



SCIENTIFIC AQUATIC SERVICES

FRESHWATER ECOSYSTEM IMPACT VERIFICATION REPORT

**FOR THE NON-INVASIVE PROSPECTING RIGHTS
APPLICATION ON THE FARMS ZWARTFONTEIN 814
LR AND MOORDKOPJE 813 LR IN THE
MOGALAKWENA LOCAL MUNICIPALITY NEAR
MOKOPANE, LIMPOPO PROVINCE.**

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EXECUTIVE SUMMARY

Scientific Aquatic Services (SAS) was appointed by Environmental Management Assistance (Pty) Ltd (the Environmental Assessment Practitioner (EAP) on the project) to verify the presence of freshwater ecosystems within the area in which BCR Projects (Pty) Ltd (the project proponent) is applying for the right to prospect Platinum Group Metals. As part of this scope of works SAS were appointed to prepare a freshwater ecosystem impact and compliance statement as part of the Environmental Authorisation (EA) process for the proposed prospecting rights application. The application area (hereafter referred to as the 'study area') falls within the Farms Zwartfontein 814 LR and Moordkopje 813 LR, in the magisterial district of Mogalakwena, Limpopo.

The Department of Forestry, Fisheries and Environment (DFFE) national web based environmental screening tool (2020), provides the criteria for the assessment and reporting of impacts on aquatic/freshwater biodiversity for activities requiring EA. The screening tool indicates that the study area is located within an area of low aquatic/ freshwater biodiversity significance, although two freshwater features located in the study area are indicated as being of very high aquatic/ freshwater biodiversity significance

Following on from desktop-based delineation of freshwater features in the study area and investigation area (defined as a 500 m radius around the study area, in line with GN 509 as it relates to the National Water Act, 1998 (Act No. 36 of 1998) as amended), a rapid field assessment was undertaken on the 4th and 5th August 2022 to verify the presence of freshwater features.

Various freshwater features were confirmed to occur in the study and investigation areas; various fluvial surface water features which largely drain westward into the Mogalakwena River that is located to the west of the study and investigation areas. These freshwater features occur primarily as watercourses – a fluvial feature that is characterised by a single macro-channel, ephemeral or episodic flows and which in some areas is characterised by woody riparian vegetation on the channel margins. Two freshwater features classified as wetlands were confirmed to occur in the study area – an un-channelled valley bottom wetland in the western part of the study area and a seep wetland located near the Mapela Clinic.

The designation of very high sensitivity to wetland features in the study area by the DFFE Screening Tool has been supported through the findings of the freshwater assessment that has confirmed the presence of wetlands in the study area. However as wetlands cannot be considered in isolation from the other components of the freshwater drainage system in the study area all freshwater features in the study area must be considered to be of very high sensitivity.

The prospecting right, as being applied for would entail non-invasive prospecting activities in the study area, thus no physical activities are proposed to be undertaken. Accordingly no impacts to the freshwater environment or freshwater features in the study area are envisioned and the risk profile to the freshwater environment is considered low to negligible. As such it is the professional opinion of the freshwater specialist that the prospecting right application be granted Environmental Authorisation, subject to prospecting remaining non-invasive with no associated physical activities in the study area. Due to the high sensitivity associated with the freshwater features in the study area, it is recommended that a future Aquatic Biodiversity Specialist Assessment must be undertaken should the prospecting rights application be altered or approved to allow any activities other than non-invasive activities as currently proposed by the applicant that would result in the potential for impacts on freshwater resources to result from such prospecting activities. Such an Aquatic Biodiversity Specialist Assessment must also be undertaken for any future mining-right or mining activities-related application for Environmental Authorisation.



GLOSSARY OF TERMS

Alien vegetation:	Plants that do not occur naturally within the area but have been introduced either intentionally or unintentionally. Vegetation species that originate from outside of the borders of the biome -usually international in origin.
Alluvial Material / deposits	Sedimentary deposits resulting from the action of rivers, including those deposited within river channels, floodplains, etc.
Anaerobic	The absence of molecular oxygen.
Catchment:	The area where water is collected by the natural landscape, where all rain and run-off water ultimately flow into a river, wetland, lake, and ocean or contributes to the groundwater system.
Cumulative Impact	The impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
Delineation (of a wetland):	To determine the boundary of a wetland based on soil, vegetation, and/or hydrological indicators.
Ecoregion:	An ecoregion is a "recurring pattern of ecosystems associated with characteristic combinations of soil and landform that characterise that region".
Ephemeral	A river or watercourse that only flows at the surface periodically, especially those drainage systems that are only fed by overland flow (runoff).
Episodic	Relating to rivers and watercourses typically located within arid or semi-arid environments that only carry flow in response to isolated rainfall events
Facultative species:	Species usually found in wetlands (76%-99% of occurrences) but occasionally found in non-wetland areas
G Horizon	A subsoil horizon that is naturally saturated with water for long periods to form dominant grey, low chroma colours (often with blue or green tints) with or without mottling, with the accumulation of colloidal (clay) matter in the horizon.
Gleying	The process by which a material (soil) has been or is becoming subject to intense reduction as a result of prolonged saturation by water. Gleyed soils are characterised by grey, blue and green colours (due to an absence of ferrous compounds).
Gulley (Donga)	A dry channel in the landscape, formed by the eroding action of running water
Hydromorphic soil:	A soil that in its undrained condition is saturated or flooded long enough to develop anaerobic conditions favouring the growth and regeneration of hydrophytic vegetation (vegetation adapted to living in anaerobic soil).
Hydrological Activation	The degree and period of time of inundation of an area / channel by water, potentially resulting in the development of hydromorphic conditions
Hydrology:	The study of the occurrence, distribution, and movement of water over, on and under the land surface.
Hydromorphy:	A process of gleying and mottling resulting from the intermittent or permanent presence of excess water in the soil profile.
Hydrophyte	A plant that grows in water or in conditions that are at least periodically deficient in oxygen as a result of saturation by water – these are typically wetland plants.
Landtype	Distinct areas defined as part of the Land Type Survey of South Africa based on a unique combination of soil pattern, macroclimate and terrain form.
Lithocutanic B horizon	A subsoil horizon underlying a topsoil or other subsoil (E) horizon, and that overlies and merges into weathering bedrock; is comprised of heterogeneous material consisting of a mixture of soil material, and saprolite (bedrock fragments), displaying cutanic properties.
Marginal	Plants and habitat on the edge of waterbodies; the marginal zone with riparian corridors is the zone that is most often subjected to flows / inundation.
Obligate species:	Species almost always found in wetlands (>99% of occurrences).
Pedocutanic B Horizon	A subsoil (B) horizon that has become enriched in clay by illuviation (the downward movement of fine materials by, and deposition from water), and that has as a result developed blocky structure
Seasonal zone of wetness:	The zone of a wetland that lies between the Temporary and Permanent zones and is characterised by saturation from three to ten months of the year, within 50 cm of the surface
Reach	A longitudinal stretch of a river, wetland or watercourse



Riparian Area /Zone	The physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas
Temporary zone of wetness:	The outer zone of a wetland characterised by saturation within 50 cm of the surface for less than three months of the year.
Vertic Soils	Soils characterised by the presence of swelling and shrinking clays, typically formed where there is a distinct wet and dry period that affects the soils. These soils swell when they become saturated, and shrink again when they dry out, leading to characteristic 'cracking' on the surface of the ground
Watercourse:	For the purposes of this report a watercourse is defined as a fluvial feature that is characterised by a clearly defined channel, which in some cases has a well-defined wooded riparian zone, and which is largely characterised by episodic or ephemeral flows. A 'Watercourse' as per the definition of the National Water Act, is referred to in this report as a freshwater feature.
Wetland Vegetation (WetVeg) type:	Broad groupings of wetland vegetation, reflecting differences in regional context, such as geology, climate, and soil, which may, in turn, influence the ecological characteristics and functioning of wetlands.

ACRONYMS

°C	Degrees Celsius.
BGIS	Biodiversity Geographic Information Systems
CBA	Critical Biodiversity Area
CSIR	Council of Scientific and Industrial Research
DFFE	Department of Forestry, Fisheries and Environment
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EC	Ecological Class
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMC	Ecological Management Class
EMPr	Environmental Management Program
ESA	Ecological Support Area
FEPA	Freshwater Ecosystem Priority Areas
GIS	Geographic Information System
GN	Government Notice
GPS	Global Positioning System
HGM	Hydrogeomorphic
m	Meter
MAP	Mean Annual Precipitation
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Areas
NBA	National Biodiversity Assessment
NWA	National Water Act
PES	Present Ecological State
REC	Recommended Ecological Category
RMO	Resource Management Objective
RQIS	Research Quality Information Services
SACNASP	South African Council for Natural Scientific Professions
SANBI	South African National Biodiversity Institute
SAS	Scientific Aquatic Services
subWMA	Sub-Water Management Area
WetVeg Groups	Wetland Vegetation Groups



WMA	Water Management Areas
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DOCUMENT GUIDE

Table 1 below provides the specialist report requirements for the assessment and reporting of impacts to the aquatic biodiversity in terms of Government Notice 320 as promulgated in Government Gazette 43110 of 20 March 2020 in line with the Department of Environmental Affairs screening tool requirements, as it relates to the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA). It is important to note that the aquatic biodiversity theme replaces Appendix 6 of NEMA.

Table A: Specialist report requirements for the assessment and reporting of impacts to the aquatic biodiversity

No.	Requirements	Section in Report
3.1	The compliance statement must be prepared by a suitably qualified specialist registered with the SACNASP, with expertise in the field of aquatic sciences.	Appendix C
3.2	The compliance statement must:	-
3.2.1	be applicable to the preferred site and the proposed development footprint;	Section 1, 2, 6
3.2.2	confirm that the site is of "low" sensitivity for aquatic biodiversity; and	Section 6.1
3.2.3	indicate whether or not the proposed development will have an impact on the aquatic features.	Section 8.2
3.3	The compliance statement must contain, as a minimum, the following information:	-
3.3.1	contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	Appendix B, C
3.3.2	a signed statement of independence by the specialist;	Appendix B
3.3.3	a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 6,
3.3.4	a baseline profile description of biodiversity and ecosystems of the site;	Section 6
3.3.5	the methodology used to verify the sensitivities of the aquatic biodiversity features on the site including the equipment and modelling used where relevant;	Section 1.1, 6.1
3.3.6	in the case of a linear activity, confirmation from the aquatic biodiversity specialist that, in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase;	N/A
3.3.7	where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMP; and	N/A
3.3.8	a description of the assumptions made as well as any uncertainties or gaps in knowledge or data; and	Section 1.1
3.3.9	any conditions to which this statement is subjected.	Section 6.1; 8.2, 8.3
3.4	A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	EAP to ensure this requirement is met.



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1. INTRODUCTION AND BACKGROUND SETTING

Scientific Aquatic Services (SAS) was appointed by Environmental Management Assistance (Pty) Ltd (the Environmental Assessment Practitioner (EAP) on the project) to verify the presence of freshwater ecosystems within the area in which BCR Projects (Pty) Ltd (the project proponent) IS applying for the right to prospect Platinum Group Metals. As part of this scope of works SAS were appointed to prepare a freshwater ecosystem impact and compliance statement as part of the Environmental Authorisation (EA) process for the proposed prospecting rights application. The application area (hereafter referred to as the 'study area') falls within the Farms Zwartfontein 814 LR and Moordkopje 813 LR, in the magisterial district of Mogalakwena, Limpopo. The area covered by the application is 4095ha in extent and is encompasses a number of peri-urban settlements (rural villages) located approximately 25km to the north-west of the town of Mokopane (Figures 1 and 2).

Apart from peri-urban housing and some areas of informal housing, vacant parts of the study area are utilised predominantly as grazing for cattle, along with the dryland (non-irrigated) cultivation of land for crops for subsistence purposes. A 500 m "zone of investigation" around the study area, (in accordance with General Notice (GN) 509 of 2016 (as it relates to the National Water Act (Act No. 36 of 1998) as amended), was generated to determine potential risks to possible freshwater ecosystems associated with the study area. This will henceforth be referred to as the "investigation area" (Figures 1 and 2).

SAS was required to report on aspects of the freshwater ecosystem biodiversity condition as well as functionality and goods and services provision. In addition, it was required to provide input into any development constraints or enviro-legal constraints that may arise for the proposed prospecting rights application within the study area in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA) and the National Water Act, 1998 (Act No. 36 of 1998) as amended (NWA). SAS was required to, if necessary, assess the risk, if any that the proposed prospecting rights application may pose to the receiving freshwater environment.

1.1 Assumptions and limitations

The following assumptions and limitations are applicable to this report:

- The ground-truthing and delineation of potential freshwater ecosystems and the assessment thereof, were confined to a single rapid site visit within the study area



undertaken on the 04th and 05th August 22. All surface water features identified within the investigation area were delineated in fulfilment of GN 509 of the NWA using various desktop methods including use of topographic maps, current digital satellite imagery and aerial photographs with limited site verification;

- The delineation of the freshwater ecosystems as provided in this report is considered the best estimate taking into consideration the limitations and conditions at the time of assessment (the site visit was conducted in winter outside of the rainfall and growing season);
- Global Positioning System (GPS) technology is inherently inaccurate to a certain extent, and some inaccuracies due to the use of handheld GPS instrumentation may occur; however, the delineations as provided in this report are deemed appropriately accurate to fulfil the authorisation requirements;
- Wetlands and/or riparian zones and terrestrial zones create transitional areas where an ecotone is formed as vegetation species change from terrestrial to obligate/facultative wetland or riparian species. Within this transition zone, some variation of opinion on the freshwater feature boundaries may occur. However, if the Department of Water Affairs and Forestry (DWAF)¹ (2008)² method is followed, all assessors should get largely similar results;
- With ecology being dynamic and complex, certain aspects (some of which may be important) may have been overlooked. The watercourse delineation as presented in this report is, however, regarded as the best estimate of the boundaries based on the site conditions present at the time of the site visit and are deemed appropriately accurate to guide any future development plans.
- As per the project description (Section 2) it has been assumed that no physical ('invasive') prospecting activities will be undertaken in the study area, and the assessment of risks and impacts to the freshwater environment in the investigation area has been based on this premise. Should this change, with the introduction of physical prospecting activities in the study area, the assessment of risks and impacts as undertaken in this report would need to be revised due to a change in the risk profile, as well as necessitating the undertaking of an Aquatic Biodiversity Assessment (as stipulated by the Protocol for the Specialist Assessment and Minimum Report Content

¹ The Department of Water Affairs and Forestry (DWAF) was formerly known as the Department of Water Affairs (DWA). At present, the Department is known as the Department of Water and Sanitation (DWS). For the purposes of referencing in this report, the name under which the Department was known during the time of publication of reference material, will be used.

