



Wetland Functional and Impact Assessment for the Mooiplaats Colliery

**Gert Sibande District Municipality, Mpumalanga
Province, South Africa**

16/10/2024

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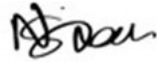
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Declaration	<p>The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, 2017. 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.</p>	

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1 Introduction

1.1 Background

The Biodiversity Company was commissioned by Environmental Impact Management Services (Pty) Ltd to conduct a wetland baseline and impact assessment in support of the Integrated Water Use License Application (IWULA) for the activities of the existing Mooiplaats Colliery near the town Ermelo. Mooiplaats Colliery is located approximately 15km south-east of Ermelo, in Mpumalanga Province, South Africa (Figure 1-1).

A 500 m area was demarcated surrounding the Mooiplaats Colliery footprint and surrounding farm portions which was used for the identification of wetlands and this area is referred to as the project area of influence (PAOI).

This assessment has been completed in accordance with the requirements of the published General 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 appropriate water use authorisation.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations (2014) (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the recently published 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 report, after taking into consideration the findings and recommendation provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making with regards to the ecological viability of the proposed development and related activities.

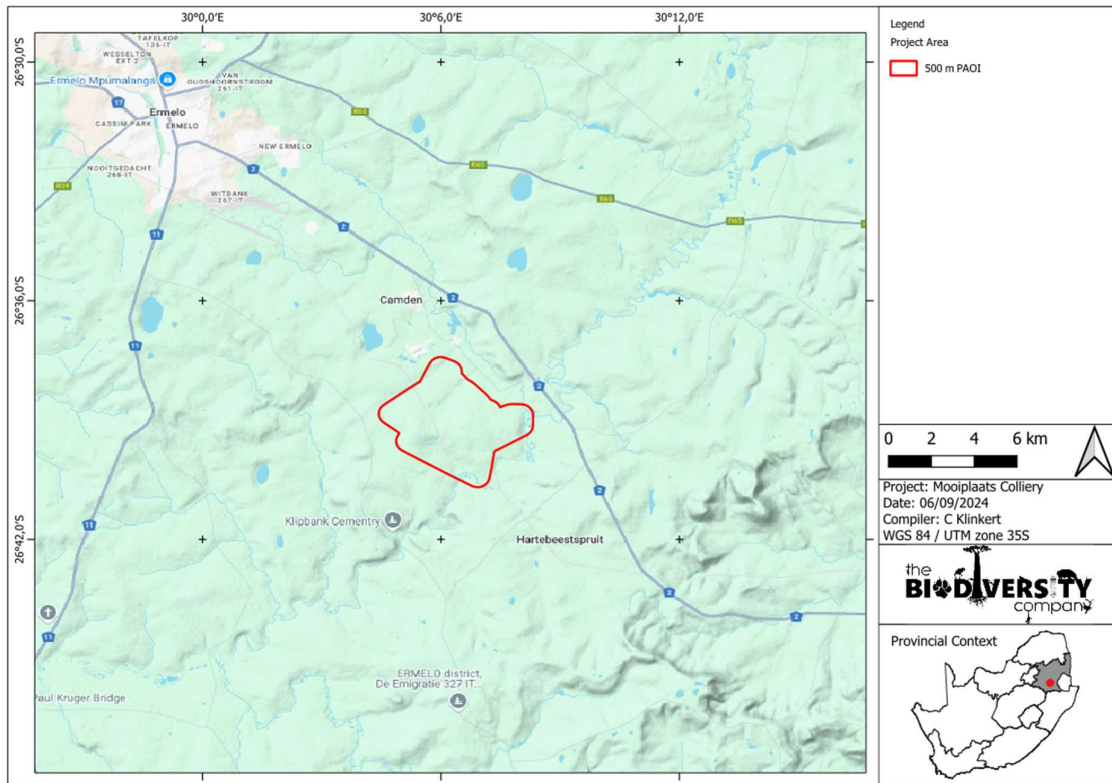


Figure 1-1 Location of Mooiplaats Colliery in relation to surrounding areas

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 colliery and surroundings to indicate potential wetland areas;
- The delineation, classification and assessment of wetlands within 500 m of the Mooiplaats Colliery and surrounding farm portions;
- An identification and assessment of the related impacts of the current operation of the Mooiplaats Colliery through the use of the Risk Assessment (DWS, 2023);
- The provision of recommendations relevant to associated impacts; and
- Report compilation detailing the baseline findings.

1.3 Project Description

Mooiplaats Colliery is an existing coal mining operation. The applicant would like to amend their existing Water Use Licence (WUL) to align the water uses with existing infrastructure and proposed future activities on site. As a main objective, Mooiplaats Colliery is no longer undertaking underground coal mining, and the existing coal beneficiation plant and associated infrastructure is intended to be repurposed for Toll Washing (the processing of third-party supplier coal). Existing and new water uses will be necessary for the intended repurposing of the plant to take effect.

Mooiplaats Colliery is located on Portions 1, 2, 8, 9 and the Remaining Extent of Portion 1 and 9 of the Farm Mooiplaats 290 in the Msukaligwa Local Municipality, Mpumalanga Province. Figure 1-2 shows the project layout, namely the Mooiplaats Colliery, surrounding lands which form part of the project area and the 500 m PAOI.

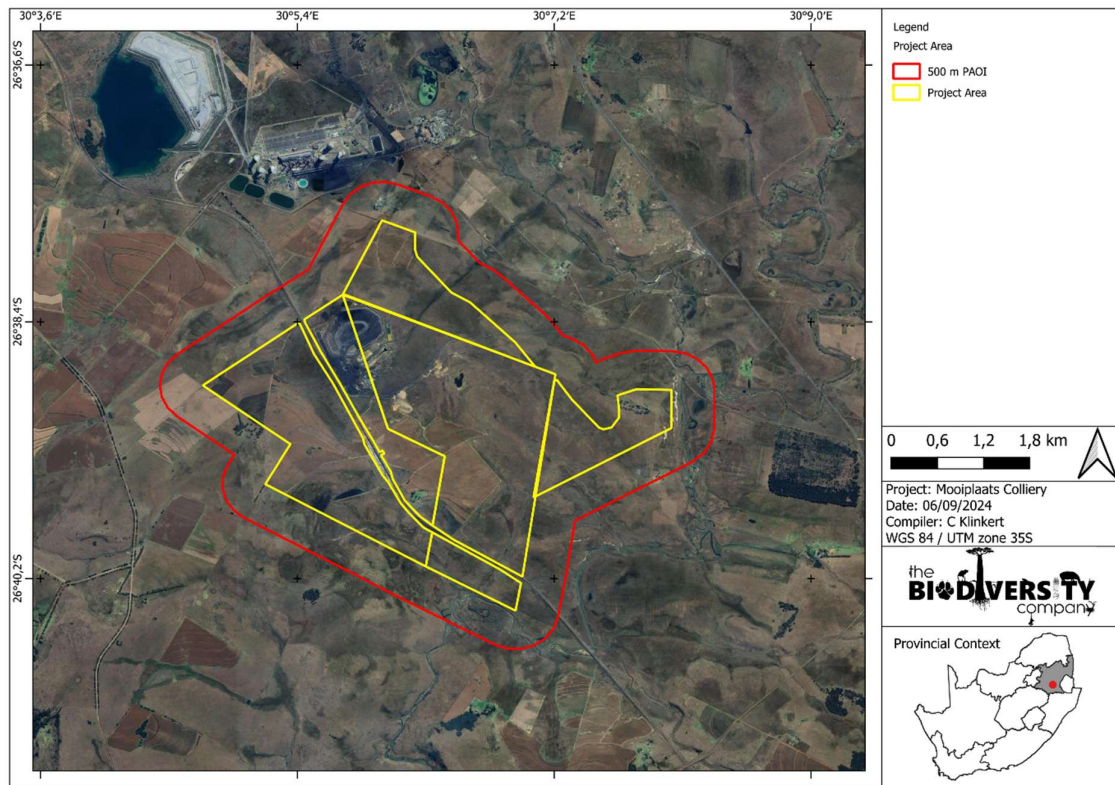


Figure 1-2 The layout of the Mooiplaats Colliery and surrounding farm portions

1.4 Assumptions and Limitations

The following aspects were considered as limitations:

- It has been assumed that the extent of the project area provided to the specialist is accurate;
- Areas characterised by external wetland indicators, such as vegetation and soil indicators to identify wetlands was the focus for this assessment;
- The assessed site was taken to be the 'Preferred' site, as no alternative options were given; and
- The GPS used for water resource delineations is accurate to within five meters. Therefore, the wetland delineation plotted digitally may be offset by a maximum of five meters to either side.

1.5 Key Legislative Requirements

The legislation, policies and guidelines listed below in Table 1-1 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 1-1 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 326, 7 April 2017), 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.
Provincial	NEMBA: Alien and Invasive Species Regulations (2014) (GNR R598, 1 August 2014)	The regulation and management of alien invasive species.
	Conservation of Agricultural Resources Act, 1983 (Act 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.
	Mpumalanga Nature Conservation Act (Act No. 10 of 1998)	To provide for conservation of the naturally sensitive biophysical environment within the province.
	Mpumalanga Conservation Plan (2022)	The spatial designation of conservation areas and targets within the province.

1.6 National Water Act (NWA, 1998)

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 and not just the water itself, and any given water resource constitutes the 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).

1.7 National Environmental Management Act (NEMA, 1998)

The National Environmental Management Act (NEMA) (Act 107 of 1998) and the associated Regulations as amended in April 2017, 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.

1.8 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:
 - “very high sensitivity” for aquatic biodiversity, must submit an Aquatic Biodiversity Specialist Assessment.

An Aquatic / Freshwater Biodiversity Specialist Assessment Report must contain the information as presented in Table 1-2 below.

Table 1-2 Aquatic Biodiversity Specialist Assessment 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
The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of aquatic sciences	7.4
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(s)	7.3
The assessment must be undertaken on the preferred site and within the proposed development footprint	1.3
A baseline description of the aquatic biodiversity and ecosystems on the site, including: aquatic ecosystem types; presence of aquatic species, and composition of aquatic species communities, their habitat, distribution and movement patterns.	3.1.5
The threat status of the ecosystem and species as identified by the screening tool	3.5.1
An indication of the national and provincial priority status of the aquatic ecosystem, including a description of the criteria for the given status (i.e. if the site includes a wetland or a river freshwater ecosystem priority area or sub catchment, a strategic water source area, a priority estuary, whether or not they are free-flowing rivers, wetland clusters, a critical biodiversity or ecologically sensitivity area)	3.1.5
A description of the ecological importance and sensitivity of the aquatic ecosystem including: <ul style="list-style-type: none"> (a) the description (spatially, if possible) of the ecosystem processes that operate in relation to the aquatic ecosystems on and immediately adjacent to the site (e.g., movement of surface and subsurface water, recharge, discharge, sediment transport, etc.); and (b) the historic ecological condition (reference) as well as present ecological state of rivers (in- stream, riparian and floodplain habitat), wetlands and/or estuaries in terms of possible changes to the channel and flow regime (surface and groundwater) 	3.3.4

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The assessment must identify alternative development footprints within the preferred site which would be of a “low” sensitivity as identified by the screening tool and verified through the site sensitivity verification and which were not considered appropriate	-
Related to impacts, a detailed assessment of the potential impacts of the proposed development on the following aspects must be undertaken to answer the following questions: Is the proposed development consistent with maintaining the priority aquatic ecosystem in its current state and according to the stated goal? Is the proposed development consistent with maintaining the resource quality objectives for the aquatic ecosystems present? How will the proposed development impact on fixed and dynamic ecological processes that operate within or across the site? This must include:	4.2
(a) impacts on hydrological functioning at a landscape level and across the site which can arise from changes to flood regimes (e.g. suppression of floods, loss of flood attenuation capacity, unseasonal flooding or destruction of floodplain processes); (b) will the proposed development change the sediment regime of the aquatic ecosystem and its sub-catchment (e.g. sand movement, meandering river mouth or estuary, flooding or sedimentation patterns); (c) what will the extent of the modification in relation to the overall aquatic ecosystem be (e.g. at the source, upstream or downstream portion, in the temporary / seasonal / permanent zone of a wetland, in the riparian zone or within the channel of a watercourse, etc.); and (d) to what extent will the risks associated with water uses and related activities change.	
How will the proposed development impact on the functioning of the aquatic feature? This must include: (a) base flows (e.g., too little or too much water in terms of characteristics and requirements of the system); (b) quantity of water including change in the hydrological regime or hydroperiod of the aquatic ecosystem (e.g., seasonal to temporary or permanent; impact of over -abstraction or instream or off stream impoundment of a wetland or river); (c) change in the hydrogeomorphic typing of the aquatic ecosystem (e.g., change from an unchanneled valley-bottom wetland to a channelled valley -bottom wetland); (d) quality of water (e.g., due to increased sediment load, contamination by chemical and/or organic effluent, and/or eutrophication); (e) fragmentation (e.g., road or pipeline crossing a wetland) and loss of ecological connectivity (lateral and longitudinal); and (f) the loss or degradation of all or part of any unique or important features associated with or within the aquatic ecosystem (e.g., waterfalls, springs, oxbow lakes, meandering or braided channels, peat soils, etc.)	4.2
How will the proposed development impact on key ecosystems regulating and supporting services especially: (a) flood attenuation; (b) streamflow regulation; (c) sediment trapping; (d) phosphate assimilation; (e) nitrate assimilation; (f) toxicant assimilation; (g) erosion control; and (h) carbon storage?	4.2
How will the proposed development impact community composition (numbers and density of species) and integrity (condition, viability, predator-prey ratios, dispersal rates, etc.) of the faunal and vegetation communities inhabiting the site?	-
A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment	2.1
The methodology used to undertake the site inspection and the specialist assessment, including equipment and modelling used, where relevant	7.1
A description of the assumptions made, any uncertainties or gaps in knowledge or data	1.4
The location of areas not suitable for development, which are to be avoided during construction and operation, where relevant	3.4
Additional environmental impacts expected from the proposed development	-
Any direct, indirect and cumulative impacts of the proposed development on site	4.2.1
The degree to which impacts and risks can be mitigated	4
The degree to which the impacts and risks can be reversed	4

The degree to which the impacts and risks can cause loss of irreplaceable resources	4
A suitable construction and operational buffer for the aquatic ecosystem, using the accepted methodologies	3.4
Proposed impact management actions and impact management outcomes for inclusion in the Environmental Management Programme (EMPr)	4
A motivation must be provided if there were development footprints identified as having a "low" aquatic biodiversity sensitivity and that were not considered appropriate	-
A substantiated statement, based on the findings of the specialist assessment, regarding the acceptability or not of the proposed development and if the proposed development should receive approval or not; and	5.2
Any conditions to which this statement is subjected	5.2

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

2 Fieldwork

2.1 Freshwater Biodiversity Field Assessment

A field survey for the area was undertaken on the 4th and 5th of December 2023 (Summer), which constitutes as a wet-season survey, to identify the presence of freshwater features (wetlands) and to delineate their spatial extents. Furthermore, to determine vegetation composition of the identified features and the likelihood of features to be used as habitat for fauna. The seasonality is not considered to be a limiting factor to the assessment of which the results are conclusive.

