).

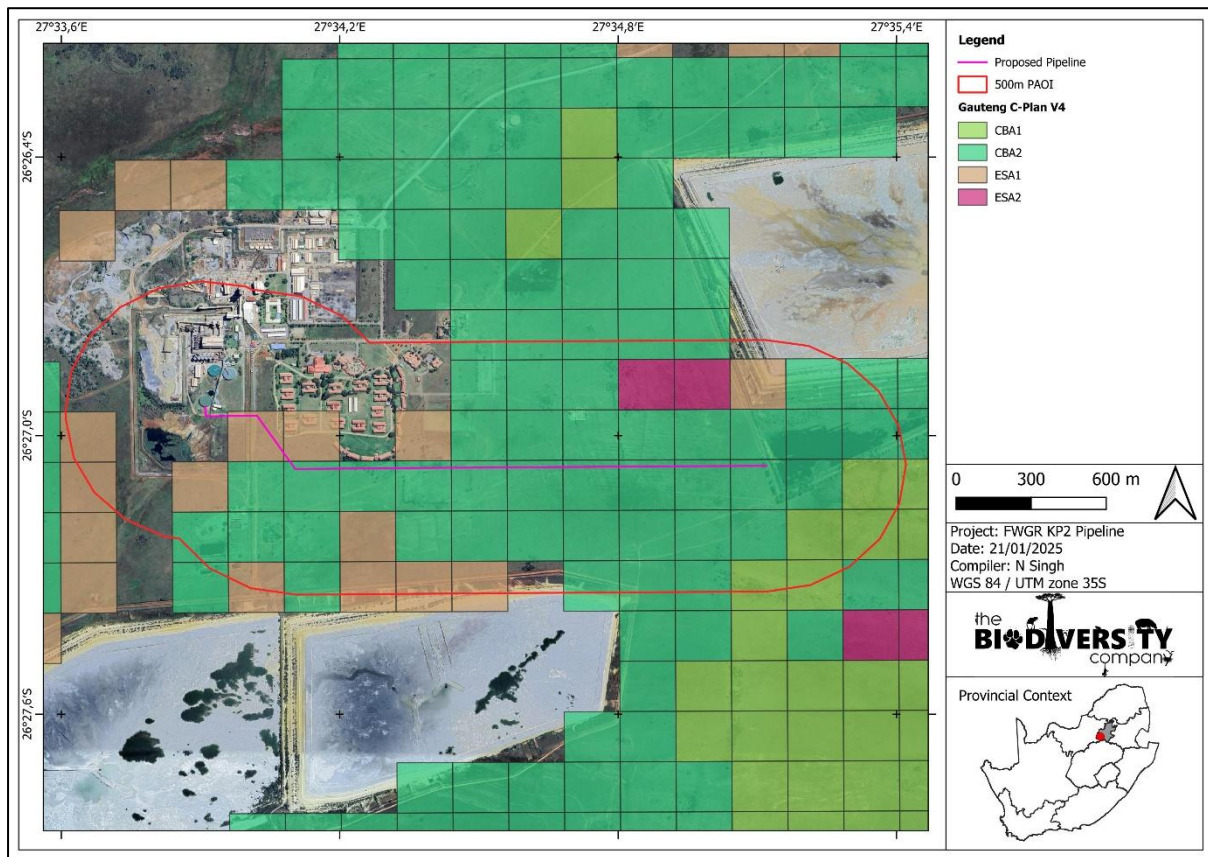


Figure 3-5 Gauteng Conservation Plan overlaid with the project area of influence

3.2 Wetland Field Survey

3.2.1 Delineation

Two (2) Hydrogeomorphic (HGM) units were identified within the encompassing 500 m PAOI. These were classified as two seeps (HGM 1 and HGM 2; Figure 3-6).

Additionally, numerous artificial wet areas were identified within the PAOI. These artificial wet areas include three dams, Waste-Water Treatment Works (WWTW) settling/oxidation ponds, a concreted drainage canal, stormwater runoff areas, an excavated pond and an artificial seep. It should be noted that the area being referred to as an excavated pond, is a historical excavation which collects rainwater and was likely used a drinking feature for livestock.

The only features directly traversed by the proposed pipelines are the artificial wet areas related to stormwater runoff. All other identified features are avoided by the proposed pipeline route. The risk status of the wetlands is further discussed in Section 3.3 and the sensitivity of the features are discussed in Section 3.4.

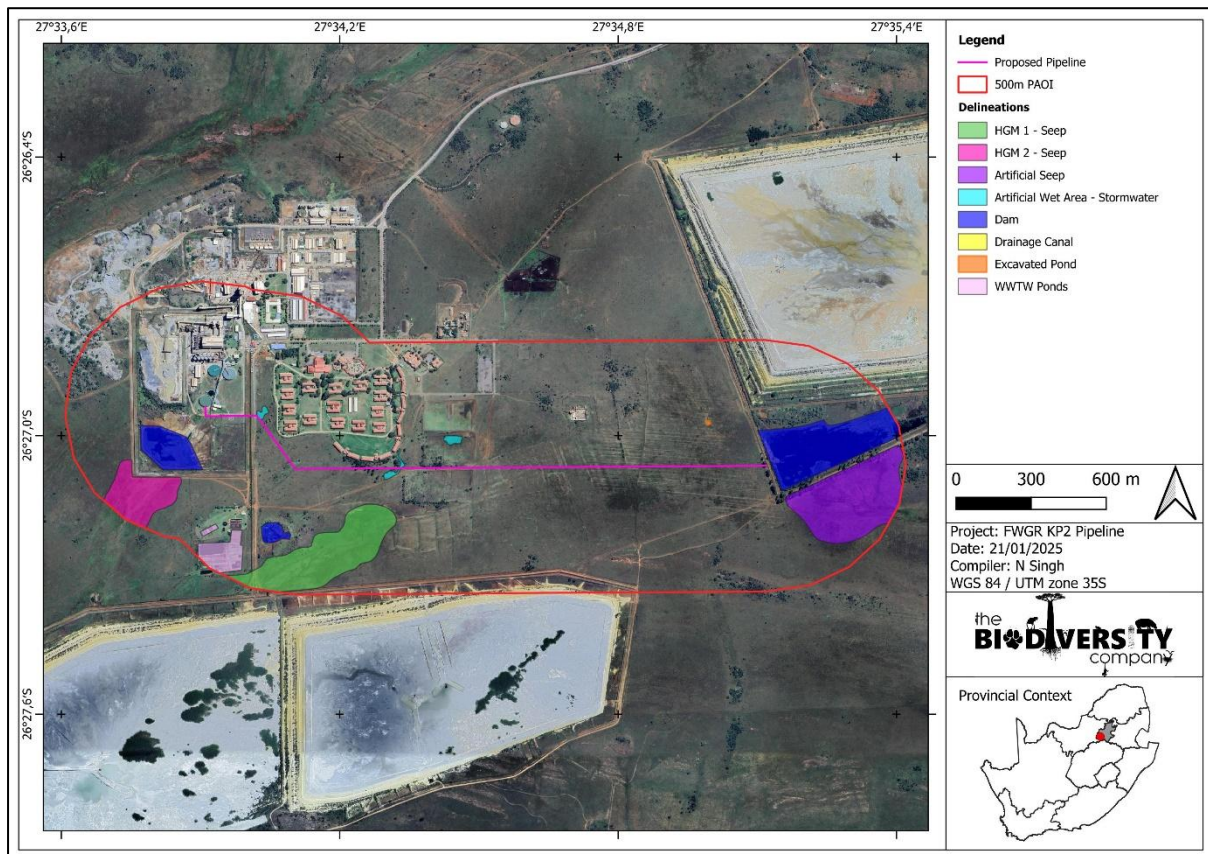


Figure 3-6 Delineation of wetland features within the project area of influence

3.2.2 Area of Wetlands

The table below summarises the individual wetland areas and the percentage that each HGM unit comprises of the total wetland area within the PAOI, which amounts to 11.75 ha (Table 3-2).

Table 3-2 Summary of wetland area within the project area of influence

| HGM Units | Area (Ha) | Size (%) |
|--------------|--------------|------------|
| HGM 1 | 8.09 | 68.85 |
| HGM 2 | 3.66 | 31.15 |
| Total | 11.75 | 100 |

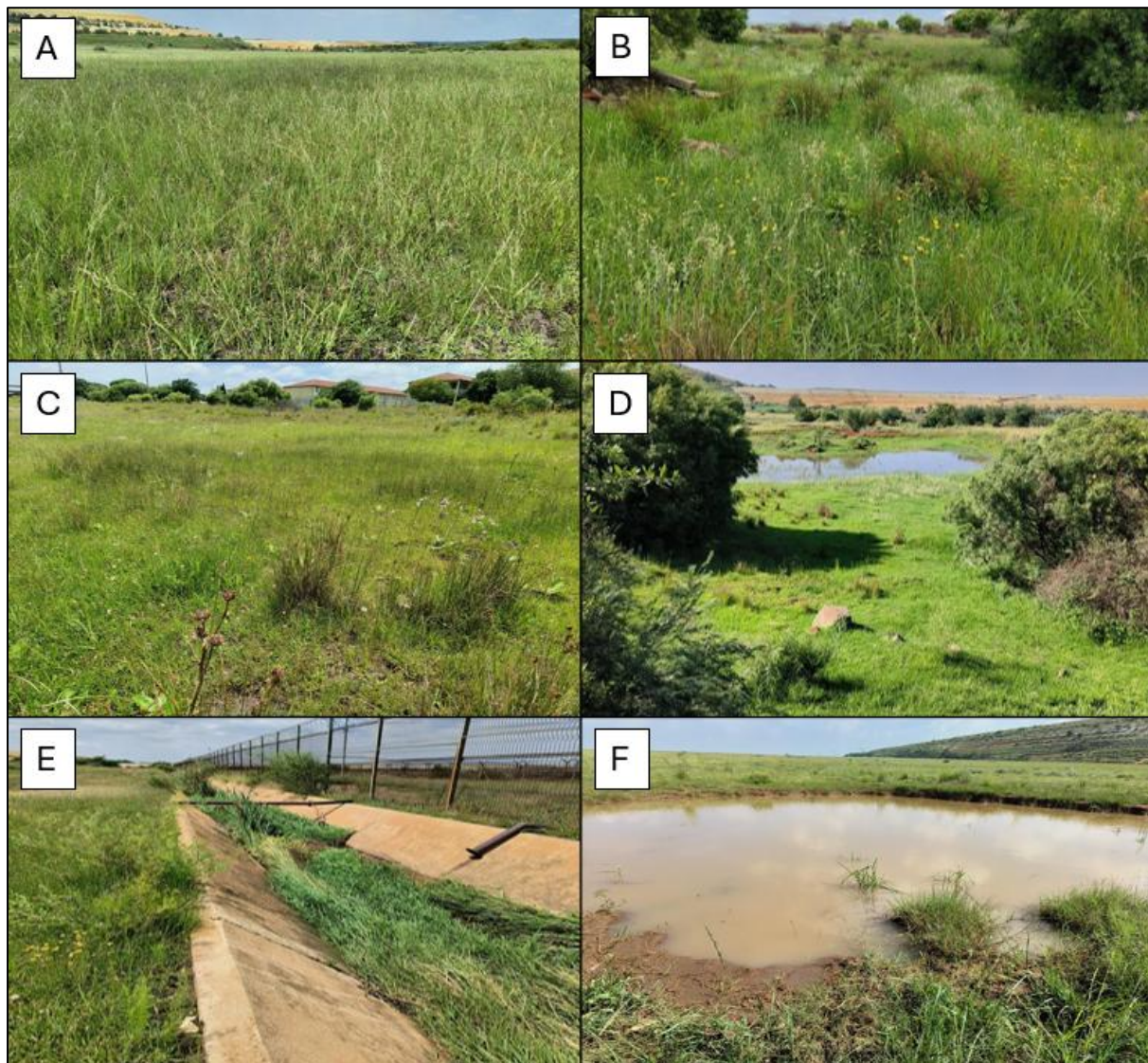


Figure 3-7 Representative photographs of freshwater features within the Project Area of Influence. A) HGM 1 – Seep; B & C) Artificial wet area from stormwater; D) Dam; E) Drainage canal and; F) Excavated pond.

3.2.3 Classification and Description

The wetland classification as per SANBI guidelines (Ollis *et al.*, 2013) is presented in Table 3-3.

Table 3-3 Wetland classification as per SANBI guideline (Ollis *et al.*, 2013)

| Wetland Unit | Level 1 | Level 2 | | Level 3 | Level 4 | | |
|--------------|---------|-----------------|----------------------------------|----------------|----------|----------------------------|-----|
| | System | DWS Ecoregion/s | NFEPA Wet Veg Group/s | Landscape Unit | 4A (HGM) | 4B | 4C |
| HGM 1 | Inland | Highveld | Mesic Highveld Grassland Group 4 | Slope | Seep | Without channelled outflow | N/A |
| HGM 2 | | | | | | | |

A seep wetland is typically located on gently to steeply sloping land and is characterised by the colluvial, unidirectional movement of water and material down-slope (Ollis *et al.*, 2013). Seeps are often found on the side-slopes of a valley but do not usually extend onto the valley floor. The primary water inputs

for seeps are subsurface flows from an up-slope direction, with water movement through the seep mainly occurring as interflow. During and after rainfall events, diffuse overland flow, known as sheetwash, can also be significant. Seeps are associated with geological formations and topographic positions that either cause groundwater to discharge to the land surface or rain-derived water to seep down-slope as subsurface interflow. This unique hydrological setting allows seeps to support specific vegetation adapted to these conditions, contributing to their ecological significance in the landscape. Figure 3-8 illustrates a diagram of the hillslope seeps, showing the dominant movement of water into, through and out of the system.

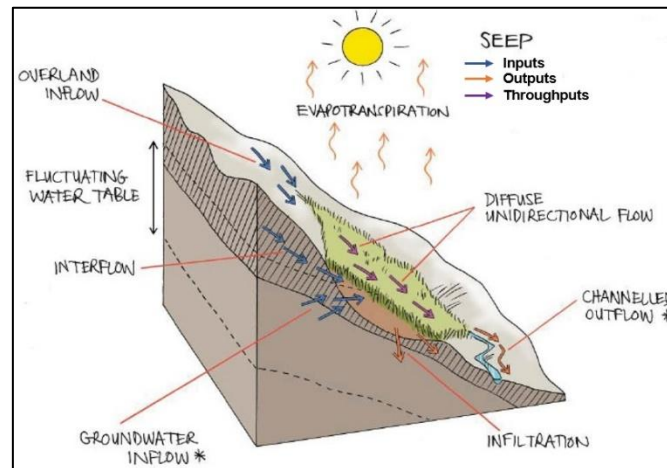


Figure 3-8 Amalgamated diagram of a typical seep, highlighting the dominant water inputs, throughputs and outputs, SANBI guidelines (Ollis et al., 2013)

3.3 Risk Screening

Table 3-4 provides the results of risk screening for the delineated wetlands and provides motivation for each of the determined categories. HGM 1 is perceived to be “At Risk” from the proposed pipeline development, while HGM 2 was not perceived at be “At Risk”, resulting from the proximity of the activities to watercourses.

Table 3-4 Risk status of the delineated wetlands

| HGM unit | Risk Status | Rationale |
|----------------------|----------------|--|
| HGM 1 | At Risk | This HGM unit is located downslope (>120 m) of the proposed development and has therefore been determined as “At Risk”. It is anticipated that indirect impacts to the wetland systems is potential, even though not expected to be of a significant magnitude. |
| HGM 2 | Not At Risk | This HGM unit was identified to be “Not at Risk”, as there is a considerable distance (> 250 m) between the proposed development and the wetland. Furthermore, there is existing infrastructure that acts as physical barriers to buffer against the impacts. Therefore, no direct or indirect impacts are anticipated to affect the wetland system. |
| Artificial Wet Areas | Not Applicable | These are artificial features and do not represent natural sensitivities. As such these systems do not have ecological scores and are not considered for the risk assessment. |

3.4 Wetland Functional and Ecological Assessment

Only natural systems that were identified to be “At Risk” from the proposed activities were considered for further assessments.

3.4.1 Functional Assessment

3.4.1.1 General Functional Description

Hillslope seep wetlands are typically found on hillsides where water emerges from subsurface flows, creating a diffuse downslope movement. These wetlands are primarily fed by groundwater discharges, although surface water contributions can also supplement flows. Hillslope seeps are particularly effective in water quality enhancement, notably in the removal of excess nutrients and pollutants such as nitrates, through processes like denitrification. This is facilitated by the wetland's vegetation, which provides organic carbon necessary for microbial processes that assimilate these nutrients. The vegetation also plays a critical role in stabilizing the soil, thereby reducing erosion risks, although the generally steep slopes of hillslope seeps can increase erosion susceptibility if vegetation cover is compromised. Additionally, these wetlands contribute to streamflow regulation by slowing down subsurface water movement, which prolongs water contribution to stream systems during low flow periods, although their flood attenuation capacity is limited once the soils are saturated (Kotze *et al.*, 2009).

It should be noted that these characteristics are representative of ideal wetland features and may not necessarily represent the characteristics of all wetlands. The functionality of wetlands and the provision of benefits is largely dependent on wetland size and influence from abiotic drivers.

3.4.1.2 Ecosystem Services

The ecosystem services provided by the relevant wetland (HGM 1) on site was assessed and rated using the WET-EcoServices method (Kotze *et al.*, 2008). The results of the assessment are presented in Table 3-5. The average ecosystem services score of HGM 1 falls within the “Intermediate” class. Ecosystem services contributing to this score includes flood attenuation, streamflow regulation, sediment trapping, phosphate assimilation, nitrate assimilation, provisioning of water for human use, erosion control, and the maintenance of biodiversity.

Table 3-5 Summary of the average ecosystem scores for the assessed systems

| | | Wetland Unit | HGM 1 | | |
|---|-------------------|------------------------------------|---------------------------------------|------------------------|-----|
| Ecosystem Services Supplied by Wetlands | Indirect Benefits | Regulating and supporting benefits | Flood attenuation | 3.0 | |
| | | | Streamflow regulation | 0.5 | |
| | | | Water Quality enhancement benefits | Sediment trapping | 3.0 |
| | | | | Phosphate assimilation | 1.0 |
| | | | | Nitrate assimilation | 1.0 |
| | | | | Toxicant assimilation | 2.0 |
| | | | Erosion control | 3.0 | |
| | Carbon storage | 1.0 | | | |
| | Direct Benefits | Provisioning benefits | Biodiversity maintenance | 3.0 | |
| | | | Provisioning of water for human use | 0 | |
| | | | Provisioning of harvestable resources | 0 | |
| | | Cultural benefits | Provisioning of cultivated foods | 0 | |
| | | | Cultural heritage | 0 | |
| | | | Tourism and recreation | 0 | |
| Education and research | | | 1.0 | | |
| Overall | | | 18.5 | | |

| | |
|----------------|---------------------|
| Average | 1.2 |
| Class | Intermediate |

HGM 1 plays a significant role in reducing the impact of floods by absorbing excess water during heavy rainfall events, thereby mitigating potential flooding or waterlogging in the immediate landscape. The wetland has a limited capacity to regulate streamflow, indicating that it provides minimal support in maintaining consistent water flow in streams due to their being no connectivity with a downstream system. The wetland is well vegetated and effectively reduces erosion and traps sediments, which helps in maintaining water clarity and quality. Attributed to their being no present agricultural activity within the wetland’s catchment, the services relating to assimilating excess phosphates and nitrates occurs at a minimal scale. Due to the catchment comprising of mine tailings, the wetland provides a moderate level of toxicant assimilation, helping to reduce the concentration of harmful substances in the water, although this may only occur if contaminated runoff enters the system from its surroundings. Due to the soil type and dominance of grasses and sedges within the wetland, its contribution towards carbon sequestration is minimal. The wetland is perceived to have high biodiversity value as the surrounding landscape is relatively disturbed which increases its importance as an ecological corridor and refugial area. The wetland is unlikely to provide any provisioning and cultural benefits due to its location and physical attributes however, there is a small potential for education and research.

3.4.2 Present Ecological State

The wetland exhibited different degrees of modification resulting from natural physical changes as well as anthropogenically induced impacts at both the local and catchment level. Resultingly, HGM 1 has scored an average Present Ecological State (PES) score within the “D – Largely Modified” class. The results of the wetland health and integrity assessment is provided in the table below. The wetland has mainly been impacted by changes to the landscape which has resulted in altered flows and subsequently vegetation structure. Furthermore, altered overland flows has resulted in minor erosion within the wetland. The proximity of the wetland to a WWTW and tailings facilities is presumed to have negative impacts to the wetlands water quality.