² Although an updated manual is available since 2008 (Updated Manual for the Identification and Delineation of Wetlands and Riparian Areas). This is still considered a draft document currently under review.



Requirements for Environmental Impacts on Aquatic Biodiversity (GN320 of March 2020)).

- The assessment of Present Ecological State (PES), Ecological Importance and Sensitivity (EIS) and assessment of wetland functionality (wetland ecoservices provided) does not form part of the scope of this freshwater / aquatic biodiversity compliance assessment. Accordingly these detailed assessments of the freshwater features in the study area are not available to be used in the assessment and confirmation of freshwater / aquatic biodiversity sensitivity on the site. Furthermore, freshwater / aquatic biodiversity sensitivity as assessed through the site investigation has been assigned through the application of the precautionary principle and has been based upon the confirmed presence of freshwater ecosystems in the study area.



2. PROJECT DESCRIPTION

BCR Projects (Pty) Ltd is applying for the right to prospect Platinum Group Metals on the Farm Zwartfontein 814 LR and Moordkopje 813 LR, in the magisterial district of Mogalakwena, Limpopo.

The proposed non-invasive prospecting activities will include the following main techniques:

- Data search, field mapping and desktop studies;
- Logging and sampling historical core; and
- Scoping and (pre) feasibility studies.

Due to the large amount of previous diamond core drilling conducted in the area, new drilling locations will only be considered after completion of all the sourced historic exploration results.

For the purpose of the current Basic Assessment (BA) process specialist studies will be undertaken at baseline and/or desktop assessment level identifying potential sensitivities in the general area of the properties.

3. ASSESSMENT APPROACH

- The desktop assessment, as presented in Section 5, reports on the findings from the relevant national, provincial and municipal datasets (such as the National Freshwater Ecosystem Priority Areas [NFEPAs], 2011 database; The National Wetland Map 5 (2018) and the Limpopo Conservation Plan (2018)) which was undertaken to aid in identifying freshwater features;
- The national web based Environmental Screening Tool (DEA, 2020) was utilised to screen the study area for any environmental sensitivity, with specific focus on aquatic sensitivities. The results are presented in Section 4.
- Section 6 reports the following:
 - A description and mapped extent of all freshwater features associated with the study area;
 - Delineation of all freshwater features (using desktop methods) located within the study area, and within 500 m of the study area in accordance with GN 509 as published in the Government Gazette 40229 of 2016 as it relates to activities as stipulated in Section 21(c) and (i) of the National Water Act, 1998 (Act No. 36 of 1998) as amended; and



- The classification of the freshwater features according to the Classification System for Wetlands and other Aquatic Ecosystems in South Africa. User Manual: Inland systems (Ollis *et al.*, 2013).
- Section 7 provides a summary of the applicable legislative conditions that may be applicable.

3.1 Freshwater Definition

The NWA is aimed at the protection of the country's water resources, defined in the Act as:

“a watercourse, surface water, estuary or aquifer”

According to the NWA a watercourse means:

- (a) a river or spring;*
- (b) a natural channel in which water flows regularly or intermittently;*
- (c) a wetland, lake or dam into which, or from which, water flows; and*
- (d) any collection of water which the Minister may, by notice in the Gazette, declare a watercourse.*

It should be noted that in the context of this report, ‘watercourse’ is used to refer to a fluvial feature that is characterised by a clearly defined channel, which in some cases has a well-defined wooded riparian zone, and which is largely characterised by episodic or ephemeral flows. A ‘Watercourse’ as per the definition of the NWA, is referred to in this report as a “freshwater feature”

The NWA further provides definitions of wetland and riparian habitats as follows:

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

Another widely used definition of wetlands is the one used under the **Ramsar Convention**; wetlands are defined as:

“areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres”

However, the presence / absence of hydric soils is the primary determining factor used to define a freshwater feature as a wetland.



This determining factor has been utilised in this assessment. Wetland soils can be termed hydric or hydromorphic soils. **Hydric soils** are defined by the United States Department of Agriculture's Natural Resources Conservation Service as being:

“soils that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part”.

These anaerobic conditions would typically support the growth of hydrophytic vegetation (vegetation adapted to grow in soils that are saturated and starved of oxygen) and are typified by the presence of redoximorphic features.

Riparian habitat includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterized by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent area.

3.2 Freshwater Ecosystem Site Verification

Verification of potential freshwater ecosystems took place according to the method presented in the “Updated manual for the identification and delineation of wetland and riparian resources” (DWAF, 2008). The foundation of the method is based on the fact that freshwater features have several distinguishing factors including the following:

- Landscape position;
- The presence of water at or near the ground surface;
- Distinctive hydromorphic soils;
- Vegetation adapted to saturated soils; and
- The presence of alluvial soils in stream systems.

A field assessment was undertaken on the 04th and 05th August 2022 (late winter) during which the presence of any riparian or wetland characteristics as defined by DWAF (2008) and by the NWA, was investigated (please refer to Section 6 of this report).



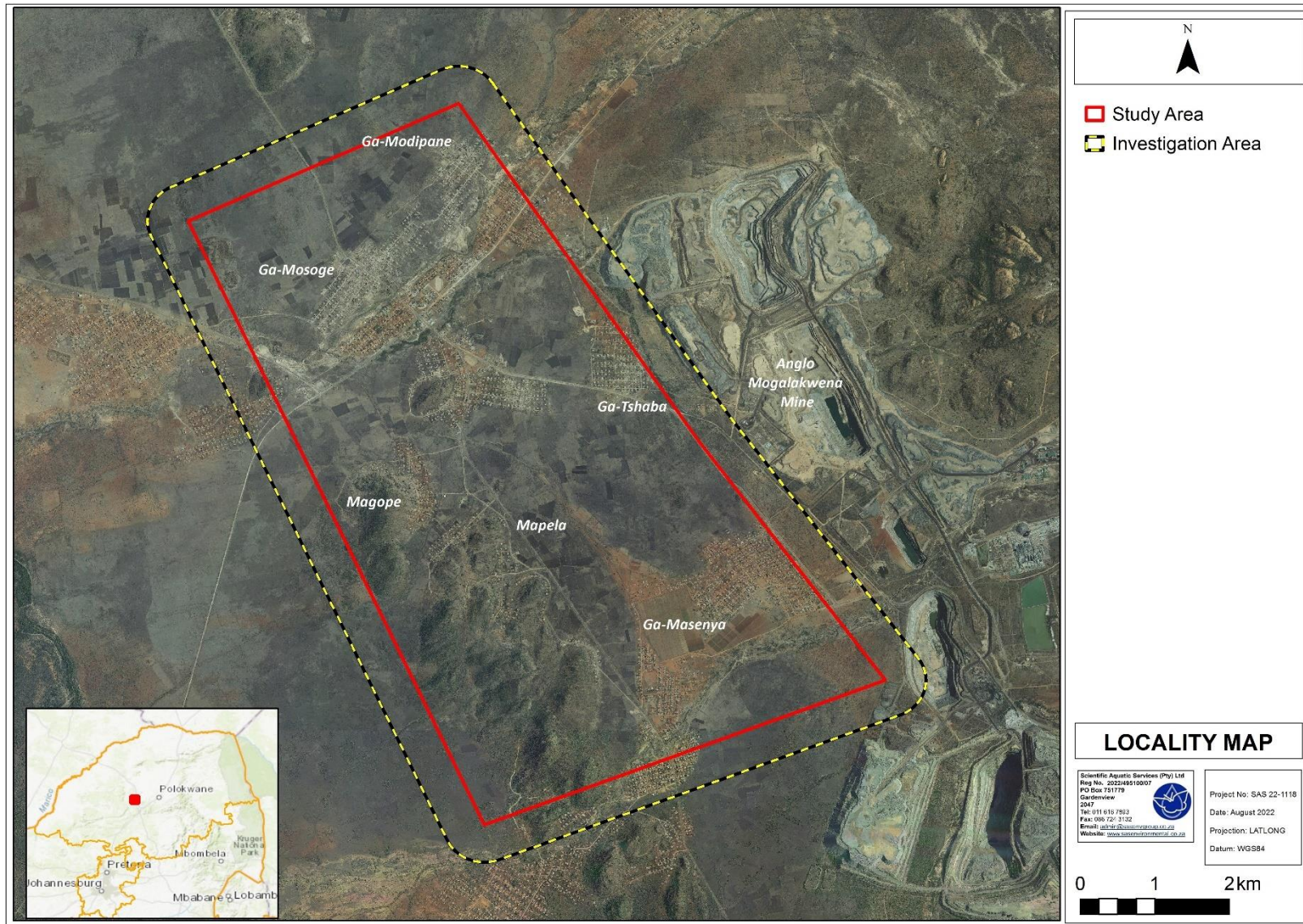


Figure 1: Digital satellite image depicting the study and investigation areas in relation to the surrounding area.



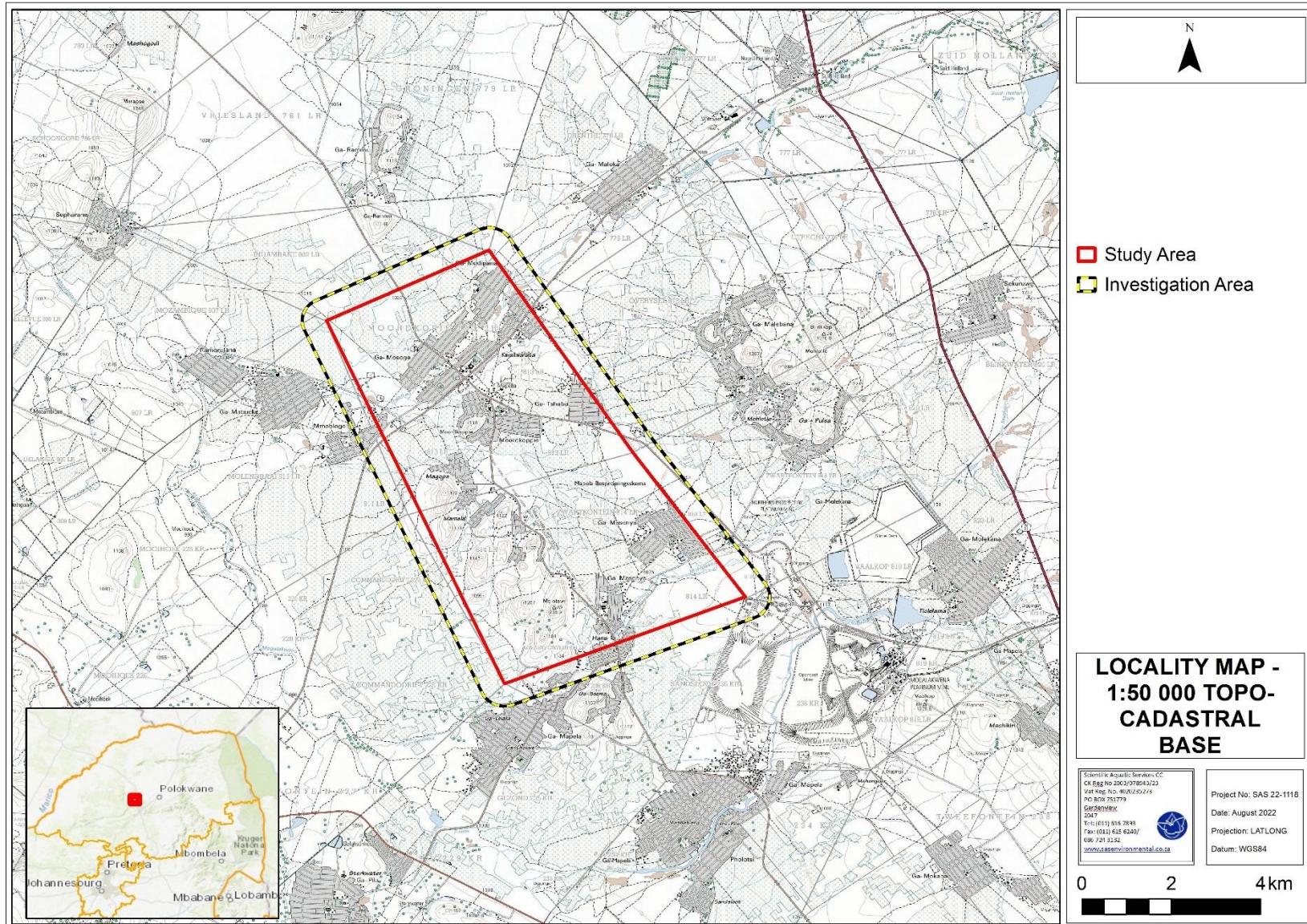


Figure 2: Location of the study and investigation areas depicted on a 1:50 000 topographical map, in relation to surrounding area



4. APPLICATION OF THE DEPARTMENT OF FORESTRY, FISHERIES AND ENVIRONMENT (DFFE) WEB-BASED SCREENING TOOL.

The protocol for the assessment of freshwater and aquatic biodiversity prepared in support of the Department of Forestry, Fisheries and Environment (DFFE) (previously the Department of Environmental Affairs (DEA)) national web based environmental screening tool (2020), provides the criteria for the assessment and reporting of impacts on aquatic/freshwater biodiversity for activities requiring Environmental Authorisation (EA). For the aquatic/freshwater biodiversity theme, the requirements are for sites which support various levels of biodiversity. The relevant aquatic/freshwater biodiversity theme in the national web based environmental screening tool (2020) has been provided by the South African National Biodiversity Institute (SANBI). Based on the sensitivity rating, a suitably qualified specialist must prepare the relevant report or opinion memorandum which is to be submitted as part of the EA application.

As part of the process of the background information gathering, the EAP applied the DFFE screening tool to the study area. According to the guidelines, an applicant intending to undertake an activity on a site identified as being of “very high sensitivity” for an aquatic biodiversity theme must submit an Aquatic Biodiversity Impact Assessment, or if the area is identified as being of “low sensitivity” then an Aquatic Biodiversity Compliance Statement must be compiled and submitted to the competent authority. It is noted, however, that during a site survey undertaken by a suitably qualified freshwater ecologist should the sensitivity be determined different from that assigned by the screening tool (i.e. that a high risk to the regional aquatic biodiversity or freshwater ecosystems in the area is likely even though it is assigned as a “low” sensitivity, or if it is assigned a high sensitivity, however, the proposed development risks are deemed low) then the relevant assessment approach must be followed based on the site survey results and not the DFFE screening tool allocation.