3 Results & Discussion

3.1 Desktop Dataset Assessment

3.1.1 Vegetation Types

The assessed area is situated within the grassland biome. This biome is centrally located in southern Africa, and adjoins all except the desert, fynbos and succulent Karoo biomes (Mucina and Rutherford, 2006). Major macroclimatic traits that characterise the grassland biome include:

- a) Seasonal precipitation; and
- b) The minimum temperatures in winter (Mucina and Rutherford, 2006).

The grassland biome is found chiefly on the high central plateau of South Africa, and the inland areas of KwaZulu-Natal and the Eastern Cape. The topography is mainly flat and rolling but includes the escarpment itself. Altitude varies from near sea level to 2 850 Meters Above Sea Level (MASL).

Grasslands are dominated by a single layer of grasses. The amount of cover depends on rainfall and the degree of grazing. The grassland biome experiences summer rainfall and dry winters with frost (and fire), which are unfavourable for tree growth. Thus, trees are typically absent, except in a few localized habitats. Geophytes (bulbs) are often abundant. Frosts, fire and grazing maintain the grass dominance and prevent the establishment of trees.

According to Mucina and Rutherford (2006), on a fine scale, the PAOI overlaps with one vegetation type, namely the Eastern Highveld Grassland.

The following information pertaining to the Eastern Highveld Grassland is noted as per Mucina and Rutherford (2006):

- i. Distribution – This vegetation type is distributed in the Gauteng and Mpumalanga provinces, within the plains between Belfast and Johannesburg. This vegetation type also extends to Bethal, the western areas of Piet Retief and Ermelo;
- ii. Altitude – This vegetation type is situated at an altitude of 1 520 to 1 780 MASL;
- iii. Topography and Structure – This vegetation type is characterised by short and dense grasslands that occur in moderately undulating plains which include low hills and pan depressions. Small scattered rocky outcrops are common in this area with wiry, sour grasses accompanied by some woody species which include *Celtis africana*, *Parinari capensis* and, *Protea caffra* etc.;
- iv. Conservation – The conservation target of this vegetation type is 24%. Fragments of this vegetation type are conserved in reserves which among others, include Holkransse, Nooitgedacht Dam and Morgenstond. Approximately half of the distribution of this vegetation has already been transformed through the work of mining, agricultural and urban development activities.

3.1.2 Climate

This region is characterised by a strongly seasonal rainfall, dry winters and a Mean Annual Precipitation (MAP) of approximately 726 mm. The rainfall gradient is relatively uniform across the region. Incidence of frost ranges between 13 to 42 days a year and occurs more abundantly and frequently at higher elevations (Figure 3-1).

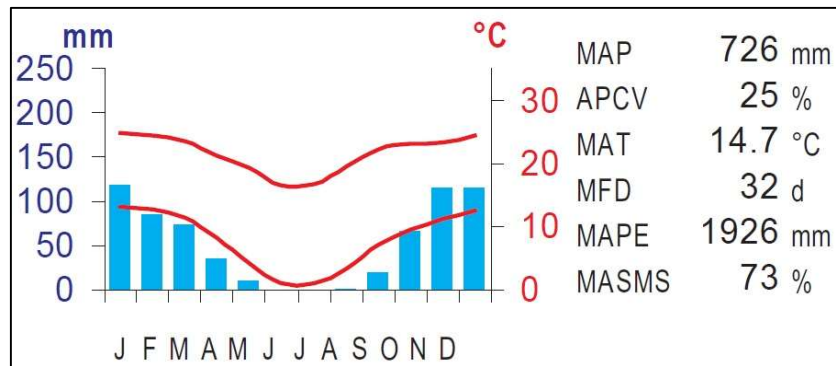


Figure 3-1 *Climate diagram for the Eastern Highveld Grassland vegetation type (Mucina and Rutherford, 2006)*

3.1.3 Soils and Geology

According to Mucina and Rutherford (2006), the geology of this region is characterised by sandstone and shale of the Madzaringwe Formations (Karoo Supergroup). Additionally, red to yellow sandy soils of the Ba and Bb land type are commonly encountered in the area.

According to the land type database (Land Type Survey Staff, 1972 - 2006), the assessed area is characterised predominantly by the Ba51 land type. The Ba51 land type is characterised by plinthic catena with upland duplex where marginalitic soils being rare. Dystrophic and mesotrophic red soils are widespread.

3.1.4 Hydrological Characteristics

The assessed area is situated in the Highveld Ecoregion, within the Vaal Water Management Area (WMA). At a finer scale, the Project Area is located within the C11B quaternary catchment, with large river systems such as Witpuntspruit and Vaal River which overlap with the PAOI. The fine scale hydrological features are presented below.

3.1.4.1 Topographical River Lines and Inland Water Areas

The topographical inland and river line data for the "2630" dataset indicated several inland water areas and drainage lines within the PAOI. Two perennial drainage lines, namely the Vaal River, overlap with the PAOI in the far eastern and southern regions of the PAOI. Additionally, several non-perennial drainage lines were identified throughout the PAOI. These non-perennial drainage lines all lead to the Vaal River. Moreover, the Inland Water Areas dataset indicates three types features namely numerous perennial pans located nearby the Vaal River, one non-perennial pan, and one dam (Figure 3-2).

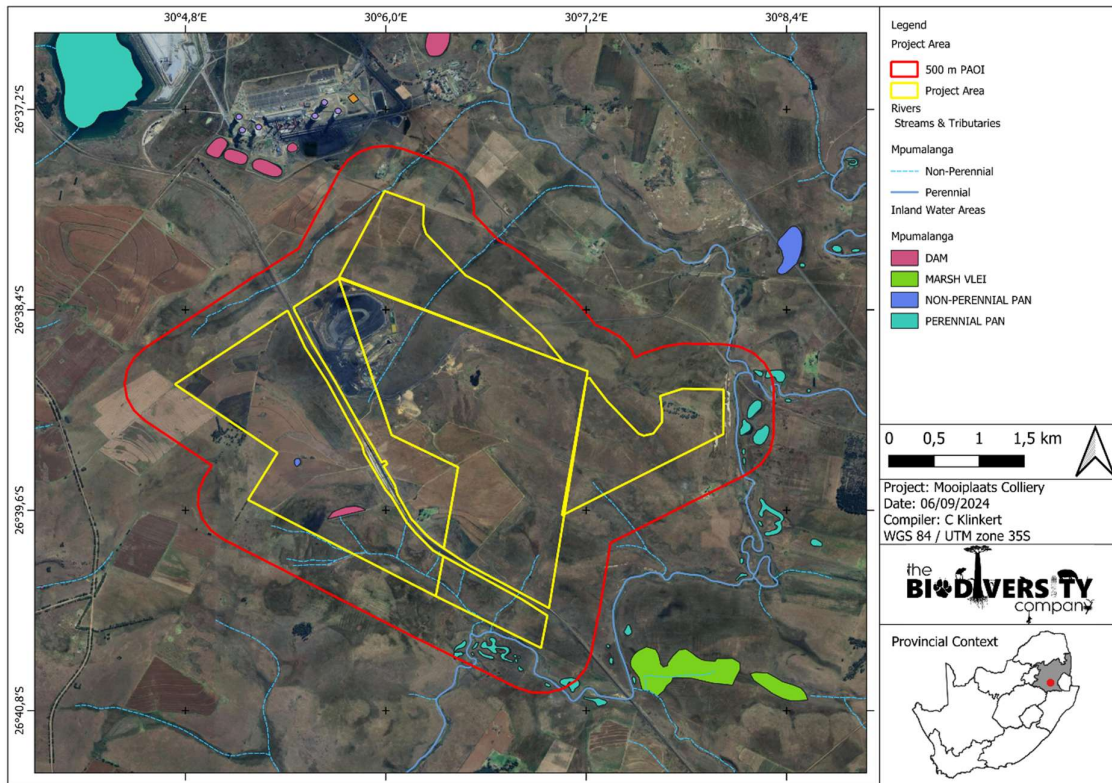


Figure 3-2 Topographical River Lines and Inland Water Areas within the PAOI

3.1.5 Ecologically Important Landscape Features

The GIS analysis pertaining to the relevance of the assessed area to ecologically important landscape features is summarised in Table 3-1.

Table 3-1 Summary of relevance of the assessed area to ecologically important landscape features

Desktop Information Considered	Relevant/Irrelevant	Section
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Relevant – PAOI does overlap with SAIIAE wetlands.	3.1.5.1
National Freshwater Priority Area	Relevant – PAOI does overlap with NFEPA wetlands.	3.1.5.2
Provincial Conservation Plan	Relevant – POAI does overlap with CBAs and ESAs.	3.1.5.3
Mpumalanga Highveld Grassland Wetlands (MPHG)	Relevant – PAOI does overlap with MPHG wetlands.	3.1.5.4
Strategic Water Source Areas	Relevant – PAOI does overlap with a National SWSA.	3.1.5.5

3.1.5.1 South African Inventory of Inland Aquatic Ecosystems

This spatial dataset is part of the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) which was released as part of the National Biodiversity Assessment (NBA 2018). National Wetland Map 5 includes inland wetlands and estuaries, associated with river line data and many other data sets within the South African Inventory of Inland Aquatic Ecosystems (SAIIAE, 2018).

Five wetland types were identified by means of this dataset within the 500 m project area of influence (PAOI), namely channelled valley bottoms; depressions, floodplain wetlands, rivers and seep wetlands. The location of the features coincides with those represented by the National Freshwater Ecosystem

Priority Areas dataset as well as the Mpumalanga Highveld Grasslands wetland dataset, with little variance in the spatial extent of some of the systems. A summary of the identified features is provided in the table below.

Table 3-2 Summary of the features identified through the SAI/AE dataset in relation to the project

Feature	Relation to the Project	Characteristics
Depression	One feature identified;	Condition: AB – Natural to Largely Natural
	<ul style="list-style-type: none"> Features located in the Southwestern Project Area. 	ETS: Least Concern EPL: Poorly Protected
Floodplain Wetland	One feature identified;	Condition: D/E/F - Largely/Seriously/Critically Modified
	<ul style="list-style-type: none"> Feature located in the eastern and southeastern PAOI. 	ETS: Critically Endangered EPL: Not Protected
Channelled Valley-Bottom Wetland	Two features identified;	Condition: AB – Natural to Largely Natural
	<ul style="list-style-type: none"> One feature located in the southeastern PAOI; and 	ETS: Critically Endangered EPL: Not Protected
	One feature identified;	Condition: AB – Natural to Largely Natural
	<ul style="list-style-type: none"> Feature located in the southern Project Area, extending into the southern PAOI. 	ETS: Critically Endangered EPL: Not Protected
Seep Wetland	Eleven features identified;	Condition: C - Moderately Modified for the central wetland and; D/E/F - Largely/Seriously/Critically Modified for the two to the east and west of the central seep.
	<ul style="list-style-type: none"> Three features located in the northern PAOI; 	ETS: Critically Endangered EPL: Poorly Protected
	<ul style="list-style-type: none"> Two features located in the eastern PAOI; 	Condition: A/B/C - Natural/Largely Natural/Moderately Modified ETS: Critically Endangered EPL: Poorly Protected
	<ul style="list-style-type: none"> Five features located in the southeastern Project Area; 	Condition: Ranging from AB – Natural to Largely Natural for the two western-most wetlands; C - Moderately Modified for the central wetland and; D/E/F - Largely/Seriously/Critically Modified for the two eastern-most wetlands ETS: Critically Endangered

EPL: Poorly Protected

Condition: D/E/F -
 Largely/Seriously/Critically Modified

- One feature located in the southern PAOI;