Table 3-6 Average Present Ecological State scores for the wetlands

| Unit | PES Assessment | Hydrology | Geomorphology | Water Quality | Vegetation |
|--------------|-------------------------------------|----------------------|---------------|---------------|------------|
| HGM 1 | Impact Score | 7.0 | 3.7 | 4.0 | 4.0 |
| | Ecological Category | E | C | D | D |
| | Combined Impact Score | 5.5 | | | |
| | Combined Ecological Category | D – Largely Modified | | | |

3.4.3 Ecological Importance and Sensitivity

The Ecological Importance and Sensitivity (EIS) assessment was applied to the HGM units in conjunction with the ecosystem service scores in the preceding section, to assess the levels of sensitivity and ecological importance of the wetland. Various components pertaining to the protection status of a wetland is considered for the EIS, including Strategic Water Source Areas (SWSA), the NFEPA wet veg protection and threat status and the protection and threat status of the wetland type itself considering the NBA wetland dataset. It should be noted that where the dataset did not identify a wetland and one was identified on site, the closest wetland of the same type within the dataset was used to extrapolate findings for the purpose of this assessment and site-specific conditions. The results of the assessment are shown in Table 3-7, indicating that the wetlands EIS score presents within the “C – Moderate” category.

Table 3-7 Aspects considered in the Ecological Importance and Sensitivity assessment.

| HGM No. | NFEPA Wet Veg | | | NBA Wetlands | | | SWSA (Y/N) | CBA / ESA (Y/N) | EIS Class |
|--------------|----------------------------------|-------------------------|----------------------------|----------------------------------|------------------------------|----------------------------|------------|-----------------|---------------------|
| | Type | Ecosystem Threat Status | Ecosystem Protection Level | Wetland Condition | Ecosystem Threat Status 2018 | Ecosystem Protection Level | | | |
| Seep (HGM 1) | Mesic Highveld Grassland Group 4 | Least Threatened | Not Protected | D Largely Modified (Field Visit) | Critically Endangered | Poorly Protected | N | Y (CBA & ESA) | C - Moderate |

3.4.4 Recommended Ecological Category and Recommended Management Objective

The Recommended Ecological Category (REC) and Recommended Management Objective (RMO) for the wetland area was determined from the results of the PES and EIS assessments. These assessments indicated that the wetland feature within the PAOI, had underwent transformation as a result of historical and current impacts. Nevertheless, despite the altered ecological integrity of the system, it is considered to provide some level of ecological benefit.

The results of the assessment are presented in below, the objective for HGM 1 is aimed at maintaining the current PES.

| HGM No. | Recommended Ecological Category - Recommended Management Objective |
|---------|--|
| HGM 1 | D – Maintain |

3.5 Buffer Requirements

The buffer requirements for the wetlands were calculated using the Site-Based Tool: Determination of buffer zone requirements for wetland ecosystems (Macfarlane *et al.*, 2014). The recommended buffer zones are presented in Table 3-8 and Figure 3-9. Although, HGM 2 was not perceived to be “At Risk” from the proposed development, it was included in the buffer computation.

A wetland buffer of 45 m was calculated for the wetlands in the pre-mitigation scenario, which can be reduced to a minimum post-mitigation buffer of 32 m. In consideration of the current layout, the proposed pipeline routes sufficiently avoid these buffers.

Table 3-8 Buffer requirements for the relevant wetland feature

| Scenario | Buffer Distance |
|-----------------|-----------------|
| Post-Mitigation | 32 m |
| Pre-Mitigation | 45 m |

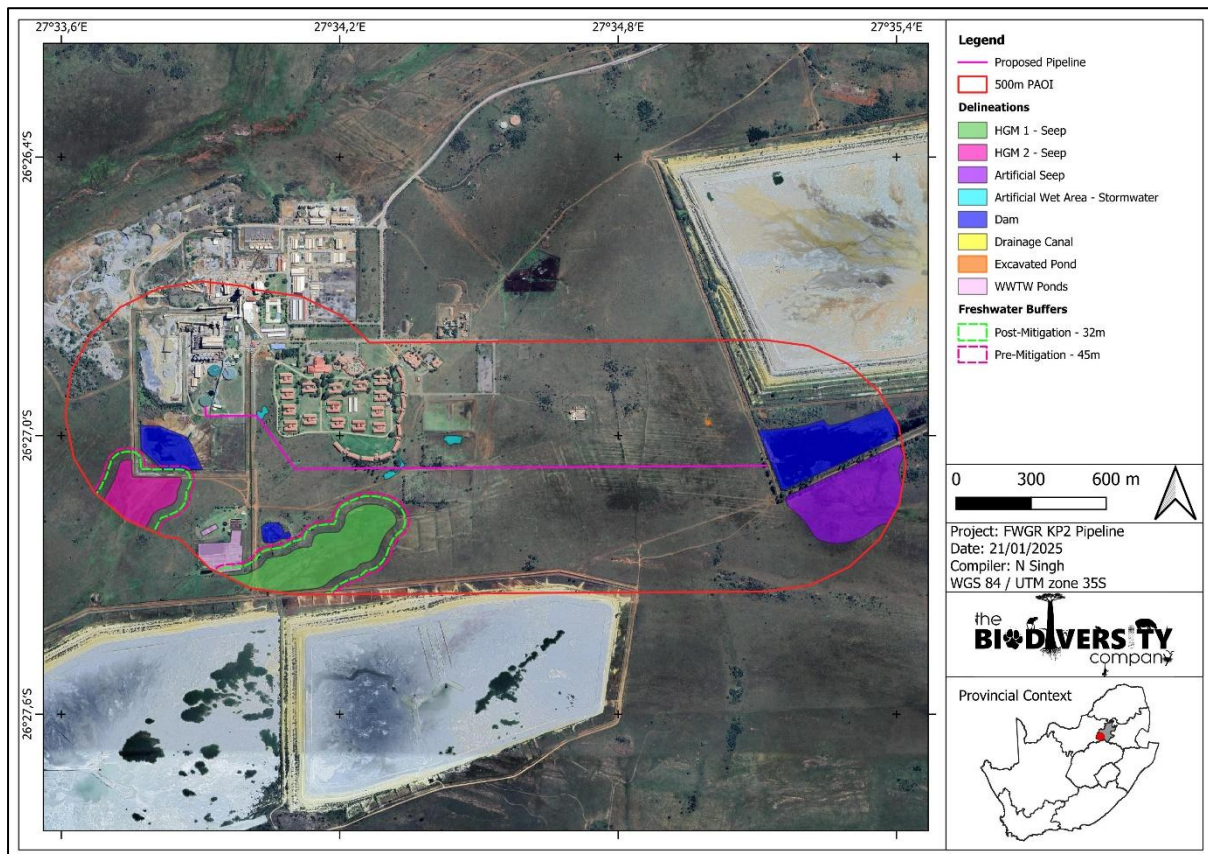


Figure 3-9 Recommended buffers for the assessed wetlands

3.5.1 Regulation Zones

Table 3-9 presents the legislated zones of regulation that would be applicable to the wetland areas.

The proposed activities do not fall within 32 m of a natural watercourse which is the zone of regulation for watercourses in terms of the NEMA. The proposed activities fall within 500 m of a natural watercourse which is the zone of regulation for watercourses in terms of the NWA.

The zones of regulation were only computed for the delineated extent of the watercourses and is displayed in Figure 3-10.

Table 3-9 Legislated zones of regulation.

| Regulatory authorisation required | Zone of applicability |
|---|---|
| Water Use License Application in terms of the National Water Act, 1998 (Act No. 36 of 1998). GN 4167 as published in the Government Gazette 49833 of 2023. GN 509 as published in the Government Gazette 40229 of 2016. | In accordance with GN 4167 of 2023 and GN 509 of 2016, as it relates to the National Water Act, 1998 (Act 36 of 1998), a regulated area of a watercourse in terms of water uses as listed in Section 21c and 21i is defined as: <ul style="list-style-type: none"> 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; 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; or a 500 m radius from the delineated boundary (extent) of any wetland or pan in terms of this regulation. |
| Listed activities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) | Activity 12 of Listing Notice 1 (GN 327) of the National Environmental Management Act, 1998 (Act No.107 of 1998) EIA regulations, 2014 (as amended) states that: The development of: |
| EIA Regulations (2014), as amended. | (xii) Infrastructure or structures with a physical footprint of 100 square meters or more; |

Where such development occurs—

- a) Within a watercourse;
- b) In front of a development setback; or
- c) If no development setback has been adopted, within 32 meters of a watercourse, measured from the edge of a watercourse.

Excluding –

... (dd) where such development occurs within an urban area...

Activity 19 of Listing Notice 1 (GN 327) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) EIA regulations, 2014 (as amended) states “The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.”

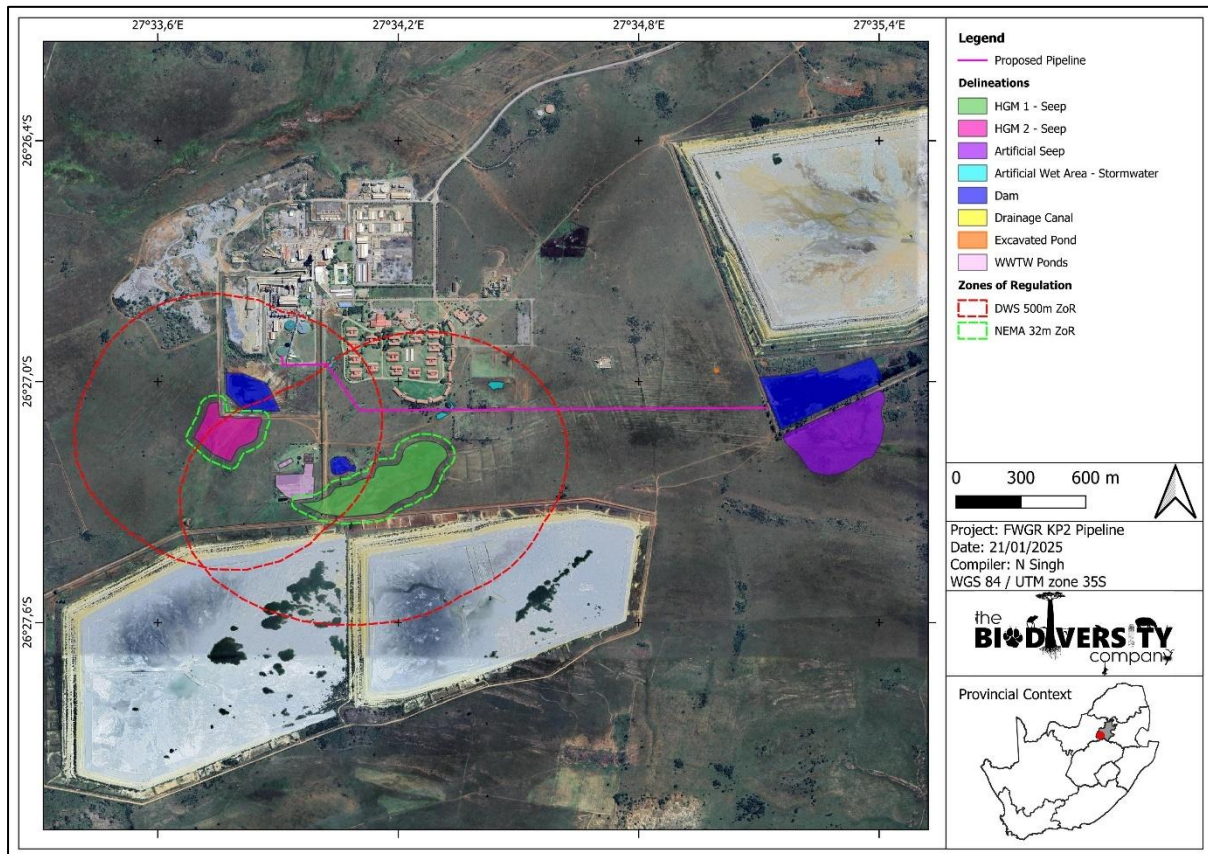


Figure 3-10 Relevant zones of regulation for the natural watercourses

3.6 Site Sensitivity Verification

3.6.1 Desktop Ecological Sensitivity

The following is deduced from the National Web-based Environmental Screening Tool Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended):

- Aquatic Biodiversity Theme Sensitivity “Low” for the Project Site, attributed to the absence of surface water features (Figure 3-11).

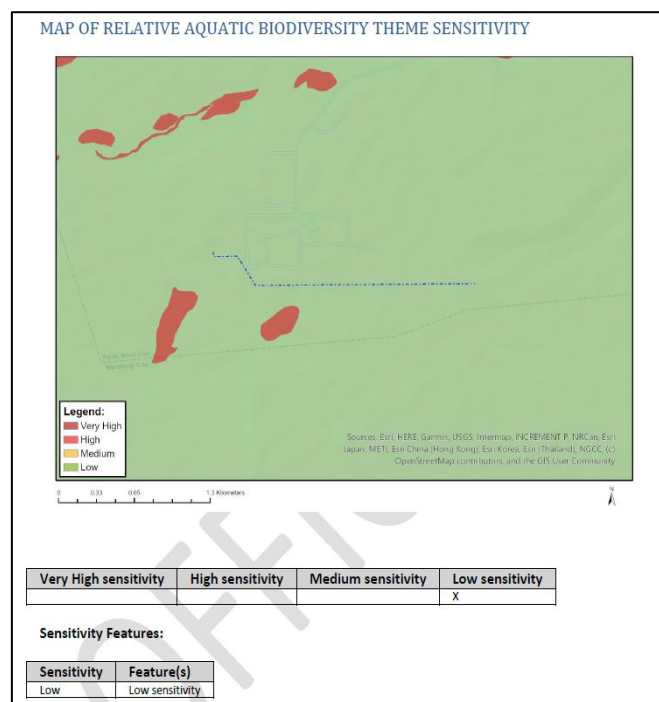


Figure 3-11 Aquatic Biodiversity Theme Sensitivity for the Project Site according to the National Web-based Environmental Screening Tool

3.6.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed areas as presented in Table 3-10 below. A summative explanation for each result is provided as relevant. It should be noted that the National Web-based Environmental Screening Tool allocates sensitivities to freshwater resources identified through the available national freshwater datasets based on their presence (very high) or absence (low). The specialist-assigned sensitivity ratings presented herein consider the presence of features, their size and the ecological characteristics of the wetlands as discussed in Section 3.4. Figure 3-12 presents the delineated systems within the PAOI and the assigned sensitivities.

Table 3-10 Summary of the screening tool vs specialist assigned sensitivities

| Feature | Screening Tool Theme | Screening Tool | Specialist Finding | Tool Validated or Disputed by Specialist - Reasoning |
|--|----------------------------|-----------------|--------------------|---|
| HGM 1 & HGM 2 | Aquatic Biodiversity Theme | Very High | Very High | Validated – Natural wetlands were identified which provide moderate levels of ecological benefit. |
| 32 m Buffer | Aquatic Biodiversity Theme | Very High / Low | Moderate | Disputed – Whilst the buffer areas do not necessarily represent freshwater features, their conservation is imperative to limiting impact to the wetlands as they form the periphery of the wetlands thereby having spatial connectivity to the wetlands. The sensitivity of the buffers is therefore determined by the landscape and the sensitivity of the features they encompass. |
| Artificial Wet Areas, Drainage Canal and | Aquatic Biodiversity Theme | Low | Low | Validated – These are artificial features which do not have natural ecological sensitivity and would cease to exist if the artificial hydrological inputs are stopped and if the landscape was returned to its pre-disturbed state. Furthermore, whilst wetland vegetation was observed within the Artificial Wet Areas, these areas are not considered to have functionality as a fully-fledged natural wetland. |
| Remaining Area | Aquatic Biodiversity Theme | Low | Low | Validated – No natural surface water features were identified within these areas. |

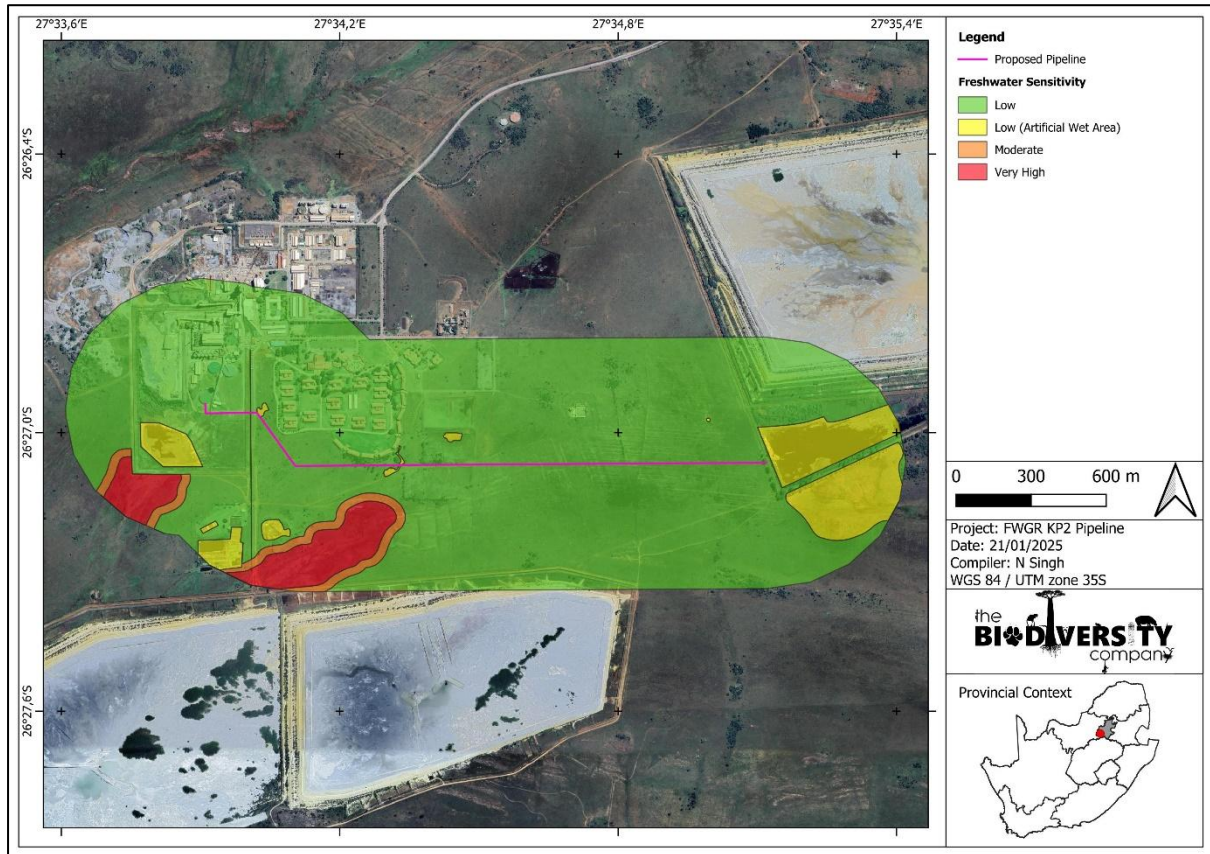


Figure 3-12 Map illustrating the freshwater sensitivity for the Project Area of Influence

4 Risk and Impact Assessment

The Risk Assessment considered the direct and indirect impacts to the wetland systems. The mitigation hierarchy as discussed by the Department of Environmental Affairs (2013) will be considered for this component of the assessment (Figure 4-1). In accordance with the mitigation hierarchy, the preferred mitigatory measure is to avoid impacts by considering options in project location, sitting, scale, layout, technology and phasing to avoid impacts.

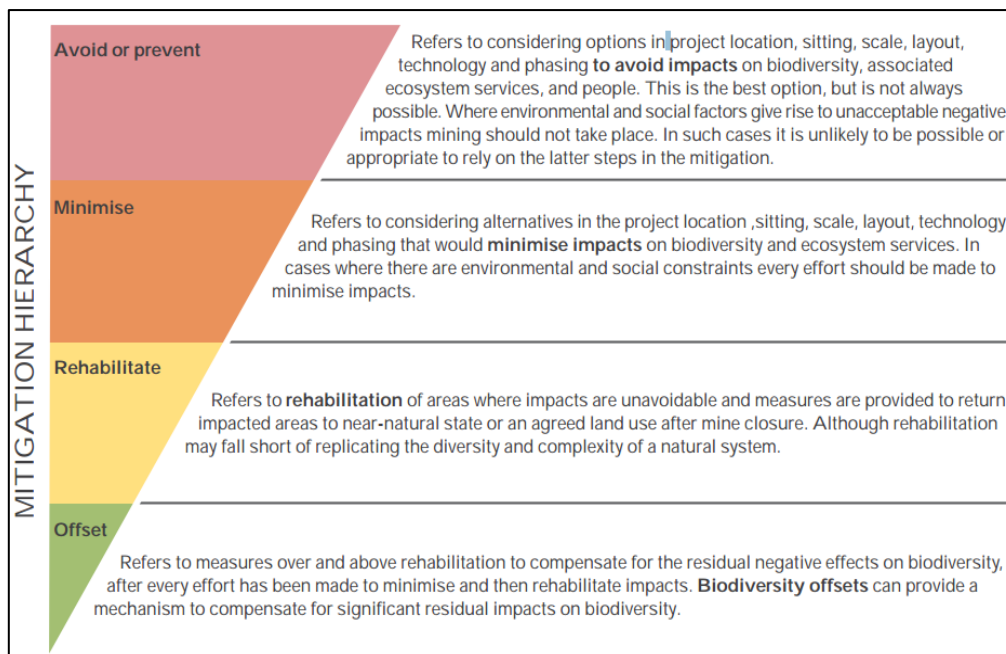


Figure 4-1 The mitigation hierarchy as described by the DEA (2013)

4.1 Potential Anticipated Impacts

Table 4-1 illustrates the potential aspects expected to threaten the integrity of sensitive receptors during the proposed activities. The post-mitigation significance ratings have been calculated considering various parameters, these results are presented in the subsequent tables. It is understood that the pipeline will be constructed in a minimally invasive manner entailing accessing the site and laying the pipeline. No large-scale earthworks or excavations are expected for the installation process; therefore, few potential indirect impacts are anticipated during project phases.