According to the national web based environmental screening tool, the study area is located within an area of **low aquatic/ freshwater biodiversity significance**, although two freshwater features located in the study area are indicated as being of **very high aquatic/ freshwater biodiversity significance** (Figure 3).



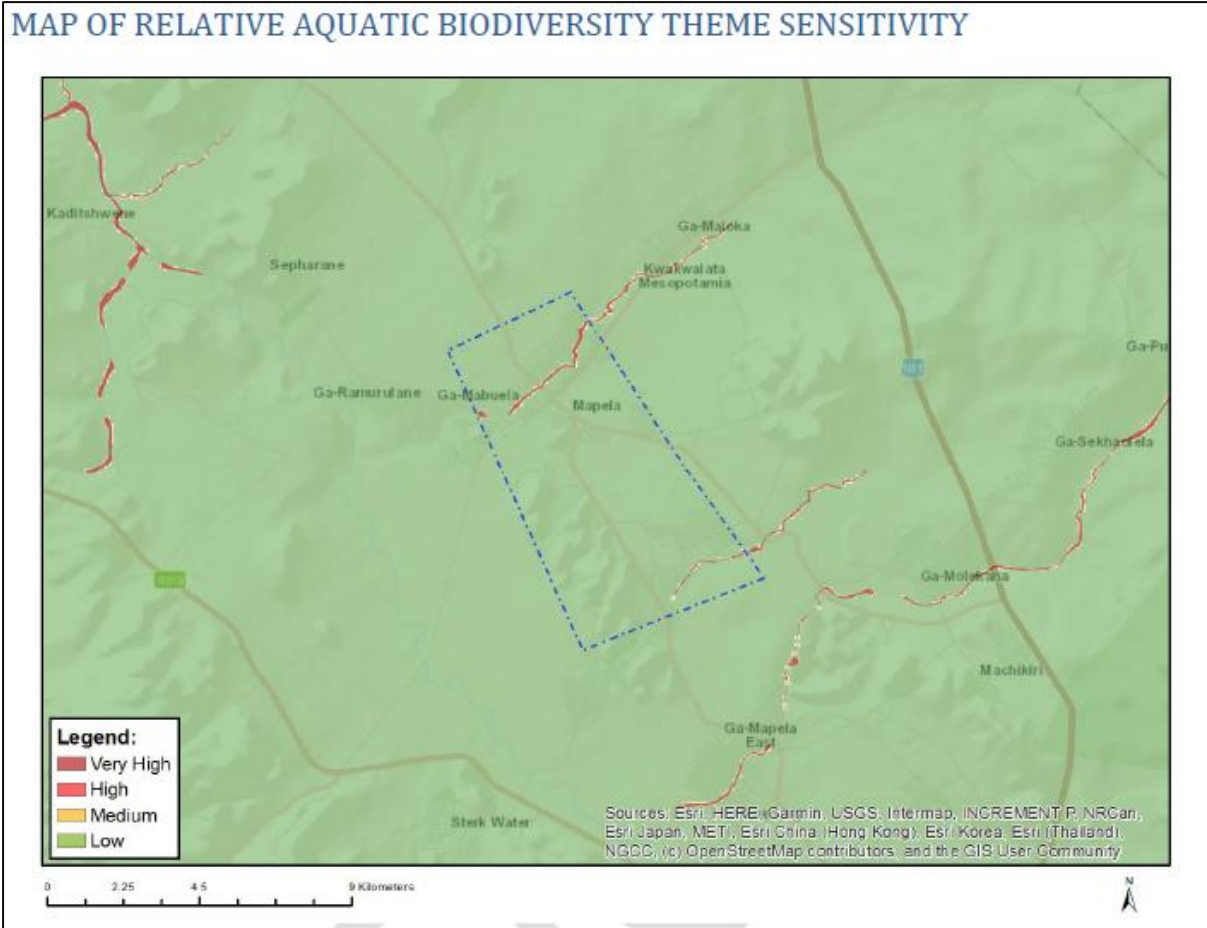


Figure 3 - Map of relative aquatic biodiversity according to the DFFE Screening Tool, indicating 'low' sensitivity within the wider study area, but very high sensitivity along two watercourses (wetlands) in the study area.

The national web based environmental screening tool report has assigned the areas of very high aquatic biodiversity sensitivity as being associated with the presence of wetlands and estuaries. As the majority of the study area has been assigned a low sensitivity, and due to the low risk profile of the proposed non-invasive prospecting activities as part of the application for EA, the assessment approach of undertaking an Aquatic Biodiversity Compliance Statement has been undertaken. However the verification site assessment was used to verify the designation of very high sensitivity to two of the freshwater features located within the study area.



5. DESKTOP INVESTIGATION FINDINGS

A background study of relevant national, provincial and municipal datasets (such as the National Freshwater Ecosystem Priority Areas [NFEPA] 2011 database; The National Wetland Map 5 (2018), the Limpopo Province Map of Critical Biodiversity Area and Ecological Support Areas – i.e. the Waterberg District Bioregional Plan³ – was undertaken to aid in defining presence of any freshwater ecosystems prior to the site survey of the study area (see Appendix A, Table 1) as well as the associated 500 m investigation area.

The results are summarised in the dashboard and relevant maps below.

³ This is the Map of Critical Biodiversity Areas and Ecological Support Areas (CBA Map) produced by the Limpopo Conservation Plan V2 (LCPv2, 2013), and updated consecutively and individually for the Waterberg (2015), Mopani (2016), Vhembe (2017), Sekhukhune (2018) and Capricorn (2018) district municipalities as part the compilation of bioregional plans for these municipalities. Each bioregional plan produced an updated CBA map for the district.



Table 1: Desktop data relating to the characteristics of the freshwater ecosystems / features associated with the study and investigation area.

Aquatic ecoregion and sub-regions in which the study and investigation areas are located		Detail of the study and investigation areas in terms of the National Freshwater Ecosystem Priority Area (NFEPA) (2011) database (Figure 5)	
Ecoregion	Limpopo Plain	FEPACODE	The study area is located within an Upstream Management Catchment which is required to prevent the downstream degradation of Freshwater Ecosystem Priority Areas (FEPAs) and Fish Support Areas (FSAs).
Catchment	Limpopo		
Quaternary Catchment (Figure A3)	A61G		
WMA	Mogalakwena	NFEPA Wetlands	According to the NFEPA Database, only limited wetlands occur within the study or investigation areas. A depression wetland is located in the north-western part of the study area (PES: AB - natural / largely natural state) and a wetland flat is located in the south-eastern part of the study area (PES Z3 – heavily to critically modified state).
subWMA	Limpopo		
Dominant characteristics of the Limpopo Plain Aquatic Ecoregion Level 2 (1.03) (Kleynhans et al., 2007)		Wetland Vegetation Type	The study area is situated within the Central Bushveld Group 4 Wetland Vegetation Type, considered Vulnerable as provided by Mbona <i>et al.</i> (2015).
Dominant primary terrain morphology	Plains; low and moderate relief, lowlands, hills and mountains; moderate and high relief (limited)		
Dominant primary vegetation types	Mixed Bushveld	NFEPA Rivers	According to the NFEPA Database, no rivers occur within the study or investigation areas. The closest river is the Groot Sandstoot to the south-east and the Mogalakwena River to the west.
Altitude (m a.m.s.l)	700 to 1300		
MAP (mm)	300 to 600	National Biodiversity Assessment (2018): South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Figure 6)	
Coefficient of Variation (% of MAP)	25 to 34	According to the NBA SAIIAE (2018) database, wetlands are located in the study area; a channelled valley bottom system along with a depression wetland are located in the northern part of the study area and a river system is located in the southern part of the study area. The depression wetland is classified as being in a largely natural ecological condition (WETCON A/B). The Ecosystem Threat Status (ETS) of the depression wetland is Least Concern (LC) and the Ecosystem Protection Level (EPL) is Poorly Protected (PP). The channelled valley bottom wetland is classified as being in a largely to critically modified ecological condition (WETCON D/E/F). The ETS of the channelled valley bottom wetland is Critically Endangered (CR) and the EPL is Not Protected (NP). No ecological condition, ETS or EPL data is provided for the river in the southern part of the study area.	
Rainfall concentration index	60 to >65		
Rainfall seasonality	Early to mid-summer		
Mean annual temp. (°C)	18 to 22	National Web Based Environmental Screening Tool (2020) (Figure 3).	
Winter temperature (July)	18 to 24 (max) 2 to 5 (min)	The Screening Tool is intended to allow for pre-screening of sensitivities in the landscape to be assessed within the EA process. This assists with implementing the mitigation hierarchy by allowing developers to adjust their proposed residential development footprint to avoid sensitive areas.	
Summer temperature (Feb)	28 to 32 (max) 16 to 19 (min)		
Median annual simulated runoff (mm)	<5 to 60		
Importance of the study area according to the Limpopo Conservation Plan (2018) (Waterberg District Municipality Bioregional Plan) (Figure 7).			
Other Natural Areas	According to the Limpopo Conservation Plan, large parts of the study area, particularly the south-western hilly ground and corridors in the north and south of the site are classified as Other Natural Areas . These are natural and intact areas, which are not required to meet targets, nor has it been identified as a CBA or ESA.		
No Natural Remaining	The remaining portions of the study area fall within an area classified as No Natural Remaining areas . These are areas with no significant direct biodiversity value. These are either not natural areas or degraded natural areas that are not required as ESA. These areas include intensive agriculture, urban, industry; and human infrastructure.		
Ecological Support Area	A very small area in the north-western part of the study area is classified as an ESA 1 . Ecological Support Areas (ESAs) are		



	<p>areas that are important for maintaining the ecological processes on which Critical Biodiversity Area (CBAs) or protected areas depend. ESA1 areas are in at least fair ecological condition i.e. in at least a semi-natural state, with their basic ecological functioning intact.</p>	<p>The wetland features identified by the NBA (2018) database are classified as being of very high aquatic biodiversity sensitivity. The rest of the study area is classified as being of low aquatic biodiversity sensitivity.</p>
<p>Importance according to the Mining and Biodiversity Guidelines (2013) (Figure 8)</p>		
<p>Large parts of the study area, in particular the vacant, undeveloped areas are considered to be of High Biodiversity Importance. The remaining portions of the study area are currently not ranked.</p> <p>During the prospecting stage of the mining life cycle relevant information on the potentially significant impacts on biodiversity and ecosystem services must be gathered as the basis for assessing impacts and providing adequate and appropriate mitigation measures. Prospecting plans should be developed to avoid impacts on key biodiversity features, particularly in high biodiversity priority areas, and/or to minimise and remedy impacts on other biodiversity in accordance with the mitigation hierarchy.</p>		
<p>Landtype Data (Figure 9)</p>		
<p>A number of landtypes are located across the study area; the northern and central parts of the study area is characterised by the Ea208 landtype. Soils within the Ea landtype grouping are dark brown / black or red coloured strongly to very strongly structured (topsoil and subsoil) of varying depths. These soils have high clay content, displaying a high water-holding capacity and mostly containing a high percentage of swelling clay minerals. Vertic and melanic soils commonly occur in this landtype grouping. Within the EA208 landtype valley floors, midslopes and footslopes are characterised by melanic and vertic topsoils, with pedocutanic and lithocutanic subsoils and limited areas characterised by wetland-related soil forms in the form of Willowbrook and Rensburg Soil Forms.</p> <p>A linear band surrounding the Thwathwe Watercourse in the northern part of the site is characterised by the la168 landtype. la landtype groupings are characterised by undifferentiated deep soil deposits, being typically deep pedologically youthful soils, which occur mostly along river courses, valley bottoms and in lower lying areas. In the la168 landtype valley floors, footslopes and midslopes are characterised by a mix of soils forms typically characterised by heavy clay topsoils and subsoils, with some occurrence of the Dundee soil form (characterised by alluvial material) along watercourses.</p> <p>The hilly ground in the south-western part of the study area is characterised by the lb447 landtype. lb447 landtype groupings are areas where 60-80% of the surface is occupied by exposed rock and stones/boulders and the slopes are usually steep. The rest of the area comprises mostly shallow soils, directly underlain by hard or weathered rock.</p> <p>The south-eastern part of the site is occupied by the Ae227 landtype. Ae landtype groupings consists of red, high base status soils. Valley floors within the Ae227 landtype are characterised by a relatively high percentage of wetland soil forms, including the Pinedene, Longlands and Kroonstad soil forms as well as the Dundee soil form. These soil forms suggest the presence of soft plinthic B, E horizons and G horizons which are diagnostic wetland soil horizons. A much smaller proportion of such soil forms characterised the footslopes and midslopes in this landtype, suggesting wetland occurrence primarily on valley floors in this part of the study area.</p>		

CBA = Critical Biodiversity Area; DWS = Department of Water and Sanitation; EI = Ecological Importance; ES = Ecological Sensitivity; EPL = Ecosystem Protection Level; ESA = Ecological Support Area; ETS = Ecosystem Threat Status; m.a.m.s.l = Metres Above Mean Sea Level; MAP = Mean Annual Precipitation; NBA = National Biodiversity Assessment; NFEPA = National Freshwater Ecosystem Priority Areas; PES = Present Ecological State; SAIIAE = South African Inventory of Inland Aquatic Ecosystems; WMA = Water Management Area.