ETS: Critically Endangered

EPL: Poorly Protected

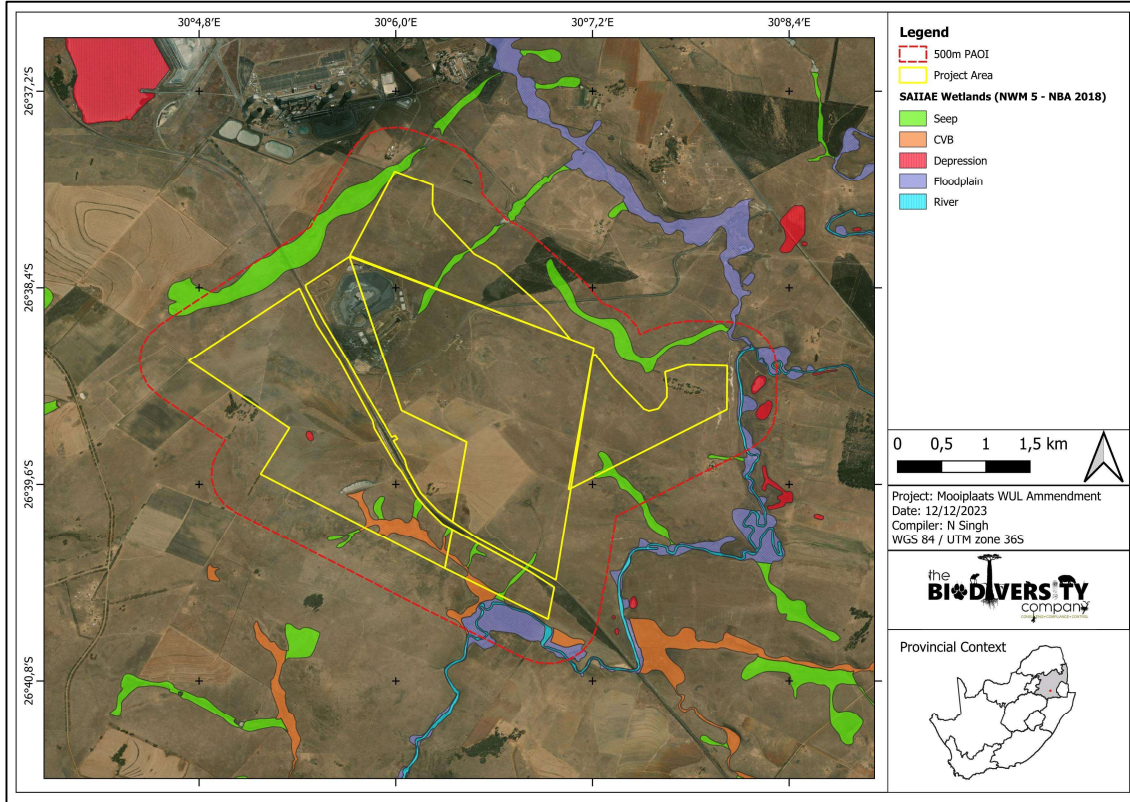


Figure 3-3 Wetland features identified within the project area of influence according to the South African Inventory of Aquatic Ecosystems dataset

3.1.5.2 National Freshwater Ecosystem Priority Areas

According to Nel *et al.* (2011), three wetland types and dams were identified within the Project Area and greater 500 m PAOI. The wetlands were classified as a channelled valley-bottom; seeps and a floodplain wetland (Figure 3-4). A summary of the identified features is provided in Table 3-3. Majority of the identified features have wetland conditions within the “AB” category which are representative of “Natural to Largely Natural” systems. Furthermore, the features fall within the Mesic Highveld Grassland Group 4.

Table 3-3 Summary of the NFEPA wetland features identified in relation to the assessed area

Feature	Relation to the Project
Dam	Four features identified; <ul style="list-style-type: none"> • Two features located in the northern PAOI, and • Two features located in the southern Project Area.

Floodplain Wetland	One feature identified; <ul style="list-style-type: none"> • Feature located in the eastern PAOI.
Channelled Valley-Bottom Wetland	Two features identified; <ul style="list-style-type: none"> • One feature located in the southeastern PAOI; and • One feature located in the southern Project Area, extending into the southern PAOI.
Seep Wetland	Twelve features identified; <ul style="list-style-type: none"> • Two features located in the eastern PAOI. • Six features located in the southeastern Project Area; • One feature located in the southern PAOI; • One feature located in the western PAOI; • One feature located in the northern Project Area, extending in the northern PAOI; and • One feature located in the northern PAOI.

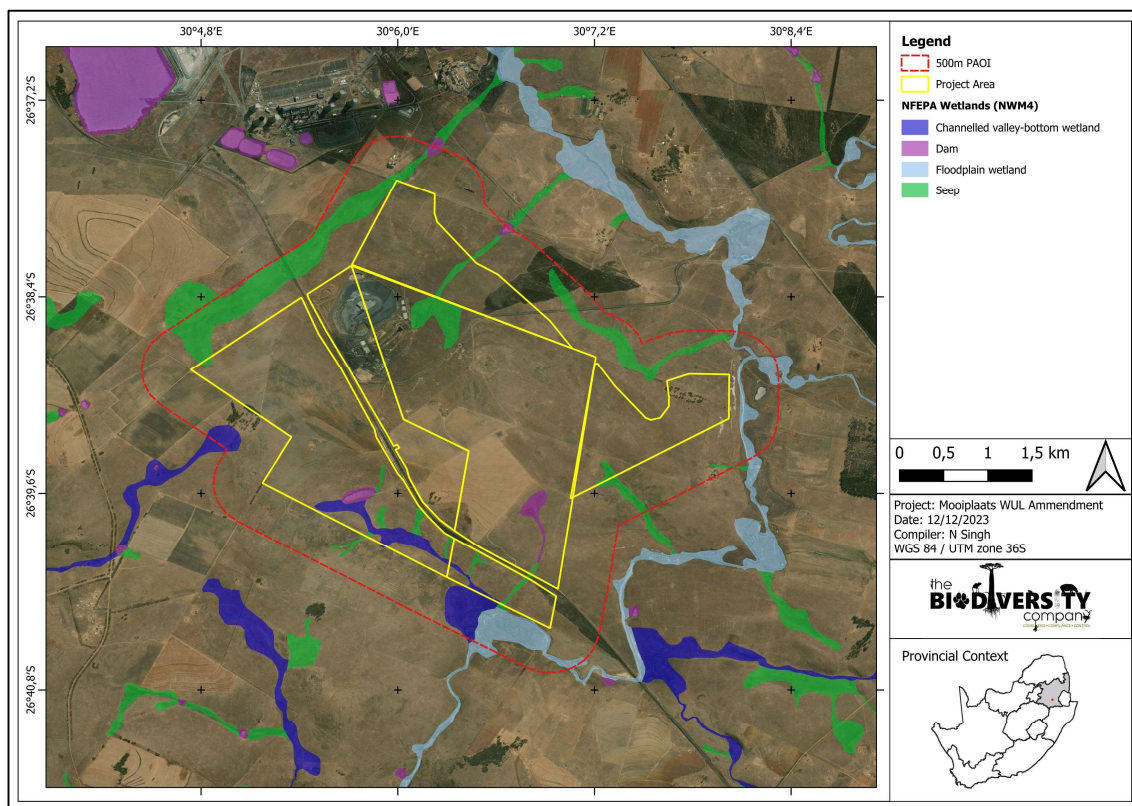


Figure 3-4 NFEPA wetlands within the PAOI

3.1.5.3 Mpumalanga Biodiversity Sector Plan

The Mpumalanga Biodiversity Sector Plan (MBSP) is a spatial tool which serves to provide information to end-users and guide decision making to ensure that the biodiversity objectives are achieved. The MBSP is based on an objective planning approach which considers national and provincial biodiversity targets while trying to avoid conflict with competing land uses.

Both terrestrial and freshwater biodiversity priority areas are identified in the MBSP, either as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs). The CBA and ESA categorised are further sub-categorised as per Figure 3-5 to provide information on the ecosystem type and aspect that it is related to, for instance, “CBA: Aquatic River”. These CBA and ESA areas must be considered and

taken into account in processes that will result in a change in land use and will also form part of the geographic areas in which certain activities will require environmental authorisation in terms of the Environmental Impact Assessment Regulations Listing Notice 3 (Government Notice R985 of 04 December 2014, as amended by Government Notice R324 of 07 April 2017), in terms of the National Environmental Management Act, 1998 (Act 107 of 1998).

A summary of the MBSP categories related to the Project Area have been provided in Table 3-4 and are displayed in Figure 3-6.

MAP CATEGORY	DESCRIPTION	SUB-CATEGORY	DESCRIPTION
Protected Areas	Areas that are formally protected by law and recognised in terms of the Protected Areas Act, including contract protected areas declared through the biodiversity stewardship programme.	National Parks & Nature Reserves	Includes formally proclaimed National Parks, Nature Reserves, Special Nature Reserve, and Forest Nature Reserves.
		Protected Environments: Natural	Includes Protected Environments, declared in terms of Protected Areas Act (Act 57 of 2003, as amended).
		Protected Environments: Modified	Heavily modified areas in formally proclaimed Protected Environments.
Critical Biodiversity Areas (CBA)	All areas required to meet biodiversity pattern and process targets; Critically Endangered ecosystems, critical linkages (corridor pinch-points) to maintain connectivity; CBAs are areas of high biodiversity value that must be maintained in a natural state.	CBA: Irreplaceable	This category includes: (1) Areas required to meet targets and with irreplaceability values of more than 80%; (2) Critical linkages or pinch-points in the landscape that must remain natural; (3) Critically Endangered Ecosystems.
		CBA: Optimal	The CBA Optimal Areas (previously called 'important and necessary' in the MBSP) are the areas optimally located to meet both the various biodiversity targets and other criteria defined in the analysis. Although these areas are not 'irreplaceable' they are the most efficient land configuration to meet all biodiversity targets and design criteria.
Ecological Support Areas (ESA)	Areas that are not essential for meeting targets, but that play an important role in supporting the functioning of CBAs and that deliver important ecosystem services	ESA: Landscape Corridor	The best option to support landscape-scale ecological processes, especially allowing for adaptation to the impacts of climate change.
		ESA: Local Corridor	Finer-scale alternative pathways that build resilience into the corridor network by ensuring connectivity between climate change focal areas, reducing reliance on single landscape-scale corridors.
		ESA: Species Specific	Areas required for the persistence of particular species. Although these may be production landscapes, a change in land-use may result in loss of this species from the area. (Only one species-specific ESA was included in the analysis — an over-wintering site for blue cranes).
		ESA: Protected Area Buffers	Areas surrounding protected areas that moderate the impacts of undesirable land-uses that may affect the ecological functioning or tourism potential of PAs. Buffer distance varies according to reserve status: National Parks — 10 km; Nature Reserves — 5 km buffer; Protected Environments — 1 km buffer.
Other Natural Areas (ONA)	Areas that have not been identified as a priority in the current systematic biodiversity plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructural functions.		
Moderately or Heavily Modified Areas	Areas in which significant or complete loss of natural habitat and ecological function has taken place due to activities such as ploughing, hardening of surfaces, open-cast mining, cultivation and so on.	Heavily Modified	All areas currently modified to such an extent that any valuable biodiversity and ecological functions have been lost.
		Moderately Modified: Old lands	Old cultivated lands that have been allowed to recover (within the last 80 years), and support some natural vegetation. Although biodiversity pattern and ecological functioning may have been compromised, the areas may still play a role in supporting biodiversity and providing ecosystem services.

Figure 3-5 Description of the categories and sub-categories represented within the Mpumalanga Biodiversity Sector Plan

Table 3-4 Summary of the MBSP features identified within the assessed area

MBSP Feature	Relation to Project
Heavily Modified	Overlaps with areas within the central Project Area, eastern PAOI and southern PAOI.
Other Natural Areas	Overlaps with areas in the central to northern Project Area and PAOI.
ESA: Strategic Water Source Area	Overlaps with PAOI (Upper Vaal).
ESA: Wetlands	Overlaps with areas in the southern and southeastern Project Area and PAOI. Overlaps with areas in the western, northern, northeastern, and eastern PAOI.
ESA: Wetland Clusters	Overlaps with areas in the southeastern PAOI.
ESA: Important Sub-catchments	Overlaps with areas in the southern and eastern Project Area and PAOI.

Critical Biodiversity Area: Aquatic Rivers	Overlaps with the northeastern and southeastern PAOI (Vaal River).
Protected Area: Wetlands	Overlaps with areas in the southern and southeastern PAOI (Vaal River Floodplain/embankment).
Dams	Overlaps with areas in the southern Project Area.