Table 4-1 Aspects and impacts relevant to the proposed activity

| Phase | Activity | Impact |
|--------------|---|--|
| Construction | Construction of slurry pipeline (Including site access and laying and installation of pipeline) | <ul style="list-style-type: none"> • Temporary increase of overland flow from hardened surfaces; • Potential erosion and sedimentation from increased flows; • Introduction and proliferation of alien invasive vegetation from disturbance; and • Potential contamination of water from accidental spills and leaks of machinery and equipment used in the construction activities. |
| | Construction of water pipeline (Including site access and laying and installation of pipeline) | |
| Operation | Operation of slurry pipeline (Including routine maintenance) | <ul style="list-style-type: none"> • Temporary alteration of hydrology in the event of a pipeline leak; • Potential erosion and sedimentation from increased flows; and • Potential contamination of water from a pipeline leak. |

| | | |
|------------------------|---|---|
| | Operation of water pipeline (Including routine maintenance) | <ul style="list-style-type: none"> • Temporary alteration of hydrology in the event of a pipeline leak; and • Potential erosion and sedimentation from increased flows. |
| Decommissioning | Removal of slurry pipeline (Including site access and dismantlement of pipeline) | <ul style="list-style-type: none"> • Temporary increase of overland flow from hardened surfaces; • Potential erosion and sedimentation from increased flows; • Introduction and proliferation of alien invasive vegetation from disturbance; and • Potential contamination of water from accidental spills and leaks of machinery and equipment used in the decommissioning activities. |
| | Removal of water pipeline (Including site access and dismantlement of pipeline) | |

Anthropogenic activities drive habitat destruction causing displacement of aquatic and terrestrial fauna and flora. Land clearing for development infrastructure (all inclusive) destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors such as rivers, streams and drainage lines and their associated riparian area, or other locally important features such as off channel wetlands (where present).

4.2 Risk Assessment (DWS, 2023)

A risk assessment was conducted for the proposed pipeline development (Table 4-2). Provided that the suggested mitigations are implemented, the project is anticipated to result in “Low” post-mitigation risks to the watercourse. This is attributed to the wetland being avoided by the proposed pipelines leaving the potential for only indirect impacts with a low probability of occurrence. Therefore, during the construction and decommissioning phases, the potential impacts are related to hardened surfaces and an induced increase of overland flow, potential for erosion and sedimentation and resultant proliferation of alien vegetation from the above-mentioned disturbances. Once installed, there is not presumed to be additional activity along the pipeline, therefore the main potential impacts relate to the low probability event of the pipelines leaking which would be a temporary event.

Table 4-2 Summary of the DWS Risk Assessment conducted for the proposed activities

| Phase | Activity | Impact | Significance (max = 100) | Risk Rating |
|---------------------|--|--|--------------------------|-------------|
| CONSTRUCTION | Construction of slurry pipeline (Including site access and laying and installation of pipeline) | Temporary increase of overland flow from hardened surfaces | 14,4 | L |
| | | Potential erosion and sedimentation from increased flows | 7,2 | L |
| | | Introduction and proliferation of alien invasive vegetation from disturbance | 3 | L |
| | | Potential contamination of water from accidental spills and leaks of machinery and equipment used in the construction activities | 4,8 | L |
| | Construction of water pipeline (Including site access and laying and installation of pipeline) | Temporary increase of overland flow from hardened surfaces | 14,4 | L |
| | | Potential erosion and sedimentation from increased flows | 7,2 | L |
| | | Introduction and proliferation of alien invasive vegetation from disturbance | 3 | L |

| | | | | |
|-----------------|---|--|------|---|
| | | Potential contamination of water from a pipeline leak | 4,8 | L |
| | | | | |
| OPERATIONAL | Operation of slurry pipeline (Including routine maintenance) | Temporary alteration of hydrology in the event of a pipeline leak | 6,6 | L |
| | | Potential erosion and sedimentation from increased flows | 5,4 | L |
| | | Potential contamination of water from a pipeline leak | 4,2 | L |
| | Operation of water pipeline (Including routine maintenance) | Temporary alteration of hydrology in the event of a pipeline leak | 6,6 | L |
| | | Potential erosion and sedimentation from increased flows | 5,4 | L |
| | | | | |
| DECOMMISSIONING | Removal of slurry pipeline (Including site access and dismantlement of pipeline) | Temporary increase of overland flow from hardened surfaces | 14,4 | L |
| | | Potential erosion and sedimentation from increased flows | 7,2 | L |
| | | Introduction and proliferation of alien invasive vegetation from disturbance | 3 | L |
| | | Potential contamination of water from accidental spills and leaks of machinery and equipment used in the construction activities | 4,8 | L |
| | Removal of water pipeline (Including site access and dismantlement of pipeline) | Temporary increase of overland flow from hardened surfaces | 14,4 | L |
| | | Potential erosion and sedimentation from increased flows | 7,2 | L |
| | | Introduction and proliferation of alien invasive vegetation from disturbance | 3 | L |
| | | Potential contamination of water from a pipeline leak | 4,8 | L |

4.3 Mitigation Measures

Considering the potential impacts from proposed activities the following mitigation measures have been proposed to lower the intensity of the impacts on the ecological integrity of the wetland catchment and its downslope wetland features. The suggested mitigation measures apply mainly to the operational phase of the proposed activities.

The focus of mitigation measures should be to reduce the significance of potential environmental impacts associated with the development and thereby to:

- Prevent the unnecessary destruction, and fragmentation, of the vegetation community of the wetland areas; and
- Limit the construction area to the defined project areas and only impact those areas where it is unavoidable to do so otherwise.

4.3.1 Consturction and Decommissioning Phase

Table 4-3 Mitigation measures for the construction and decommissioning phase

| Impact | Mitigation |
|--|--|
| Temporary increase of overland flow from hardened surfaces | <ul style="list-style-type: none"> Implement temporary drainage and stormwater systems to manage surface runoff effectively in a manner that reduces the erosion potential and subsequent sedimentation, especially along the roads and tracks used for the pipeline installation. Rehabilitate and revegetate disturbed areas. Remove any temporary drainage systems only after site stabilisation. Monitor runoff patterns and adjust rehabilitation efforts as needed. |
| Potential erosion and sedimentation from increased flows | <ul style="list-style-type: none"> Ensure adequate sediment control around construction areas and within drainage systems to prevent sediment laden runoff entering water bodies from the roads. Interceptor ditches and earth sumps may be used. Stabilise exposed soil with vegetation or erosion control mats where required. Schedule construction activities during dry seasons to minimize erosion risk. Ensure that all disturbed areas are stabilized before the onset of rainy seasons. Conduct post-decommissioning and post-construction inspections to assess and address erosion issues. |
| Introduction and proliferation of alien invasive vegetation from disturbance | <ul style="list-style-type: none"> Conduct regular monitoring and removal of invasive species. Use native plant species for site rehabilitation and landscaping. |
| Potential contamination of water from accidental spills and leaks of machinery and equipment used in the construction activities | <ul style="list-style-type: none"> Develop and implement a spill response plan, including training for construction personnel. Use drip trays and secondary containment for machinery and equipment. Regularly inspect and maintain equipment to prevent leaks. Follow best practices for installation, dismantling and removing equipment to prevent spills. Ensure all hazardous materials are properly disposed of or recycled. Conduct a post-decommissioning and post-construction site assessment to confirm no residual contamination remains. |

4.3.2 Operational Phase

Table 4-4 Mitigation measures for operational phase

| Impact | Mitigation |
|---|---|
| Temporary alteration of hydrology in the event of a pipeline leak | <ul style="list-style-type: none"> Implement temporary drainage and stormwater systems if a largescale leak occurs. Conduct regular maintenance and inspections of the pipeline to ensure integrity. Develop a contingency plan for hydrological alterations, including temporary water diversion strategies. Maintain vegetation cover along the pipeline route to stabilise soil. |
| Potential erosion and sedimentation from increased flows | <ul style="list-style-type: none"> Use erosion control measures in vulnerable areas if pipeline leaks lead to erosional scarring. Monitor and repair any erosion damage promptly. |

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| | |
|--|---|
| <p>Potential contamination of water from a pipeline leak</p> | <ul style="list-style-type: none">• Implement a comprehensive monitoring program for the pipeline and ensure maintenance and repairs are undertaken accordingly.• Use corrosion-resistant materials and coatings for pipelines.• Establish emergency response protocols for pipeline leaks. |
|--|---|

5 Conclusion

Two HGM units were identified within the encompassing 500 m PAOI. These were classified as two seeps (HGM 1 and HGM 2). Additionally, numerous artificial wet areas were identified within the PAOI. These artificial wet areas include three dams, Waste-Water Treatment Works (WWTW) settling/oxidation ponds, a concreted drainage canal, stormwater runoff areas, an excavated pond and an artificial seep.

The only features directly traversed by the proposed pipelines are the artificial wet areas related to stormwater management or the lack thereof. All other identified features are avoided by the proposed pipeline route.

Furthermore, only the natural wetlands that were deemed “At Risk” as a result of the pipeline development were assessed further. Due to the considerable distance between the proposed pipeline and HGM 2, where no foreseeable impacts were anticipated to result, the functional and risk assessments were only completed for HGM 1.

The seep wetland (HGM 1) presented within the “D - Largely Modified” PES class, with an overall “Intermediate” ecoservices provision score, and “C - Moderate” EIS. Furthermore, the Recommended Ecological Category and Recommended Objective Management is to maintain the current PES of the wetland.

The prescribed buffer zones for the wetlands (HGM 1 and 2) are a minimum post-mitigation buffer of 32 m. In consideration of the current layout, the proposed pipeline routes sufficiently avoid these buffers.

5.1 Risk and Impact Statement

A risk assessment was conducted for the proposed project. The post-mitigation risks for the project presented within the “Low” significance category attributed to the direct avoidance of the natural wetlands and the limited probability for indirect impacts to reach the system attributed to the distance between the proposed pipeline route and the natural wetland features.

It is deemed acceptable for the pipeline to traverse the artificial wet areas resulting from stormwater management, as these have been identified as low sensitivity features that do not have significant biodiversity attributes and do not have spatial connectivity to the natural wetlands within the larger PAOI.

5.1.1 Linear Impact

It is the opinion of the specialists that the environment can return to its natural (pre-construction) state within two years of project completion, given that the best practice engineering methods will be implemented during the construction phase of the project.

5.2 Specialist Opinion

No fatal flaws were identified for the project. It is the opinion of the specialists that the project may be favourably considered for approval, and the Competent Authority must consider the prescribed mitigation measures for the authorisation.

The following Exclusions from the Notice No. 4167 for a General Authorisation in terms of the National Water Act 36 of 1998 for Water Uses as Defined in Section 21 (c) or Section 21 (i) in Government Gazette 49833 (December 2023) are applicable:

- 3 (e) – “to any section 21 (c) or (i) water use associated with construction/installation or maintenance of main or bulk sewerage pipelines, French drains, pipelines carrying hazardous materials”; and

- 3 (g) – “to any section 21 (c) or (i) water use associated with any hazardous material within the regulated area of a watercourse.”

However, given that the risks of the project were determined to be “Low” and improbable, a General Authorisation in terms of the National Water Act 36 of 1998 for Water Uses as Defined in Section 21 (c) or Section 21 (i) can be considered for the project, nevertheless the final decision on the appropriate authorisation for the project must be determined by the Competent Authority.

6 References

Department of Water Affairs and Forestry (DWAF). 2005a. A Practical Field Procedure for Identification and Delineation of Wetlands and Riparian Areas.

Department of Water and Sanitation (DWS). 2005b. River Ecoclassification: Manual for Ecostatus Determination. First Draft for Training Purposes. Department of Water Affairs and Forestry.

Department of Water Affairs and Forestry (DWAF). 1999a. Appendix W4 of the DWAF Resource Directed Measures for Water Resources: Wetland Ecosystems. Department of Water Affairs and Forestry, Pretoria, South Africa.

Department of Water and Sanitation (DWS). 2016. General Authorisation in Terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for water uses as defined in Section 21(c) or section 21(i). Government Gazette Notice: 509 in Government Gazette 40229 of 26 August 2016.

Department of Water and Sanitation (DWS). 2023. General Authorisation in Terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for water uses as defined in Section 21(c) or section 21(i). Government Gazette Notice: 4167 in Government Gazette 49833 of 08 December 2023.

GDARD (2014): Technical Report for the Gauteng Conservation Plan (Gauteng C-Plan v3.3). Gauteng Department of Agriculture and Rural Development: Nature Conservation Directorate.

Kotze, D.C., Marneweck, G.C., Batchelor, A.L., Lindley, D.C., and Collins, N.B. 2009. A Technique for rapidly assessing ecosystem services supplied by wetlands, Mondi Wetland Project.

Kongiwe Environmental (Pty) LTD. 2025. Memorandum: FWGR KP2 Pipelines Authorisations.

Land Type Survey Staff. 1972 - 2006. Land Types of South Africa: Digital Map (1:250 000 Scale) and Soil Inventory Databases. Pretoria: ARC-Institute for Soil, Climate, and Water.

Macfarlane, D.M., Bredin, I.P., Adams, J.B., Zungu, M.M., Bate, G.C. and Dickens, C.W.S. 2014. Preliminary guideline for the determination of buffer zones for rivers, wetlands and estuaries. Final Consolidated Report. WRC Report No TT 610/14, Water Research Commission, Pretoria.

Macfarlane, D.M., Kotze, D.C., Ellery, W.N., Walters, D., Koopman, V., Goodman, P. and Goge, C. 2007. A technique for rapidly assessing wetland health: WET-Health. WRC Report TT 340/08.

Mucina, L., and Rutherford, M.C., 2010. The vegetation of South Africa, Lesotho and Swaziland. *Strelizia* 19. South African National Biodiversity Institute, Pretoria South African.

Nel, J. L., Driver, A., Strydom, W. F., Maherry, A. M., Petersen, C. P., Hill, L., Roux, D. J., Nienaber, S., van Deventer, H., Swartz, E. R. & Smith-Adao, L. B. (2011). Atlas of Freshwater Ecosystem Priority Areas in South Africa: Maps to support sustainable development of water resources, WRC Report No. TT 500/11. Water Research Commission, Pretoria.

Nel J.L., Murray K.M., Maherry A.M., Petersen C.P., Roux D.J., Driver A., Hill L., Van Deventer H., Funke N., Swartz E.R., Smith-Adao L.B., Mbona N., Downsborough L. and Nienaber S. 2011. Technical Report for the National Freshwater Ecosystem Priority Areas project. WRC Report No. K5/1801.

Ollis D.J., Snaddon C.D., Job N.M., and Mbona N. 2013. Classification System for Wetlands and other Aquatic Ecosystems in South Africa. User Manual: Inland Systems. SANBI Biodiversity Series 22. South African Biodiversity Institute, Pretoria.

Rountree, M. & Kotze, D. 2013. Ecological Importance and Sensitivity Assessment. In: Rountree, M., Malan, H. & Weston. ed., Manual for the Rapid Ecological Reserve Determination of Inland Wetlands. Report to the Water Research Commission and Department of Water Affairs. WRC Report No. 1788/1/12. Pretoria. p. 42-46.

Soil Classification Working Group. 2018. Soil Classification A Taxonomic system for South Africa. Pretoria: The Department of Agricultural Development.

Van Deventer, H., Smith-Adao, L., Mbona, N., Petersen, C., Skowno, A., Collins, N.B., Grenfell, M., Job, N., Lötter, M., Ollis, D., Scherman, P., Sieben, E., Snaddon, K. 2018. South African Inventory of Inland Aquatic Ecosystems. South African National Biodiversity Institute, Pretoria. Report Number: CSIR report number CSIR/NRE/ECOS/IR/2018/0001/A; SANBI report number <http://hdl.handle.net/20.500.12143/5847>.

7 Appendix Items

7.1 Appendix A – Methodology

7.1.1 Desktop Dataset Assessment

The desktop assessment was undertaken using Geographic Information System (GIS) to access, view and overlay the latest available related datasets with the project area. The information represented within the datasets was used to develop the relevant digital maps used to identify potentially environmentally sensitive areas. These datasets and their respective dates of publishing are provided below:

- Vegetation Types - Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018 & Mucina and Rutherford 2006);
- Soils and Geology - Land Types Database (Land Type Survey Staff, 1972 - 2006); and
- Topographical Inland Water Areas and River Lines (based on the 1994 1:500 000 topographic maps as per the Chief Directorate of the National Geo-spatial Information).

7.1.1.1 Vegetation Types - Vegetation Map of South Africa, Lesotho and Swaziland

The Vegetation Map of South Africa, Lesotho and Swaziland (SANBI, 2018) is the latest and updated version of the maps published in earlier time such as those presented by Mucina and Rutherford (2006) and those presented in the National Biodiversity Assessment (2011). The map provides spatial details on the representative vegetation of South Africa and is complemented in this report using information from Strelitzia (Mucina & Rutherford, 2006) to provide insight on the landscape features, biogeography, climate, geology, and soils of the project area.

7.1.1.2 Soils and Geology - Land Type Database

The Land Type Survey provides information on the soils, terrain, climate, and geology of areas within South Africa. The data includes the pedological classification of soils and is used in this report to provide insight on the common soil forms associated with aquatic or freshwater systems of a particular area.

7.1.1.3 Topographical River Lines and Inland Water Areas

Topographical Inland Water Areas and River Lines for South Africa are based on the topographic maps dated 1994 as per the National Geo-spatial Information. These datasets are used in this report to provide insight on potential wetland areas and serves to highlight the location and extent of drainage features, dams, wetlands, reservoirs and other relevant inland waterbodies.

7.1.1.4 Ecologically Important Landscape Features

The datasets listed below were incorporated to establish the relation between the project and ecologically important or sensitive freshwater entities. Emphasis was placed around the following spatial datasets:

- South African Inventory of Inland Aquatic Ecosystems (SAIIAE), NBA 2018 Rivers and Wetlands (Van Deventer *et al.*, 2019);
- National Freshwater Priority Areas, Rivers and Wetlands, 2011 (Nel *et al.*, 2011); and
- Gauteng Conservation Plan V3.3 (GDARD, 2024).

7.1.1.4.1 The South African Inventory of Inland Aquatic Ecosystems

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the 2018 NBA, the SAIIAE is a collection of spatial data layers that represent the extent of river and inland wetland ecosystem types as well as the pressures on these systems. The same two headline indicators, and their associated categorisations, are applied as with the terrestrial ecosystem NBA, namely Ecosystem Threat Status and Ecosystem Protection Level. The Ecosystem Threat Status of river and wetland ecosystem types are based on the extent to which each ecosystem type had been altered from its natural condition.

7.1.1.4.2 National Freshwater Ecosystem Priority Areas, Rivers and Wetlands

In an attempt to better conserve aquatic ecosystems, South Africa has categorised its inland aquatic systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs). The FEPAs are intended to be conservation support tools, and it is envisioned that they will guide the effective implementation of measures to achieve the National Environment Management: Biodiversity Act's biodiversity conservation goals (Nel *et al.*, 2011).

7.1.1.4.3 Gauteng Conservation Plan

A systematic conservation plan for the Gauteng Province was undertaken by Gauteng Nature Conservation, a division within the Gauteng Department of Agriculture and Rural Development (GDARD). The Gauteng Conservation Plan Version 3.3 (Gauteng C-Plan v3.3) was released in February 2012. It was built on and replaces C-Plan Version 2.1 (2007).

This document provides a technical explanation of the data used, and the systematic conservation planning approach and methodology applied in developing the Gauteng C-Plan v3.3. It is based on the initial technical report (GDARD, 2013).