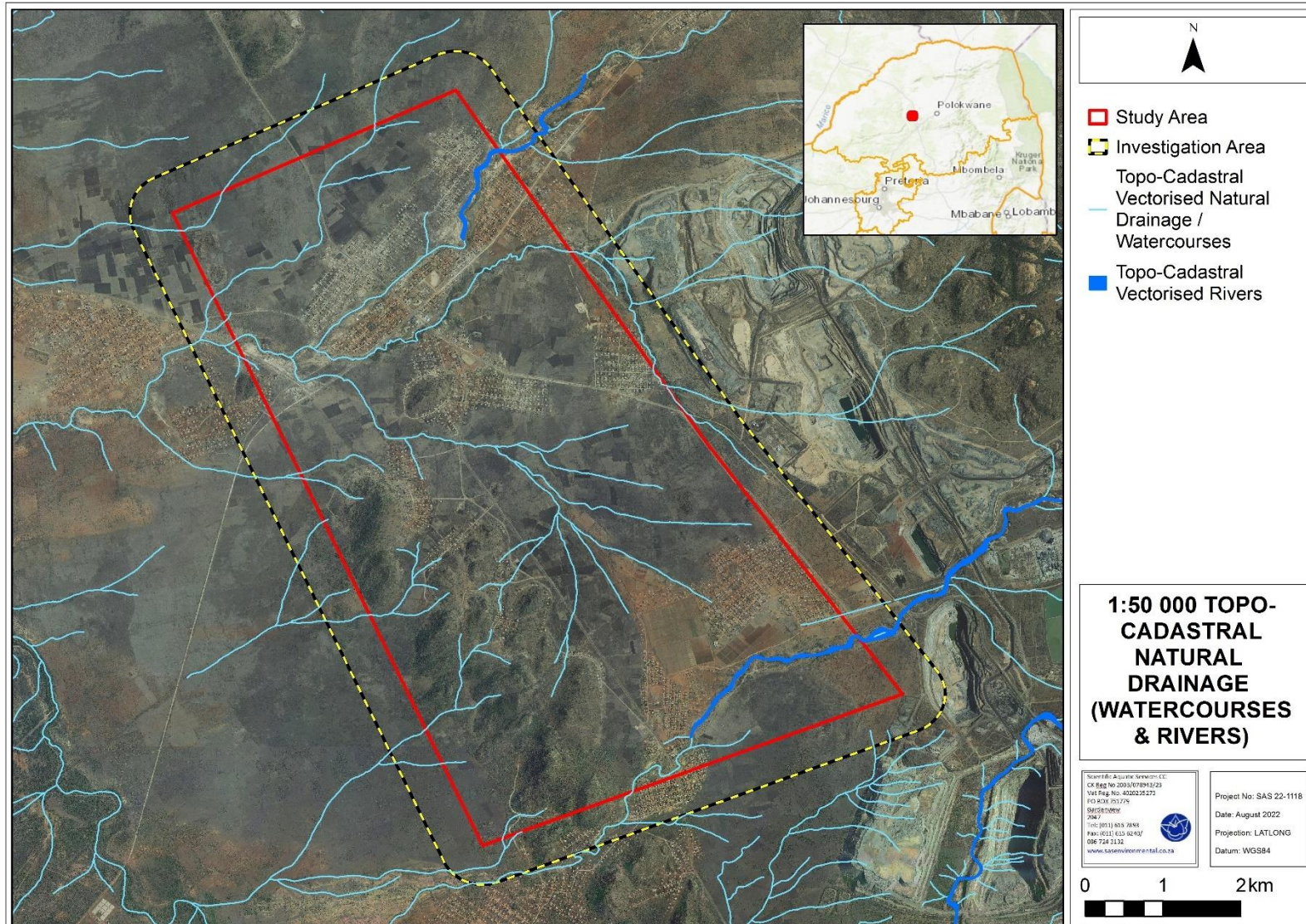


Figure 4: Map of natural surface water drainage in the study and investigation areas, as presented on the 1:50 000-scale topo-cadastral map for the area.



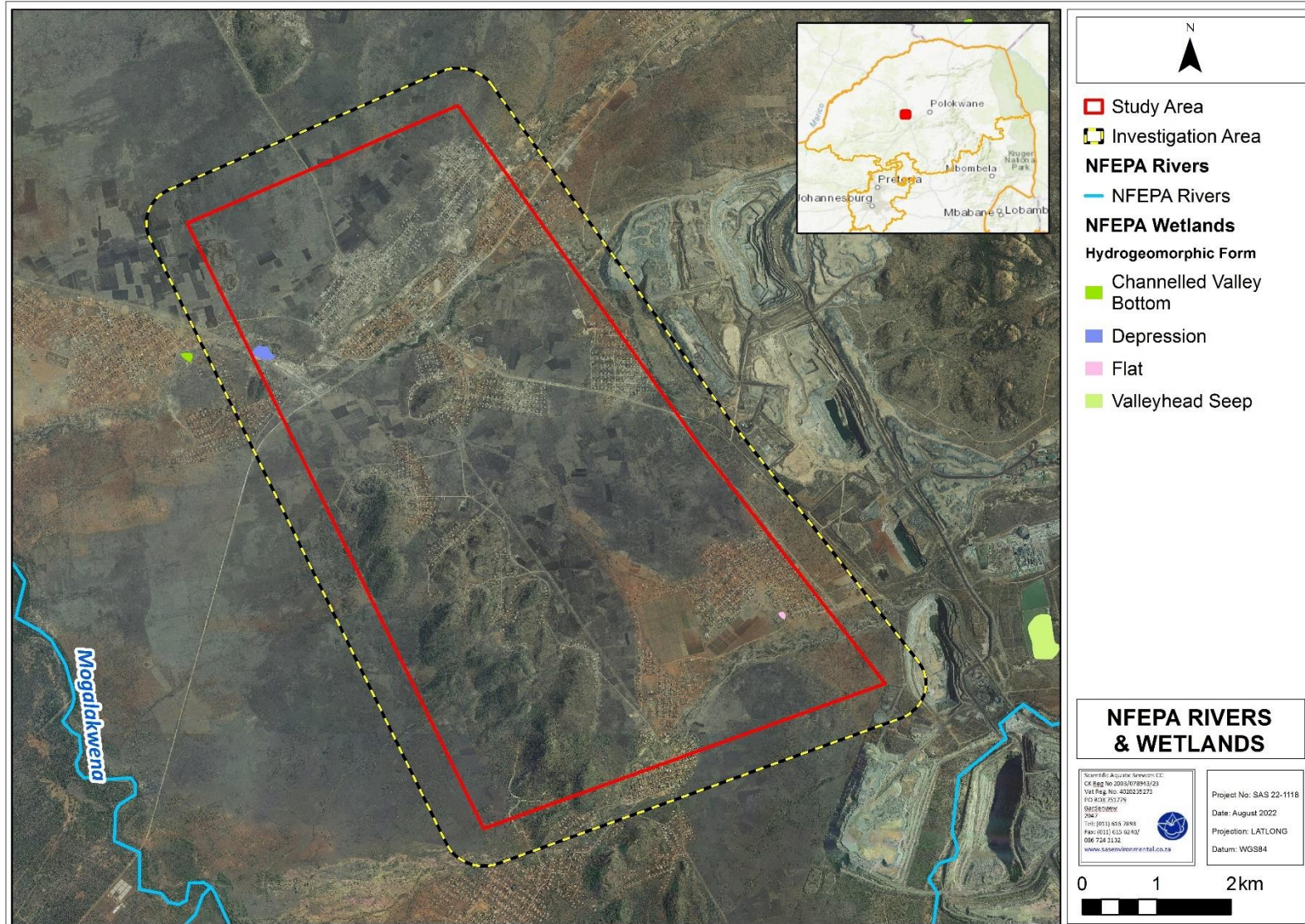


Figure 5: Wetlands and Rivers within the investigation area indicated by the NFEPA database.



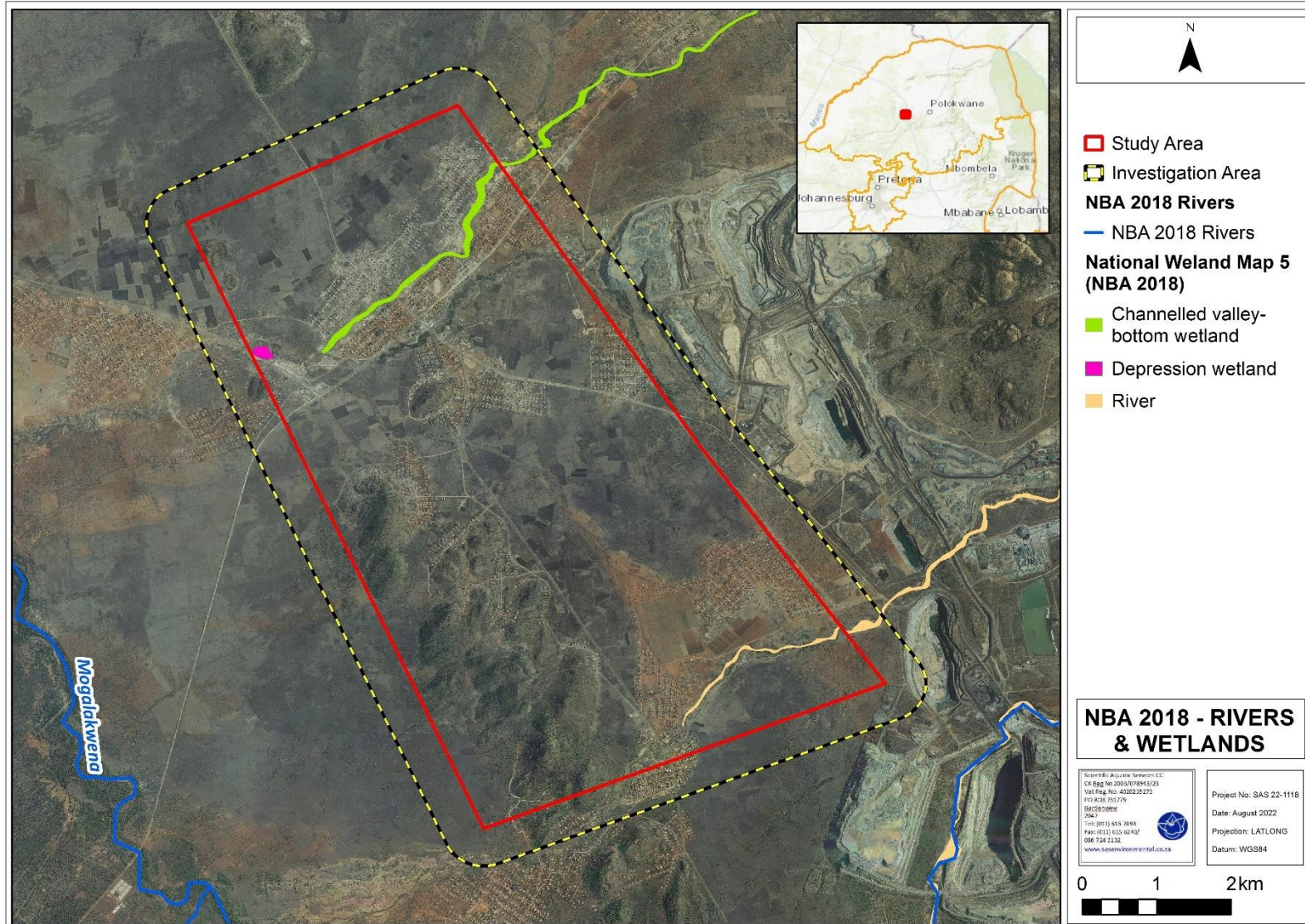


Figure 6: Wetlands and Rivers within the investigation area indicated by the National Biodiversity Assessment, 2018.



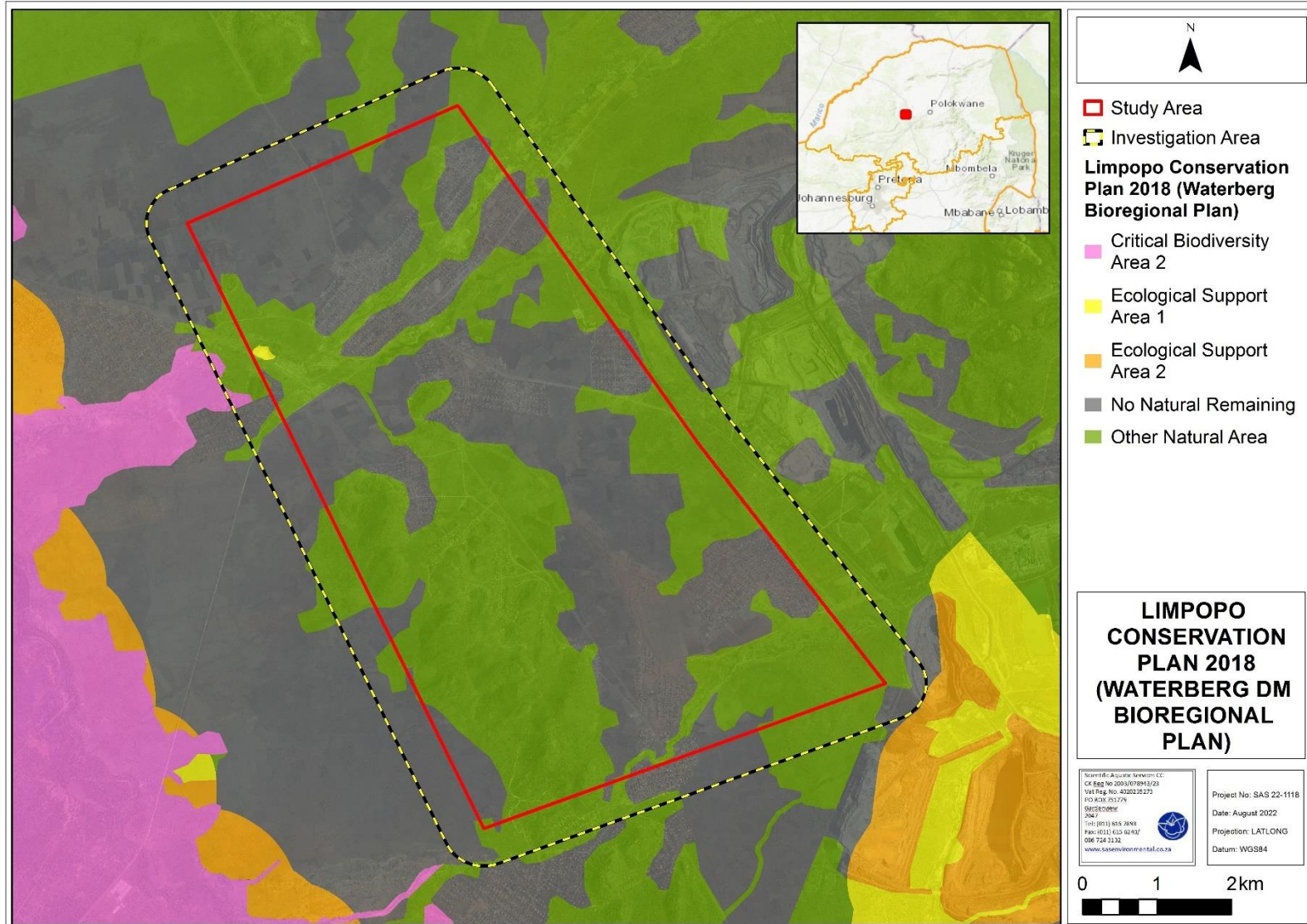


Figure 7: Designations in the Study and Investigation Areas according to the Limpopo Conservation Plan 2018 (Waterberg Bioregional Plan).