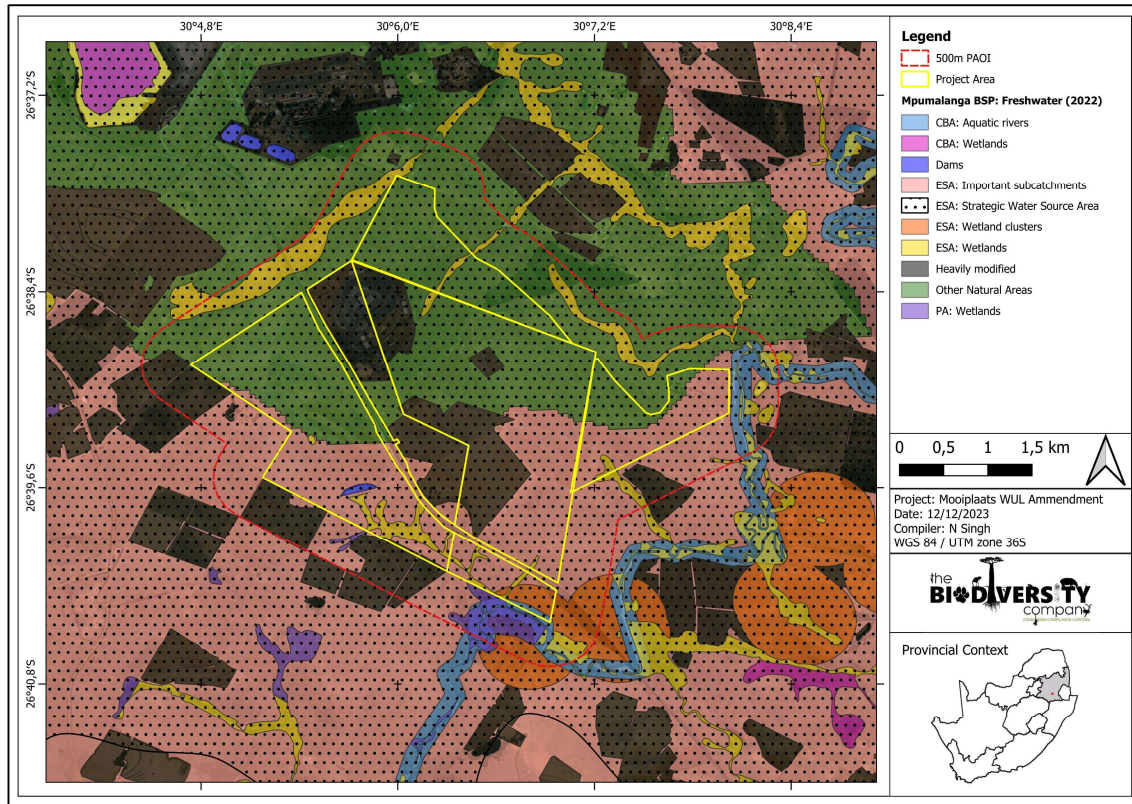


Figure 3-6 Areas of conservation importance within the project area of influence as per the Mpumalanga Biodiversity Sector Plan for Freshwater (2022)

3.1.5.4 Mpumalanga Highveld Grassland Wetlands

The Mpumalanga Highveld Grassland (MPHG) wetland dataset is an outcome of SANBI that aims to refine the wetland delineations of the province. The delineations were based on tracking wetlands on Spot 5 imagery, supported by google earth, 1:50 000 contour lines, 1:50 000 river lines, exigent data, and NFEPA wetlands.

These features spatially coincide with the delineations identified through the NFEPA dataset (Figure 3-7).

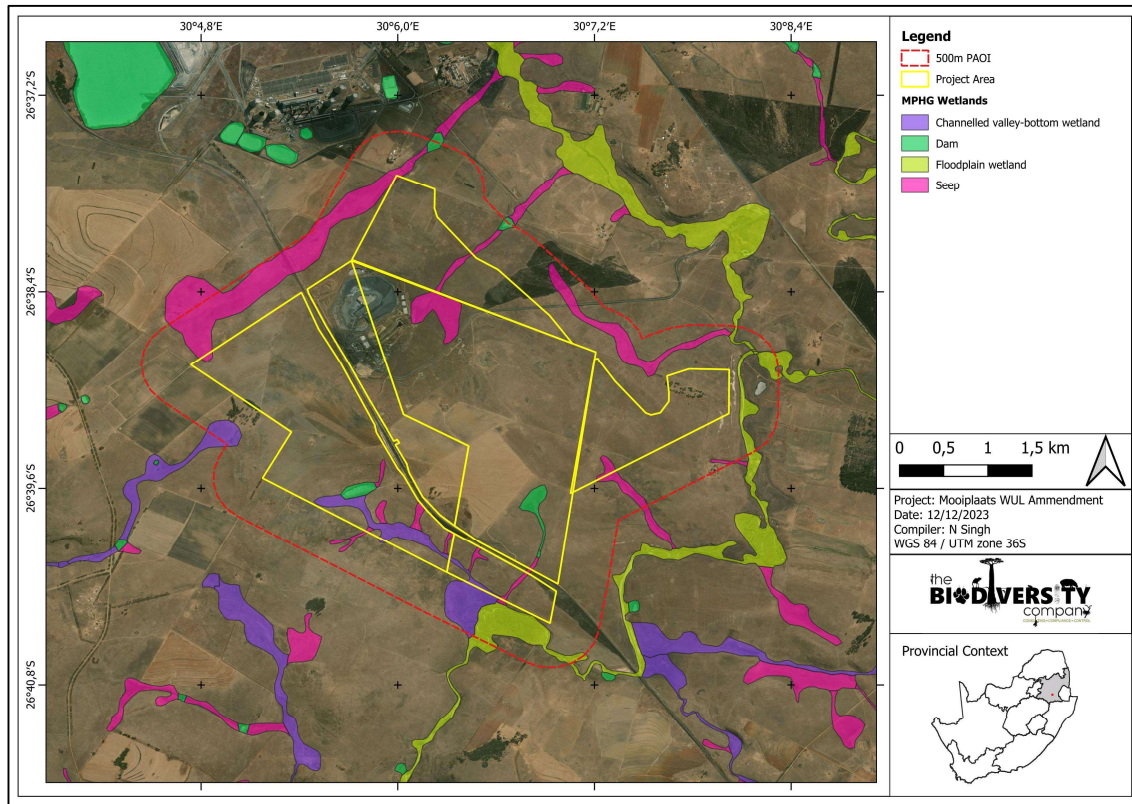


Figure 3-7 Wetlands identified in the project area of influence as per the Mpumalanga Highveld Grassland dataset

3.1.5.5 Strategic Water Source Areas

The PAOI overlaps with the Upper Vaal National Strategic Water Source Area.

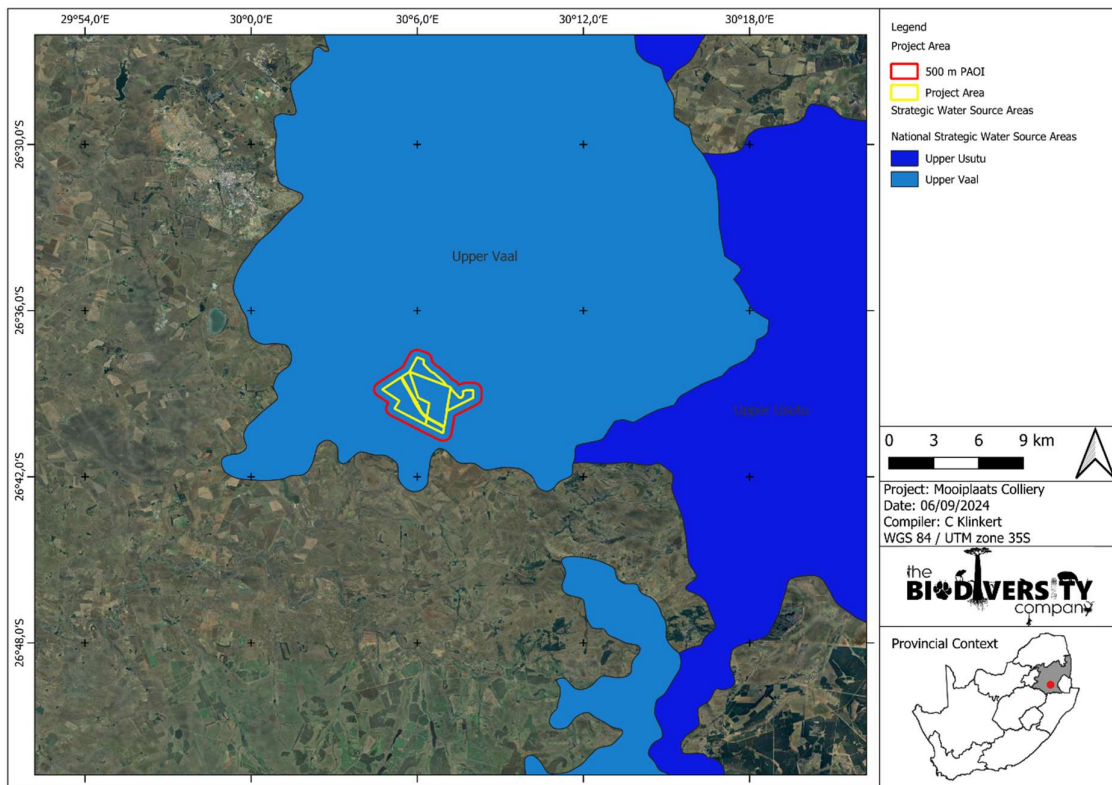


Figure 3-8 National Strategic Water Source Areas which overlap with the PAOI

3.2 Wetland Field Survey

3.2.1 Delineation

The Vaal River and associated wetlands are situated in the upper reaches of the Vaal River catchment. These systems form part of the Upper Vaal Water Management Area and are zoned under Quaternary catchment C11B. In the north (existing colliery) water drains in a north-easterly direction towards the Witpuntspruit. This river runs to the north of the project area before merging with the Vaal River. In the south, a network of seeps and valley-bottom wetlands direct water towards the Vaal River Floodplain. This large, well-developed floodplain flows in a south-westerly direction. A further 6.5 km downstream it is joined by the Klein Vaal. The deeply incised topography of the farm portions surrounding the Mooiplaats Colliery has likely aided in the protection of its wetland systems which remain, for the most part, in a relatively intact, healthy and functional state.

Wetland units have been grouped based on the HGM type, size and ecological condition. It is assumed that systems of the same type and that are positioned in a similar landscape setting are likely to provide similar ecological services.

Four wetland types were identified within the colliery and the surrounding farms, namely, valley bottom wetlands – channelled and unchannelled, floodplain wetlands, and numerous seep wetlands which make up the majority of the wetlands identified. These wetlands consist of six Hydrogeomorphic (HGM) units – namely three seepage wetland systems (HGM 1, 3 and 6), unchannelled valley bottom systems (HGM 2), a channelled valley bottom wetland (HGM 4), and lastly floodplain wetland systems with an active channel (HGM 5). Additionally, three instream dams were also identified within the valley bottom wetland systems (HGM 2 and 4), and lastly several artificial wet areas, either artificial seeps or water storage dams were identified, located near the existing colliery.

The wetland systems all exhibited a very dense, diverse and healthy coverage of wetland vegetation . The wetlands showed few signs of impact, despite being located within 500 m of an active colliery.