Gauteng C-Plan v3.3 is based on the systematic conservation planning approach described by Margules & Pressey (2000). The key characteristics of a systematic conservation plan are representation, persistence, quantitative targets, and efficiency and conflict avoidance (DEAT, 2009).

The main aims of Gauteng Conservation Plan Version 3.3 are to:

- Serve as the basis for biodiversity inputs into land use planning processes in the province.
- Serve as the basis for biodiversity inputs into bioregional plans for municipalities within the province.
- Serve as the primary informant for the biodiversity component of the Basic Assessment and Environmental Impact Assessment (EIA) processes.
- Guide protected area expansion and biodiversity stewardship programmes in the province.

7.1.2 Wetland Field Survey

7.1.2.1 Identification and Mapping

The wetland areas were delineated in accordance with the DWAF (2005) guidelines, a cross section is presented in Figure 7-1. The outer edges of the wetland areas were identified by considering the following four specific indicators:

- The Terrain Unit Indicator helps to identify 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 forms (types of soil) found in the landscape were identified using the South African soil classification system namely; Soil Classification: A Taxonomic System for South Africa (Soil Classification Working Group, 1991);
- The Soil Wetness Indicator identifies the morphological "signatures" developed in the soil profile as a result of prolonged and frequent saturation; and
- The Vegetation Indicator identifies hydrophilic vegetation associated with frequently saturated soils.

Vegetation is used as the primary wetland indicator. However, in practise the soil wetness indicator tends to be the most important, and the other three indicators are used in a confirmatory role.

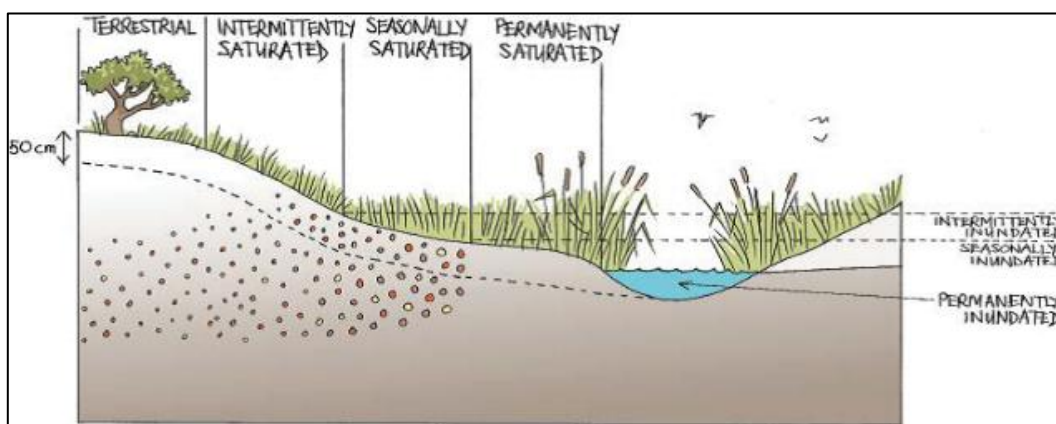


Figure 7-1 Cross section of a wetland, indicating how the soil wetness and vegetation indicators respond to changes in topography (Ollis *et al.* 2013)

7.1.2.2 Delineation

The wetland indicators described above are used to determine the boundaries of the wetlands within the project area. These delineations are then illustrated by means of maps accompanied by descriptions.

7.1.2.3 Classification and Description

The National Wetland Classification Systems (NWCS) developed by the South African National Biodiversity Institute (SANBI) will be considered for this study. This system comprises a hierarchical classification process of defining a wetland based on the principles of the hydrogeomorphic (HGM) approach at higher levels, and then also includes structural features at the lower levels of classification (Ollis *et al.*, 2013).

7.1.3 Risk Screening

A risk screening procedure which considers the general topography of the proposed area in conjunction with the spatial proximity of the natural wetlands to the proposed areas of development was used to determine the 'Risk Status' of the delineated wetlands. Two broad categories are included in the screening process which classify wetlands to be 'At Risk' or 'Not at Risk'.

7.1.4 Wetland Functional and Ecological Assessment

7.1.4.1 Functional Assessment

Wetland Functionality refers to the ability of wetlands to provide healthy conditions for the wide variety of organisms found in wetlands as well as humans. Eco-services serve as the main factor contributing to wetland functionality.

The assessment of the ecosystem services supplied by the identified wetlands was conducted per the guidelines as described in WET-EcoServices (Kotze *et al.*, 2009). An assessment was undertaken that examines and rates the following services according to their degree of importance and the degree to which the services are provided (Table 7-1).

Table 7-1 Classes for determining the likely extent to which a benefit is being supplied

| Score | Rating of likely extent to which a benefit is being supplied |
|-----------|--|
| < 0.5 | Low |
| 0.6 - 1.2 | Moderately Low |
| 1.3 - 2.0 | Intermediate |
| 2.1 - 3.0 | Moderately High |
| > 3.0 | High |

7.1.4.2 Present Ecological Status

The overall approach as described by Macfarlane *et al.*, 2009, is to quantify the impacts of human activity or clearly visible impacts on wetland health, and then to convert the impact scores to a Present Ecological Status (PES) score. This takes the form of assessing the spatial extent of impact of individual activities/occurrences and then separately assessing the intensity of impact of each activity in the affected area. The extent and intensity are then combined to determine an overall magnitude of impact. The Present State categories are provided in Table 7-2.

Table 7-2 The Present Ecological Status categories (Macfarlane *et al.*, 2009)

| Impact Category | Description | Impact Score Range | PES Score (%) | PES |
|-----------------|--|--------------------|---------------|-----|
| None | Unmodified, natural | 0 to 0.9 | 90-100 | A |
| Small | Largely Natural with few modifications. A slight change in ecosystem processes is discernible and a small loss of natural habitats and biota may have taken place. | 1.0 to 1.9 | 80-89 | B |
| Moderate | Moderately Modified. A moderate change in ecosystem processes and loss of natural habitats has taken place, but the natural habitat remains predominantly intact. | 2.0 to 3.9 | 60-79 | C |
| Large | Largely Modified. A large change in ecosystem processes and loss of natural habitat and biota has occurred. | 4.0 to 5.9 | 40-59 | D |
| Serious | Seriously Modified. The change in ecosystem processes and loss of natural habitat and biota is great, but some remaining natural habitat features are still recognizable. | 6.0 to 7.9 | 20-39 | E |
| Critical | Critically Modified. The modifications have reached a critical level, and the ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota. | 8.0 to 10 | 0-19 | F |

7.1.4.3 Ecological Importance and Sensitivity

The importance and sensitivity of water resources is determined in order to establish resources that provide higher than average ecosystem services, biodiversity support functions or are particularly

sensitive to impacts. The mean of the determinants as described by Rountree *et al.*, 2013, is used to assign the Ecological Importance and Sensitivity (EIS) category as listed in Table 7-3.

Table 7-3 Description of Ecological Importance and Sensitivity categories

| EIS Category | Range of Mean | Recommended Ecological Management Class |
|--------------|---------------|---|
| Very High | 3.1 to 4.0 | A |
| High | 2.1 to 3.0 | B |
| Moderate | 1.1 to 2.0 | C |
| Low Marginal | < 1.0 | D |

7.1.4.4 Recommended Ecological Category and Recommended Management Objective

The Recommended Ecological Category (REC) and Recommended Management Objective (RMO) (Table 7-4) was determined based on the results obtained from the PES and EIS of the assessed wetlands, with the objective of recommending how a water resource should be managed. This is achieved by either maintaining or improving the ecological integrity of the wetland in order to ensure continued ecological functionality (DWA, 1999).

Table 7-4 Recommended Ecological Category and Recommended Management Objectives for water resources based on Present Ecological State and Ecological Importance and Sensitivity scores

| | | Ecological Importance and Sensitivity | | | |
|-----|--------------|---------------------------------------|-------------|--------------|--------------|
| | | Very High | High | Moderate | Low |
| PES | A (Pristine) | A Maintain | A Maintain | A Maintain | A Maintain |
| | B (Natural) | A Improve | A/B Improve | B Maintain | B Maintain |
| | C (Good) | A Improve | B/C Improve | C Maintain | C Maintain |
| | D (Fair) | C Improve | C/D Improve | D Maintain | D Maintain |
| | E/F (Poor) | D Improve | E/F Improve | E/F Maintain | E/F Maintain |

7.1.5 Buffer Requirements

The “Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries” (Macfarlane *et al.*, 2014) was used to determine the appropriate buffer zone for the proposed activity.

7.2 Appendix B – Risk Assessment

The Department of Water and Sanitation (DWS) risk matrix assesses impacts in terms of consequence and likelihood. The significance of the impact is rated according to the classes presented in Table 7-5.

Table 7-5 Significance ratings matrix

| Rating | Class | Management Description |
|----------|-------------------|---|
| 1 – 29 | (L) Low Risk | Acceptable as is or with proposed mitigation measures. Impact to watercourses and resource quality small and easily mitigated, or positive. |
| 30 – 60 | (M) Moderate Risk | Risk and impact on watercourses are notable and require mitigation measures on a higher level, which costs more and require specialist input. Licence required. |
| 61 – 100 | (H) High Risk | Watercourse(s) impacts by the activity are such that they impose a long-term threat on a large scale and lowering of the Reserve. Licence required. |

7.3 Appendix C – Specialist Declaration of Independence

Declaration

I, Namitha Singh, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority 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 the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Namitha Singh

Ecologist

The Biodiversity Company

January 2025

Declaration

I, Rowan Buhrmann, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority 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 the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Rowan Buhrmann

Ecologist

The Biodiversity Company

January 2025

7.4 Appendix D – Specialist CVs

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BSc. (Hons) Environmental Science
(Cum Laude) (Pr Sci Nat)



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Email: namitha@thebiodiversitycompany.com

Identity Number: 9509260335089

Date of birth: 26 September 1995

Profile Summary

Working experience in 7 provinces of South Africa.

Specialist experience within construction and development (residential/commercial/mixed-use/solar), wastewater infrastructure and agriculture.

Specialist expertise includes wetland resource management and rehabilitation, estuary and coastal management and, hydroponology.

Areas of Interest

Water Resource Management, Mining, Renewable Energy, Infrastructure Development, Agriculture, Land contamination, Sustainability and Conservation.

Key Experience

- Wetland Delineation and Functional Assessments
- Hydroponology Assessments
- Wetland Rehabilitation
- Coastal and Estuarine Assessments

Country Experience

South Africa

Nationality

South African

Languages

English – Proficient

Afrikaans – Basic

Qualifications

- BSc. Honours – Environmental Science (Cum Laude)
- BSc. Environmental Science and Life Science

Rowan Buhrmann

MSc Biology (Plant Ecophysiology)
Pr Sci Nat (136853)

Cell: +27 78 558 1124

Email: rowan@thebiodiversitycompany.com

Identity Number: 9111085091086

Date of birth: 08 November 1991



Profile Summary

Working experience throughout KwaZulu-Natal (South Africa).

Experience in Environmental Consulting as an EAP (EIAs and WULA).

Environmental Control Officer (ECO).

Specialist expertise in Climate Change (elevated temperatures) and Botany.

Areas of Interest

Aquatic Ecology and Water Resource Management.

Renewable Energy.

Sustainability and Conservation.

Landscape rehabilitation.

Geographic Information Systems.

Experimental Design.

Key Experience

- Environmental Impact Assessments and Water Use Licence Applications
- Vegetation Assessments
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring

Countries worked in

South Africa

Nationality

South African

Languages

English – Proficient

Qualifications

- MSc (University of KwaZulu-Natal) – Plant EcoPhysiology.
- BSc Honours (University of KwaZulu-Natal) – Biology
- BSc (University of KwaZulu-Natal) – Biology
- Certificate of Competence: Wetland WET-Health (V2)
- Pr Sci Nat (136853)



**TERRESTRIAL BIODIVERSITY COMPLIANCE
STATEMENT FOR THE PROPOSED FAR WEST
GOLD RECOVERIES (FWGR) KP2 PIPELINES
PROJECT**

**Rand West City Local Municipality, West Rand
District Municipality, Gauteng Province, South
Africa**

17/03/2025

Prepared by:

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| | |
|--------------------------|---|
| Report Name | TERRESTRIAL BIODIVERSITY COMPLIANCE STATEMENT FOR THE PROPOSED FAR WEST GOLD RECOVERIES (FWGR) KP2 PIPELINES PROJECT |
| Specialist Theme | Terrestrial Biodiversity Compliance Statement |
| Project Reference | FWGR KP2 Pipelines |
| Report Version | Draft 1 / 17/03/2025 |

Environmental Assessment Practitioner



Fieldwork + Report Writer Byron Goris (Cert. Nat. Sci. 170720)

Reviewer Leigh-Ann de Wet (Pri. Sci. Nat. 400233/12)

Declaration

The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.

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1. Introduction

1.1 Background

The Biodiversity Company (TBC) was appointed to undertake a terrestrial biodiversity baseline assessment for the proposed Far West Gold Recoveries KP2 Pipelines Project (the Project). The project is located near Westonaria within the Rand West City Local Municipality (RWLM), West Rand District Municipality, within Gauteng Province, South Africa (Figure 1-1). A 50 m buffer has been demarcated for the project; this area is referred to as the Project Area of Influence (PAOI) (Figure 1-2).

To determine the baseline ecological state of the area and to present a detailed description of the receiving environment, both a desktop assessment, as well as a field survey on the 16th of January 2025 were conducted. Furthermore, the desktop assessment and field survey both involved the detection, identification and description of any locally relevant sensitive receptors and habitats. The way these sensitive features may be affected by the proposed development was also investigated.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations, 2014 (GN R982 of 8 December 2014, as amended in 2017 and 2021) of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998). The approach has taken cognisance of the Government Notice 320 in terms of NEMA dated 20 March 2020 as well as the Government Notice 1150 in terms of NEMA dated 30 October 2020: "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". The National Web based Environmental Screening Tool has characterised the terrestrial biodiversity theme for the area as 'Very High' sensitivity (National Environmental Screening Tool, 2024).

The purpose of conducting the specialist study is to provide relevant input into the Environmental Authorisation application process, with a focus on the proposed activities and their impacts associated with the project. This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Registered Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making as to the ecological viability of the proposed project.

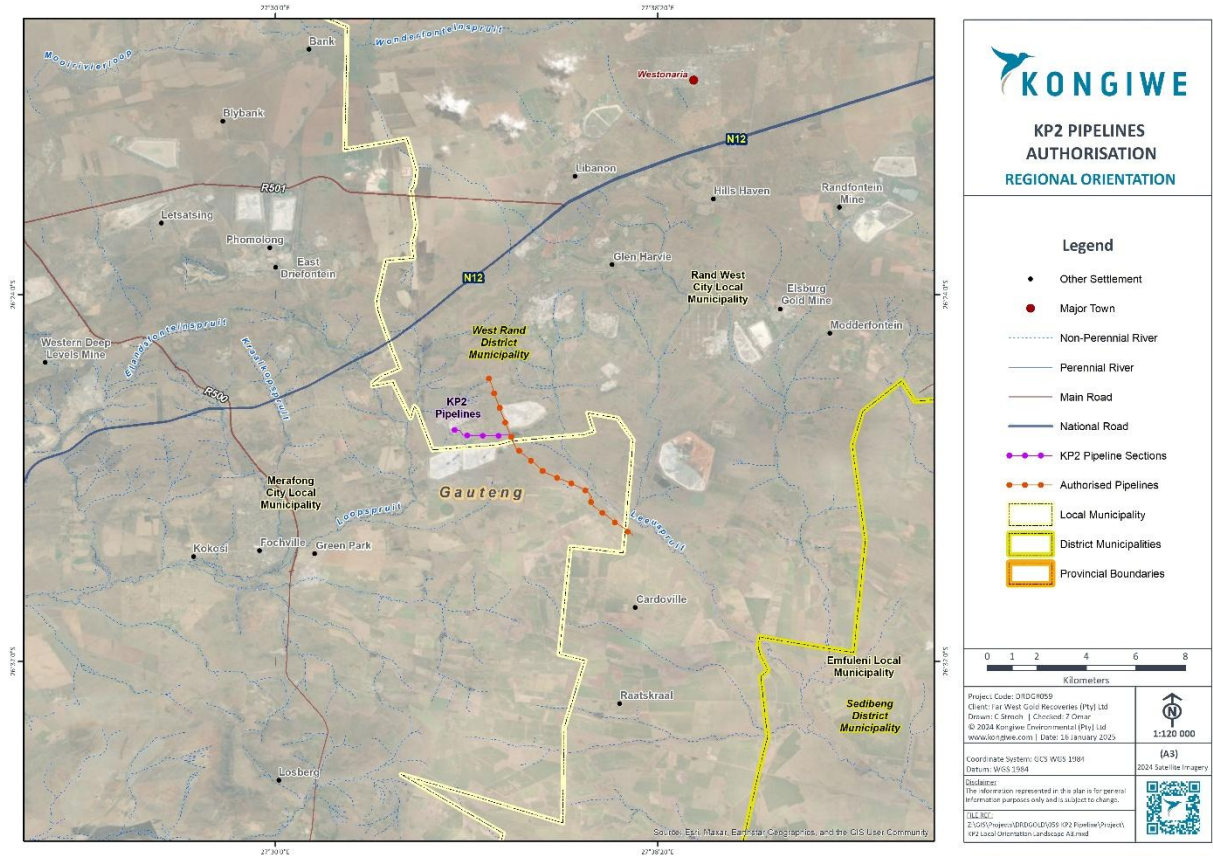


Figure 1-1 Map illustrating the regional context of the PAOI (Kongiwe, 2025)

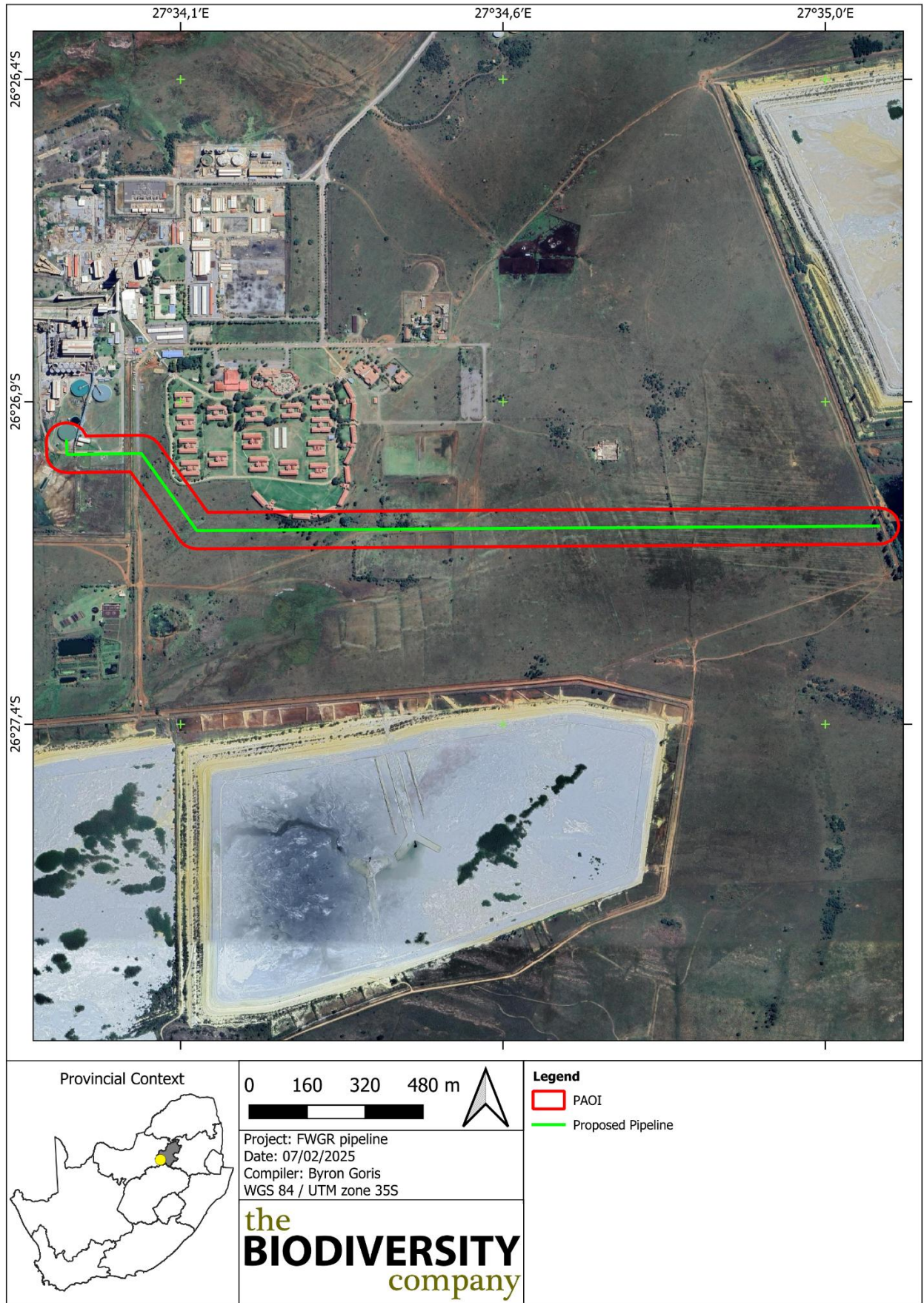


Figure 1-2 Map illustrating the Project Area of Influence (PAOI)

1.2 Project Description

The following information was provided by Kongiwe Environmental (Pty) Ltd (2025) and relates to the details for the KP2 Pipeline Project.