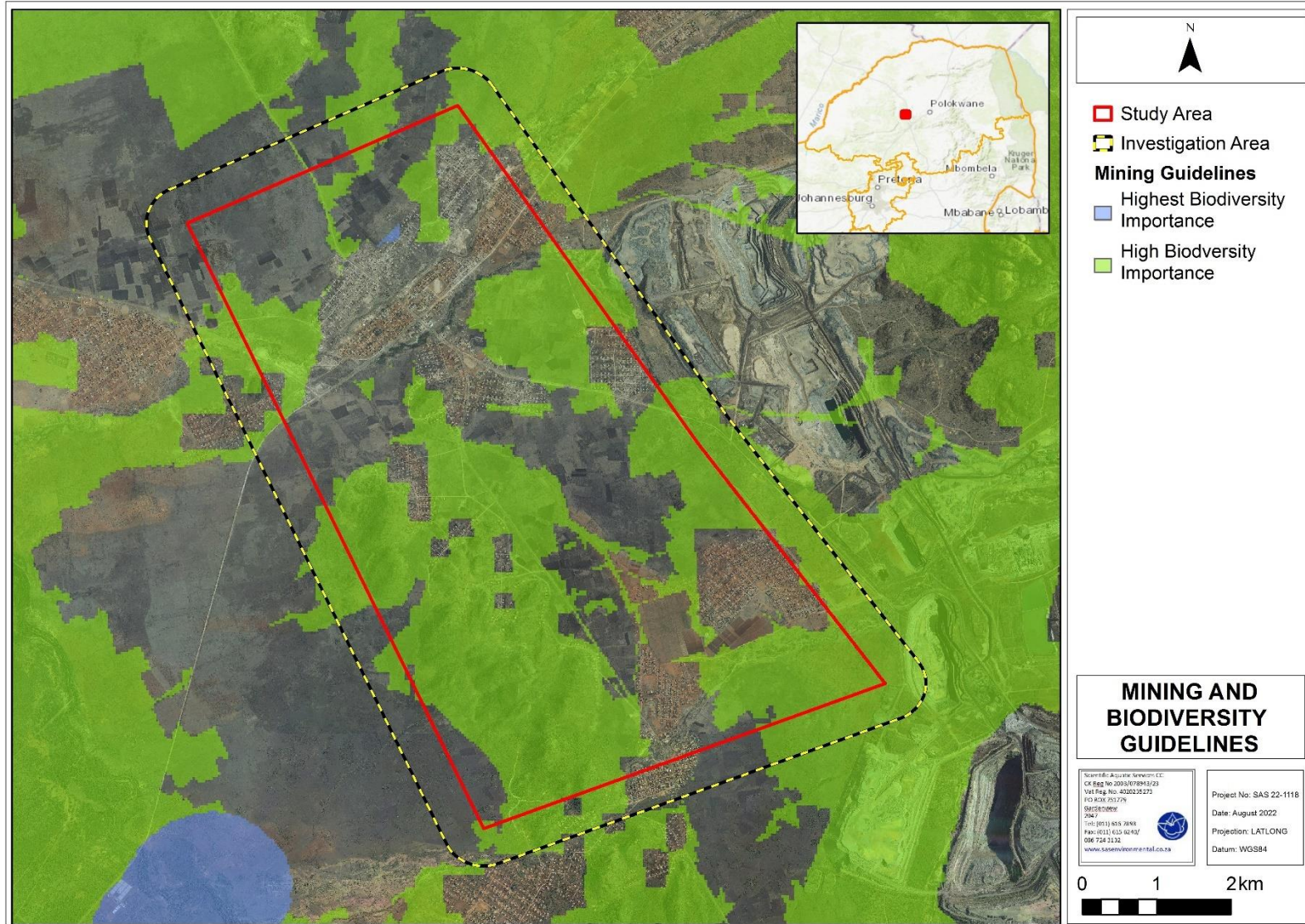


Figure 8: Areas of Sensitivity in the Study and Investigation Areas according to Mining and Biodiversity Guidelines.



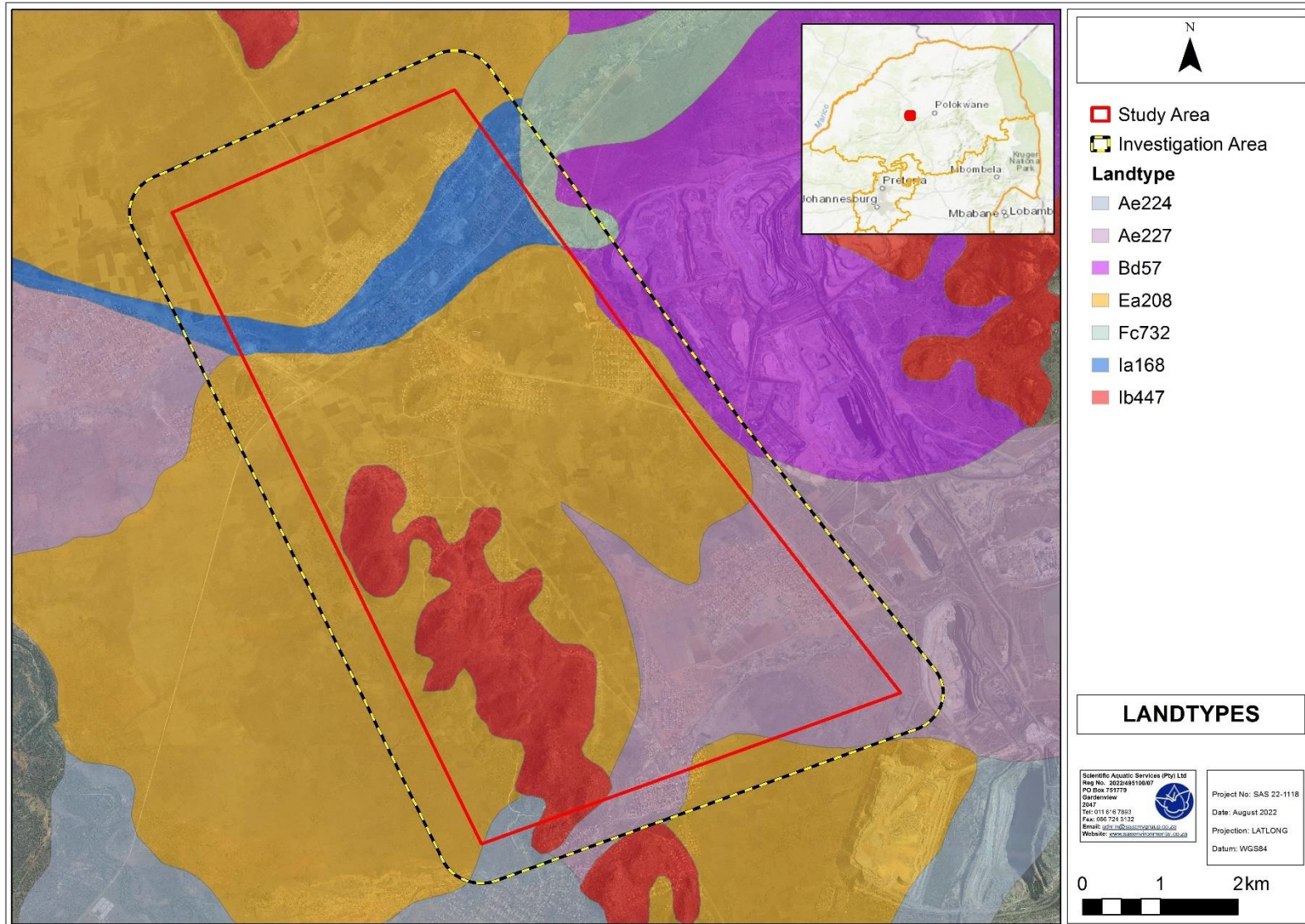


Figure 9: Landtypes within the Study Area and Investigation Areas



- According to the NFEPA (2011) and the NBA (2018) databases, wetlands are located in the study area; the NBA database which shows more extensive wetlands shows a channelled valley bottom system along with a depression wetland that are located in the northern part of the study area (labelled as the Thwathwe on the topo-cadastral maps for the study area), along with a river system that is located in the southern part of the study area (labelled as the Mohlosane on the topo-cadastral maps of the study area). These wetlands correlate with the area of 'very high' aquatic biodiversity indicated by the DFFE screening tool (2020). The channelled valley bottom wetland is indicated to be in a heavily to critically modified ecological condition, whereas the depression wetland is indicated to be in a largely natural condition.
- Neither the NFEPA (2011) nor the NBA (2018) databases indicate the presence of any rivers in the study area. The closest river according to these databases is the Sandisoot River to the south-east of the study area and the Mogalakwena River that is located west of the study area. All drainage on the study site drains into the Mogalakwena River.
- The topo-cadastral drainage map layer (CDNGI, 2006) indicates the presence of numerous watercourses on the study and investigation areas. The majority are characterised as non-perennial watercourses, with the exception of the Mohlosane Watercourse, a reach of which in the south-eastern part of the study area is indicated as a non-perennial river, and a reach of the Thwathwe Watercourse in the north-eastern part of the study area which is similarly indicated as a non-perennial river.

6. SITE SURVEY RESULTS

A site investigation of the study area was undertaken on the 04th and 05th August 2022 during the winter season, using visual assessment methods. In addition, a 'bucket' soil auger was used to investigate soils in certain freshwater features for the presence of hydromorphy where vegetation species composition and structure suggested the presence of wetland habitat.

The site assessment confirmed that, as indicated in the topo-cadastral depiction of natural drainage in the wider area (Figure 4), there are various fluvial surface water features which largely drain westward into the Mogalakwena River that is located to the west of the study area. Importantly not all components of the surface water drainage on the site as indicated by the topo-cadastral depiction of natural drainage were confirmed to be visible freshwater features, with many drainage features that are indicated as watercourses on the topo-cadastral layer either being non-existent or taking the form of preferential flow paths which were not considered to be watercourses.



The primary form of surface water feature in the study area and surrounds as confirmed by the site assessment is the, although widespread removal / felling of woody vegetation along watercourses is expected to be a significant impact in the context of the study area and accordingly under natural conditions a greater coverage of woody riparian species along most watercourses could be expected. The channel of such watercourses was often eroded to bedrock, with most of the reaches having channel beds consisting of fine to coarse alluvial material.

The majority of watercourses in the study area are ephemeral or episodic in nature, and although certain were noted to be characterised by active flow of surface water at the time of the assessment, none are expected to be characterised by perennial flows even under normal circumstances. Notably the reaches of the Thwathwe Watercourse located downstream of the seep wetland (Figure 15) confirmed on the site were noted to be characterised by active water flow, whereas the reaches of this system upstream were not, suggesting that this seep performs an important role in providing stream flow recharge and regulation to the lower reaches of the watercourse and the downstream unchannelled valley bottom wetland.



Figure: 10 The channel and associated riparian zone of the Mohlosane Watercourse in the southern part of the study area, one of the watercourse reaches in the study area that displays an intact woody riparian zone.

The downstream (western) reaches of the watercourses in the study area, and particularly the lower reaches of the Thwathwe and Mohlosane Watercourses were noted to be characterised by a wider macro channel and a more defined wooded riparian zone.

The presence of the Ea 208 landtype (Figure 9) and its associated highly expansive turf clay (vertic and melanic) soils appears to have a strong influence on the spatial distribution and physical characteristics of watercourses in the parts of the study area in which it is located. Large parts of the study area are located in areas characterised by clay soils which are highly expansive in nature in response to their high moisture retention capacity. In the study area the Ea 208 landtype is typified by very flat terrain in which surface drainage is very poorly defined or largely absent. The absence of surface water drainage features is particularly prevalent in the upper parts of sub-catchments of the watercourses that drain the EA208 landtype in the study area, with highly inconspicuous diffuse flow paths the only expression of surface drainage in these parts of the site. Where watercourses subsequently develop, they take the form of a narrow somewhat incised channels that are not typically characterised by the presence of a distinct riparian zone or wetland characteristics, either in the context of vegetation structure or species composition. Surface water drainage is typically better defined in the Ae227 landtype, with its redder, apedal soils (e.g. the watercourse in Figure 11).



Figure 11 – An example of an episodic watercourse located to the north of the village of Ga-Masenyia in the study area

Along the channel margins and beds of mist watercourses that drain the study area limited hydrophytic plants were typically encountered, and the channel banks were typically characterised by an assemblage of terrestrial grass species which are not associated with watercourses. Hydrophytes such as the grass species *Imperata cylindrica* and the sedge species *Cyperus sexangularis* were only encountered in scattered localities, being indicative of the episodic / ephemeral nature of flow and associated limited inundation / hydrological activation of channels and their associated marginal zones.



Figure 12 – The unchannelled valley bottom (Thwathwe) wetland located close to the western edge of the study area



Figure 13 – Examples of gleyed hydromorphic soils from the wetlands on the site – left: from the unchannelled valley bottom and right: from the seep wetland

Only two wetlands were identified within the study area. In its lower reaches the Thwathwe Watercourse widens to form a broad unchannelled lateral extent with no distinct flow channel. This reach was classified as an unchannelled valley bottom wetland. Hydromorphic soils were encountered within the channel bed, characterised by distinctive gleying and leaching of minerals from these soils.(Figure 13). Vegetatively the wetland is characterised primarily by extensive stands of the sedge *Cyperus sexangularis* (Figure 12), as well as other facultative wetland species such as *Panicum repens* and *Setaria sphacelata* var. *sphacelata*



Figure 14 – The seep wetland located close to the Mapela Clinic

A second wetland, a seep wetland was encountered close to the Mapela Clinic (Figure 14). The seep is characterised by extensive calcrete deposits which according to members of the community has been previously quarried at this location. The presence of a wetland was confirmed by active seepage, the presence of extensive communities of obligate hydrophytes, and primarily the presence of hydromorphic soils in the form of highly gleyed soils which as encountered within in a G horizon are characteristic of the permanent saturation of soils by water and associated anaerobic conditions, leading to the development of hydromorphy (Figure 13). The seep wetland was vegetatively characterised by extensive stands of the obligate hydrophyte *Typha capensis* as well as other hydrophytes including *Cyperus sexangularis*, *Juncus rigidus*, *Andropogon eucomus* and *Cynodon nlemfuensis*. The

hydrophytic grass species *Paspalum distichum* was noted to be present in areas of surface water within the wetland.