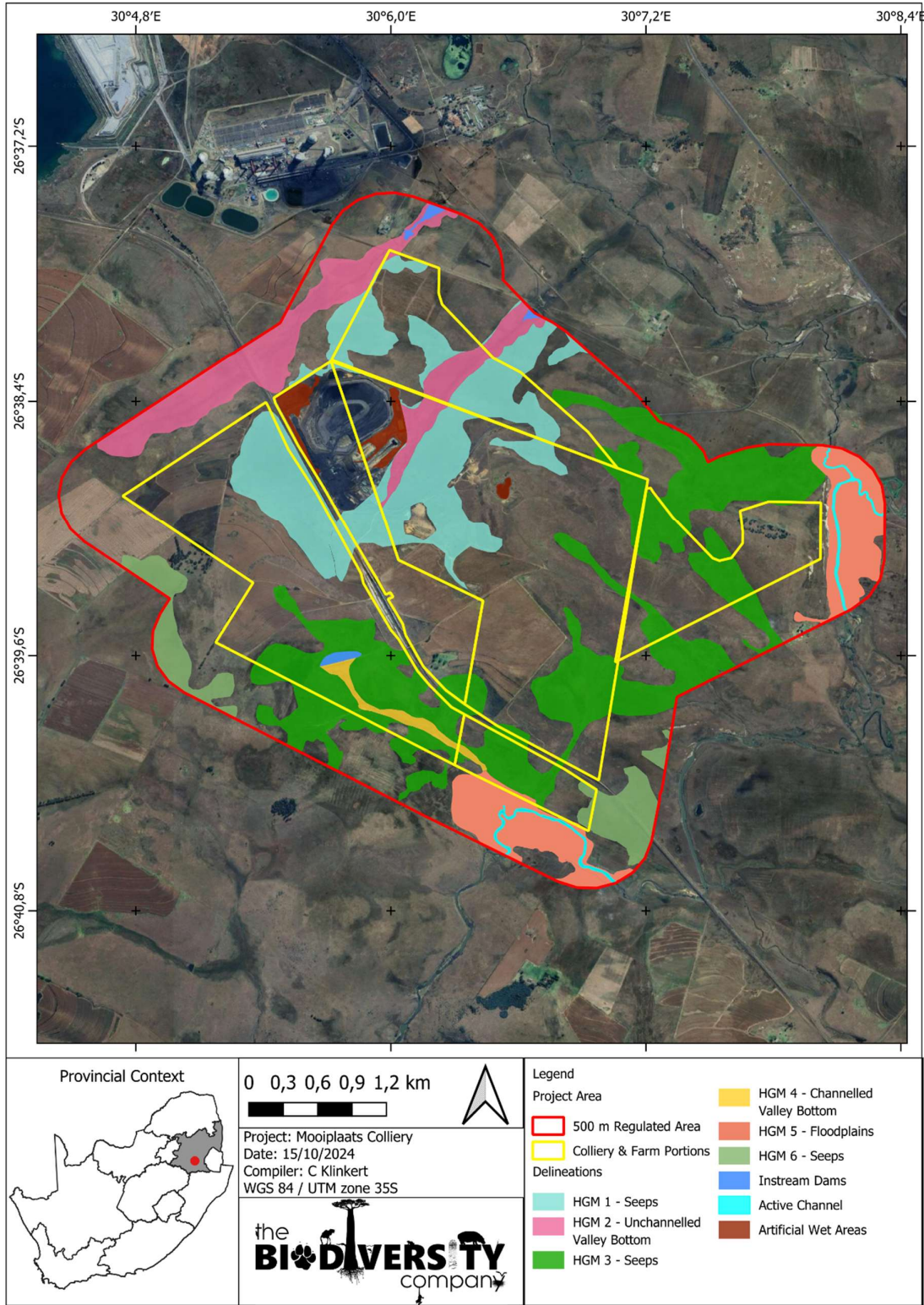


Figure 3-9 Delineation of wetlands within the Mooiplaats Colliery and surrounds

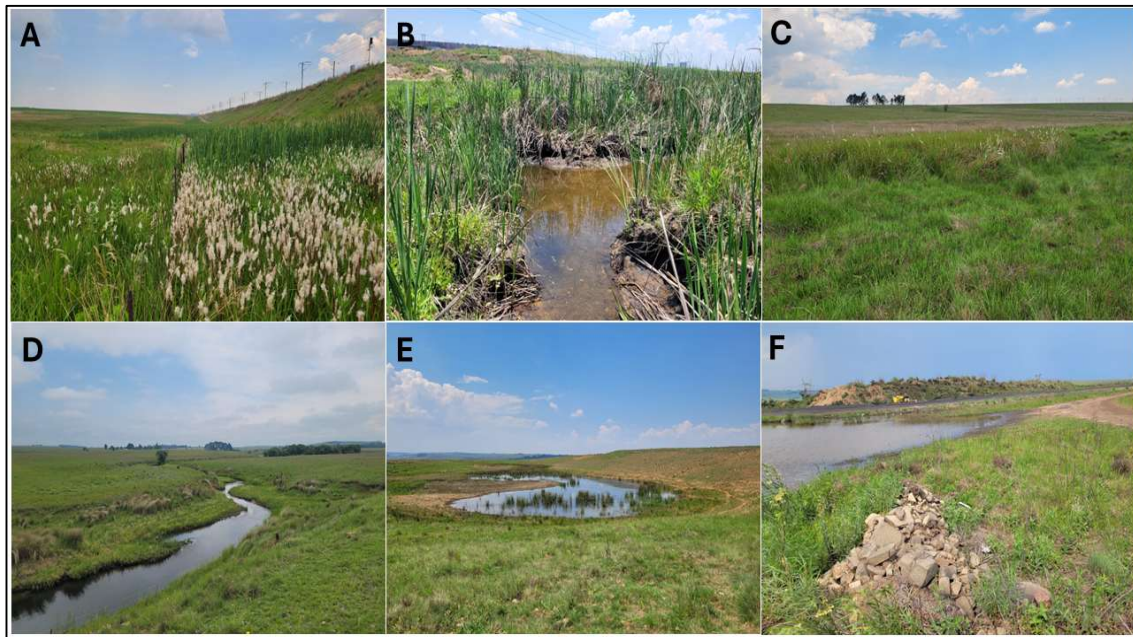


Figure 3-10 *Examples of the different features delineated within the assessed area. A & B) Seeps; C) Unchannelled valley bottom; D) Floodplain; E) Instream dam; and F) Artificial wet area.*

3.2.2 Classification and Description

The wetland classification as per SANBI guidelines (Ollis et al., 2013) is presented in Table 3-5. Four wetland types were identified within the colliery and surrounds consisting of seeps, unchannelled valley-bottoms, channelled valley-bottoms and floodplain wetlands.

Table 3-5 *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
Seep				Slope	Seep	With Channelled Outflow	N/A
Unchannelled valley-bottom	Inland	Highveld	Mesic Highveld Grassland Group 4	Valley Floor	Unchannelled valley-bottom	N/A	N/A
Channelled valley-bottom				Valley Floor	Channelled valley-bottom	N/A	N/A
Floodplain				Plain	Floodplain	Floodplain flat	N/A

A typical hillslope seep is located on the slope terrain unit. Isolated hillslope seeps are characterised by colluvial movement of material. These systems are fed by very diffuse sub-surface flows which seep out at very slow rates, ultimately ensuring that no direct surface water connects this wetland with other water courses within the valleys. Figure 3-12 illustrates a diagram of the hillslope seeps, showing the dominant movement of water into, through and out of the system.

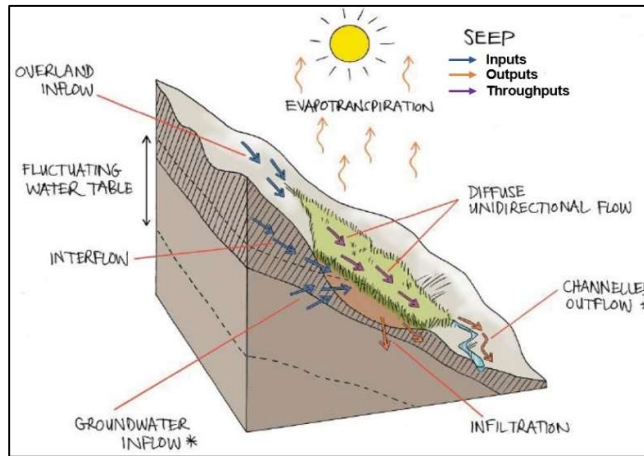


Figure 3-11 Amalgamated diagram of a seep wetland, highlighting the dominant water inputs, throughputs and outputs, SANBI guidelines (Ollis et al., 2013)

Unchannelled valley bottom wetlands are typically found on valley floors where the landscape does not allow high energy flows. Figure 3-12 illustrates a diagram of a typical unchannelled valley-bottom wetland, showing the dominant movement of water into, through and out of the system.

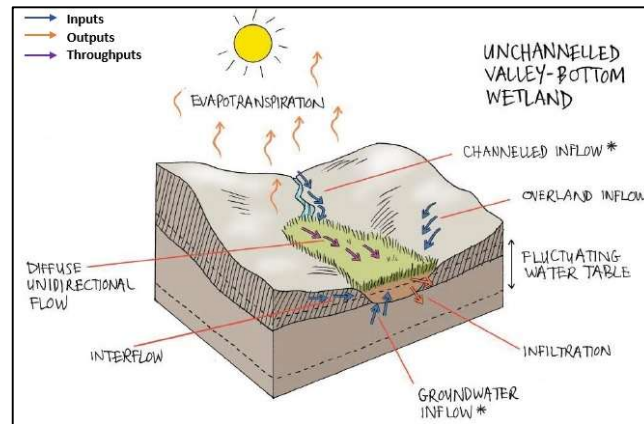


Figure 3-12 Amalgamated diagram of an unchannelled valley bottom, highlighting the dominant water inputs, throughputs and outputs, SANBI guidelines

Channelled valley bottom wetlands are typically found on valley floors with a clearly defined, finite stream channel and lacks floodplain features, referring specifically to meanders. Channelled valley bottom wetlands are known to undergo loss of sediment in cases where the wetlands' slope is steep and the deposition thereof in cases of low relief. Figure 3-13 presents a diagram of a typical channelled valley bottom, showing the dominant movement of water into, through and out of the system.

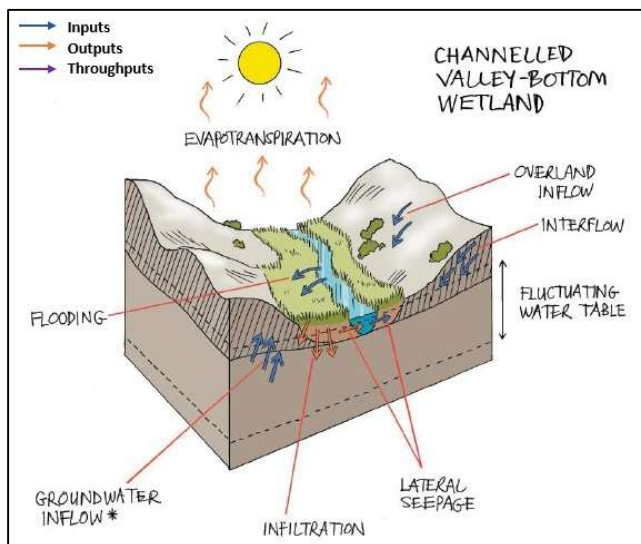


Figure 3-13 Amalgamated diagram of a typical channelled valley bottom, highlighting the dominant water inputs, throughputs and outputs, SANBI guidelines (Ollis et al. 2013)

Floodplain wetlands are located on valley floors and are characterised by a well-defined stream channel with typical floodplain features, including levees, scroll bars and oxbows. The water inputs of this wetland are mainly from overspills from the stream channel’s banks during flooding events. Figure 3-13 presents a diagram of the delineated floodplain, showing the dominant movement of water into, through and out of the system.

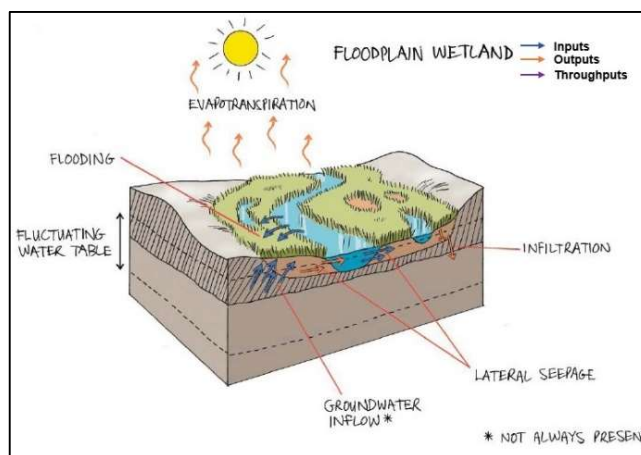


Figure 3-14 Amalgamated diagram of a typical floodplain system, highlighting the dominant water inputs, throughputs and outputs, SANBI guidelines (Ollis et al. 2013)

3.3 Wetland Functional and Ecological Assessment

3.3.1 Functional Assessment

3.3.1.1 General Functional Description

Hillslope seeps are well documented by (Kotze et al., 2009) to be associated with sub-surface ground water flows. These systems tend to contribute to flood attenuation given their diffuse nature. This attenuation only occurs while the soil within the wetland is not yet fully saturated. The accumulation of organic material and sediment contributes to prolonged levels of saturation due to this deposition

slowing down the sub-surface movement of water. Water typically accumulates in the upper slope (above the seep). Additionally, organic matter accumulation is essential in the denitrification process involved with nitrate assimilation. Seeps generally also improve the quality of water by removing excess nutrient and inorganic pollutants originating from agriculture, industrial or mine activities. The diffuse nature of flows ensures the assimilation of nitrates, toxicants and phosphates with erosion control being one of the ecosystem services provided in a limited capacity given the nature of a typical seep’s position in the landscape.

Unchannelled valley-bottoms are characterised by sediment deposition and a gentle gradient with streamflow generally being spread diffusely across the wetland, ultimately ensuring prolonged saturation and high levels of organic matter. The assimilation of toxicants, nitrates and phosphates are usually high for unchannelled valley-bottom wetlands, especially in cases where the valley is fed by sub-surface interflow from slopes. The shallow depths of surface water within this system adds to the degradation of toxic contaminants by means of sunlight penetration (Kotze *et al.*, 2009).

Channelled valley bottom wetlands tend to contribute less to sediment trapping and flood attenuation than other systems. Channelled valley bottom wetlands are well known to improve the assimilation of toxicants, nitrates and sulphates, especially in cases where sub-surface flows contribute to the system’s water source (Kotze *et al.*, 2009).

Floodplains generally are formed during high flow events which subsequently cause water to overspill its banks. Due to the topographic setting of floodplains, flood attenuation for these systems are very high, especially during seasons where the soil within the wetland is not yet saturated and before the oxbows are filled. Seeing that floodplains usually are characterised by clayey soils which retain water for long periods and are susceptible to vast amounts of evapotranspiration, very little streamflow regulation is expected for floodplains. In hindsight, floodplains with coarse soil types are ideal in regulating streamflow. Floodplains are excellent in assimilating phosphates due to the decrease in velocity during the overspill of banks. During this process, lateral deposition of sediment is prone to happen. Phosphorus tends to bound strongly to mineral particles which ensures that the phosphorus is retained on the floodplain after the deposition of these particles. Denitrification does occur to a lesser extent due to little exposure of large amounts of water seeing that these water masses are dependent on floods. Additionally, sub-surface flows are rare for floodplains which decrease the possibility of denitrification even more so.

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.

3.3.2 Ecosystem Services

The ecosystem services provided by the relevant wetland units on site were assessed and rated using the WET-EcoServices method (Kotze *et al.*, 2008). The results of the assessment are presented in Table 3-6. Ecosystem services contributing to these scores include flood attenuation, stream flow regulation, nutrient and toxicant assimilation and the maintenance of biodiversity.