Table 1-1 Project details

| Aspect | Description |
|---|---|
| Project Description | <p>Far West Gold Recoveries (Pty) Limited (hereafter FWGR) has recently received an environmental authorisation (EA) for the optimised pipeline route for FWGR's Tailings Retreatment Projects in the West Rand. It has since been identified that additional water and slurry pipelines are required. These pipelines will tie into the authorised Regional TSF (RTSF) pipelines and run approximately 2.16 km to the Kloof No. 2 Plant.</p> <p>The Proposed Project requires the following authorisations:</p> <ul style="list-style-type: none"> • Environmental Authorisation (EA) in terms of the National Environmental Management Act No. 1998 (Act No. 107 of 1998) (NEMA), which will follow a Basic Assessment (BA) process in terms of the EIA 2014 Regulations, as amended; and • General Authorisation (GA) in terms of the National Water Act (Act No. 36 of 1998) (NWA) for Section 21 (c) and (i) water uses, before it can commence. |
| Locality | <p>The proposed location of the proposed pipeline route is in Westonaria, within Ward 25 of the Rand West Local Municipality (RWLM) as shown in Figure 1-3. The pipelines run southwest of the Kloof No. 2 TSF, and directly south of the Kopanang Hostel.</p> <p>The project area is predominantly surrounded by other TSFs, grasslands, water bodies and bare ground. Please refer to Figure 1-3 for the Proposed Project's locality map.</p> |
| Infrastructure Proposed for the Project | <p>The following infrastructure is proposed:</p> <ul style="list-style-type: none"> • Two process water pipelines of 600 mm in diameter; and • Four overland slurry pipelines of 550 mm in diameter. <p>The proposed pipelines will tie into the authorised RTSF pipeline route and run approximately 2.16 km to the Kloof No.2 Plant.</p> |
| Life of Operation | <p>The life of the Proposed Project is expected to be approximately 30 years.</p> |

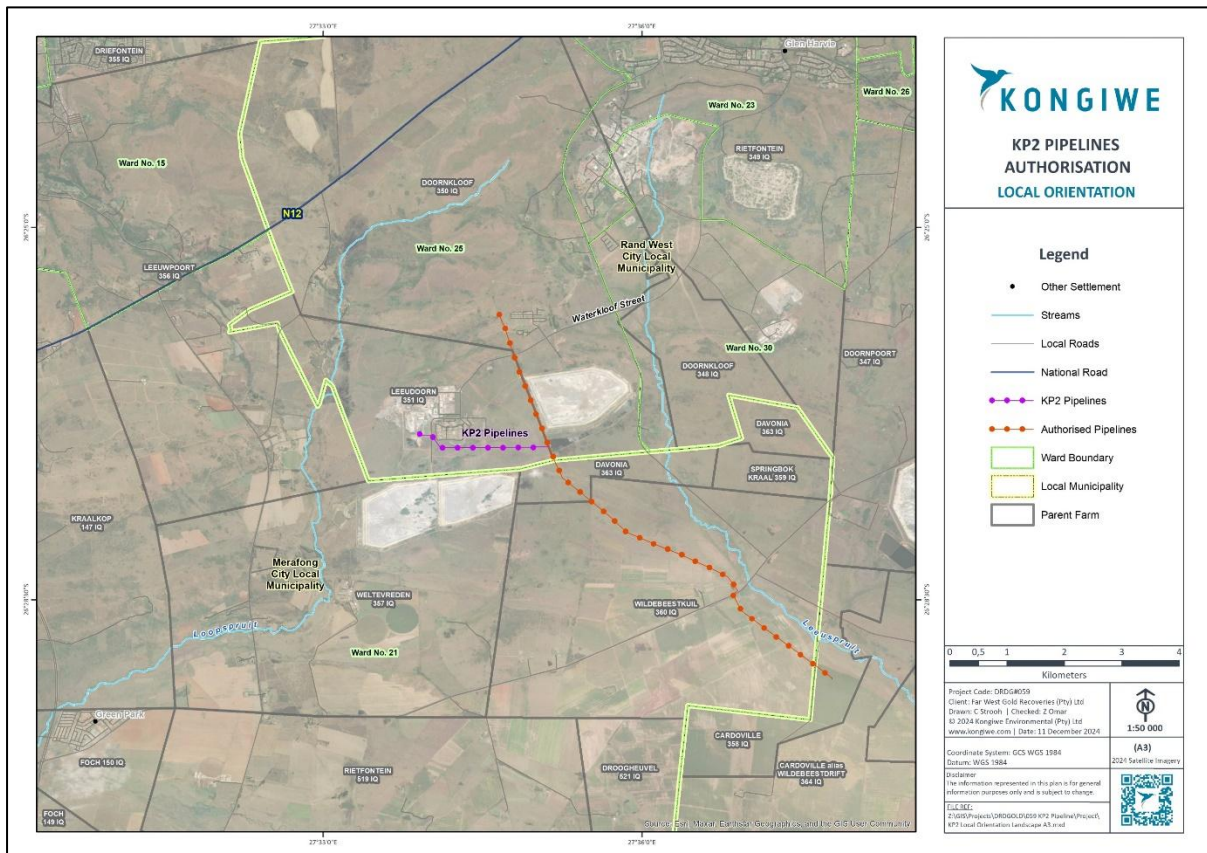


Figure 1-3 Location of the project (Kongiwe, 2025)

1.3 Scope of Work

The aim of the biodiversity assessment was to provide information to guide the risk of the proposed activity to the current state of the associated ecosystems within the development area. This was achieved through the following:

- Desktop assessment to identify the ecologically important features within the landscape comprising of terrestrial features;
- Desktop assessment to identify possible Species of Conservation Concern (SCC) that occur within the landscape;
- Field survey to record flora and fauna species, especially Species of Conservation Concern (SCC);
- Determination of the Site Ecological Importance (SEI), also commonly referred to as sensitivity; and
- The prescription of mitigation measures for identified risks.

1.4 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- It is assumed that all information received from the client and landowner is accurate;
- Apart from the “Pipeline Route” location, no other relevant spatial information in terms of the structure design was provided in relation to the proposed development at the time of survey and report preparation;
- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes;
- The assessment area (PAOI) was based on the footprint areas as provided by the client, and any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment;
- The area was surveyed during a single site visit; therefore, this assessment does not consider temporal trends (note that the data collected is considered sufficient to derive a meaningful baseline);
- The single site visit was conducted during the wet season (summer), and is considered sufficient for this assessment;
- Whilst every effort was made to cover as much of the PAOI as possible, representative sampling was completed, and by its nature it is possible that some plant and animal species that are present within the PAOI were not recorded during the field investigations;
- This report must be considered in conjunction with the accompanying wetland report (TBC, 2025); and

- The GPS used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by up to 5 m.

1.5 Legislative Framework

In line with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity, as per Government Notice 320 published in terms of NEMA, dated 20 March 2020: “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” – section 3, subsection 1:

- An applicant intending to undertake an activity identified in the scope of the protocol, on a site identified on the screening tool as being of 'Very High' sensitivity for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment; however
- Where the information gathered from the site sensitivity verification differs from the designation of 'Very High' terrestrial biodiversity sensitivity on the screening tool and it is found to be of a 'Low' sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted.

The information obtained from a site sensitivity verification, which involved both a desktop assessment as well as a field survey, confirmed that the proposed PAOI is of a 'Low' sensitivity. Therefore, this report constitutes a Terrestrial Biodiversity Compliance Statement.

As per sections 2 and 3 of the protocol discussed above, a Terrestrial Biodiversity Compliance Statement must contain the information as presented in Table 1-2 below.

Table 1-2 *Terrestrial Biodiversity Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report*

| Information to be Included (as per GN 320, 20 March 2020) | Report Section |
|---|----------------|
| Methodology used to undertake the site assessment and survey, and prepare the compliance statement, including relevant equipment and modelling used | 7.1 |
| Description of the assumptions and any uncertainties or gaps in knowledge or data | 1.4 |
| A baseline profile description of biodiversity and ecosystems of the site | 2.1 |
| Site sensitivity verification: Desktop Analysis using satellite imagery and available information | 3.1 |
| A statement on the duration, date and season of the site inspection | 2 |
| Site sensitivity verification: Onsite inspection, include a description of current land use and vegetation found on-site | 3.2 |
| Site sensitivity verification: Photographs/evidence of environmental sensitivity | 3.2/3.4/3.5 |
| Screening tool confirmation/dispute: The assessment must verify the “low” sensitivity of the site, in terms of plant, animal, and terrestrial biodiversity themes | 3.7 |
| Proposed impact management outcomes or monitoring requirements for inclusion in the EMPr | 4 |
| Indicate whether or not the proposed development will have any impact on the terrestrial environment, animals and/or plants | 5 |
| A signed statement of independence by the specialist | 7.3 |
| Specialist details, including a CV | 7.4 |

A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.

2. Fieldwork

2.1 Biodiversity Field Assessment

A single season field survey was undertaken on the 16th of January 2025, which constitutes a wet season survey, to determine the presence of any local SCC and to achieve the delineation of local habitat types and their associated sensitivities. Effort was made to cover all the different habitat types within the PAOI, within the limits of time, access and security. This site visit is considered sufficient for the project (Figure 2-1).

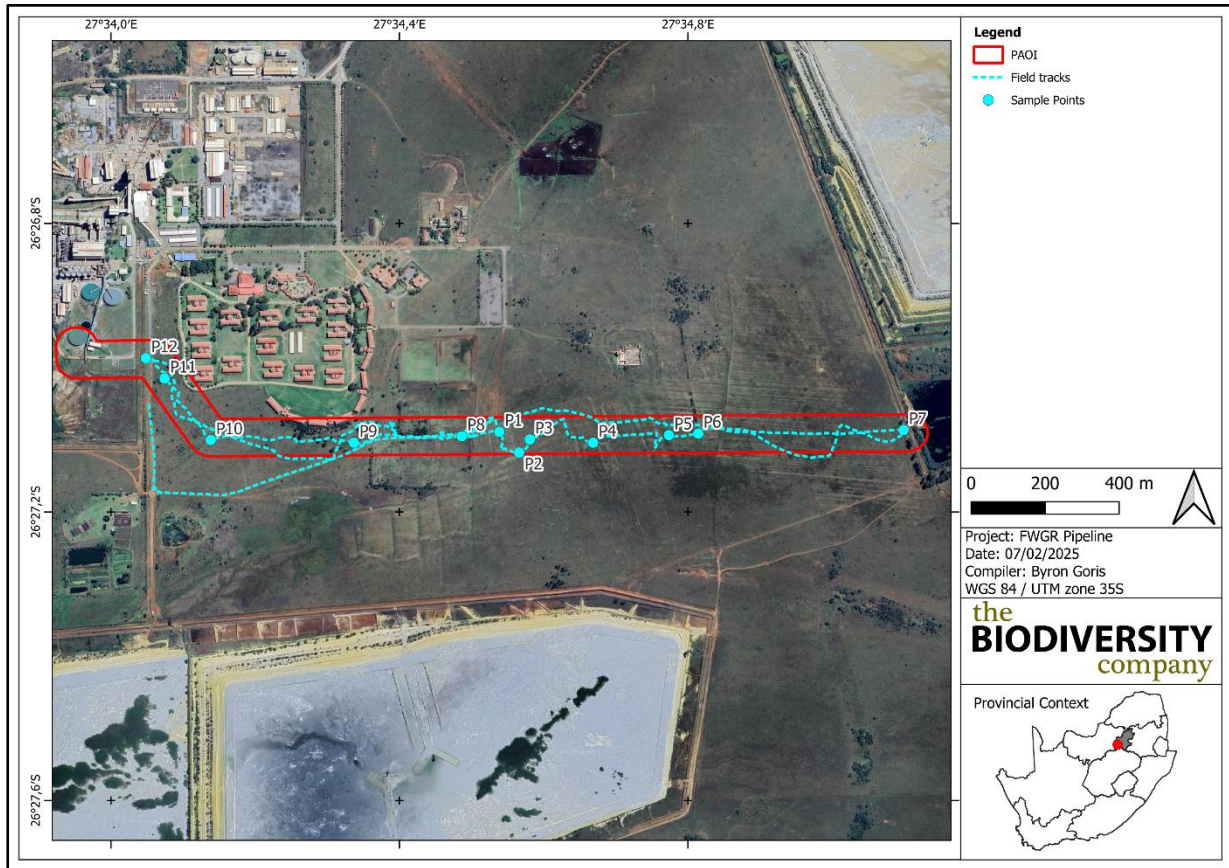


Figure 2-1 Map illustrating the field tracks of the field survey

3. Results & Discussion

3.1 Ecologically Important Landscape Features

Table 3-1 below has been produced as a result of the spatial data collected and analysed as provided by relevant sources. It presents a summative breakdown of the ecological boundaries considered and the associated relevance that each has to the region or PAOI.

Table 3-1 *Summary of relevance of the proposed project to ecologically important landscape features*





| Desktop Information Considered | Relevance | Reasoning |
|---|------------|--|
| Ecosystem Threat Status | Relevant | Overlaps with a 'Vulnerable' Ecosystem – Rand Highveld Grassland (RLE, 2021) |
| Ecosystem Protection Level | Relevant | Overlaps with a 'Poorly Protected' Ecosystem (NBA, 2018) |
| Provincial Conservation Plan | Relevant | Overlaps marginally with Ecological Support Area (ESA) and a CBA: Important Area (CBA 2) |
| SAPAD & SACAD | Irrelevant | Does not overlap with any protected areas |
| Gauteng Ridges | Irrelevant | No overlap with Gauteng Ridges |
| National Protected Areas Expansion Strategy | Irrelevant | No overlap with NPAES Focus Area (NPAES, 2018) |
| Key Biodiversity Area (KBA) | Relevant | Does not overlap with any KBAs, none within 10km. |
| South African Inventory of Inland Aquatic Ecosystems (SAIIAE) | Relevant | PAOI overlaps with SAIIAE wetlands. |
| National Freshwater Priority Area (NFEPA) | Relevant | PAOI overlaps with NFEPA wetlands. |
| Strategic Water Source Area (SWSA) | Irrelevant | PAOI does not overlap with a SWSA. |


3.2 Biodiversity Field Survey

The following sections discuss the results from the field survey that was conducted for the proposed project, which was undertaken on the 16th of January 2025. A selection of sample points is described in Table 3-2.

Table 3-2 Sensitivity summary of the survey points and habitat types delineated within the PAOI

| Survey Point | Description | SEI | Photographs |
|--|---|-----|--|
| | Secondary Grassland | |  |
| Site GPS Reference: P1 to P6 Date: 16/01/2025 GPS Coordinates (P1): 26°27'3.79"S 27°34'31.52"E | Healthy regrowth of indigenous grassveld species, including grasses (<i>Themeda triandra</i> , <i>Eragrostis capensis</i> , <i>Hyparrhenia hirta</i> , and others) as well as herbs, shrubs, and ground-creepers (<i>Helichrysum</i> spp, <i>Hypoxis</i> spp, <i>Ziziphus zeyheriana</i> , <i>Ipomoea ommanneyi</i> , <i>Entada elephantina</i> , <i>Ledebouria luteola</i> , <i>Arctotis</i> spp, <i>Berkheya</i> spp. and more). This recovery has taken place after historic clearing and disturbances from various anthropogenic activities, now offering some opportunities for foraging, grazing, or movement corridors. AIP (alien and invasive plant) species also noted including Pompom weed (<i>Campuloclinium macrocephalum</i>) and Vervain (<i>Verbena incompta</i>). Spoor and burrows found of suspected aardvark (<i>Orycteropus afer</i>) and mongoose (family <i>Herpestidae</i>) species. Termite mounds present indicating improving soil ecology. <i>Aloe davyana</i> (Highveld Spotted Aloe) were also found but these are not included as protected Aloes in Gauteng. | Low |  |
| | Protected flora species noted were <i>Boophone disticha</i> (Poison bulb/Oxbane) and Thicketleaf Gladiolus (<i>Gladiolus crassifolius</i>). No fauna or flora SCC observed, and none expected for the habitat unit. | | |
| | Artificial Water Resource | |  |
| Site GPS Reference: P7 & P9 Date: 16/01/2025 GPS Coordinates (P7): 26°27'3.64"S 27°35'6.84"E | These wetlands have formed in historically dug pits that have evolved into wetland-like ecosystems over time. Despite their development, these artificial wetlands exhibit limited ecological functions and biodiversity. They provide minimal ecosystem services such as water filtration and flood control, and their contribution to habitat provision for aquatic and semi-aquatic species is restricted. | Low | |

| Survey Point | Description | SEI | Photographs |
|---|--|-----------------|---|
| | <p>No fauna or flora SCC observed, and none expected for the habitat unit. More information regarding this habitat unit can be found in the accompanying wetland assessment (TBC, 2025).</p> | |  |
| <p>Site GPS Reference: P10 & P11 Date: 16/01/2025 GPS Coordinates (P11): 26°26'59.14"S 27°34'2.27"E</p> | <p>Degraded Grassland This habitat is severely impacted by anthropogenic activities, including old dumping from construction, edge effects from roads, and other activities. These areas are characterised by significant ecological degradation, with a high prevalence of AIP, naturalised exotic, and encroacher infestations (recorded on site include Pompom weed (<i>Campuloclinium macrocephalum</i>) and Vervain (<i>Verbena incompta</i>)).</p> <p>Loss of indigenous vegetation is evident, exacerbated by mining-associated activities, but some species still present included <i>Searsia spp.</i>, <i>Chironia palustris transvaalensis</i>, <i>Striga elegans</i>, <i>Macladium zeyheri</i>, and others. Human ingress, including walkways and litter, further contributes to the degradation. The proximity to mine infrastructure and abandoned housing adds to the environmental pressures. <i>Aloe davyana</i> (Highveld Spotted Aloe) were also found but these are not included as protected <i>Aloes</i> in Gauteng.</p> | <p>Low</p> |   |
| <p>Site GPS Reference: P8, P12 Date: 16/01/2025 GPS Coordinates (P12): 26°26'57.36"S 27°34'0.65"E</p> | <p>Modified Modified areas included roads, buildings, mining-related facilities, and a <i>Eucalyptus</i> plantation patch. Modified habitat units include all areas that maintain little to no indigenous vegetation and/or where anthropogenic activity has substantially modified an area's primary ecological functions and species composition.</p> | <p>Very Low</p> |  |

| Survey Point | Description | SEI | Photographs |
|--------------|---|-----|--|
| | No fauna or flora SCC observed, and none expected for the habitat unit. | |  |

3.3 Protected species and locations

The appearances (Figure 3-1 and Figure 3-2) and localities (Figure 3-3) of the protected plant species noted during the site assessment are detailed below. Note that this is not exhaustive, and it is highly possible that there are more individuals of each species occurring within the PAOI that were not encountered or may only emerge closer to the time of construction activities commencing.



Figure 3-1 Provincially protected flora *Thickleaf Gladiolus (Gladiolus crassifolius)*.



Figure 3-2 Provincially protected flora *Boophone disticha* (Common oxbane/Poison bulb).