Although a detailed assessment of freshwater state (PES) for the study area has not been undertaken as part of the scope of this assessment, observations relating to anthropogenic influences acting on the watercourses and wetlands in the study area were made during the field investigation. Impacts on freshwater features primarily relate to landuse-related pressures. The uncontrolled grazing of livestock appears to have resulted in overgrazing in certain parts of the study area, primarily areas that are located close to human settlements. This has been likely to promote the development of accelerated erosion in parts of the site in the form of gullying (donga development) and sheet erosion. Many watercourses in the vicinity of settlements were noted to subject to dumping of household and other waste, which is likely to result in the pollution and associated deterioration in water quality of the affected watercourses (Figure 15). The dumping of large numbers of disposable nappies into watercourse channels was noted to be particularly prevalent near areas of human settlement, and this factor is likely to be introducing faecal coliforms to the watercourses where flow occurs.

The removal / felling of woody vegetation, particularly larger shrubs and trees was noted to be prevalent across the study area, and this practice is likely to have resulted in changes to the species and structural composition of riparian zones in watercourses across the study area.



Figure 15 – Example of extensive dumping of household waste into a watercourse located to the south of the Mapela Clinic and downstream of the seep wetland

Lastly, the presence of the Mogalakwena Mine has resulted in indirect and direct impacts on watercourses in the study area. The Mogalakwena Mine and its associated waste rock dumps occupy large parts of the area to the east of the study area and accordingly of the catchments of certain of the larger watercourses on the site. This has resulted in the loss of catchment yield for these watercourses which has likely altered the hydrology of these watercourses. Direct impacts have occurred in the form of channelisation (straightening) of a watercourse reach near the village of Ga-Tshaba and the complete physical transformation of a reach of the same watercourse to the north (within the investigation area) where the footprint of the waste rock dump has completely encroached upon the watercourse reach, thus completely transforming all freshwater habitat within the affected reach.

It should be noted that the pan / depression wetland that is indicated to occur in the western part of the study area by both the NBA 2018 and NFEPA wetland databases was confirmed to not be a wetland or freshwater feature. The area indicated as a wetland is a flat area of shallow outcropping of calcrete that is currently used as an informal football field.

The distribution and classification of freshwater features in the study area and associated investigation area is indicated in Figures 16 to 18.



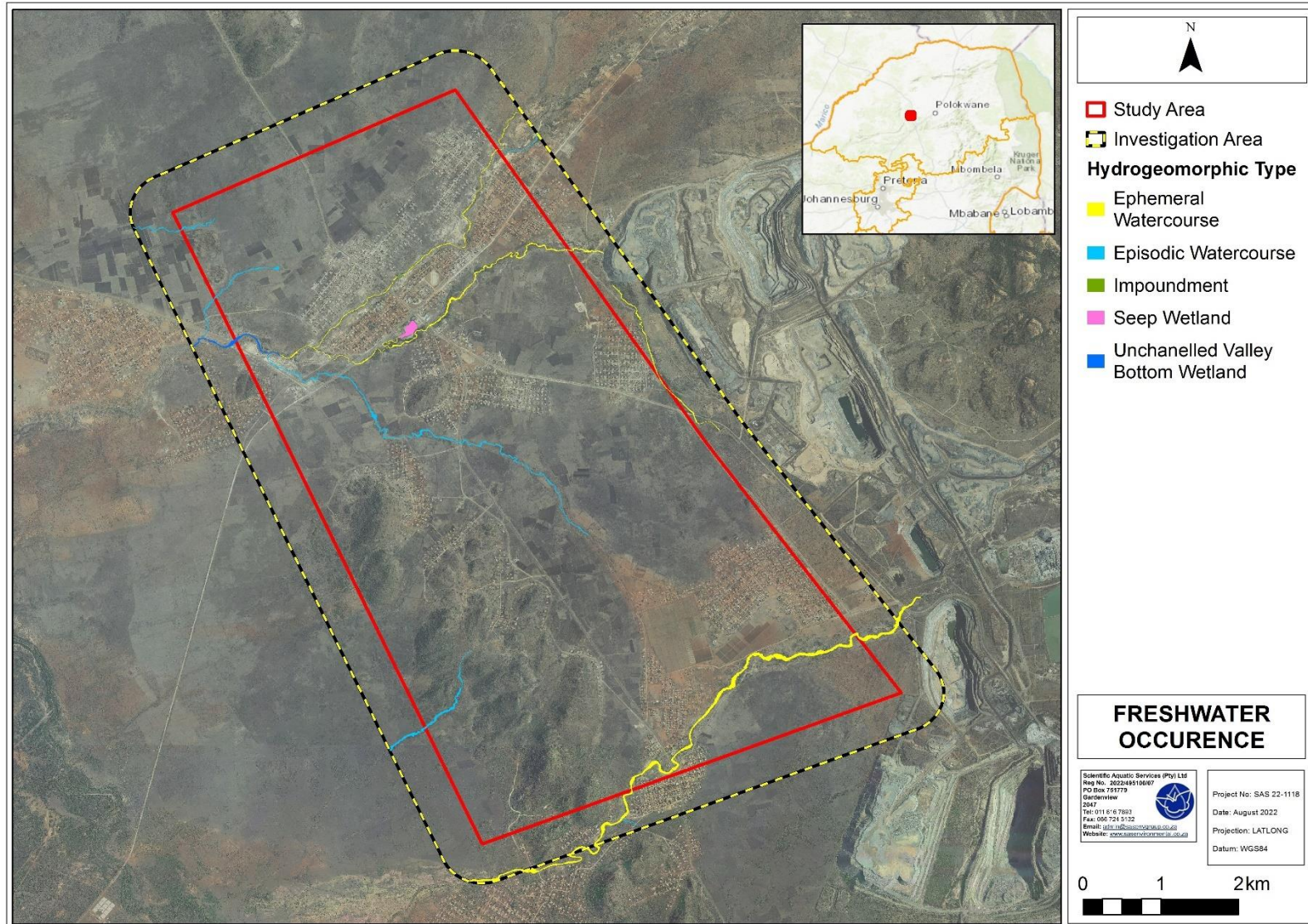


Figure 16 – Freshwater features located within the study and investigation areas



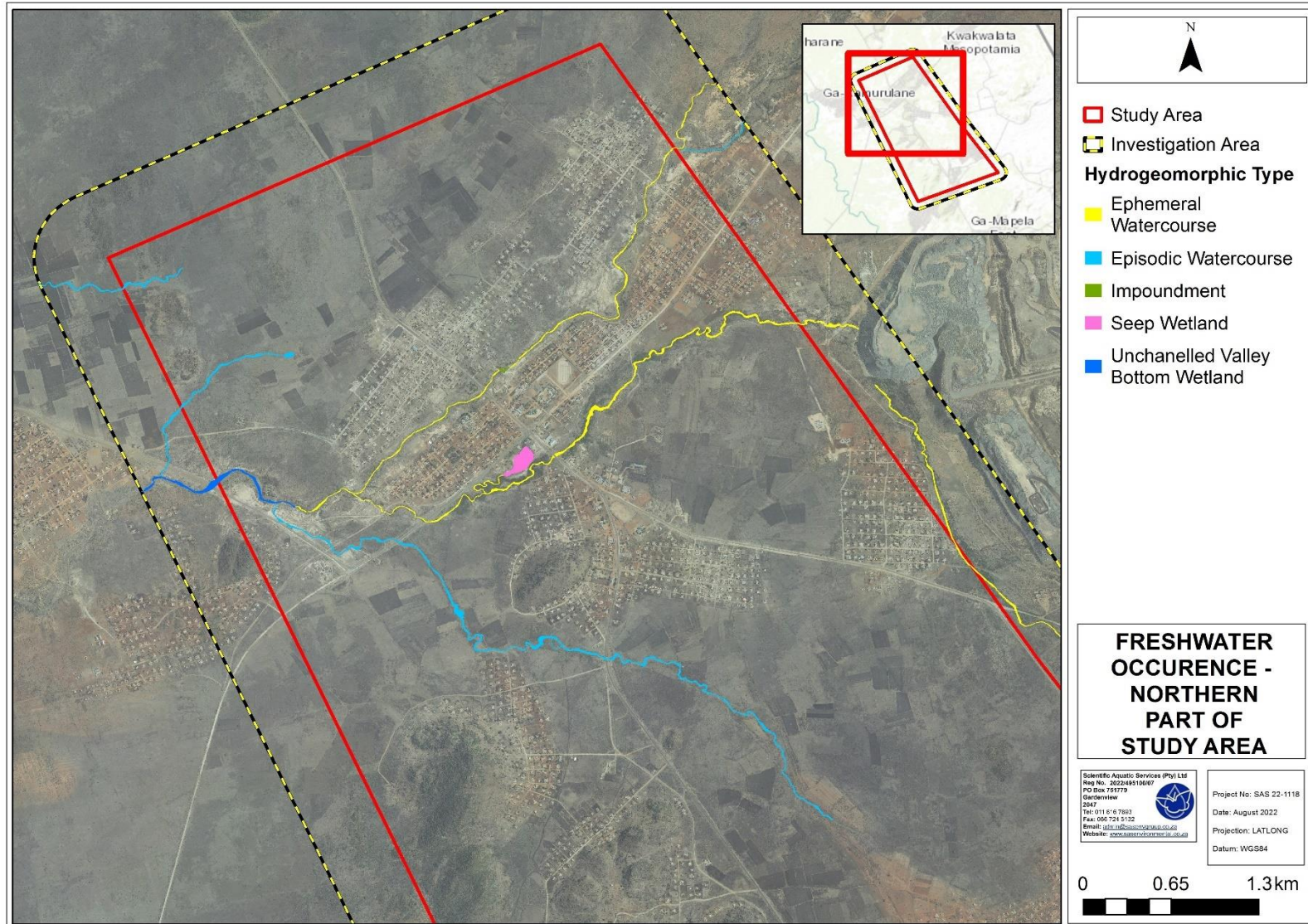


Figure 17 - Freshwater features located within the northern parts of the study and investigation areas



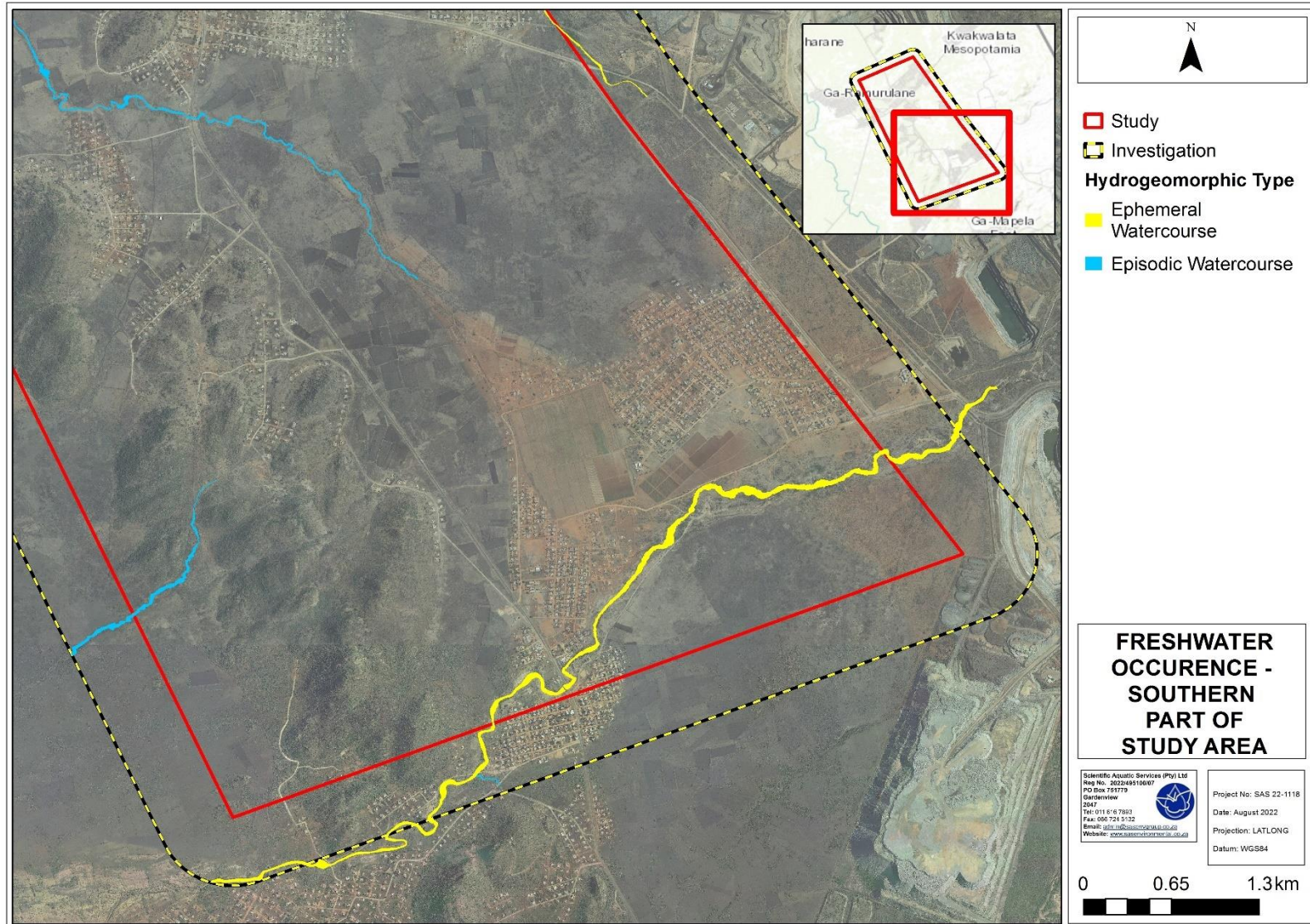


Figure 18 - Freshwater features located within the southern parts of the study and investigation areas



6.1 Freshwater Wetland Sensitivity

As described in Section 5, the DFFE Web-based Screening Tool has designated the majority of the study area as being of low aquatic biodiversity sensitivity with the exception of two wetland systems as designated under the 2018 National Wetland Map that were assigned a very high sensitivity. The presence of wetland habitat in the study area has been confirmed in the parts of the study area in the form of a seep wetland and an unchannelled valley bottom (Figures 16-18). The assigning of very high sensitivity to such wetland features is supported through the findings of this freshwater assessment. However these two wetland systems are ecologically and hydrologically inter-dependent on the non-wetland watercourses on the site, in particular the (Thwathwe Watercourse) unchannelled valley bottom wetland which occurs at the downstream end of most of the watercourses draining the northern part of the study area, and thus the wetlands cannot be considered in isolation from the upgradient watercourses. As such all freshwater features on the site must be considered to have high aquatic biodiversity / freshwater sensitivity.