Table 3-6 Summary of the average ecosystem scores of the assessed wetland units

High	Moderately High	Intermediate
HGM 2	HGM 1	HGM 6
HGM 5	HGM 3	-
-	HGM 4	-

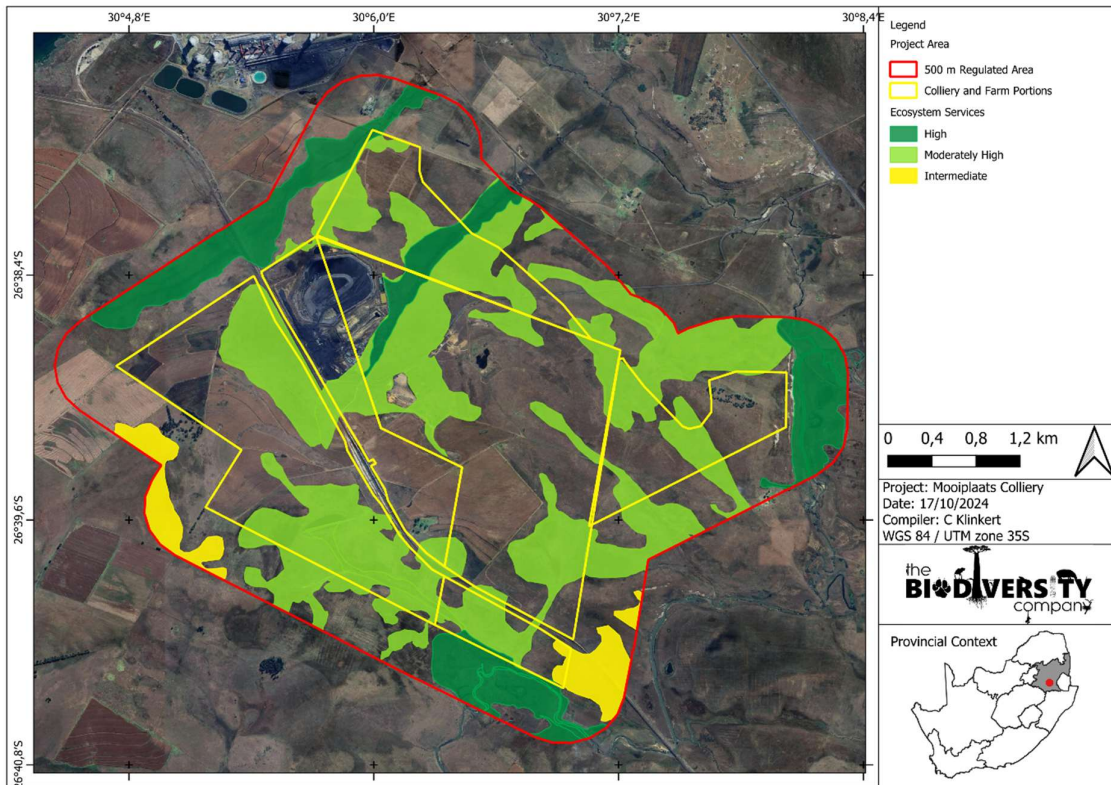


Figure 3-15 Ecosystem Service Scores provided by the wetland systems within the assessment area

3.3.3 Present Ecological State

The wetlands have exhibited some degree of modification resulting from natural physical changes as well as anthropogenically induced impacts at both the local and catchment level. Resultingly, the wetlands scored average Present Ecological State (PES) scores within the “B – Largely Natural”, C – Moderately Modified” and “D – Largely Modified” PES classes. Wetland systems which showed the highest disturbance and impact were the seeps (HGM 1) surrounding the existing colliery. These impacts are discussed below, and further discussed in Section 4.1. The results of the wetland health and integrity assessment is provided in Table 3-7.

Table 3-7 Average Present Ecological State scores for the assessed wetlands

B - Largely Natural	C - Moderately Modified	D - Largely Modified
HGM 2	HGM 3	HGM 1
HGM 5	HGM 4	
	HGM 6	

The highest disturbance to the wetland systems is related to agriculture. This includes direct disturbance from grazing livestock, and agricultural fields extending into the wetlands and fragmenting the wetlands. The indirect impacts include soil deposition during high rainfall periods and potential pollutants such as increased nutrients, herbicides and toxins entering the wetland systems from runoff. The wetland systems have also experienced altered hydrology due to damming within the wetlands, and minor water

flow changes from infrastructure within and surrounding the wetlands altering topography and runoff characteristics, such as from the railway.

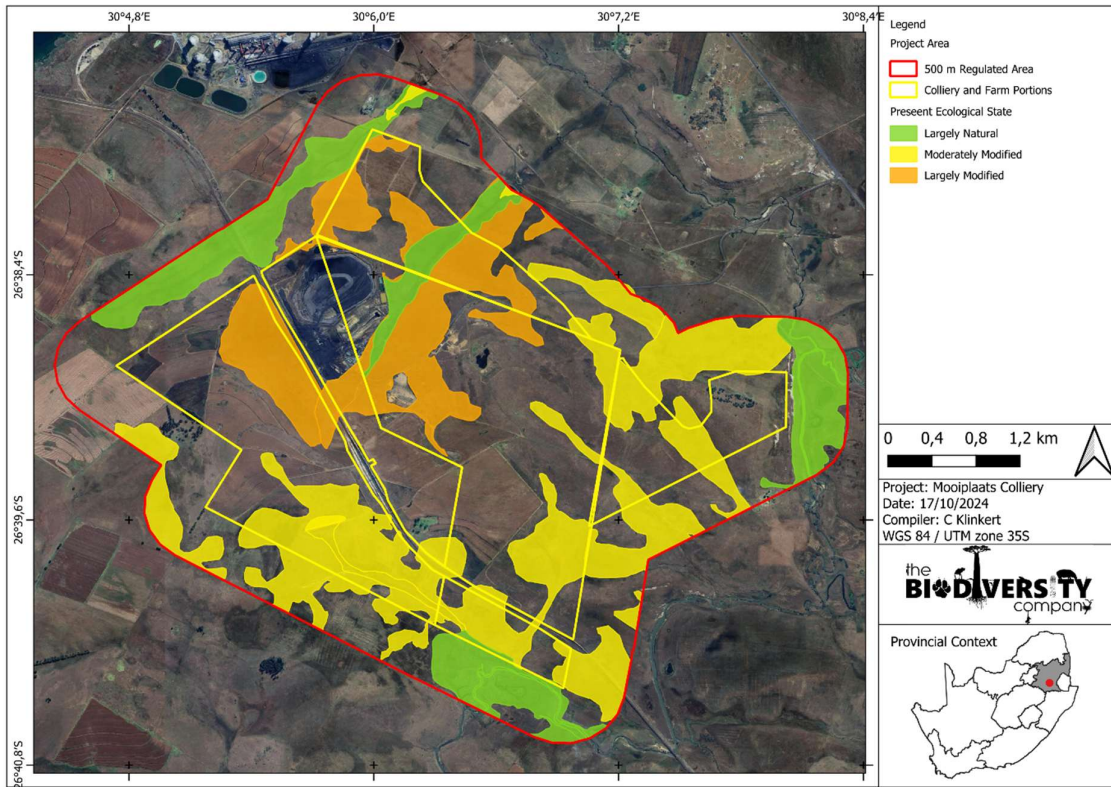


Figure 3-16 Present Ecological State of the wetland systems identified within the assessment area

3.3.4 Ecological Importance and Sensitivity

The Ecological Importance and Sensitivity (EIS) assessment was applied to the wetland types in conjunction with the present ecological state and ecosystem service scores in the preceding sections, 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 status and the protection status of the wetland itself considering the NBA wetland dataset as displayed in Table 3-8. The wetland average EIS score was “Very High” for the floodplain wetlands, and “High” for the seep and valley bottom wetlands.

Table 3-8 Aspects considered in the Ecological Importance and Sensitivity assessment

HGM Type	NFEPA Wet Veg			NBA Wetlands			SWS A (Y/N)	CBA/ESA (Y/N)	Overall EIS
	Type	Ecosystem Threat Status	Ecosystem Protection Level	Wetland Condition	Ecosystem Threat Status 2018	Ecosystem Protection Level			
Seep		Endangered	Not Protected	C/D/E/F	Critically Endangered	Poorly Protected	Y – Upper Vaal	ESA	High
Unchannelled Valley-Bottom	Mesic Highveld Grassland Group 4	Critically Endangered	Not Protected	B (Field Visit)	Critically Endangered	Not Protected	Y – Upper Vaal	ESA	High
Channelled Valley-Bottom		Critically Endangered	Not Protected	A/B	Critically Endangered	Not Protected	Y – Upper Vaal	ESA	High

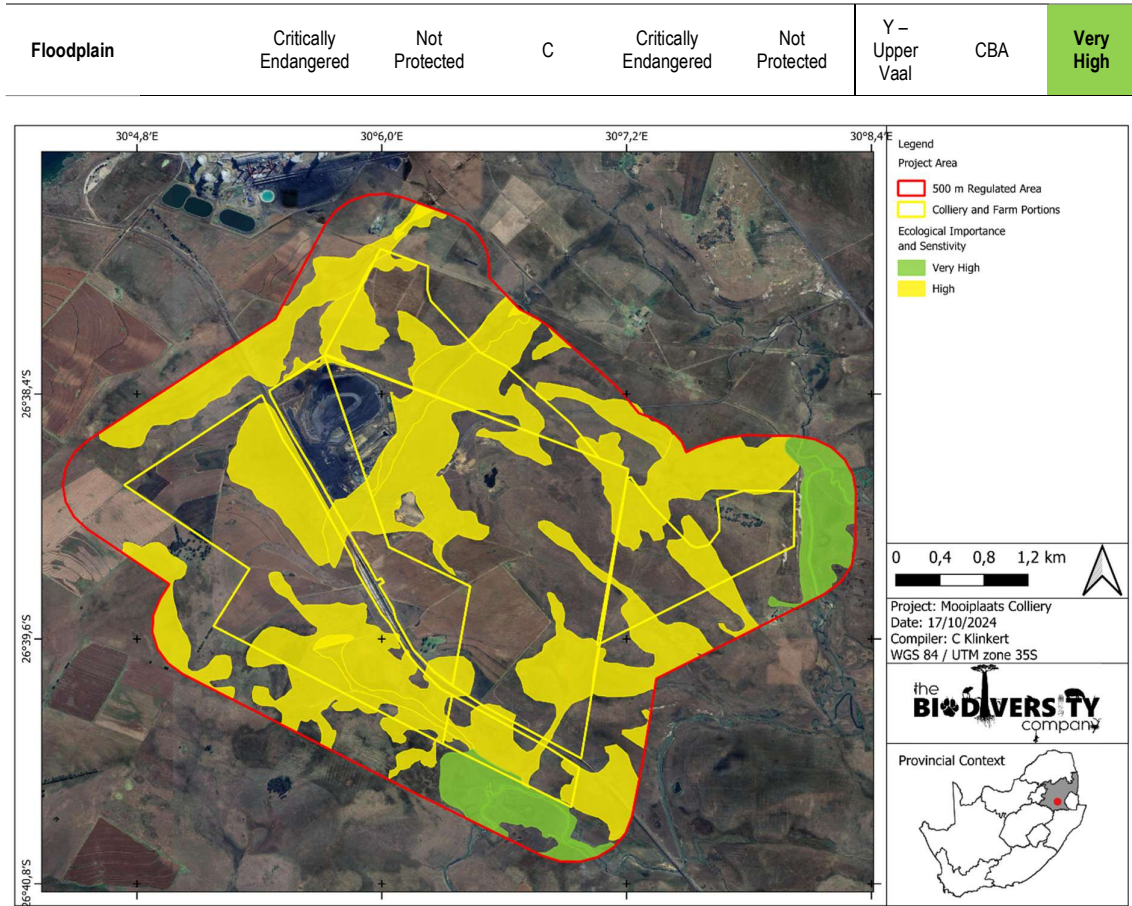


Figure 3-17 Ecological Importance and Sensitivity of the wetland systems identified within the assessment area

3.3.5 Recommended Ecological Category and Recommended Management Objective

The REC and RMO for the wetland area was determined from the results of the PES and EIS assessments. These assessments indicated that all wetland features within the site, had to an extent, underwent transformation as a result of historical and current impacts. Nevertheless, despite the altered ecological integrity of these systems, they are considered to provide important ecological services. The appropriate REC and RMO estimated for the wetland areas is presented in Table 3-9 below.

Table 3-9 Summary of the REC and RMO categories assigned to the relevant wetlands

HGM Unit	REC – RMO
HGM 1	C/D - Improve
HGM 2	A/B - Improve
HGM 3	B/C - Improve
HGM 4	B/C - Improve
HGM 5	A - Improve
HGM 6	B/C - Improve

3.4 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 3-10.

It should be noted that the existing Mooiplaats Colliery has authorization for the associated activities, however, wetland systems should be avoided where possible.

Table 3-10 Buffer requirements for the relevant wetland features

Wetland	HGM Unit	Sensitivity	Post-Mitigation
Valley bottoms & seeps	1, 2, 3, 4, & 6	High	25 m
Floodplains	5	Very High	30 m

3.4.1 Regulation Zones

Table 3-11 presents the legislated zones of regulation that would be applicable to the wetland areas.

In accordance with General Notice (GN) 509 of 2016 as it relates to the NWA (1998), a regulated area of a watercourse for Section 21 (c) and 21 (i) of the NWA, 1998 means the outer edge of the 1 in 100 year flood or where no flood line has been determined it means 100 m from the edge of a watercourse or a 500 m radius from the delineated boundary (extent) of any wetland or pan.

Listed activities in terms of the NEMA (1998), (Act 107 of 1998) EIA Regulations as amended in April 2017 must be taken into consideration if any infrastructure is to be placed within the applicable zone of regulation.

Both types of authorisations are applicable to the WULA given that water resources were identified within the farm portions surrounding the existing colliery.