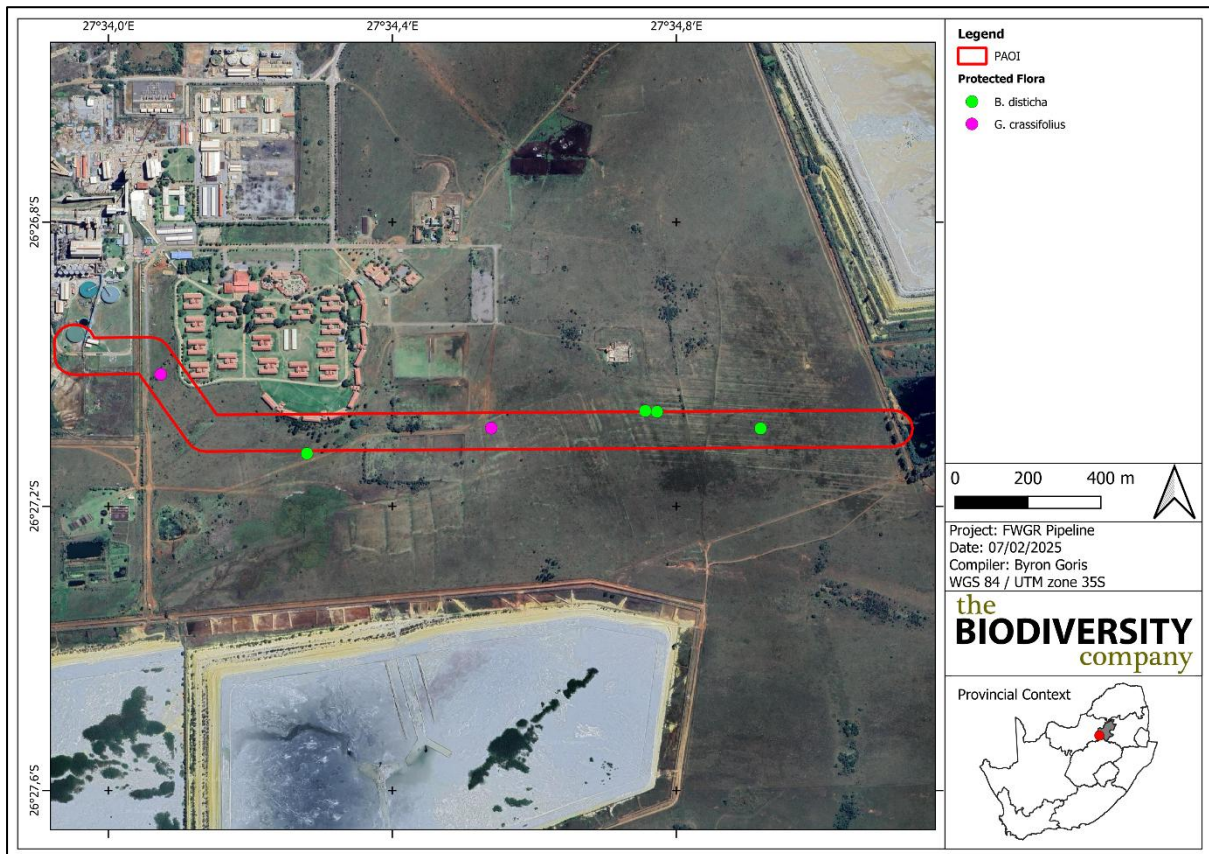


Figure 3-3 Location of the protected flora found during the field survey

3.4 Habitat Assessment

Four (4) main habitat types were identified across the PAOI and include:

- Degraded Grassland;
- Secondary Grassland;
- Artificial Water Resources; and
- Modified areas.

The habitat units for the PAOI can be seen delineated in Figure 3-4 and descriptions of the habitat units can be found in Table 3-3.

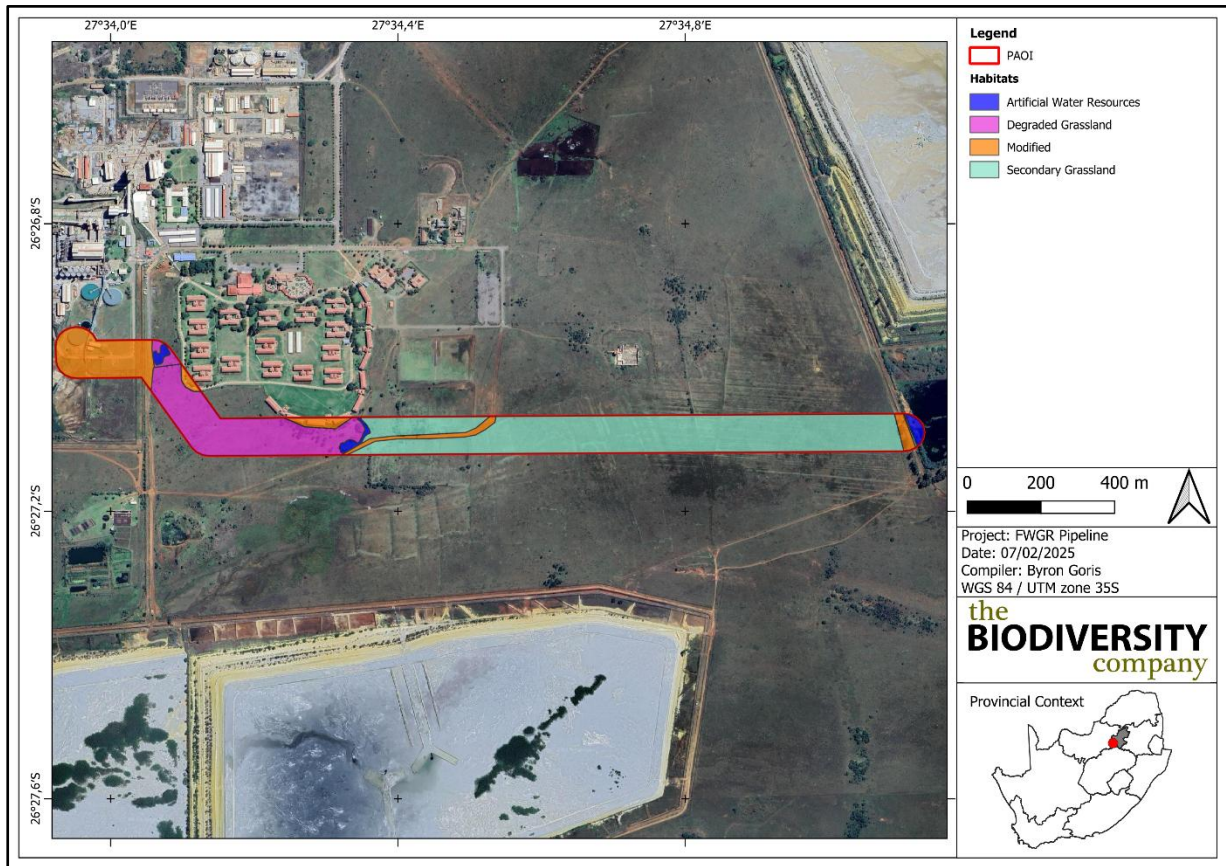


Figure 3-4 Habitats identified within the PAOI

Table 3-3 *Table providing descriptions of the habitat types delineated for the PAOI*

| Habitat | Description and Condition |
|----------------------------|--|
| Secondary Grassland | <p>Developed on land previously subjected to significant agricultural and mining disturbances, this habitat is in a state of recovery. According to satellite imagery these disturbances were created over 10 years ago. It features a mix of indigenous and non-indigenous species, with moderate AIP infestations. The ecological services are improving, providing moderate habitat quality for fauna and flora, with opportunities for foraging and grazing. It acts as a transitional zone, supporting the gradual return of indigenous species and ecological processes. Some indigenous vegetation was recorded, with dominant vegetation included <i>Themeda triandra</i> and <i>Eragrostis curvula</i>, <i>Ledebouria</i> species, <i>Helichrysum</i> species, and <i>Berkheya</i> species.</p> <p>No fauna or flora SCC were observed, and none are expected to be resident in the PAOI. Some fauna SCC may make use of the PAOI for foraging and as a movement corridor. It however no longer fully functions as a CBA nor ESA.</p> |
| Degraded Grassland | <p>This habitat unit is characterised by the presence of indigenous grassland species in areas with high anthropogenic disturbances such as mining-related infrastructure, dumping and a well-used road network.</p> <p>The ecological services provided by this habitat are lowered, with reduced biodiversity and compromised ecosystem functions. It offers some habitat quality for fauna and flora, with few opportunities for foraging, grazing, or movement corridors. Thus, these areas are no longer representative of Rand Highveld Grassland habitat and will not recover fully without active human intervention.</p> <p>No fauna or flora SCC were observed, and none are expected to be resident in the PAOI. Some fauna SCC may make use of the PAOI for foraging and as a movement corridor however, due to current anthropogenic activity this is unlikely.</p> |
| Modified | <p>This habitat unit represents all areas that have been cleared of natural vegetation and/or have had physical modifications made to the landscape, linked to various mining-related activities taking place within the project area. These habitats exist in a state where it cannot recover to a more natural state without human intervention.</p> <p>The ecological services provided by this habitat are limited due to ongoing human activities linked to mining, the removal of natural vegetation, the large number of artificial surfaces, and AIP infestations. Some common faunal species will still use these areas as corridors for movement between habitats, although generally SCCs are not expected for this habitat.</p> |
| Artificial Water Resources | <p>The structure of these wetlands is relatively simple, with a mix of indigenous and non-indigenous plant species, but lacking the complexity and diversity found in natural wetlands. The habitat supports few small faunal species and offers limited feeding and breeding opportunities for avifauna. Due to their artificial origins and low ecological value, these wetlands are assigned a low sensitivity rating. They play a minor role in the landscape's ecological dynamics and are not prioritized for conservation efforts, especially in areas where more valuable natural wetlands are present.</p> <p>No fauna or flora SCC were observed, and none are expected to be resident in the PAOI. Some fauna SCC may make use of the PAOI for foraging and as a movement corridor.</p> <p>Additional information regarding this habitat unit may be found in the accompanying wetland assessment (TBC, 2025).</p> |

3.5 Site Ecological Importance

Based on the criteria provided in Appendix B of this report, all habitats within the PAOI were assigned a sensitivity category, i.e., a SEI category. The PAOI was categorised as possessing habitats with areas ranging from 'Very Low' to 'Low' SEI (Table 3-3 and Figure 3-8). This indicates that the findings of this

assessment are contrary to the Screening Tool with respect to the Combined Terrestrial Biodiversity Theme sensitivity.

Table 3-4 Summary of habitat types delineated within the PAOI

| Habitat Type | Conservation Importance | Functional Integrity | Biodiversity Importance | Receptor Resilience | Site Ecological Importance Guidelines |
|----------------------------------|---|---|-------------------------|---|---------------------------------------|
| Secondary Grassland | Low | Low | Low | Medium | Low |
| | No confirmed or highly likely populations of SCC | Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat | | Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality | |
| Degraded Grassland | Low | Low | Low | Medium | Low |
| | < 50% of receptor contains natural habitat with limited potential to support SCC. | Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat | | Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality | |
| Modified | Low | Very Low | Very Low | High | Very Low |
| | No confirmed or highly likely populations of SCC | Very small (< 1 ha) area. No habitat connectivity except for flying species or flora with wind-dispersed seeds. | | Will recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality | |
| Artificial Water Resource | Low | Low | Low | Medium | Low |
| | No confirmed or highly likely populations of SCC | Several minor and major current negative ecological impacts. | | Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality | |

3.6 Desktop Ecological Sensitivity

The following is deduced from the National Web-based Environmental Screening Tool Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended):

- Terrestrial Biodiversity Theme sensitivity is Very High for the proposed development area, due to it overlapping with Terrestrial ESA 1, and a VU ecosystem (Rand Highveld Grassland) (Figure 3-5);
- Plant Species Theme sensitivity is Medium for the proposed development area due to the possible presence of two (2) medium sensitivity plant species (Figure 3-6); and

- Animal Species Theme sensitivity is Medium for the proposed development area due to the possible presence of six (6) medium sensitivity species – two avifauna, two invertebrates, and two mammals (Figure 3-7).

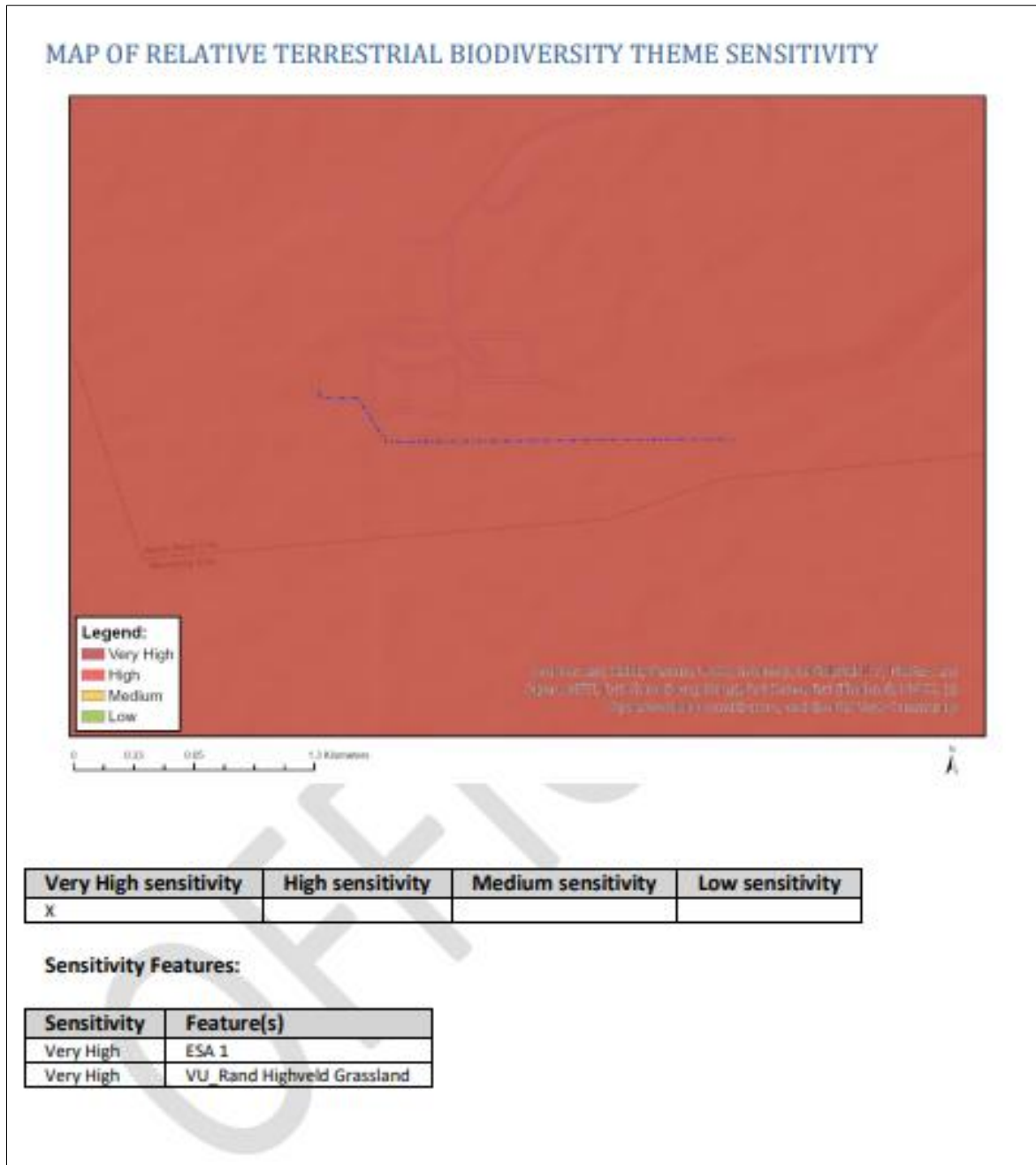
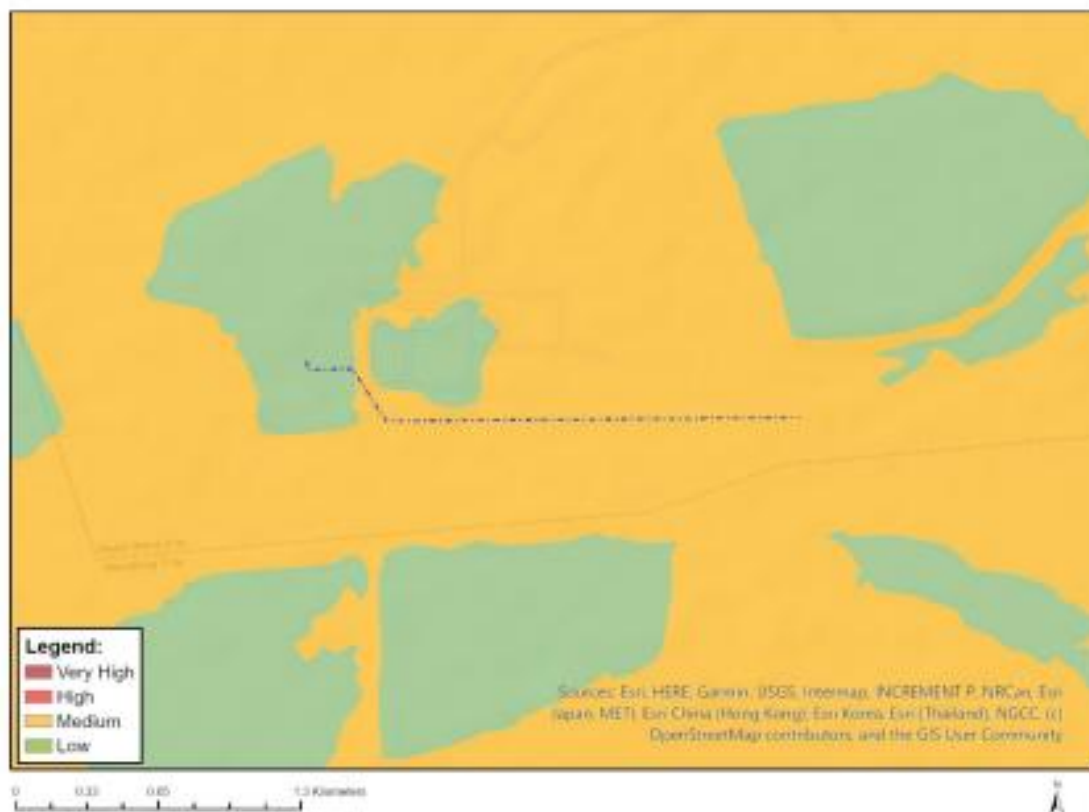


Figure 3-5 Terrestrial Biodiversity Theme Sensitivity

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
| | | X | |

Sensitivity Features:

| Sensitivity | Feature(s) |
|-------------|------------------------|
| Low | Low Sensitivity |
| Medium | Sensitive species 1252 |
| Medium | Sensitive species 691 |

Figure 3-6 Plant Species Theme Sensitivity

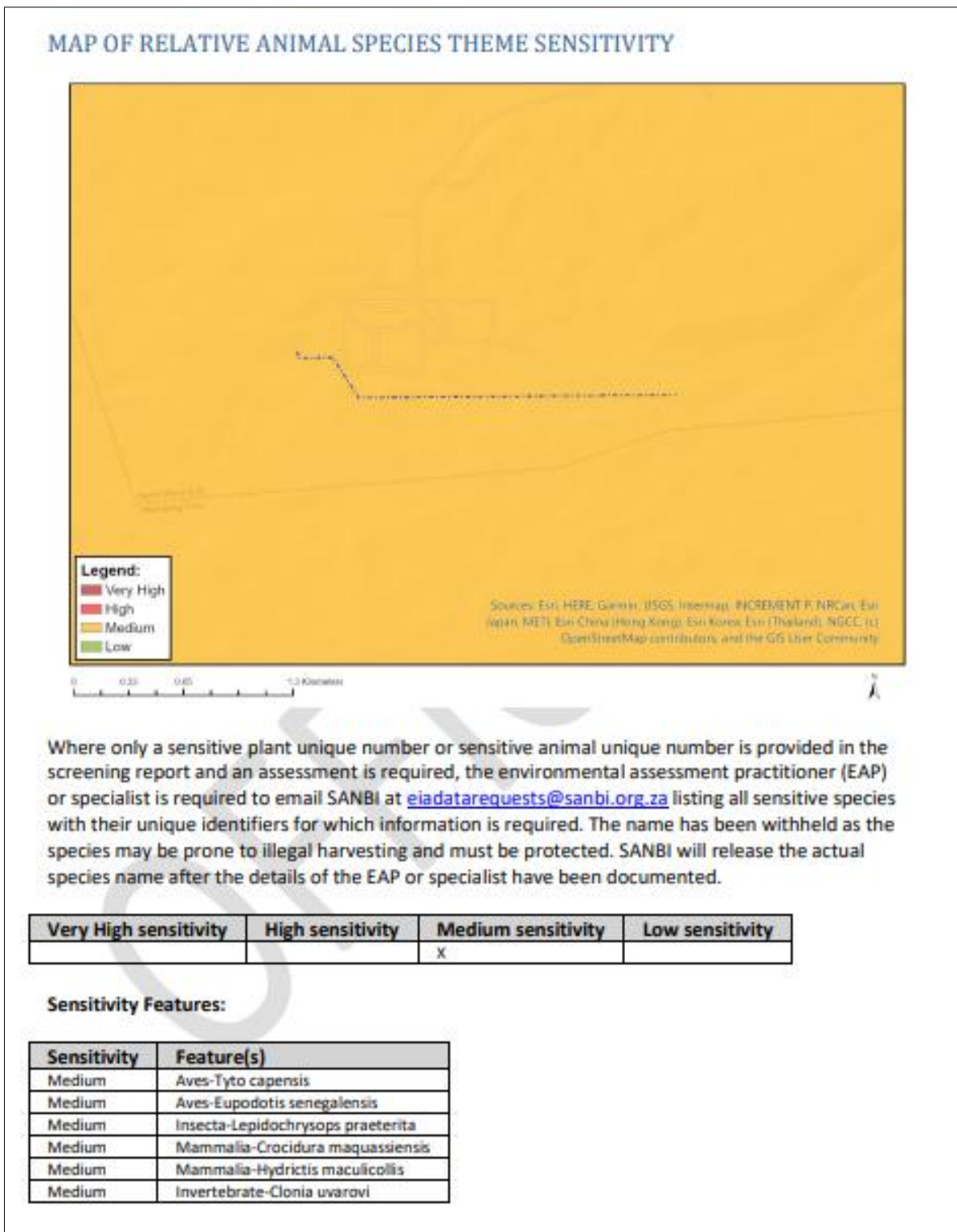


Figure 3-7 Animal Species Theme Sensitivity

3.7 Fauna Species of Conservation Concern

The Screening Tool indicates that five (5) medium sensitivity mammal species, two (2) medium sensitivity invertebrate species, one (1) medium and one (1) high sensitivity avifaunal species could occur in the general area (Table 3-5). The likelihood of occurrence within the PAOI are included here. None have been confirmed for the site during the site assessment and likelihood of occurrence is considered low.