Under the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Aquatic Biodiversity, (GN320 of March 2020), for areas of low aquatic biodiversity sensitivity an Aquatic Biodiversity Compliance Statement must be produced. Due to the designation of most of the study area as being of low aquatic biodiversity sensitivity, and due to the non-invasive and adaptable nature of the proposed prospecting activity (i.e. comprising of no physical activities and thus no prospecting-related impacts on the freshwater features in the study area) the approach of producing such a compliance statement was taken. However the confirmation of freshwater features of very high sensitivity would normally require that an Aquatic Biodiversity Specialist Assessment be undertaken. Due to the low risk profile associated with the proposed prospecting activities as currently proposed, the compilation of a freshwater compliance statement was taken. However it is recommended that a future Aquatic Biodiversity Specialist Assessment must be undertaken should the prospecting rights application be altered or approved to allow any activities other than non-invasive activities as currently proposed by the applicant that would result in the potential for impacts on freshwater resources to result from such prospecting activities. Such an Aquatic Biodiversity Specialist Assessment must also be undertaken for any future mining-right or mining activities-related application for Environmental Authorisation and a Water Use Authorisation.



7. LEGISLATIVE REQUIREMENTS

The following legislative requirements were considered during the assessment.

- The Constitution of the Republic of South Africa, 1996⁴;
- The National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA);
- The National Water Act, 1998 (Act No. 36 of 1998) as amended (NWA);
- Government Notice 509 as published in the Government Gazette 40229 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998).
- Government Notice 704 as published in the Government Gazette 20119 of 1999 as it relates to the National Water Act, 1998 (Act No. 36 of 1998); and
- The Minerals and Petroleum Resources Development Act, 2002 (Act No.28 of 2002) (MPRDA).

The legislative context of a regulated zone(s) of activity for the protection of freshwater ecosystems as based on the above legislation can be summarised as follows:

Table 2: Articles of Legislation and the relevant zones of regulation applicable to each article.

Regulatory authorisation required	Zone of applicability
Water Use Authorisation. Application for water uses as stipulated in Section 21(c) and (i) of the National Water Act, 1998 (Act No. 36 of 1998) as amended. Department of Water and Sanitation (DWS)	Government Notice 509 as published in the Government Gazette 40229 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998) In accordance with GN509 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998), a regulated area of a watercourse in terms of water uses as listed in Section 21 (c) and 21(i) 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.

⁴ Since 1996, the Constitution has been amended by seventeen amendments acts. The Constitution is formally entitled the 'Constitution of the Republic of South Africa, 1996'. It was previously also numbered as if it were an Act of Parliament – Act No. 108 of 1996 – but since the passage of the Citation of Constitutional Laws Act, neither it nor the acts amending it are allocated act numbers.



Regulatory authorisation required	Zone of applicability
	<p>Government Notice 704 Regulations as published in the Government Gazette 20119 of 1999 as it relates to the National Water Act, 1998 (Act No. 36 of 1998) as amended regarding the use of water for mining and related activities aimed at the protection of water resources.</p> <p>These Regulations were put in place in order to prevent the pollution of water resources and protect water resources in areas where mining activity is taking place from impacts generally associated with mining. It is recommended that the proposed project in its current and future phases complies with GN704 of the National Water Act, 1998 (Act No. 36 of 1998) as amended which contains regulations on use of water for mining and related activities aimed at the protection of water resources.</p> <p>GN704 states that:</p> <p><i>No person in control of a mine or activity may:</i></p> <p>(a) <i>locate or place any residue deposit, dam, reservoir, together with any associated structure or any other facility within the 1:100 year floodline or within a horizontal distance of 100 metres from any watercourse or estuary, borehole or well, excluding boreholes or wells drilled specifically to monitor the pollution of groundwater, or on waterlogged ground, or on ground likely to become waterlogged, undermined, unstable or cracked; According to the above, the activity footprint must fall outside of the 1:100 year floodline of the aquatic resource or 100m from the edge of the resource, whichever distance is the greatest.</i></p>
<p>Listed activities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) EIA Regulations (2014), as amended in 2017.</p>	<p>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 in 2017)</p> <p>The development of—</p> <p>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or</p> <p>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</p> <p>where such development occurs—;</p> <p>a) within a watercourse;</p> <p>b) in front of a development setback; or</p> <p>c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.</p> <p>excluding—</p> <p>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such development occurs within an urban area;</p> <p>(ee) where such development occurs within existing roads, road reserves or railway line reserves; or</p> <p>(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.</p>

As the prospecting and the acquisition of the rights to prospect is expected to be non-invasive, i.e. not involve any physical activity, then the prospecting (right) alone would not trigger either a Section 21 (c) and (i) water use, or Activity 12 in terms of Listing Notice 1 of the EIA Regulations of 2014 as amended in 2017. Similarly under Listing Notice 3 of the EIA Regulations no activities associated with a Zone of Regulation are expected to apply to the



proposed prospecting right. Thus no Zones of Regulation would apply to the application for the prospecting, as contemplated.

However if the nature of the prospecting changed to involve any physical activity, then these legislative triggers may become relevant along with the applicable zones of regulation and their associated environmental authorisations which would apply to the identified natural watercourses:

- A 32 m Zone of Regulation (ZoR) in accordance with the National Environmental Management Act, 1998 (Act No. 107 of 1998), applying to all identified watercourses and wetlands; and
- A 100 m, as well as a 500m ZoR in accordance with the National Water Act, 1998 (Act No. 36 of 1998) applying to all identified watercourses (with the 500m ZoR applying to all wetlands).

Figures 19 to 21 below indicate the potential Zones or Regulation in the study area and in the Investigation area.

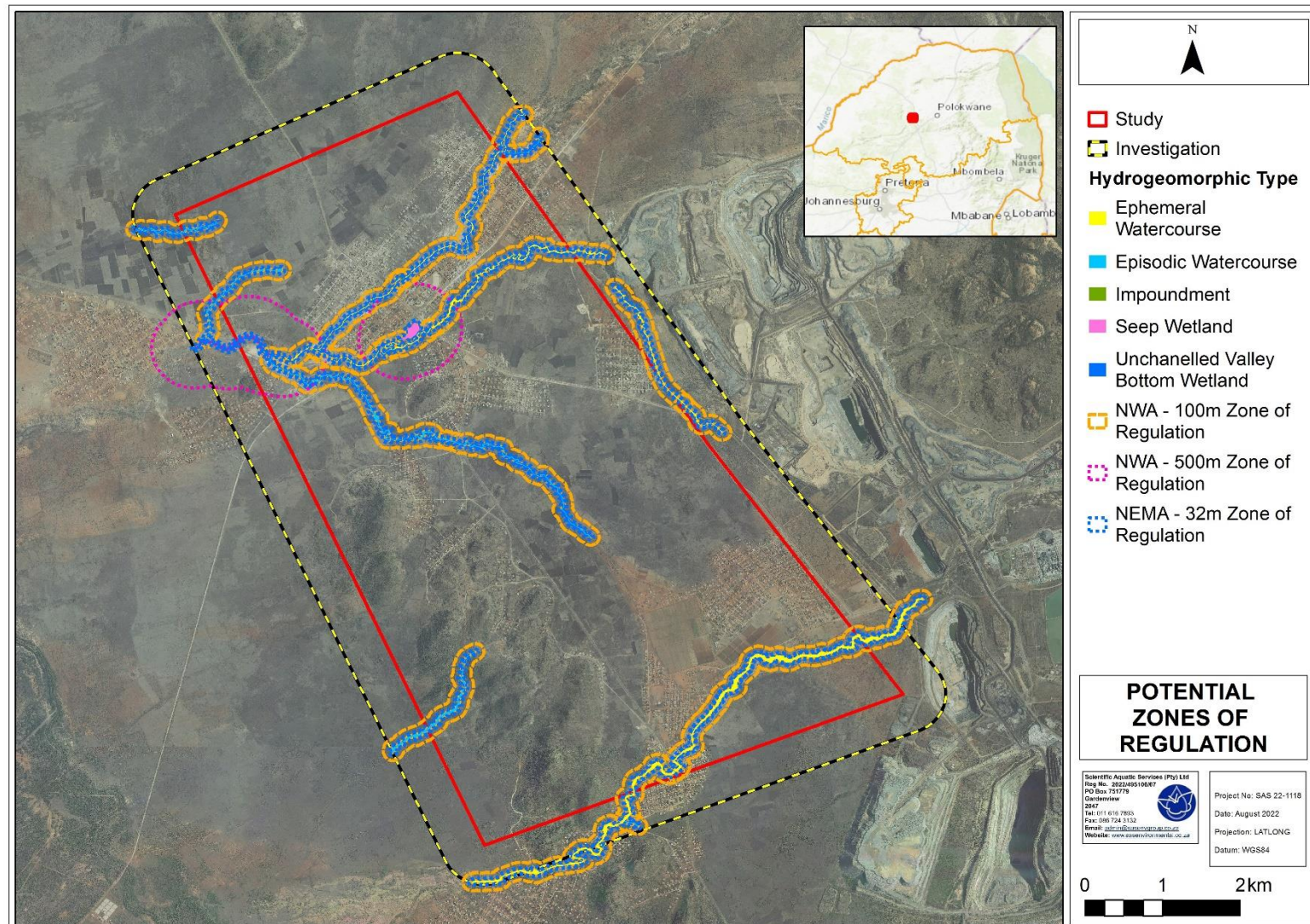


Figure 19 – Potential Zones of Regulation in the study and investigation areas



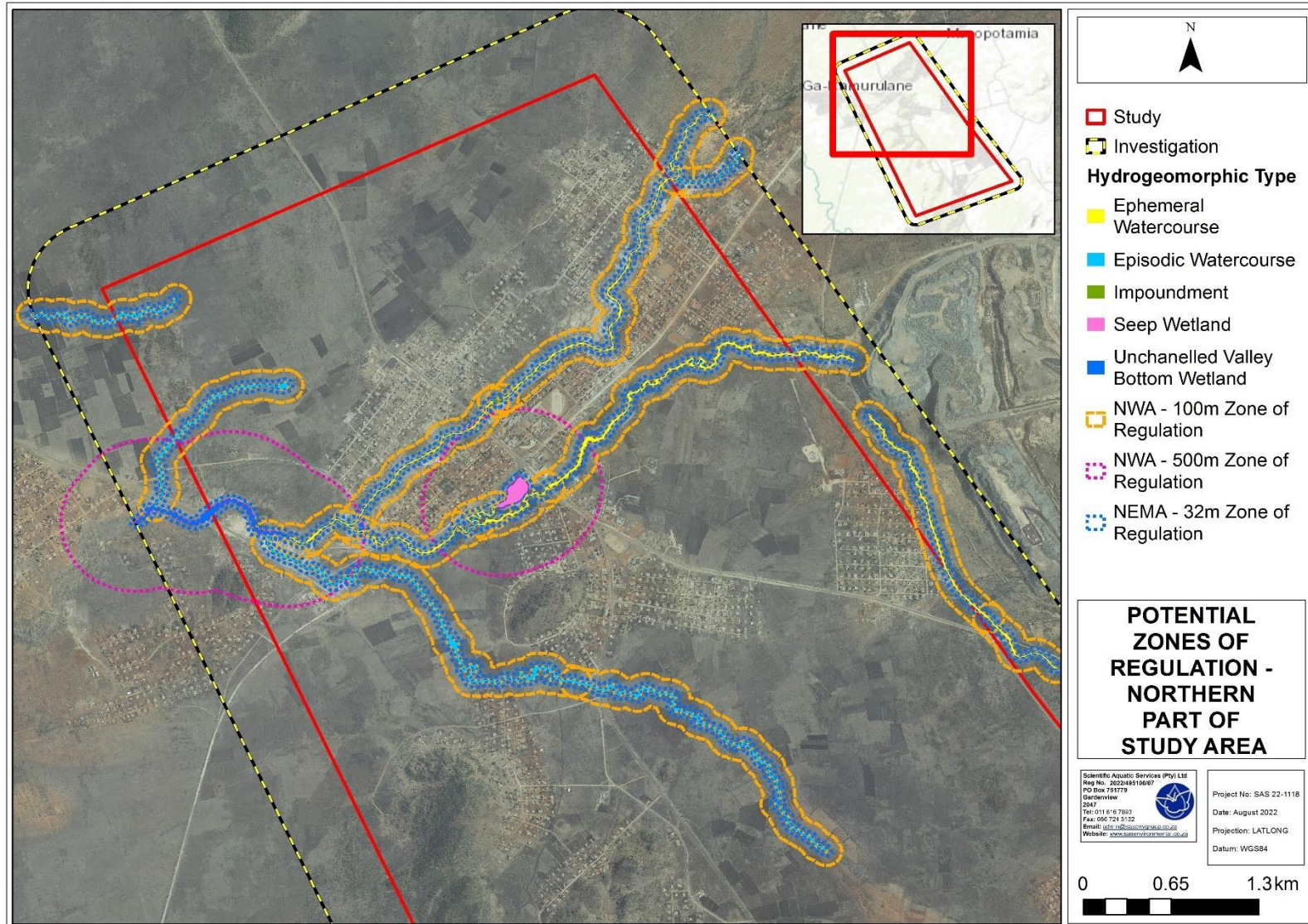


Figure 20 - Potential Zones of Regulation in the northern parts of the study and investigation areas