Table 3-11 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.
Environmental Authorisation in terms of the Listed activities of the National Environmental Management Act, 1998 (Act No. 107 of 1998). EIA Regulations (2014), as amended.	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: (xii) Infrastructure or structures with a physical footprint of 100 square meters or more; Where such development occurs— Within a watercourse; In front of a development setback; or If no development setback has been adopted, within 32 meters of a watercourse, measured from the edge of a watercourse. ... (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 that:
"The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse."

3.5 Site Sensitivity Verification

3.5.1 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 as "Very High" for the Mooiplaats Colliery and surrounding farm portions (Figure 3-18); The "Very High" rating is a result of the following watercourse features present:
 - Presence of "CBA - Aquatic Rivers", namely the Vaal River;
 - Presence of "ESA Important water subcatchments";
 - Entire assessment area falls within the "Upper Vaal Strategic Water Source Area";
 - Presence of "FEPA Wetlands and Subcatchments"; and
 - Numerous wetland types overlapping with "ESA Wetlands", namely:
 - Floodplain;
 - Seep;
 - Valley Bottom; and
 - Depression.

Table 3-12 Summary of the screening tool vs specialist assigned sensitivities

Features	Screening Tool Theme	Environmental Screening Tool Sensitivity	Specialist Sensitivity	Tool Validated or Disputed by Specialist - Reasoning
Floodplains	Aquatic Biodiversity Theme	Very High	Very High	Screening Tool Sensitivity Validated. Rational for the specialist assigned 'Very High' rating: These wetland systems are relatively large in size, exhibiting surface saturation with an active channel, and high vegetation coverage. They have high connectivity to the surrounding wetlands and the Vaal River, therefore considered to be a hydrological, sediment and nutrient source to the river. Although these systems have suffered historical impacts from anthropogenic influences, they are healthy and functioning. The potential for them to support freshwater and terrestrial biodiversity therefore remains.
Channelled and Unchannelled valley-bottoms, & Seep - including Dams	Aquatic Biodiversity Theme	Very High	High	Screening Tool Sensitivity Disputed. Rational for the specialist assigned 'High' rating: These wetlands have connectivity to downstream wetland systems. Whilst exhibiting impact from the surrounding agricultural practices and historical altered hydrology, the wetlands do have importance as a biodiversity corridor and as a hydrological driver for downstream systems.
Remaining Area – excluding Artificial Wet Areas	Aquatic Biodiversity Theme	Very High	Moderate	Screening Tool Sensitivity Disputed. Rational for the specialist assigned 'Moderate' rating: The area assessed falls within a Surface Water Strategic Water Source Area, as well as overlaps with an ESA water subcatchment. Furthermore, numerous wetlands were identified within the farm portions surrounding the Mooiplaats colliery, which provide hydrological inputs and create biodiversity corridors to the watercourses, therefore the area has been deemed to be of Moderate sensitivity with regard to freshwater biodiversity.
Artificial Wet Areas and Existing Colliery	Aquatic Biodiversity Theme	Very High	Low	Screening Tool Sensitivity Disputed. Much of the area has been historically modified through historical agricultural activity, mining activities or other disturbances. The operational activities are not anticipated to significantly modify the hydrological characteristics of the area; therefore a "Low" sensitivity has been assigned for these areas in relation to freshwater biodiversity.

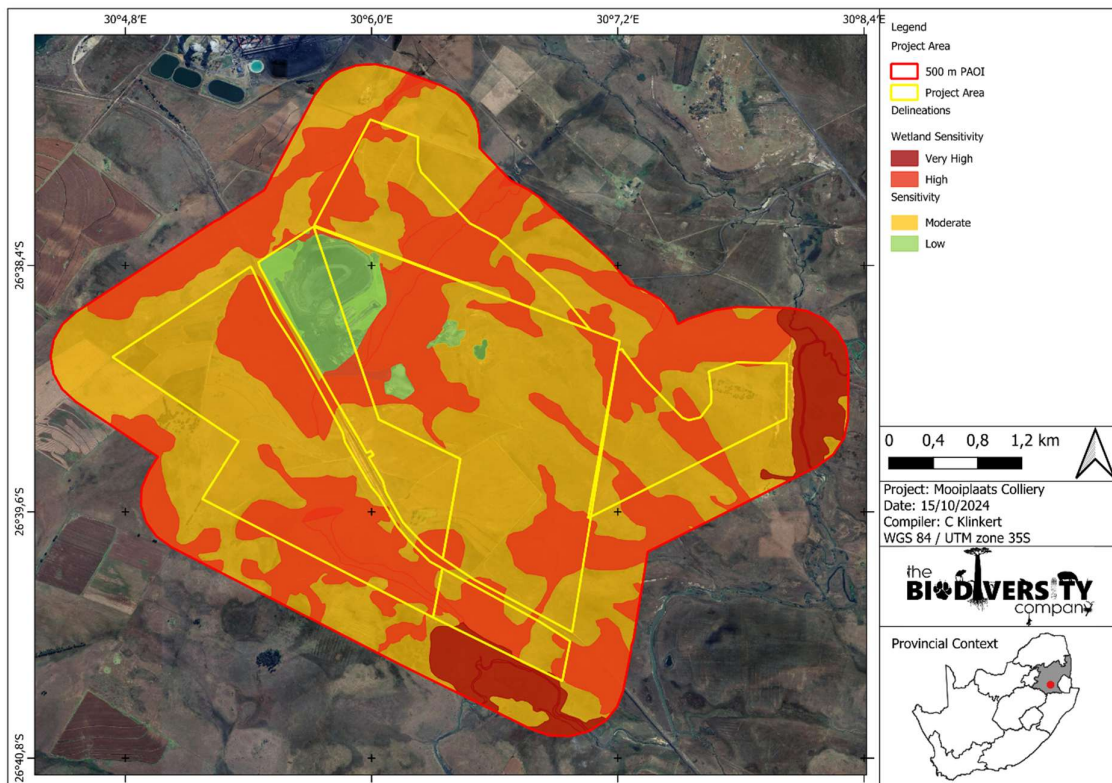


Figure 3-19 Sensitivity classification of the Mooiplaats Colliery and the surrounds with respect to freshwater resources

4 Risk and Impact Assessment

4.1 Current Impacts to Freshwater Biodiversity

The list below refers to the present-day local impacts observed within the assessed wetland areas:

- Sediment and vegetation loss from stockpiles and sediment pits;
- Increased disturbance from vehicle traffic;
- Stormwater systems and artificial water channels contributing to altered overland flow;
- Dams within the wetland systems altering the natural hydrology of the systems;
- Agricultural land encroaching on wetland systems; and
- Grazing of livestock.

4.2 Quantitative Risk and Impact Assessment

The Risk / Impact 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.

For this assessment, the specialist was provided with a layout including the existing Mooiplaats Colliery and surrounding farm portions (i.e. no proposed developments, stormwater or abstraction

infrastructure). As the WULA is intended for the activities associated with the existing colliery all of the natural wetland and watercourse systems, within the existing Mooiplaats Colliery and surrounding farm portions, including the 500 m regulated area were focused on.

It is assumed that current operation and activities associated with the Mooiplaats Colliery will avoid all delineated wetland areas and reduce hydrological disturbance to the systems as much as possible. Therefore, emphasis was therefore placed on minimising impacts by means of mitigation.

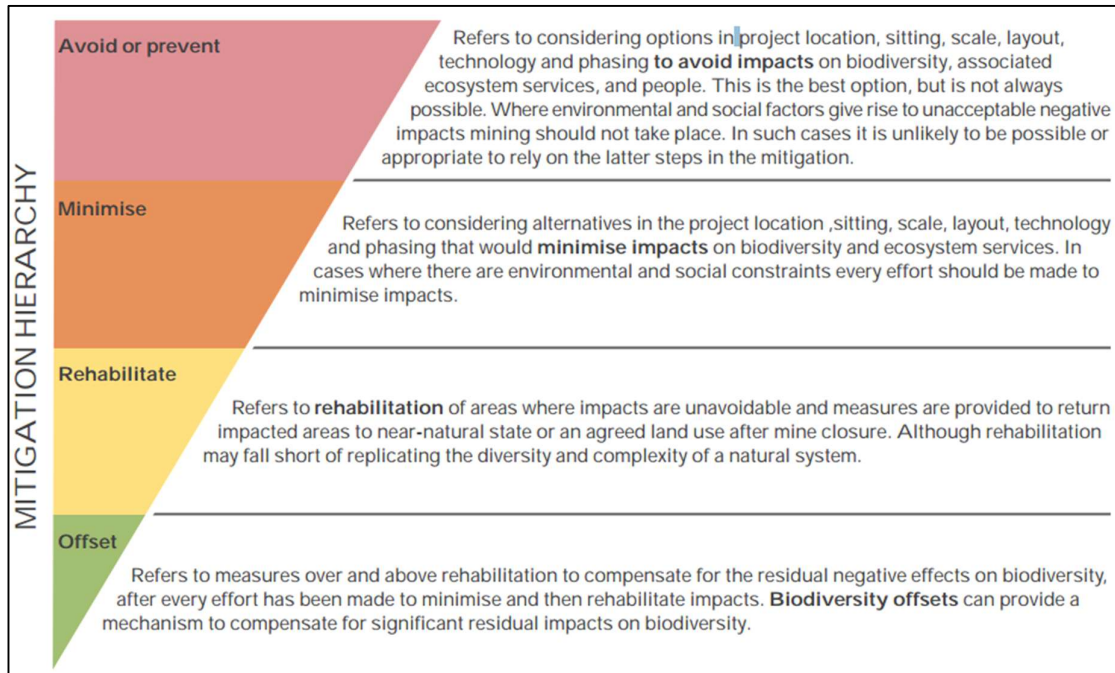


Figure 4-1 The mitigation hierarchy as described by the DEA (2013)

4.2.1 Potential Anticipated Impacts

Table 4-1 illustrates the potential aspects expected to threaten the integrity of sensitive receptors during the operation of the Mooiplaats Colliery and associated activities. The post- mitigation significance ratings have been calculated considering various parameters, these results are presented in the subsequent tables.

Table 4-1 Aspects and impacts relevant to the existing colliery and related activities

Project Phase	Activity	Impact
Operation of existing Colliery	Water Usage	Altered hydrology reducing wetland health and functioning. Introduction and / or proliferation of alien invasive vegetation from disturbed areas. Chemical contaminants and coal sediment deposits entering watercourses. Overall wetland degradation. Depletion and/ or contamination of groundwater reserves.
	Vehicle Access	Altered overland flow from increased hardened surfaces. Vegetation and biodiversity disturbance. Induced erosion and sedimentation. Introduction and / or proliferation of alien invasive vegetation from disturbed areas.

	Maintenance of equipment and machinery	Water quality impairment from stochastic fuel and oil spills.
Decommissioning of the underground mining operation	Reshaping	Filling excavations with topsoil.
		Re-vegetating bare soils.
	Waste Management	Treating affected areas to prevent AMD contamination and water pollution from runoff.

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).

It is anticipated that the current operation of the Mooiplaats Colliery and associated activities will pose a “Moderate” to “Low” post-mitigation risk on the surrounding wetlands. The majority of the risks posed onto the wetland systems from the operation of the Mooiplaats Colliery were scored as “Low”. Two risks were scored as “Moderate” due to the nature of the operation and the reliance on the surrounding watercourses. These risks are “Altered hydrology reducing wetland health and functioning” and “Chemical contaminants and coal sediment deposits entering watercourses”. The colliery is currently in the decommissioning phase of the portion of the colliery which related to the previous underground mining activities. The decommissioning phase includes activities which are associated with rehabilitation. Therefore, the decommissioning phase was included in the RAM. All of the risks associated with decommissioning are “Low”. Moreover, the “Reshaping” activity was scored with a positive (+) score.

Despite the low to moderate risks, the impact of this can still be mitigated to a large degree through consideration of greener alternatives, sustainable use of water resources, and effective and ongoing mitigation measures that need to be implemented.

Table 4-2 Summative results of the Risk Assessment conducted for the existing colliery

Phase	Activity	Impact	Score	Risk Rating
Operation Phase	Water Usage	Altered hydrology reducing wetland health and functioning.	32	M
		Introduction and / or proliferation of alien invasive vegetation from disturbed areas.	17.6	L
		Chemical contaminants and coal sediment deposits entering watercourses.	40.8	M
		Overall wetland degradation.	19.2	L
		Depletion and/ or contamination of groundwater reserves.	22.4	L
	Vehicle Access	Altered overland flow from increased hardened surfaces.	21.6	L
		Vegetation and biodiversity disturbance.	21.6	L
		Induced erosion and sedimentation.	15.8	L
	Maintenance of equipment and machinery	Introduction and / or proliferation of alien invasive vegetation from disturbed areas.	17.6	L
		Water quality impairment from stochastic fuel and oil spills.	17.6	L
Decommissioning	Reshaping	Filling excavations with topsoil.	19.2	L
		Re-vegetating bare soils.	-31.2	+
	Waste Management	Treating affected areas to prevent AMD contamination and water pollution from runoff	24	L

4.3 Mitigation Measures

In light of the expected impacts from operational 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 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 of, and fragmentation, of the vegetation community of the perennial drainage system and downstream wetland areas.

4.3.1 Impact specific mitigation measures

4.3.1.1 Wetland Degradation

Any activities within proximity to wetland systems have the potential to degrade these systems directly or indirectly either by improper conduct, negligence, or stochastic / uncontrolled / accidental events. The following measures have therefore been suggested to alleviate the potential for these impacts to occur on the delineated systems.

Mitigation:

- Restrict unauthorised and unnecessary activities within the wetlands and their respective buffers;
- Use the wetland shapefiles to signpost the edge of the wetlands closest to site. Label these areas as “environmentally sensitive areas, keep out!”;
- Minimise the impacts near wetland areas and avoid land clearing outside of these areas to prevent indirect impact to the wetlands;
- Educate staff and relevant contractors on the location and importance of the identified wetlands through toolbox talks and by including them in site inductions as well as the making them aware of the overall site plan which should indicate sensitive areas, waste disposal areas and any other relevant project specifics;
- Promptly control the spread of alien vegetation; and
- Landscape and re-vegetate all denuded areas as soon as possible.

4.3.1.2 Erosion and sedimentation of catchment and downstream watercourses

The alteration of surface topography and hydrology for the existing colliery will inevitably be accompanied by an increase in erosion and sedimentation as rainwater erodes and washes exposed soils (active working and exposed areas) into the downslope watercourses.

Mitigation:

- Loose soils are particularly prone to loss due to wind or water. It is therefore preferable that construction takes place during the dry season where feasible, to reduce the erosion potential of the exposed surfaces. Should higher rainfall during the construction be foreseen then excavation and backfilling activities should be suspended until drier conditions return;
- Avoid the creation of concentrated flow paths;

- Ensure soil stockpiles **and concrete / building sand** are sufficiently safeguarded against rain wash;
- Signs of erosion must be addressed immediately to prevent further erosion of the area to prevent head cut and gully erosion from forming. This can be addressed as it occurs by filling, and re-contouring to gentler gradients followed by re-vegetating;
 - Temporary and permanent erosion control methods may include retention basins, detention ponds, interceptor ditches, seeding and sodding, riprap of exposed embankments, erosion mats, and mulching;
- **Any exposed earth or cleared sites (includes the areas adjacent to the proposed infrastructure) should** be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil. Sandbags and geotextiles should be used to assist until vegetation has established in these reworked areas;
- Compacted soils should be lightly tilled to a maximum depth of 400mm without the use of heavy machinery to promote vegetation reestablishment and reduce the potential for preferential flow paths and subsequent erosion and sedimentation from occurring; and
- Where required, the rehabilitation of watercourses and their banks must take place following **construction**. Key areas where erosion has occurred should be rehabilitated through bank reprofiling to gentler gradients and the revegetation of the wetland periphery areas.

4.3.1.3 Spread of alien invasive vegetation

Alien invasive vegetation is particularly opportunistic and has the potential to spread rapidly, especially in disturbed settings. These plants outcompete the natural vegetation and in turn alter the abiotic and biotic components of freshwater ecosystems. The control of such species is considered imperative in consideration of the **proposed development and** in maintaining the ecological integrity and functioning of such systems.

Mitigation:

- Revegetate bare or denuded areas as soon as possible;
- Once and if detected, control the spread of any existing colonies;
- Avoid working in areas with alien vegetation as dispersal into unaffected areas may be aided through vehicular movement; and
- Should alien vegetation infestation be considered a contributing factor to ecosystem degradation on the site, the implementation of an alien invasive management plan should be considered.

4.3.1.4 Impaired water quality and pollution

Impaired water quality can be detrimental to freshwater ecosystems and can be a result of several factors or activities, most commonly related to the use of harmful or hazardous substances such as fuels, oils, and herbicides. This impact has the potential to adversely affect the biotic component of the freshwater resources and will ultimately result in a degraded ecosystem with reduced functionality.

Mitigation:

- All chemicals and toxicants to be used for the colliery operations must be stored outside the watercourse areas and their respective buffers, preferably on flat terrain and in a bunded area;
- All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site in a designated area;
- All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”;
- Adequate sanitary facilities and ablutions must be provided for all personnel within the project area. These facilities should be placed outside of sensitive environmental areas (wetlands and buffers included). These facilities must be maintained to promote their use;
- Have action plans on site, and training for contractors and employees in the event of spills, leaks and other impacts to the freshwater systems;
- The contractors used for the project should have spill kits available to ensure that any fuel or oil spills are clean-up and discarded correctly; and
- All waste **generated on-site during construction** must be adequately managed. Separation and recycling of different waste materials should be supported and no waste should be allowed to accumulate for a period longer than two weeks.

4.3.1.5 Altering overland flow characteristics

During the **construction phase**, alterations to the topography of the land will alter the surface flow patterns and in turn affect the hydrological dynamics of the wetland systems. Similarly, during the operational phase of the development, increased hardened surfaces will increase the overland flow in the local area of the infrastructure which will subsequently increase the water input to the wetlands.

Mitigation:

- Minimise the extent of concreted / paved / gravel areas;
- Re-vegetate denuded areas as soon as possible to increase surface roughness and promote infiltration; and
- Regularly clear drains to prevent uncalled for accumulation of surface water and the establishment of concentrated flow paths out of the accumulation areas.

4.3.1.6 Alteration of channel characteristics

Attributed to the operational activities of the colliery taking place within close proximity to the wetland areas, associated buffers and adjacent to the watercourse channel, it is anticipated that some modification of the channel characteristics will occur.

Mitigation:

- Ensure that any flow diversion within the channel is conducted such that it is temporary and can be restored to its preconstruction state;
- Flow diversions should be undertaken such that water impoundment is not supported and rather that flow continuation even in low flow periods is supported;

- Any bank destabilisation resulting from the diversion activities or any other related construction activity must be corrected through bank rehabilitation which may include retaining structures (which should be authorised if found to be necessary).

4.3.1.7 Contamination of wetlands

Impaired water quality can be detrimental to freshwater ecosystems and can be a result of several factors or activities, most commonly related to the use of harmful or hazardous substances such as fuels, oils, pesticides and herbicides. This impact has the potential to adversely affect the biotic component of the freshwater resources and will ultimately result in a degraded ecosystem with reduced functionality.

Suggested Mitigation:

- All waste generated on-site must be adequately managed. Separation and recycling of different waste materials should be supported;
- All wastewater used during the operation should undergo water treatment to reduce chemicals, toxins and silt from entering watercourses;
- Where possible minimise the use herbicides to control alien or unwanted vegetation on the site and in proximity to the watercourse. If herbicides must be used do so well prior to any significant predicted rainfall events; and
- Materials such as sand and cement should not be stored within the wetland or buffer areas and should be safe guarded against rain-wash. Should accidental spillages of unset cement occur then this should be immediately cleaned by scraping the impacted area and removing the remnants of cement from the watercourse.

5 Conclusion

Six HGM units were identified within the assessed area relating to the Mooiplaats Colliery and the surrounding farm portions. The HGM units have been classified as: three seepage wetland systems (HGM 1, 3 and 6), unchannelled valley bottom systems (HGM 2), a channelled valley bottom wetland (HGM 4), and lastly floodplain wetland systems with an active channel (HGM 5).

A summary of the ecological results for the features are displayed in the table below.

Table 5-1 Ecological characteristics and buffer requirements of the freshwater resources

HGM Unit / Feature	PES	EIS	Ecosystem Services	REC - RMO
1 – Seep	D - Largely Modified	High	Moderately High	C/D - Improve
2 – Unchannelled valley-bottom	B - Largely Natural	High	High	A/B - Improve
3 – Seep	C - Moderately Modified	High	Moderately High	B/C - Improve
4 – Channelled valley-bottom	C - Moderately Modified	High	Moderately High	B/C - Improve
5 – Floodplain	B - Largely Natural	Very High	High	A - Improve
6 – Seep	C - Moderately Modified	High	Intermediate	B/C - Improve

5.1 Risk and Impact Statement

A risk and impact assessment were conducted for the risk posed by the operation of the existing colliery. The majority of the post-mitigation risks for the operation of the colliery presented within the “Low” consequence and significance categories, with the exception of two activities, that presented with “Moderate” risks. These risks are “Altered hydrology reducing wetland health and functioning” and “Chemical contaminants and coal sediment deposits entering watercourses”. A Decommissioning Phase was also assessed as the Mooiplaats Colliery is currently decommissioning the portions of the mine that related to the previous activities – namely underground mining. All activities relating to the decommissioning phase present within the “Low” category.

5.2 Specialist Opinion

Considering the assessment findings and the assumption that all of the suggested mitigation measures will be implemented, no fatal flaws are evident for the Water Use Licence. It is the opinion of the specialists that the application may be favourably considered for authorisation.

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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 and 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);
- Strategic Water Source Areas, 2021 (Lötter & Le Maitre, 2021); and

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).

7.1.2 Wetland Field Survey

7.1.2.1 Identification and Mapping

The wetland areas were delineated in accordance with the DWA (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.

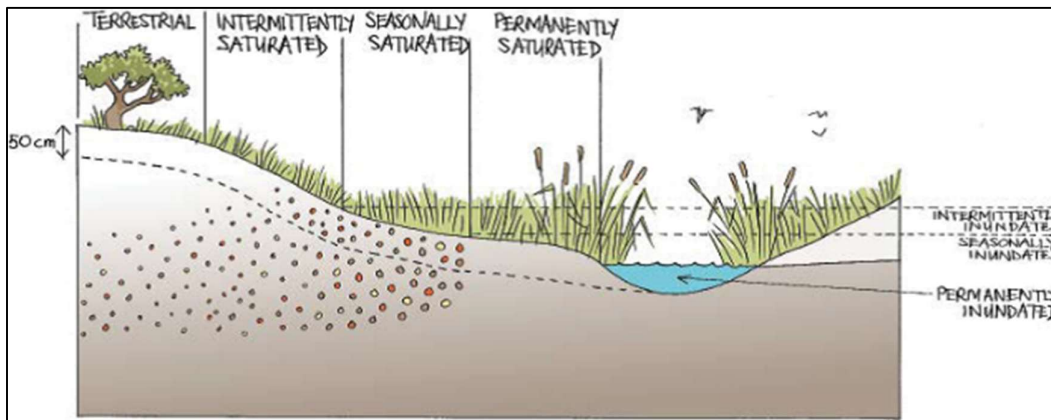


Figure 7-1 Cross section of a wetland, indicating how the soil wetness and vegetation indicators respond to changes in topography (Ollis *et al.* 2013)

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 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., 2007)*

Impact Category	Description	Impact Score Range	PES
None	Unmodified, natural	0 to 0.9	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	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	C
Large	Largely Modified. A large change in ecosystem processes and loss of natural habitat and biota has occurred.	4.0 to 5.9	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	E
Critical	Critical Modification. 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	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 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			
		<i>Very High</i>	<i>High</i>	<i>Moderate</i>	<i>Low</i>
RES	<i>A (Pristine)</i>	A Maintain	A Maintain	A Maintain	A Maintain
	<i>B (Natural)</i>	A Improve	A/B Improve	B Maintain	B Maintain
	<i>C (Good)</i>	A Improve	B/C Improve	C Maintain	C Maintain
	<i>D (Fair)</i>	C Improve	C/D Improve	D Maintain	D Maintain
	<i>E/F (Poor)</i>	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.

7.1.6 Site Sensitivity Verification

The baseline aquatic / freshwater sensitivity of the project area was obtained using the National Web-based Environmental Screening Tool (Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended). The sensitivities based on the National Web-based Environmental Screening Tool allocated present as “Very High”, or “Low”, which operates on a presence/absence methodology of freshwater resources. Therefore, each of the relevant themes are either disputed or validated for the assessed areas based on the specialist assigned Ecological Importance and Sensitivity of the different systems (where applicable), with consideration been given to the presence of observed or likely sensitive fauna and flora.

7.2 Appendix B: Risk and Impact 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 – 55	(L) Low Risk	Acceptable as is or consider requirement for mitigation. Impact to watercourses and resource quality small and easily mitigated. Wetlands may be excluded.
56 – 169	(M) Moderate Risk	Risk and impact on watercourses are notably and require mitigation measures on a higher level, which costs more and require specialist input. Wetlands are excluded.
170 – 300	(H) High Risk	Always involves wetlands. Watercourse(s) impacts by the activity are such that they impose a long-term threat on a large scale and lowering of the Reserve.

7.3 Appendix C: Specialist Declaration of Independence

I, Celine Klinkert, 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.



Celine Klinkert

Ecologist

The Biodiversity Company

October 2024

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

October 2024

7.4 Appendix D: Specialist CVs

Celine Klinkert

BSc. Hons Environmental Science

Cell: +27 73 742 8832

Email: celine@thebiodiversitycompany.com

Identity Number: 9708200130085

Date of birth: 20 August 1997



Profile Summary

Working experience throughout Southern Africa

Specialist experience with wetland system dynamics, classification and water quality.

Specialist expertise include wetlands resources, freshwater ecology, faecal contamination and wetland filtration.

Areas of Interest

Sustainability and Conservation, Corporate Sustainability, Green Finance, Wetland Systems and Dynamics, Wetland Contamination and Degradation and Wetland Rehabilitation

Key Experience

- Environmental Impact Assessments (EIA)
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Measurement and analysis of physio-chemical water properties
- Microbiological and faecal contamination in water

Country Experience

South Africa

Nationality

South African

Languages

English – Proficient

Qualifications

- MSc (University of Witwatersrand, Johannesburg) – Environmental Science in Wetland Systems and Water Quality (Waiting for examination)
- BSc Honours (University of Witwatersrand, Johannesburg) – Environmental Science in Business Sustainability (Cum Laude)
- BSc Biological Sciences (University of Witwatersrand, Johannesburg)

Namitha Singh

BSc. (Hons) Environmental Science
(Cum Laude) (Pr Sci Nat 157927)

Cell: +27 63 684 1752

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

- Pr. Sci. Nat. 157 927
- BSc. Honours – Environmental Science (Cum Laude)
- BSc. Environmental Science and Life Science