Please note that as per the best practice guideline that accompanies the Animal and Plant Species Protocol for the screening tool, the name of the sensitive species may not appear in the final EIA report nor any of the specialist reports released into the public domain. It should be referred to as sensitive plant or sensitive animal and its threat status may be included, e.g. critically endangered sensitive plant or endangered sensitive animal.

Table 3-5 *Threatened fauna species that are expected to occur within the PAOI. VU = Vulnerable; EN = Endangered*

| Scientific Name | Common Name | Screening Tool Sensitivity | Regional Conservation Status | Likelihood of Occurrence | Reason |
|----------------------------------|-----------------------|----------------------------|------------------------------|--------------------------|---|
| Avifauna | | | | | |
| <i>Tyto capensis</i> | African Grass Owl | Medium | VU | Low | High site disturbance levels (not conducive to suitable habitat) |
| <i>Eupodotis senegalensis</i> | White-bellied korhaan | Medium | VU | Medium | Significant disturbances but suitable grassland present |
| Mammalia | | | | | |
| <i>Crocidura maquassiensis</i> | Makwassie Musk Shrew | Medium | VU | Low | High site disturbance levels (not conducive to suitable habitat) |
| <i>Hydrictis maculicollis</i> | Spotted-necked Otter | Medium | VU | Low | Limited food and lack of suitable habitat availability, high disturbance levels |
| Invertebrates | | | | | |
| <i>Lepidochrysops praeterita</i> | Highveld Blue | Medium | Rare | Low | On-site disturbances; limited suitable food sources |
| <i>Clonia uvarovi</i> | Uvarov's Clonia | Medium | VU | Low | On-site disturbances; Species prefers tall, woodland savannah |

3.8 Flora Species of Conservation Concern

The Screening Tool indicates that two threatened flora species are expected to occur within the PAOI. Furthermore, no flora SCC were observed within the PAOI.

Table 3-6 *Threatened plant species that are expected to occur within the project area*

| Species | Common Name | Conservation Status (Regional) | Screening Tool Sensitivity | Likelihood of Occurrence |
|------------------------|-------------|--------------------------------|----------------------------|---|
| Sensitive species 1252 | NA | VU | Medium | Low (limited suitable habitat & high anthropogenic impacts) |
| Sensitive species 691 | NA | VU | Medium | Low (unsuitable habitat) high anthropogenic impacts) |

3.9 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the overall PAOI in Table 3-7 below. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC species. A map illustrating the overall SEI allocations for the PAOI can be seen in Figure 3-8.

Table 3-7 *Summary of the screening tool vs specialist assigned sensitivities*

| Screening Tool Theme | Screening Tool | Habitat | Specialist | Tool Validated or Disputed by Specialist - Reasoning |
|----------------------|----------------|----------------------------|------------|---|
| Animal Theme | Medium | N/A | Low | Disputed – Habitat exists in a largely impacted and in some sections a degraded state with high levels of anthropogenic disturbances, particularly those associated with the TSF, housing, and other mining-related activities on site, as well as historical land clearing. No SCC observed and unlikely to be resident, although some may use the habitats on site for foraging and as a movement corridor. |
| Plant Theme | Medium | N/A | Low | Disputed – Habitat exists in a largely degraded or modified state with high levels of anthropogenic disturbance, particularly those associated with the TSF on site. High numbers of alien and invasive plants. No SCC observed and unlikely to occur. |
| Terrestrial Theme | Very High | Secondary Grassland | Low | Disputed – This habitat has developed on land previously subjected to significant disturbance (TSF, housing, and other mining-related activities) and is in a state of recovery. While it retains some ecological functions and supports a mix of indigenous and non-indigenous species, the presence of invasive species and edge effects from nearby developments are prevalent. The ecological services are improving, but the habitat quality remains sub-standard. Although it acts as a transitional zone supporting the gradual return of indigenous species, the overall ecological value is reduced compared to more intact grassland types, justifying a lower sensitivity rating. |
| | | Degraded Grassland | Low | The habitat is no longer representative of an ESA or CBA, nor natural Rand Highveld Grassland, but does exhibit some ecological functionality. No SCC noted nor expected. Disputed – This habitat has been exposed to various disturbances, such as mining-related activities, AIP invasions, and dumping – leading to significant ecological degradation. While it still exhibits some natural grassland characteristics and hosts restricted ecological functions, the overall habitat quality is compromised. |
| | | Artificial Water Resources | Low | The limited presence of indigenous vegetation and reduced biodiversity contribute to its low sensitivity rating, reflecting the habitat's diminished capacity to support diverse ecological processes and species. No SCC noted and none are expected. These wetlands have formed in historically dug pits and exhibit limited ecological functions and biodiversity. While they provide minimal ecosystem services, such as water filtration and habitat provision, their contribution to the overall ecological landscape is restricted. |

Due to their artificial origins and low ecological value, these wetlands are appropriately assigned a low sensitivity rating, reflecting their limited role in the landscape's ecological dynamics.

Modified Very Low

Disputed – Habitat has been severely altered by anthropogenic activities with limited ecological functions provided to surrounding ecosystems.

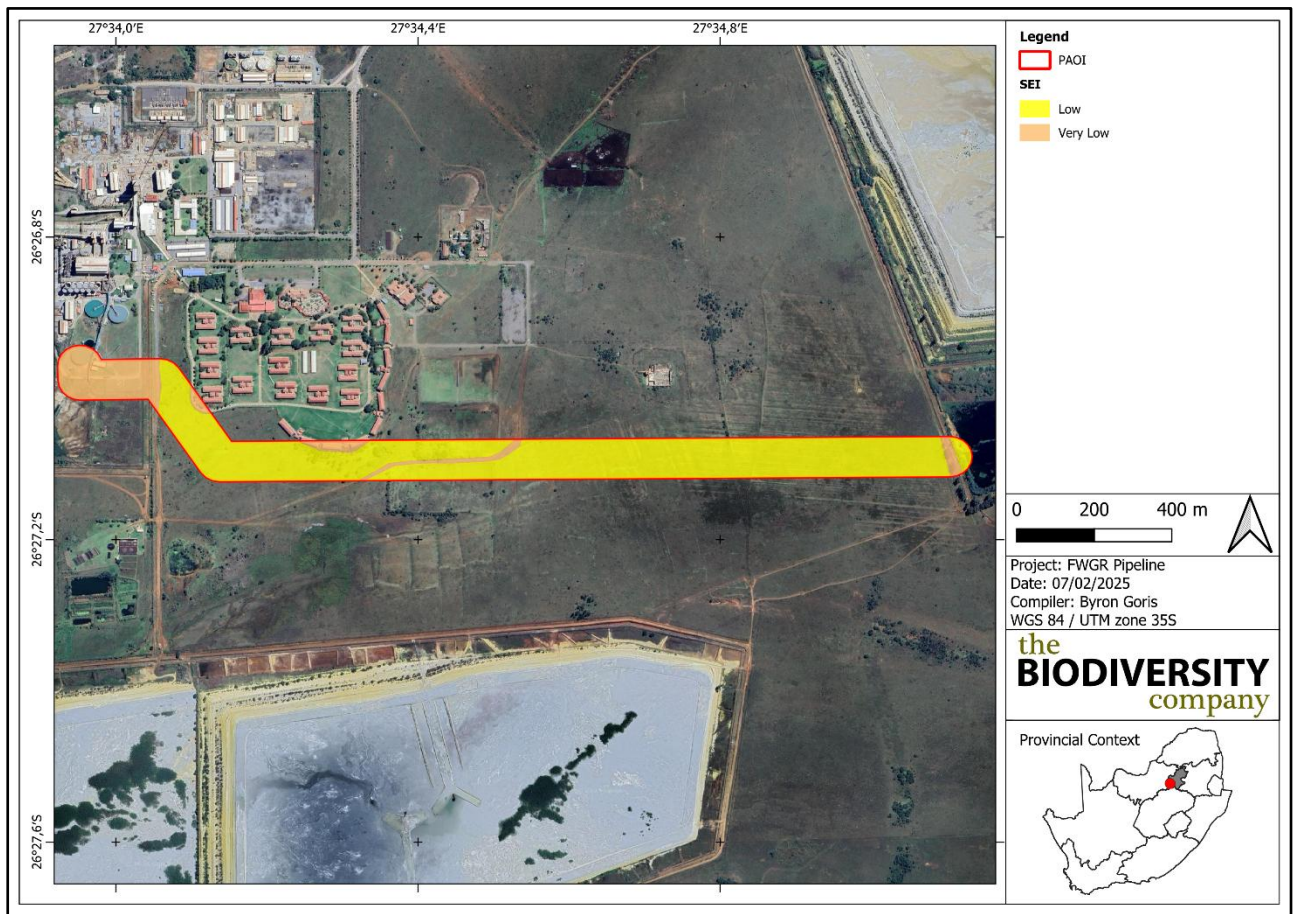


Figure 3-8 Map illustrating the site ecological importance for the PAOI

4. Impact Management and Mitigation Plan

The aim of the management outcomes is to present mitigation actions in such a way that they can be incorporated into the Environmental Management Programme (EMPr), and possible biodiversity management programme, for the project, which should in turn allow for a more successful implementation and auditing of the mitigations and monitoring guidelines. Table 4-1 presents the recommended mitigation measures and the respective time frames, targets, and performance indicators relative to the terrestrial assessment.

The focus of mitigation measures is to reduce the significance of the likely impacts associated with the development, and thereby:

- Prevent the further loss and fragmentation of indigenous vegetation communities within the ecosystem in the vicinity of the PAOI;
- Reduce the negative fragmentation effects of the development and enable the safe movement of fauna species;
- Prevent the direct and indirect loss and disturbance of flora and fauna species and communities, including the negative effects associated with the introduction and proliferation of alien and invasive species; and
- Adequately follow the guidelines for interpreting the Site Ecological Importance ratings assigned to the PAOI.

Table 4-1 *Project specific mitigation measures including requirements for timeframes, roles and responsibilities*

| Management outcome: Vegetation and Habitats | | | | |
|---|------------------------------------|--|---|---|
| Impact Management Actions | Implementation | | Monitoring | |
| | Phase | Responsible Party | Aspect | Frequency |
| Laydown and construction preparation activities must be limited to already modified areas and should take up the smallest footprint possible. | Construction Phase | Project manager, Environmental Officer | Development footprint | Ongoing |
| Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should not be fragmented or disturbed further if possible. | Construction Phase | Project manager, Environmental Officer | Development footprint | Ongoing |
| All vehicles and personnel must make use of existing roads and walking paths as far as possible, especially construction/operational vehicles. | Construction Phase | Project manager, Environmental Officer | Development footprint | Ongoing |
| The clearing of vegetation must be minimised where possible. All activities must be restricted to within the authorised areas. Protected flora species must be relocated away from the development footprint. If these are relocated within the property boundary (not off-site), a permit is not required. | Life of operation | Project manager, Environmental Officer | Areas of indigenous vegetation | Ongoing |
| All laydown, chemical toilets etc. should be restricted to Low and Very Low SEI areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded. | Construction and Operational Phase | Environmental Officer, Design Engineer, and Contractor | Laydown areas and material storage & placement. | Ongoing |
| Areas that are denuded during construction need to be re-vegetated with indigenous vegetation, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by alien invasive plant species. All grazing mammals must be kept out of the areas that have recently been re-planted. | Operational phase | Environmental Officer & Contractor | Assess the state of rehabilitation and encroachment of alien vegetation | Quarterly for up to two years after the closure |
| All footprints to be rehabilitated after construction is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority. | Life of Operation | Environmental Officer & Contractor | Rehabilitation | Quarterly monitoring |
| A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. A plan must be put in place to avoid and manage tailings spillage. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. | Life of operation | Environmental Officer & Contractor | Spill events, Vehicles dripping. | Ongoing |
| <ul style="list-style-type: none"> Drip trays or any form of oil absorbent material must be | | | | |

FWGR KP2 Pipelines

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| <p>placed underneath vehicles/machinery and equipment when not in use.</p> <ul style="list-style-type: none"> No servicing of construction and maintenance equipment/vehicles on site unless necessary. All contaminated soil / yard stone or gravel shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment. Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting the functioning of the ecosystem. All vehicles and equipment must be maintained, and all re-fueling and servicing of equipment is to take place in demarcated areas outside of the PAOI. | | | | |
|--|--|--|--|--|

| | | | | |
|---|-------------------|--|---------------|---------|
| It must be made an offence for any staff member to remove any protected indigenous plant species from the PAOI or bring any alien species in. This is to prevent the spread of exotic or alien species or the illegal collection of plants. | Life of operation | Project manager, Environmental Officer | Any instances | Ongoing |
|---|-------------------|--|---------------|---------|

| | | | | |
|--|--------------------|------------------------------------|--------------------|--------------|
| All construction waste must be removed from site at the closure of the construction phase. | Construction phase | Environmental Officer & Contractor | Construction waste | During Phase |
|--|--------------------|------------------------------------|--------------------|--------------|

| | | | | |
|---|-------------------|--|-----------------------------------|--------|
| Precautions must be taken against the erosion damage that would be caused by unplanned pipe leaks. A leak warning and detection system must be installed. Dense indigenous pioneer grass seeds should also be planted across all bare earth areas to prevent erosion. | Life of operation | Project manager, Environmental Officer | Damaged pipes and unplanned leaks | Weekly |
|---|-------------------|--|-----------------------------------|--------|

Management outcome: Fauna

| Impact Management Actions | Implementation | | Monitoring | |
|---|--------------------------------|--|--|-----------|
| | Phase | Responsible Party | Aspect | Frequency |
| Clearing and disturbance activities must be conducted in a progressive linear manner, always outwards and away from the centre of the PAOI, so as to provide an easy escape route for all small mammals and herpetofauna. | Construction Phase | Environmental Officer & Contractor | Progressive land clearing operations and the movement of fauna | Ongoing |
| The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this. | Construction/Operational Phase | Project manager, Environmental Officer | Infringement into these areas | Ongoing |
| The duration of the activities should be minimised to as short a term as | Construction | Project manager, Environmental | Construction/Closure Phase | Ongoing |

FWGR KP2 Pipelines

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| possible, to reduce the period of disturbance to fauna. | | Officer & Design Engineer | | |
| No trapping, killing, or poisoning of any wildlife is to be allowed and signs must be put up to enforce this. Monitoring must take place in this regard. | Life of operation | Environmental Officer | Evidence of trapping etc | Ongoing |
| Outside lighting (if required) should be designed and limited to minimise impacts on fauna. All outside lighting should be directed away from any sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible. | Construction/Operational Phase | Project manager, Environmental Officer & Design Engineer | Light pollution and period of light | Ongoing |
| All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited. | Life of operation | Health and Safety Officer | Compliance to the training | Ongoing |
| Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons. In this case, activities should take place during the day. | Life of operation | Project manager, Environmental Officer & Design Engineer | Activities should take place during the day | Ongoing |
| If fencing is required: wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area. | Planning and construction | Environmental Officer & Contractor, Engineer | Fauna movement corridor | Ongoing |

Management outcome: Alien Species

| Impact Management Actions | Implementation | | Monitoring | |
|---|--------------------------------|---|---|-------------------|
| | Phase | Responsible Party | Aspect | Responsible Party |
| An Alien Invasive Plant (AIP) Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in AIP composition. | Life of operation | Project manager, Environmental Officer & Contractor | Manage and assess presence and encroachment of alien vegetation | Twice a year |
| The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths. | Construction/Operational Phase | Project manager, Environmental Officer & Contractor | Footprint Area | Life of operation |

Management outcome: Waste Management

| Impact Management Actions | Implementation | | Monitoring | |
|--|-------------------|------------------------------------|---------------|-----------|
| | Phase | Responsible Party | Aspect | Frequency |
| Waste management must be a priority and all waste must be collected and stored effectively and responsibly according to a site-specific waste management plan. Dangerous waste | Life of operation | Environmental Officer & Contractor | Waste Removal | Weekly |

FWGR KP2 Pipelines

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|--|--------------------------------------|---|--|------------------------|
| such as metal wires and glass must only be stored in fully sealed and secure containers, before being moved off site as soon as possible. | | | | |
| Litter, spills, fuels, chemical and human waste in and around the PAOI must be minimised and controlled according to the waste management plan. | Construction & Decommissioning Phase | Environmental Officer & Health and Safety Officer | Presence of Waste | Daily |
| Toilets at the recommended Health and Safety standards must be provided. These should be emptied regularly and once no longer required, they must be pumped dry to prevent leakage into the surrounding environment and removed from site. | Construction & Decommissioning phase | Environmental Officer & Health and Safety Officer | Number of toilets per staff member. Waste levels | Daily |
| The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility. | Construction & Decommissioning phase | Environmental Officer & Health and Safety Officer | Availability of bins and the collection of the waste | Ongoing |
| Any refuse bins provided during construction and decommissioning must be responsibly emptied and secured. | Construction & Decommissioning phase | Environmental Officer, Contractor & Health and Safety Officer | Management of bins and collection of waste | Ongoing, every 10 days |

Management outcome: Environmental Awareness Training

| Impact Management Actions | Implementation | | Monitoring | |
|---|------------------------|--|----------------------------|-----------|
| | Phase | Responsible Party | Aspect | Frequency |
| All personnel and contractors are to undergo basic Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the PAOI to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. | Pre-construction phase | Health and Safety Officer, Environmental Officer | Compliance to the training | Ongoing |

Management outcome: Erosion

| Impact Management Actions | Implementation | | Monitoring | |
|---|-------------------|--|---------------------------------|-----------|
| | Phase | Responsible Party | Aspect | Frequency |
| Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds, where these are not already present. | Life of operation | Project manager, Environmental Officer | Water Runoff from road surfaces | Ongoing |
| Only existing access routes and walking paths may be made use of. | Life of operation | Project manager, Environmental Officer | Routes used within the area | Ongoing |

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|--|-----------------------|--|---|------------------------------------|
| Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc. | Life of operation | Project manager, Environmental Officer | Re-establishment of indigenous vegetation | Progressively |
| A stormwater management plan must be compiled and implemented if necessary. | Life of operation | Project manager, Environmental Officer | Management plan | Before construction phase: Ongoing |
| Management outcome: Pipeline Leak or Spill | | | | |
| Impact Management Actions | Implementation | | Monitoring | |
| | Phase | Responsible Party | Aspect | Frequency |
| Leak detection or any similar monitoring tool must be incorporated to try identifying leaks in the pipeline. Dense indigenous pioneer grass seeds should also be planted across all bare earth areas to prevent erosion. | Life of operation | Environmental Officer, Health and Safety Officer | Detection of leaks | Weekly |

5. Conclusion

The PAOI exists in a predominantly degraded, modified, or otherwise recovering state – owing to previous and current anthropogenic disturbances as well as a low rate of habitat rehabilitation procedures. The PAOI has been subjected to various anthropogenic impacts such as, human and vehicle ingress, invasions and infestations by alien and invasive plants, and the edge effects associated with the nearby mining activities. This habitat is unlikely to recover without human intervention and will continue to degrade further without active rehabilitation.

Prior to any construction activities taking place, it is recommended that a final walkthrough of the pipeline route must be conducted to ensure all protected plant species are noted (in case some arise which were not present during this survey). These must be marked and relocated to a similar habitat nearby which will not be affected by construction activities. Protected flora species must be relocated away from the development footprint and if these are relocated within the property boundary (not off-site), a permit is not required.