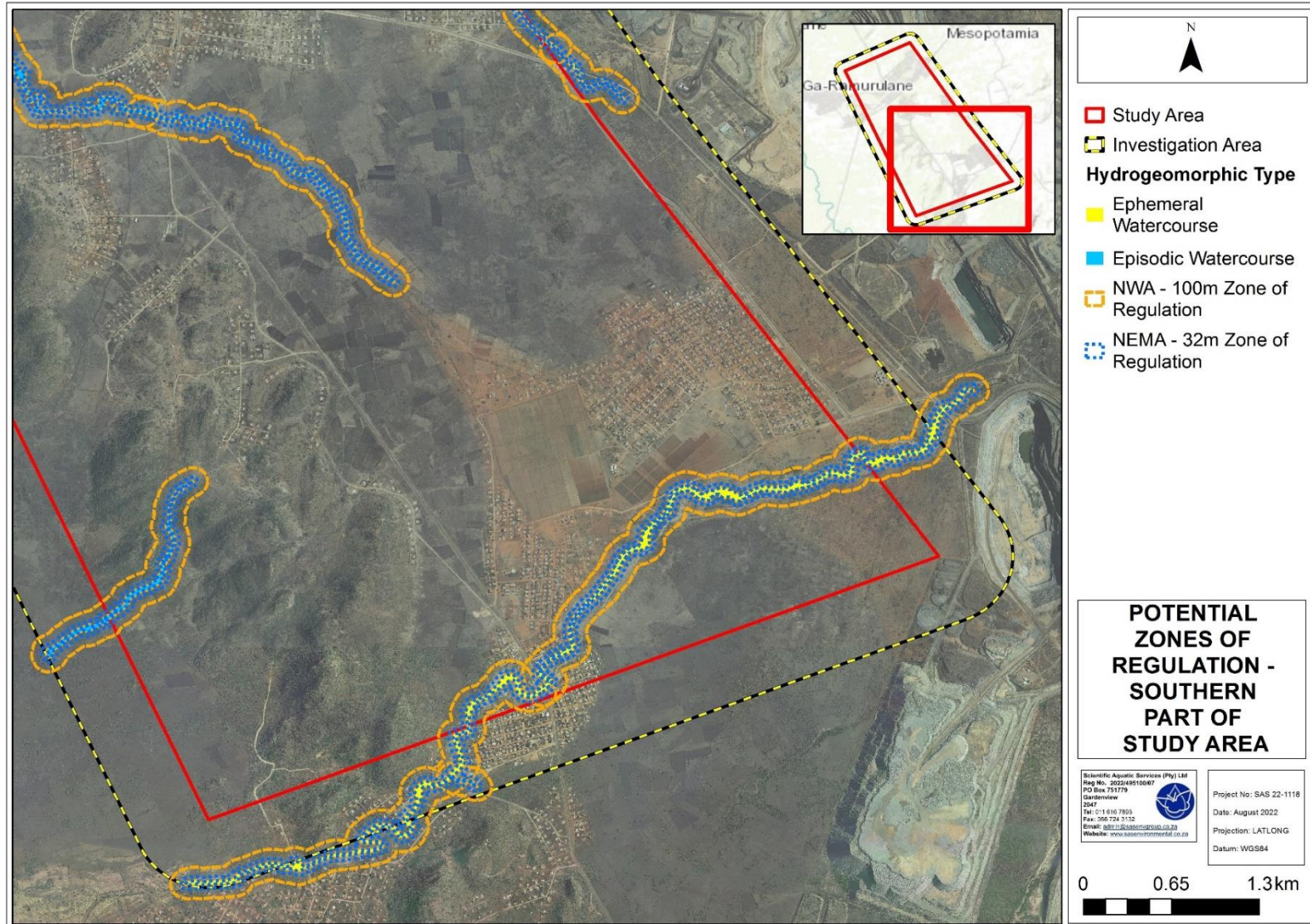


Figure 21 - Potential Zones of Regulation in the southern parts of the study and investigation areas



8. CONCLUSION

8.1 Summary of Desktop Verification Outcome/Findings

Based on the site verification undertaken by Scientific Aquatic Services and the findings thereof presented in this report, numerous freshwater features were confirmed to occur in the study area associated with the application for (non-invasive) prospecting rights on the non-invasive prospecting on farms Moordkopje and Zwartfontein. The majority of these freshwater features are watercourses that are episodic or ephemeral in terms of their hydrology regime, but two wetlands, an unchannelled valley bottom wetland and a seep wetland are located within the study area.

The designation of very high sensitivity to wetland features in the study area by the DFFE Screening Tool has been supported through the findings of the freshwater assessment that has confirmed the presence of wetlands in the study area. However as wetlands cannot be considered in isolation from the other components of the freshwater drainage system in the study area all freshwater features in the study area must be considered to be of very high sensitivity.

Under the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Aquatic Biodiversity, (GN320 of March 2020), for areas of low aquatic biodiversity sensitivity an Aquatic Biodiversity Compliance Statement must be produced. Due to the designation of most of the study area as being of low aquatic biodiversity sensitivity, and due to the non-invasive nature of the proposed prospecting activity (i.e. comprising of no physical activities and thus no prospecting-related impacts on the freshwater features in the study area) the approach of producing such a compliance statement was taken. However the findings of the study that all freshwater features are of high sensitivity has implications for the assessment type as discussed in Table 4 below.

Table 3: Outcome of Freshwater Assessment Findings

Screening Assigned Sensitivity	Tool	Verified Sensitivity	Outcome Statement / Plan of Study	Relevant Section Motivating Verification
Very (applicable to the Thwathwe and Mohlosane Watercourses; Remainder of Study Area – Low	High and / Study	All wetlands and watercourses on the site have a very high aquatic biodiversity sensitivity	It recommended that a future Aquatic Biodiversity Specialist Assessment must be undertaken <i>should the prospecting rights application be altered or approved to allow any activities other than non-invasive activities as currently proposed by the applicant that would result in the potential for impacts on freshwater resources to</i>	Section 6.1



		<p>result from such prospecting activities. Such an Aquatic Biodiversity Specialist Assessment must also be undertaken for any future mining-right or mining activities-related application for Environmental Authorisation</p>	
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8.2 Compliance Statement/Impact Statement

The prospecting right, as being applied for would entail non-invasive prospecting activities in the study area, thus no physical activities are proposed to be undertaken. Accordingly no impacts to the freshwater environment or freshwater features in the study area are envisioned and the risk profile to the freshwater environment is considered low to negligible. The freshwater features in the study area have been confirmed to be of very high aquatic biodiversity / freshwater sensitivity. Should the prospecting activities, as proposed, remain non-invasive (with no physical activity on the site), the prospecting activities will not result in an impact (new or cumulative) on the freshwater features in the study area and the prospecting right in its current form is associated with a low risk to the freshwater environment in the study area. The risk profile would change if any physical activities on the site were introduced.

8.3 Reasoned Opinion for issuing of EA

Due to the non-invasive nature of the proposed prospecting on the site (i.e. no associated physical activities and use of previous data), no impact on the freshwater environment in the site is anticipated. As such it is the professional opinion of the freshwater specialist that the prospecting right application be granted Environmental Authorisation, subject to prospecting remaining non-invasive with no associated physical activities in the study area. Due to the high sensitivity associated with the freshwater features in the study area, it is recommended that a future Aquatic Biodiversity Specialist Assessment must be undertaken should the prospecting rights application be altered or approved to allow any activities other than non-invasive activities as currently proposed by the applicant that would result in the potential for impacts on freshwater resources to result from such prospecting activities. Such an Aquatic Biodiversity Specialist Assessment must also be undertaken for any future mining-right or mining activities-related application for Environmental Authorisation, particularly within any potential Zone of Regulation as detailed in Section 7 above.



9. REFERENCES

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- NFEPA: Driver, A., Nel, J.L., Snaddon, K., Murrui, K., Roux, D.J., Hill, L., Swartz, E.R., Manuel, J. and Funke, N. 2011. Implementation Manual for Freshwater Ecosystem Priority Areas. Water Research Commission. Report No. 1801/1/11. Online available: <http://bgis.sanbi.org/nfepa/project.asp>
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APPENDIX A - INDEMNITY AND DECLARATION OF INDEPENDENCE

INDEMNITY AND TERMS OF USE OF THIS REPORT

The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and SAS and its staff reserve the right to, at their sole discretion, modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

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This report must not be altered or added to or used for any other purpose other than that for which it was produced without the prior written consent of the author(s). This also refers to electronic copies of this report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

DETAILS, EXPERTISE AND CURRICULUM VITAE OF SPECIALISTS

1. (a) (i) Details of the specialist who prepared the report

Stephen van Staden	MSc (Environmental Management) (University of Johannesburg)
Kim Marais	BSc Hons (Zoology) (University of Witwatersrand)
Amanda Mileson	Advanced Diploma: Nature Conservation (UNISA)

1. (a). (ii) The expertise of that specialist to compile a specialist report including a curriculum vitae

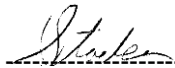
Company of Specialist:	Scientific Aquatic Services		
Name / Contact person:	Stephen van Staden		
Postal address:	29 Arterial Road West, Oriel, Bedfordview		
Postal code:	1401	Cell:	083 415 2356
Telephone:	011 616 7893	Fax:	011 615 6240/ 086 724 3132
E-mail:	stephen@sasenvgroup.co.za		
Qualifications	MSc (Environmental Management) (University of Johannesburg) BSc (Hons) Zoology (Aquatic Ecology) (University of Johannesburg) BSc (Zoology, Geography and Environmental Management) (University of Johannesburg)		
Registration / Associations	Registered Professional Natural Scientist at South African Council for Natural Scientific Professions (SACNASP) Accredited River Health Practitioner by the South African River Health Program (RHP) Member of the South African Soil Surveyors Association (SASSO) Member of the Gauteng Wetland Forum		



1. (b) a declaration that the specialist is independent in a form as may be specified by the competent authority.

I, Stephen van Staden, 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 relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, 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.



Signature of the Specialist

I, Paul da Cruz, 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 relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, 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.



Signature of the Specialist

APPENDIX B - CV OF SPECIALISTS





**SAS ENVIRONMENTAL GROUP OF COMPANIES –
SPECIALIST CONSULTANT INFORMATION**

CURRICULUM VITAE OF STEPHEN VAN STADEN

PERSONAL DETAILS

Position in Company	Group CEO, Water Resource Discipline Lead, Managing Member, Ecologist, Aquatic Ecologist
Joined SAS Environmental Group of Companies	2003 (year of establishment)

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Registered Professional Scientist at South African Council for Natural Scientific Professions (SACNASP)
Accredited River Health Practitioner by the South African River Health Program (RHP)
Member of the South African Soil Surveyors Association (SASSO) Member of the Gauteng Wetland Forum
Member of the Gauteng Wetland Forum
Member of International Association of Impact Assessors (IAIA) South Africa;
Member of the Land Rehabilitation Society of South Africa (LaRSSA)

EDUCATION

Qualifications

MSc Environmental Management (University of Johannesburg)	2003
BSc (Hons) Zoology (Aquatic Ecology) (University of Johannesburg)	2001
BSc (Zoology, Geography and Environmental Management) (University of Johannesburg)	2000

Short Courses

Integrated Water Resource Management, the National Water Act, and Water Use Authorisations, focusing on WULAs and IWWMPs	2017
Tools for Wetland Assessment (Rhodes University)	2017
Legal liability training course (Legricon Pty Ltd)	2018
Hazard identification and risk assessment training course (Legricon Pty Ltd)	2018
Wetland Management: Introduction and Delineation (WLID1502S) (University of the Free State)	2018
Hydropedology and Wetland Functioning (TerraSoil Science and Water Business Academy)	2018

AREAS OF WORK EXPERIENCE

South Africa – All Provinces
Southern Africa – Lesotho, Botswana, Mozambique, Zimbabwe Zambia
Eastern Africa – Tanzania Mauritius
West Africa – Ghana, Liberia, Angola, Guinea Bissau, Nigeria, Sierra Leona
Central Africa – Democratic Republic of the Congo



DEVELOPMENT SECTORS OF EXPERIENCE

1. Mining: Coal, chrome, Platinum Group Metals (PGMs), mineral sands, gold, phosphate, river sand, clay, fluorspar
 2. Linear developments (energy transmission, telecommunication, pipelines, roads)
 3. Minerals beneficiation
 4. Renewable energy (Hydro, wind and solar)
 5. Commercial development
 6. Residential development
 7. Agriculture
 8. Industrial/chemical
-

KEY SPECIALIST DISCIPLINES

Legislative Requirements, Processes and Assessments

- Water Use Applications (Water Use Licence Applications / General Authorisations)
- Environmental and Water Use Audits
- Freshwater Resource Management and Monitoring as part of EMPR and WUL conditions

Freshwater Assessments

- Freshwater (wetland / riparian) Delineation and Assessment
- Freshwater Eco Service and Status Determination
- Rehabilitation Assessment / Planning
- Maintenance and Management Plans
- Plant Species and Landscape Plans
- Freshwater Offset Plans
- Hydropedological Assessment
- Pit Closure Analysis

Aquatic Ecological Assessment and Water Quality Studies

- Habitat Assessment Indices (IHAS, HRC, IHIA & RHAM)
- Aquatic Macro-Invertebrates (SASS5 & MIRAI)
- Fish Assemblage Integrity Index (FRAI)
- Fish Health Assessments
- Riparian Vegetation Integrity (VEGRAI)
- Toxicological Analysis
- Water quality Monitoring
- Screening Test
- Riverine Rehabilitation Plans

Biodiversity Assessments

- Floral Assessments
- Biodiversity Actions Plan (BAP)
- Biodiversity Management Plan (BMP)
- Alien and Invasive Control Plan (AICP)
- Ecological Scan
- Terrestrial Monitoring
- Biodiversity Offset Plan

Soil and Land Capability Assessment

- Soil and Land Capability Assessment
- Hydropedological Assessment

Visual Impact Assessment

- Visual Baseline and Impact Assessments

Visual Impact Peer Review Assessments





**SAS ENVIRONMENTAL GROUP OF COMPANIES –
SPECIALIST CONSULTANT INFORMATION**

CURRICULUM VITAE OF PAUL DA CRUZ

PERSONAL DETAILS

Position in Company	Senior Ecologist
Joined SAS Environmental Group of Companies	2022

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Registered Certificated Scientist at South African Council for Natural Scientific Professions (SACNASP)
Registered Environmental Assessment Practitioner (EAP) with the Environmental Assessment Practitioners Association of South Africa (EAPASA)
Member of the South African Wetland Society (SAWS)

EDUCATION

Qualifications

BA (Hons) (Geography and Environmental Studies) (University of the Witwatersrand)	1998
BA (Geography) (University of the Witwatersrand)	1997

Short Courses

Taxonomy of Wetland Plants (Water Research Commission)	2017
Advanced Grass Identification (Frits van Outshoorn)	2010
Grass Identification (Frits van Outshoorn),	2009
Soil Form Classification and Wetland Delineation; (TerraSoil Science)	2008

AREAS OF WORK EXPERIENCE

South Africa – All Provinces
Southern Africa – Lesotho, Botswana
International – United Kingdom (England and Scotlan

DEVELOPMENT SECTORS OF EXPERIENCE

1. Renewable energy (Wind and solar)
2. Linear developments (energy transmission, telecommunication, pipelines, roads, border infrastructure)
3. Nature Conservation and Ecotourism Development
4. Commercial development
5. Residential development
6. Environmental and Development Planning and Strategic Assessment
7. Industrial/chemical; Non-renewable power Generation