Desktop assessments also showed that the PAOI overlapped with the Critical Biodiversity Area (CBA) as well as an Ecological Support Area (ESA) however, the habitats surveyed are no longer representative of an ESA or CBA. Completion of the terrestrial biodiversity assessment led to the dispute of the 'Very High' classification for the terrestrial biodiversity theme sensitivity as allocated by the National Environmental Screening Tool. The PAOI is instead assigned an overall terrestrial sensitivity of 'Low'.

The Animal Species Theme sensitivity is 'Medium' for the PAOI as allocated by the National Environmental Screening Tool, which was disputed and found to be 'Low' due to lack of suitable habitat and high levels of persecution. Plant Species Theme sensitivity is 'Medium' for the project area as allocated by the National Environmental Screening Tool, which was disputed due to a lack of suitable habitat.

5.1 Impact Statement

The location, state and size of the ecosystem suggests that it is unlikely that any functional habitat or SCCs will be lost as a result of the impacts arising from the proposed activities. However, these assumptions pertain to the terrestrial habitat within the PAOI only and the recommendations and mitigations presented in the accompanying freshwater assessment must be strictly adhered to.

5.2 Specialist Opinion

It is the opinion of the specialist that the proposed development is favourable only if all mitigation measures provided in this and other specialist reports are implemented, as well as the following:

- A final site walkthrough must be conducted prior to construction to ensure all protected plant species are marked and relocated to a similar habitat nearby which will not be affected by construction activities (in case some arise which were not present during this survey). Protected flora species must be relocated away from the development footprint and if these are relocated within the property boundary (not off-site), a permit is not required. Any relocations must be conducted while accompanied by an ECO or relevant ecological specialist.
- An alien invasion plant (AIP) management plan must be compiled and implemented; and
- A rehabilitation plan must be compiled and implemented for all areas of the PAOI impacted by the project activities.

6. References

Apps, P. 2000. *Smither's Mammals of Southern Africa – A Field Guide*. Struik Nature, Cape Town.

Bates, M.F., Branch, W.R., Bauer, A.M., Burger, M., Marais, J., Alexander, G.J & de Villiers, M.S. (Eds). 2014. *Atlas and Red List of Reptiles of South Africa, Lesotho and Swaziland. Suricata 1*. South African Biodiversity Institute, Pretoria.

Branch, B. 1998. *Field Guide to Snakes and Other Reptiles of Southern Africa*. Struik Nature, Cape Town.

Department of Forestry, Fisheries and the Environment (DFFE). 2023. SACAD (South Africa Conservation Areas Database) and SAPAD (South Africa Protected Areas Database). <http://egis.environment.gov.za>.

Department of Forestry, Fisheries and the Environment (DFFE). 2022. National Protected Areas Expansion Strategy <http://egis.environment.gov.za>.

Fish, L., Mashau, A.C., Moeaha, M.J. & Nembudani, M.T. 2015. *Identification Guide to Southern African Grasses: An Identification Manual with Keys, Descriptions, and Distributions*. SANBI, Pretoria.

FitzPatrick Institute of African Ornithology. 2024a. MammalMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=MammalMAP>

FitzPatrick Institute of African Ornithology. 2024b. ReptileMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=ReptileMAP>

FitzPatrick Institute of African Ornithology. 2024c. FrogMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=FrogMAP>

Mucina, L. & Rutherford, M.C. (Eds.). 2006. *The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19*. South African National Biodiversity Institute, Pretoria, South African.

Mucina, L., Rutherford, M.C. & Powrie, L.W. (Eds.). 2007. *Vegetation map of South Africa, Lesotho and Swaziland. 1:1 000 000 scale sheet maps. 2nd ed.* South African National Biodiversity Institute, Pretoria.

Mucina, L., Scott-Shaw, CR., Rutherford, MC., Camp., KGT., Matthews, WS., Powrie, LW and Hoare, DB. *Indian Ocean Coastal Belt*. IN Mucina, L. & Rutherford, M.C. (Eds.). 2006. *The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19*. South African National Biodiversity Institute, Pretoria, South African.

National Biodiversity Assessment spatial data. 2018. <http://bgis.sanbi.org/>.

Nel JL, Murray KM, Maherry AM, Petersen CP, Roux DJ, Driver A, Hill L, Van Deventer H, Funke N, Swartz ER, Smith-Adao LB, Mbona N, Downsborough L and Nienaber S. 2011. *Technical Report for the National Freshwater Ecosystem Priority Areas project*. WRC Report No. K5/1801.

NEMBA. 2014. *Government Gazette, Volume 584. No 37320*. www.gpwonline.co.za.

POSA. 2016. *Plants of South Africa - an online checklist. POSA ver. 3.0*. <http://newposa.sanbi.org/>. (Accessed: August 2023).

Raimondo, D., von Staden, L., Foden, W., Victor, J.E., Helme, N.A., Turner, R.C., Kamundi, D.A. and Manyama, P.A. 2009. *Red List of South African Plants. Strelitzia 25*. South African National Biodiversity Institute, Pretoria.

SANBI. 2022. *Red List of South African Plants version 2020*. redlist.sanbi.org

SANBI-BGIS. 2017. *Technical guidelines for CBA Maps: Guidelines for developing a map of Critical Biodiversity Areas & Ecological Support Areas using systematic biodiversity planning*.

SAPAD (South Africa Protected Areas Database) and SACAD (South Africa Conservation Areas Database) (2024). <http://egis.environment.gov.za>

Skinner, J.D. & Chimimba, C.T. 2005. *The Mammals of the Southern African Sub-region*. Cambridge University Press, Cape Town.

Skowno, A.L. & Monyeke, M.S. 2021. *South Africa's Red List of Terrestrial Ecosystems (RLEs)*. *Land*, 10, 1048, 1-14.

FWGR KP2 Pipelines

Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. & Slingsby, J.A. (eds.). 2019. South African National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm. South African National Biodiversity Institute, Pretoria.

Taylor A, Cowell C, Drouilly M, Schulze E, Avenant N, Birss C, Child MF. 2016. A conservation assessment of *Pelea capreolus*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

Taylor, M.R., Peacock, F. & Wanless, R.M. (Eds). 2015. The 2015 Eskom Red Data Book of birds of South Africa, Lesotho and Swaziland. BirdLife South Africa, Johannesburg.

Van Deventer H, Smith-Adao L, Collins NB, Grenfell M, Grundling A, Grundling P-L, Impson D, Job N, Lötter M, Ollis D, Petersen C, Scherman P, Sieben E, Snaddon K, Tererai F. and Van der Colff D. 2019. *South African National Biodiversity Assessment 2018: Technical Report*. Volume 2b: Inland Aquatic (Freshwater) Realm. CSIR report number CSIR/NRE/ECOS/IR/2019/0004/A. South African National Biodiversity Institute, Pretoria. <http://hdl.handle.net/20.500.12143/6230>.

7. Appendix Items

7.1 Appendix A: Methods

7.1.1 Desktop Dataset Assessment

7.1.1.1 Ecologically Important Landscape Features

Existing ecologically relevant data layers were incorporated into a GIS to establish how the proposed development might interact with any ecologically important entities. Emphasis was placed around the following spatial datasets:

- National Biodiversity Assessment 2018 (Skowno *et al*, 2019) - The purpose of the National Biodiversity Assessment (NBA) is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are:
 - Ecosystem Protection Level – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. Not Protected, Poorly Protected or Moderately Protected ecosystem types are collectively referred to as under-protected ecosystems.
 - Red List of Ecosystems (RLE) 2021 – The list was first published in 2011 and has since been substantially revised by authors Dr Andrew Skowno and Mrs Maphale Monyeki (SANBI, 2022). This list is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa by Mucina and Rutherford (2006). A total of 120 of the 456 terrestrial ecosystem types assessed are categorised as threatened and together make up approximately 10% of the remaining natural habitat in the country. Of these 120 ecosystem types, 55 are Critically Endangered (CR), 51 Endangered (EN) and 14 are Vulnerable (VU). The remainder are categorised as Least Concern (LC) (SANBI, 2022; Skowno & Monyeki, 2021).
- Protected areas:
 - South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) (DFFE, 2023a) – The South African Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) contains spatial data for the conservation of South Africa. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. The database is updated on a continuous basis and forms the basis for the Register of Protected Areas which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.
 - National Protected Areas Expansion Strategy (NPAES) (DFFE, 2022b) – The National Protected Area Expansion Strategy (NPAES) provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact

and unfragmented and are therefore, of high importance for biodiversity, climate resilience and freshwater protection.

- Conservation/Biodiversity Sector Plans:

The Gauteng Conservation Plan (Version 4) (GDARD, 2014b) classified areas within the province on the basis of its contribution to reach the conservation targets within the province. These areas are classified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) to ensure sustainability in the long term. The CBAs are classified as either 'Irreplaceable' (must be conserved), or 'Important'.

Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met.

- Gauteng Ridges

The quartzite ridges of Gauteng are one of the most important natural assets in this northern province of South Africa. This is because these ridges, and the areas immediately surrounding them, provide unique habitat for a wide variety of fauna and flora, some of which are Red-Listed, rare or endemic species, or in the case of certain plant species, are found nowhere else in South Africa or around the world.

In order to give practical effect to this policy, the Gauteng Department of Agriculture and Rural Development (GDARD) has classified all ridges in Gauteng into one of four classes, based on the existing extent and percentage of area converted by urban development or disturbed by other human activities. According to GDARD (2019), the ridges within Gauteng may be classified as follows:

- Class 1 Ridges: 5% or less of the ridge area has been transformed by human activity (Approx. 58% of ridges fall within this category);
- Class 2 Ridges: Between 6 and 34% of the ridge area has been transformed by human activity (Approx. 23% of ridges fall within this category);
- Class 3 Ridges: Between 35 and 64% of the ridge area has been transformed by human activity (Approx. 8% of ridges fall within this category); and
- Class 4 Ridges: Over 65% of the ridge area has been transformed by human activity (Approx. 11% of ridges fall within this category).

The 2019 Ridges Guideline has defined general guidelines that must be followed with regard to the amount of development that should be permitted on different ridges according to their class. GDARD (2019) stipulates that no development is to be permitted on any class 1 ridge, and varying levels of development may be permissible with regards to the higher ridge classes – depending on the impact level of the proposed activity and the corresponding spatial scale. Buffers and permitted developments are as follows (GDARD, 2019):

- Class 1 Ridges: Only low impact activities with an ecological footprint of 5% or less in the 200 m buffer zone of the ridge will be supported and no development will be permitted in the ridge itself;

- Class 2 Ridges: Development activities and uses that have a high environmental impact on a Class 2 ridge will not be permitted. Low impact development activities, such as tourism facilities, which comprise of an ecological footprint of 5% or less of the property may be supported (the ecological footprint includes all areas directly impacted on by a development activity, including all paved surfaces, landscaping, property access and service provision). Low impact development activities on a ridge will not be supported where it is feasible to undertake the development on a portion of the property abutting the ridge;
 - Class 3 Ridges: The guidelines for Class 2 ridges will be applied to areas of the ridge that have not been significantly impacted on by human activity. The guidelines for Class 3 ridges will be applied to areas of the ridge that have been significantly impacted on by human activity; and
 - Class 4 Ridges: Further development activities will not be supported in areas of the ridge where the remaining contiguous extent of natural habitat is 4 ha or more.
- Key Biodiversity Areas (KBA, NCG, 2024) – A new set of Key Biodiversity Areas (KBA) specific to South Africa has been identified using the Global Standard for the Identification of Key Biodiversity Areas version 1.2 (IUCN 2016), applied to South African species and ecosystems. KBAs are critical sites that play a vital role in maintaining global biodiversity by serving as essential habitats for species. The identification of KBAs enables governments and civil society to pinpoint key locations crucial for species and their habitats worldwide. This understanding facilitates collaborative efforts to manage and conserve these areas, thereby safeguarding global biological diversity and supporting international biodiversity objectives. Unlike the Important Bird Areas (IBAs), which primarily focus on birds, the KBA framework encompasses a broader spectrum of biodiversity, including mammals, amphibians, plants, and other taxa. BirdLife South Africa (BLSA), in consultation with the KBA National Coordination Group, has opted to retire IBAs and integrate KBAs into its conservation strategy. This strategic shift acknowledges the necessity of investing resources effectively to protect avian and other macroecological elements at the site level within a comprehensive framework of biodiversity conservation; and
 - Freshwater Ecology:
 - Strategic Water Source Areas (SWSAs) (Le Maitre *et al*, 2018) – SWSAs are defined as areas of land that supply a quantity of mean annual surface water runoff in relation to their size and therefore, contribute considerably to the overall water supply of the country. These are key ecological infrastructure assets and the effective protection of surface water SWSAs areas is vital for national security because a lack of water security will compromise national security and human wellbeing.
 - South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al*, 2018) – A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the National Biodiversity Assessment of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types as well as pressures on these systems.
 - National Freshwater Ecosystem Priority Area (NFPEPA) (Nel *et al.*, 2011) – The NFPEPA database provides strategic spatial priorities for conserving the country's freshwater ecosystems and associated biodiversity as well as supporting sustainable use of water resources.

7.2 Appendix B: Terrestrial Site Ecological Importance

The different habitat types within the PAOI were delineated and identified based on observations made during the field survey, and information from available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of SCC and their ecosystem processes.

Site Ecological Importance (SEI) is a function of the Biodiversity Importance (BI) of the receptor (e.g., SCC, the vegetation/fauna community or habitat type present in the Project Area) and Receptor Resilience (RR) (its resilience to impacts).

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor. The criteria for the CI and FI ratings are provided in Table 7-1 and Table 7-2 respectively.

Table 7-1 Summary of Conservation Importance (CI) criteria

| Conservation Importance | Fulfilling Criteria |
|-------------------------|---|
| Very High | Confirmed or highly likely occurrence of Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Extremely Rare or CR species that have a global extent of occurrence (EOO) of < 10 km ² . Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of an EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population). |
| High | Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population). |
| Medium | Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. > 50% of receptor contains natural habitat with potential to support SCC. |
| Low | No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC. |
| Very Low | No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining. |

Table 7-2 Summary of Functional Integrity (FI) criteria

| Functional Integrity | Fulfilling Criteria |
|----------------------|--|
| Very High | Very large (> 100 ha) intact area for any conservation status of ecosystem type or > 5 ha for CR ecosystem types. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches. No or minimal current negative ecological impacts, with no signs of major past disturbance. |
| High | Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN ecosystem types. Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential. |
| Medium | Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential. |
| Low | Small (> 1 ha but < 5 ha) area. Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts. |
| Very Low | Very small (< 1 ha) area. No habitat connectivity except for flying species or flora with wind-dispersed seeds. Several major current negative ecological impacts. |

BI can be derived from a simple matrix of CI and FI as provided in Table 7-3.

Table 7-3 Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)

| Biodiversity Importance | | Conservation Importance | | | | |
|-------------------------|-----------|-------------------------|-----------|----------|----------|----------|
| | | Very High | High | Medium | Low | Very Low |
| Functional Integrity | Very High | Very High | Very High | High | Medium | Low |
| | High | Very High | High | Medium | Medium | Low |
| | Medium | High | Medium | Medium | Low | Very Low |
| | Low | Medium | Medium | Low | Low | Very Low |
| | Very Low | Medium | Low | Very Low | Very Low | Very Low |

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor, as summarised in Table 7-4.

Table 7-4 Summary of Receptor Resilience (RR) criteria

| Resilience | Fulfilling Criteria |
|------------------|---|
| Very High | Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed. |
| High | Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed. |
| Medium | Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed. |
| Low | Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed. |
| Very Low | Habitat that is unable to recover from major impacts, or species that are unlikely to: (i) remain at a site even when a disturbance or impact is occurring, or (ii) return to a site once the disturbance or impact has been removed. |

After the determination of BI and RR, the SEI can be ascertained using the matrix as provided in Table 7-5.

Table 7-5 Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)

| Site Ecological Importance | | Biodiversity Importance | | | | |
|----------------------------|-----------|-------------------------|-----------|----------|----------|----------|
| | | Very High | High | Medium | Low | Very Low |
| Receptor Resilience | Very Low | Very High | Very High | High | Medium | Low |
| | Low | Very High | Very High | High | Medium | Very Low |
| | Medium | Very High | High | Medium | Low | Very Low |
| | High | High | Medium | Low | Very Low | Very Low |
| | Very High | Medium | Low | Very Low | Very Low | Very Low |

Interpretation of the SEI in the context of the proposed project is provided in Table 7-6.

Table 7-6 *Guideline for interpreting Site Ecological Importance in the context of proposed activities*

| Site Ecological Importance | Interpretation in relation to proposed development activities |
|----------------------------|--|
| Very High | Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/not possible (i.e., last remaining populations of species, last remaining good condition patches of ecosystems/unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains. |
| High | Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities. |
| Medium | Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities. |
| Low | Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities. |
| Very Low | Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required. |

The SEI evaluated for each taxon can be combined into a single multi-taxon evaluation of SEI for the assessment area. Either a combination of the maximum SEI for each receptor should be applied, or the SEI may be evaluated only once per receptor but for all necessary taxa simultaneously. For the latter, justification of the SEI for each receptor is based on the criteria that conforms to the highest CI and FI, and the lowest RR across all taxa.

7.3 Appendix C – Specialist Declaration of Independence

I, Byron Goris, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority 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 the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Byron Goris

Terrestrial Ecologist

The Biodiversity Company

February 2025

I, Leigh-Ann de Wet, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority 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 the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Leigh-Ann de Wet

Terrestrial Ecologist

The Biodiversity Company

February 2025

7.4 Appendix D – Specialist CVs

Byron Goris

B.Sc Hons in Global Socio-Ecological Systems Change (Cert. Nat. Sci.)

Cell: +27 81 790 8603

Email: byron@thebiodiversitycompany.com

Identity Number: 9904145161083

Date of birth: 14 April 1999



Profile Summary

Environmental work experience across South Africa (2 years).

Theoretical and practical understanding of methodology in both aquatic, terrestrial, and global change ecology.

General training and experience in aspects of conservation, biogeography, and socio-economic sustainability.

Areas of Interest

Ecological systems approaches, global environmental change, socio-economic sustainability, multi/trans-disciplinarity, sports ecology, traditional medicinal plant science.

Key Experience

- Aquatic, Terrestrial, and Wetland Ecological Assessments
- Environmental Field work and basic field methodology
- Business sustainability
- Sports Ecology Research
- Habitat delineation
- Field work and research

Country Experience

South Africa

Nationality

South African

Languages

English – Proficient
Afrikaans – Basic

Qualifications

- BSc (Hons) Animals, Plants, and Environmental Sciences; University of the Witwatersrand
- BSc Biology, University of the Witwatersrand
- Certificated Natural Scientist (170720)

Leigh-Ann de Wet

M.Sc. Botany (*Pr Sci Nat*)

Cell: +27 83 352 1936

Email: leigh-ann@thebiodiversitycompany.com

Identity Number: 8209010127081

Date of birth: 1 September 1982



Profile Summary

Working experience throughout South Africa, Southern Africa West and Central Africa and also Madagascar.

Specialist experience in exploration, mining, engineering, hydropower, private sector and renewable energy.

Experience with project management for national and international biodiversity projects.

Experience with IFC Performance Standards, Critical Habitat and High Conservation Value Assessments. Experience in numerous vegetation and habitat types throughout Africa,

Specialist expertise includes botany, forest ecology, and terrestrial fauna. Methodology development, conservation management and terrestrial monitoring.

Areas of Interest

Forest ecology and ecosystem functionality.

Ecology and plant identification.

Field methodology.

Publication of scientific journals and articles.

Key Experience

- World Bank, Equator Principles and the International Finance Corporation requirements
- Familiar with High Conservation Value assessments as per ProForest guidelines.
- Conservation Management Plans.
- Flora assessments.
- Terrestrial fauna assessments.
- Monitoring.
- Ecosystem services
- Rehabilitation Plans.
- Alien Invasive Plant Management Plans.
- Permitting.

Country Experience

Mozambique,

Botswana;

Malawi,

Zambia,

Madagascar,

Liberia,

Guinea'

Democratic Republic of the Congo,

South Africa

Nationality

South African

Languages

English – Proficient

Afrikaans – Conversational

Qualifications

- MSc (Rhodes University) – Botany.
- BSc Honours (Rhodes University) – Botany
- BSc Natural Science (Botany and Entomology)
- Pr Sci Nat (400233/12)
- Certificate of Competence: UFS Introduction to wetland delineation.
- Certificate of Competence: UFS Introduction to wetland law
- Certificate of competence: Africa Land Use Training Grass Identification (long and short course)
- Certificate of Competence: ASI Snake Awareness, first aid for snake bite and venomous snake handling.

Signed:

