



Scientific Aquatic Services

Applying science to the real world

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Date: Sunday, 30 May 2021

Ref: SAS/SRK 220162

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Attention: Mr Marius van Huyssteen.

RE: AQUATIC ECOLOGICAL IMPACT AND COMPLIANCE STATEMENT CONSIDERING DEVELOPMENT OF THE PROPOSED 100 MW NEWCASTLE GAS ENGINE POWER PLANT (NGEPP) INDEPENDENT POWER PRODUCER (IPP) PROJECT IN KWAZULU-NATAL PROVINCE.

1. INTRODUCTION AND BACKGROUND SETTING

Scientific Aquatic Services (SAS) was appointed by SRK Consulting (Pty) Ltd. to prepare an Aquatic Impact and Compliance Statement as part of the Environmental Authorisation (EA) process for the proposed Newcastle Gas Engine Power Plant (NGEPP) Independent Power Producer (IPP) project. The NGEPP is proposed to be located within the Newcastle Local municipality and the Amajuba district municipality on ERF 15618, in KwaZulu-Natal province. Newcastle Energy (Pty) Ltd., a subsidiary of Vutomi Energy (Pty) Ltd. (Vutomi), own a 18.5 megawatt (MW) capacity gas fired cogeneration (steam and power) plant within the Karbochem Industrial Complex. Other industries within the Karbochem Industrial Complex include African Amines (alkyl amines plant), Lanxess (chrome chemicals plant) and SA Calcium Carbide. Through the NGEPP IPP project, Newcastle Energy proposes to increase its electricity generation capacity to approximately 100 MW. The subject property for the NGEPP project and existing Vutomi Energy steam and power plant will hereafter be referred to as the NGEPP study site whilst the 500 m “zone of investigation” around study site, (in accordance with General Notice 509 of 2016 (as it relates to the National Water Act, 1998 (Act No. 36 of 1998)), will be referred to as the “investigation area” (Appendix A, Figures A1 and A2).

As part of the NGEPP IPP project, the primary fuel source that will be used to supply the power plant with is Methane Rich Gas (MRG) via the existing gas pipeline (SRK, 2021). The secondary fuel, or backup fuel, to satisfy a three-day reserve, is proposed to be in the form of Liquefied Natural Gas (LNG). In this regard, Newcastle Energy (Pty) Ltd. proposes to develop a 2100 m³ LNG storage facility comprising of:

- 7 x 300 m³ cryogenic tanks;
- A regassification facility;
- An LNG offloading skid;
- Pressure reduction station

The proposed LNG facility is to be located within the Karbochem Industrial Complex, on the area immediately to the east of the NGEPP site (as indicated in Figure A1, Appendix A). The proposed LNG facility will allow for three days of LNG storage and to utilize the natural boil off gas to feed into the existing piped gas supply at a point after the piped gas pressure reduction station and before entering the gas engines. The boil off gas replenishment would be supplied by LNG ISO containers and offloaded into the cryogenic storage facility.

As part of the latest amendments to the Environmental Impact Assessment (EIA) Regulations (2014), as published on 07 April 2017, a power generation project of this magnitude requires an application for Environmental Authorisation by means of a Scoping and Environmental Impact Reporting (S&EIR) process. The proposed NGEPP project involves the following:

- Decommissioning, demolition and removal of the existing cogeneration plant (i.e. to make space for the NGEPP project).
- Engineering, procurement, construction, commissioning and operation of the new 100 MW NGEPP and associated infrastructure.

SAS was required to report on aspects of freshwater ecology and provide input into any development constraints this may have for the proposed NGEPP project in terms of the National Environmental Management Act, 1998 (NEMA) (Act No. 107 of 1998) and the National Water Act, 1998 (Act No. 36 of 1998). Furthermore, SAS was required to, as necessary, assess the risk the proposed development poses to the freshwater resources within the receiving environment.

2. OUTCOMES OF THE APPLICATION OF THE DEPARTMENT OF ENVIRONMENTAL AFFAIRS (DEA) SCREENING TOOL

The protocol for the assessment of freshwater and aquatic biodiversity prepared in support of the DEA screening tool, provides the criteria for the assessment and reporting of impacts on aquatic biodiversity for activities requiring environmental authorisation. The assessment requirements of this protocol are associated with a level of environmental sensitivity determined by the national web based environmental screening tool. For aquatic biodiversity, the requirements are for landscapes or sites which support various levels of biodiversity. The relevant aquatic biodiversity data in the national web based

environmental screening tool 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 memo which is to be submitted as part of the environmental authorisation application.

As part of the process of initiating the Scoping and Environmental Impact Reporting (SR&EIR) process, SRK Consulting (Pty.) Ltd. applied the Department of Environmental Affairs (DEA) screening tool to the NGEPP study site. According to the screening tool, the study site is located within an area of very high aquatic ecological significance. As a result, an applicant, intending to undertake an activity on a site identified as being of “very high sensitivity” for an aquatic biodiversity theme based on the national web based environmental screening tool, must submit an Aquatic Biodiversity Compliance Statement to the competent authority unless the site survey, or findings by the specialist determine that a high risk to the regional aquatic ecology or watercourses in the area is likely.

3. DEFINITIONS AND LEGISLATIVE REQUIREMENTS

The legislation considered during this investigation included the following:

- The Constitution of the Republic of South Africa, 1996¹;
- The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- The National Water Act, 1998 (Act No. 36 of 1998) (NWA);
- Government Notice 509 (GN 509) as published in the Government Gazette 40229 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998).

For the purposes of this site survey, the definition of a watercourse, riparian and wetland habitat were taken as per that in the National Water Act, 1998 (Act No. 36 of 1998). The definition is as follows:

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

Riparian habitat includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterized by alluvial soil, 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 areas.

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”.

4. DESKTOP INVESTIGATION FINDINGS

A database review and desktop analysis was undertaken prior to the site survey of the NGEPP study site. The results are summarised in the points below with the relevant maps presented in Appendix A.

- According to the NFEPA (2011) dataset (Appendix A, Figure A3), there are two natural wetland flats within the northern portion of the investigation area, as well as one natural channelled valley bottom and two artificial channelled valley bottom wetland features within the south eastern portion of the investigation area. The NFEPA database indicates these wetlands are in a moderately modified condition. Upon the site survey, the wetland flats identified by the

¹ 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.

database were noted to be stormwater drainage features and associated excavation within the landscape, whilst the artificial channelled valley bottom wetland features were determined to be process water dams associated with the Karbochem Industrial Complex. These features thus, cannot be classified as watercourses. The natural channelled valley bottom wetland identified by the NFEPA database was identified to be a true watercourse classified as a non-perennial river rather than a wetland as defined by NFEPA (2011). This non-perennial river is an unnamed tributary of the iNgagane River and is known locally as the Karbochemspruit;

- The NBA (2018): SAIIAE largely correlates with the NFEPA (2011) database, (Appendix A, Figure A5) which indicates there are two seep wetland features associated with the investigation area of the NGEPP study site. As discussed above, the seep feature towards the north of the investigation area was identified to be a stormwater drainage feature and associated excavation, whilst the drainage feature to the south of the subject property was identified as the Karbochemspruit;
- The iNgagane River is situated approximately 2.11 km south of the NGEPP study site and was classified as Moderately modified (Category C) according to the DWS RQIS PES EIS database (2014);
- According to the KZN Biodiversity Spatial Planning (2016), (Appendix A, Figure A4) a CBA optimal area is located within the southern portion of the investigation area of the NGEPP study site.

4.1 Site survey results

A survey of the NGEPP study site and 500 m investigation area was undertaken on the 29th October 2020, using visual assessment methods and use of digital satellite imagery. In addition, the use of a bucket soil auger was used to verify the presence, or lack thereof, of any potential wetland features on the NGEPP study site and investigation area. The study site comprises of the existing Vutomi Energy 18.5 MW gas fired cogeneration steam and power plant with a small portion of vacant land. The vacant land on the study site has been transformed and contains debris and building material used to facilitate maintenance on the power plant. As a result of the transformation, majority of the NGEPP study site is infested with alien invasive plant species such as *Tagetes minuta*, *Datura ferox*, *Solanum mauritianum*, and *Verbena bonariensis*.

In addition, an artificial man-made pond was constructed towards the south eastern boundary of the NGEPP study site. It was ascertained that the pond was driven by means of a leak in the municipal water supply and was artificial in nature (Shannet Anoop, *pers comms*, 29th October). Upon rectification of the leaking infrastructure, the pond began drying out and presently has been deconstructed (Figure 1, below). An area situated within the greater Karbochem Industrial Complex, directly east of the study site is proposed for the LNG facilities. The proposed area for the LNG facilities was concreted along some portions and surrounded by existing infrastructure of the greater Karbochem Industrial Complex (Figure 2).

A flow path of stormwater traverses the study site and has since been formalised into a stormwater channel which conveys runoff from the greater Karbochem Industrial Complex. The stormwater channel discharges into a non-perennial river situated approximately 140 m south of the NGEPP study site which is an unnamed tributary of the iNgagane River known locally as the Karbochemspruit. The Karbochemspruit was surveyed for indicators of wetland and riparian habitat as per the “*Updated Manual for the Identification and Delineation of Wetlands and Riparian Areas*” (DWAF, 2008). The findings of the site survey indicated that no wetland characteristics occur along the Karbochemspruit. The system displayed alluvial soils with a weakly defined riparian zone further downstream and was classified as a river with associated weakly developed riparian habitat (Figure 3). The Karbochemspruit is in a largely modified condition due to point and diffuse sources of pollution, including runoff from the Karbochem Industrial Complex and surrounding industry (ESA, 2009). This has resulted in incipient bankside erosion along the river reach, with some portions channelised due to the effects of culverts constricting flow. The Karbochemspruit drains into the iNgagane River situated approximately 2.11 km downgradient of the NGEPP study site which is classified as largely modified.

No wetlands or other sensitive freshwater habitat occur in positions which are likely to be directly affected by the proposed NGEPP project. Due to the nature of the NGEPP project on the study site and relative locality to the Karbochemspruit, the proposed project is considered to pose a very low risk of further impact to the already largely impacted river system. In addition, the NGEPP study area is not subject to any zones of regulation as per the National Water Act, 1998 (Act No. 36 of 1998), as the study site does not fall within the 100 m Zone of Regulation (as applicable to rivers) of the Karbochemspruit (Figure 4). As such, no development constraints are applicable from a watercourse management perspective. It is however, highly recommended that the NGEPP study site is developed responsibly and that necessary authorisation from the relevant competent authorities are granted.



Figure 1: (Upper left) representative view of the existing Vutomi Energy steam and power plant; (upper right) remains of the man-made pond; (bottom left) stormwater channel which conveys runoff from the greater Karbochem Industrial Complex; (bottom right) debris and transformed land within the vacant portion of the NGEPP study site.



Figure 2: Representative views of the proposed area for the LNG facilities.



Figure 3: (Left) representative photograph of the Karbochemspruit situated downgradient of the Karbochem Industrial Complex (inset shows alluvial soil) and (right) downstream of the Karbochemspruit (inset shows stormwater pipe discharging into Karbochemspruit).

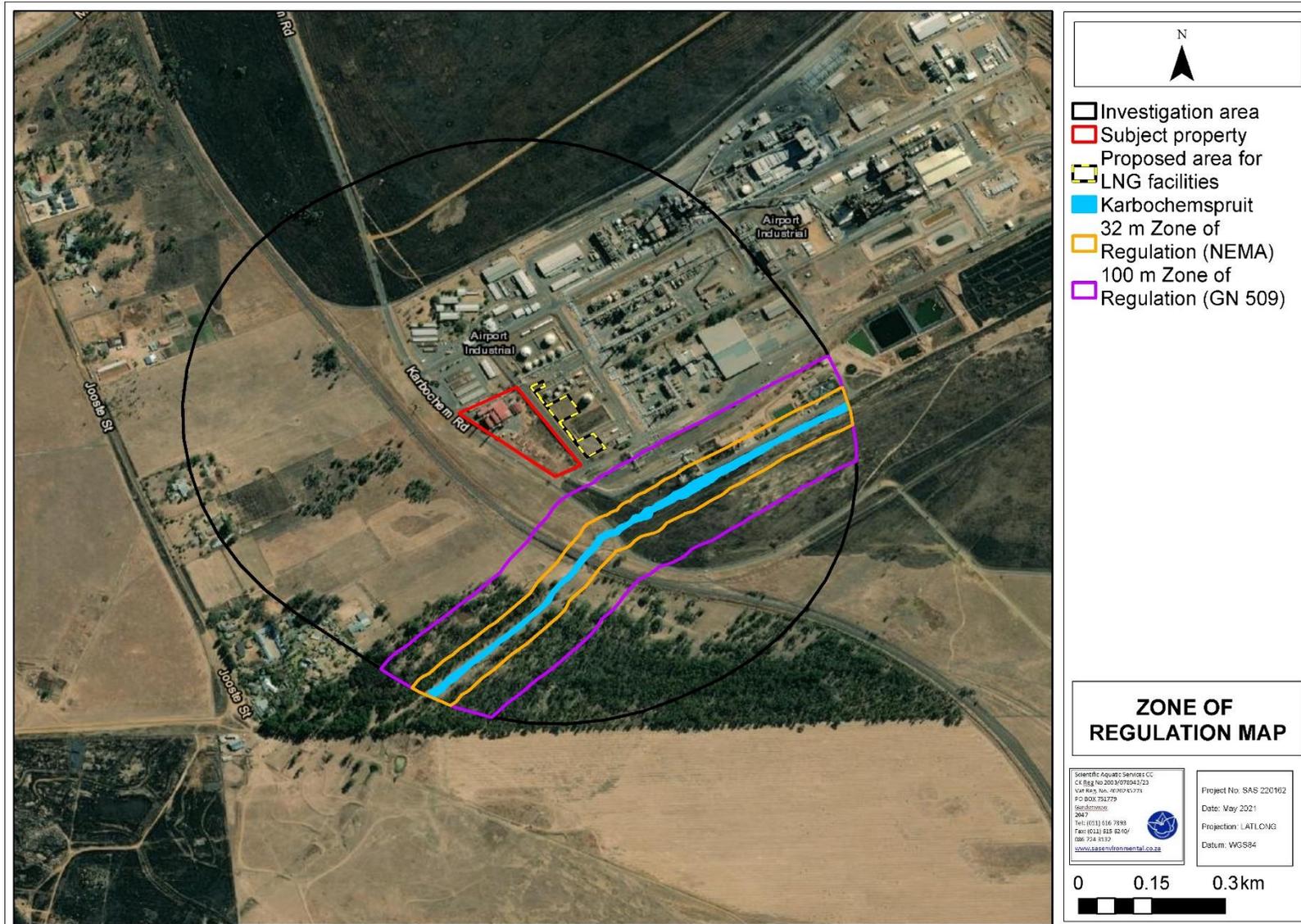


Figure 4: Conceptual presentation of the zones of regulation in terms of NEMA and GN 509 as it relates to the National Water Act, 1998 (Act No. 36 of 1998) in relation to the Karbochemspruit associated with the NGEPP study site and investigation area.

5. GENERAL GOOD HOUSEKEEPING AND MITIGATION MEASURES

Whilst no direct impacts as a result of the NGEPP project on the study site (nor the LNG facilities on the area adjacent) are anticipated, the potential for indirect impacts such as sediment laden runoff and ingress of contaminants such as cement into the Karbochemspruit may have the potential to occur. As a result, should the NGEPP project receive approval, responsible construction techniques and general good housekeeping is considered essential to ensure that potential impacts are adequately mitigated and minimised as much as possible.

General mitigation measures that are to be implemented during the construction and operational phase of the proposed NGEPP project include the following:

- Any clearing of vegetation and associated soil disturbance during construction should be limited to essential areas only and exposed soil and soil stockpiles should be protected by covering with a suitable geotextile such as hessian sheeting. It must also be ensured that stockpiles do not exceed 2 m in height. This will ensure prevention of excessive sedimentation and runoff into the Karbochemspruit;
- All construction activities and site clearing associated with the study site and proposed area for LNG facilities situated adjacent should ideally take place during the dry season to limit potential impacts and runoff into the Karbochemspruit;
- Concrete and cement-related mortars associated with construction activities can be toxic to aquatic life and other biota. Proper handling and disposal of cement on the NGEPP study site and proposed area for LNG facilities situated adjacent is considered imperative to minimise or eliminate discharge into the Karbochemspruit situated downgradient. Measures to minimise contamination include ensuring that mixing of cement should only be undertaken within the construction camp and may not be mixed on bare soil. In addition, it is advised that the mixing of concrete is to be strictly undertaken within a lined, bound or bunded portable mixer;
- Of particular importance, no waste disposal is to be permitted within the Karbochemspruit or the stormwater channel within that traverses the eastern boundary of the study site and discharges into the Karbochemspruit. All waste is to be removed from the study site and disposed of at a registered waste disposal facility. It is further recommended that waste such as wash water should be treated on-site or discharged to a suitable sanitation system to prevent contamination and runoff into the Karbochemspruit;
- Any concrete spillage outside of the demarcated area on the NGEPP study site must be promptly removed and taken to a suitably licensed waste disposal facility;
- During the operational phase of the NGEPP project, general good housekeeping must be ensured at all times in order to prevent spills, potential leakage and runoff of hazardous chemicals associated with the NGEPP into the Karbochemspruit. No waste must be disposed into the stormwater channel and appropriate waste disposal facilities should be allocated as part of the NGEPP project.

6. BUSINESS CASE, OPPORTUNITIES AND CONSTRAINTS APPLICABLE TO THE PROPOSED DEVELOPMENT OF THE SUBJECT PROPERTY.

The NGEPP study site comprises of the existing Vutomi Energy 18.5 MW gas fired cogeneration steam and power plant and a small portion of vacant land. The stormwater system of the area discharges into an unnamed tributary of the iNgagane River known as the Karbochemspruit situated approximately 140 m downgradient of the NGEPP study site. The findings of the site survey indicated that no wetland characteristics occur along the Karbochemspruit. The system displayed alluvial soils with a weakly defined riparian zone further downstream and was classified as a river with associated weakly developed riparian habitat. The Karbochemspruit is the closest watercourse to the NGEPP study site and is noted to be in a largely modified condition as the river primarily receives pollution sources from the surrounding industry. No wetlands or other sensitive freshwater habitat occur in positions which are likely to be directly affected by the proposed NGEPP project and indirect impacts are likely to be very limited.

Given the nature of the NGEPP project on the study site and relative locality to the watercourse, a very low risk of further impact is anticipated to occur on the Karbochemspruit which is already largely impacted. In addition, the NGEPP study site falls outside and is not subject to the 100 m zone of regulation applicable to rivers as per the National Water Act, 1998 (Act No. 36 of 1998). As a result, provided that the NGEPP study site is developed responsibly and that necessary authorisations from the relevant competent authority is granted, it is the opinion of the specialist that from a watercourse management perspective, the proposed NGEPP project may be considered favourably and there are no constraints in terms of Section 21 (c) and (i) of the National Water Act, 1998 (Act No. 36 of 1998) that prevent the development from being authorised. Should the proposed NGEPP project be authorised, general good housekeeping and appropriate mitigation measures must be employed throughout the construction and operation of the NGEPP project. This will ensure that any impacts to the Karbochemspruit are appropriately avoided and/or minimised and ensure the ongoing health and functionality of the river system is maintained in the present state, as a minimum.

We trust that we have interpreted your requirements correctly. Please do not hesitate to contact us if there are any aspects of this memorandum that you would like to discuss.

Yours Faithfully,

Stephen van Staden
SACNASP REG.NO: 400134/05 (Ecology)

Declaration of independence and CV included in Appendix B and C respectively

7. REFERENCES

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APPENDIX A- PROJECT MAPS

Table 1: Desktop data relating to the characteristics of the watercourses associated with the NGEPP study site and investigation area.

Aquatic ecoregion and sub-regions in which the NGEPP study site is located.		Details of the NGEPP study site in terms of the National Freshwater Ecosystem Priority Area (NFEPA) (2011) database.	
Ecoregion	North Eastern Uplands	FEPACODE	The NGEPP study site falls within a sub quaternary catchment considered a Phase2FEPA. These are sub-quaternaries identified as the most efficient set for rehabilitating to an A or B condition to meet under-achieved river type targets. The condition of these Phase 2 FEPAs should not be further degraded as they may in future be considered for rehabilitation, but only once FEPAs in good condition are considered fully rehabilitated and well managed.
Catchment	Tugela		
Quaternary Catchment	V31K		
WMA	Buffalo		
subWMA	Thukela		
Details of the NGEPP study site in terms of the National Freshwater Ecosystem Priority Area (NFEPA) (2011) database.			
NFEPA Wetlands (Figure A1)	According to the NFEPA dataset, there are three natural wetland features associated with the investigation area of the NGEPP study site. These are two wetland flats within the northern portion of the investigation area and natural channelled valley-bottom wetland within the southern portion of the investigation area. These wetlands are considered in a moderately modified ecological condition (Class C). In addition, there are two artificial channelled valley bottom wetlands situated within the south eastern portion of the investigation area. These wetlands are considered to be in a heavily to critically modified ecological condition (Class Z3).	NFEPA Rivers (A1)	According to the NFEPA (2011) database, the iNgagane River is situated approximately 2.11 km south of the NGEPP study site. According to the NFEPA (2011) dataset and the PES 1999 Classification the iNgagane River is considered largely modified (Class D).
Wetland Vegetation Type	The NGEPP study site is situated within Sub-Escarpment Grassland Group 2 (Least threatened) Wetland Vegetation Type, Mbona <i>et al.</i> (2015).	KZN Biodiversity Spatial Planning (Figure A2)	According to the KZN Biodiversity Spatial Planning (KZNBSP) (2016), a small portion within the southern boundary of the NGEPP study site investigation area is classified as a CBA Optimal area. According to the (KZNBSP, 2016), CBA Optimal areas are defined as areas identified by local experts as representing areas of biodiversity importance.
Ecological Status of the most proximal sub-quaternary reach (DWS, 2014).		Dominant characteristics of the North Eastern Uplands Ecoregion Level 2 (14.02) (Kleynhans <i>et al.</i> , 2007)	
Sub-quaternary reach	V31K-02541 (closest database point)	Dominant primary terrain morphology	Irregular undulating lowlands with hills
Proximity to NGEPP study site	±2.32 south of the NGEPP study site	Dominant primary vegetation types	North-eastern Mountain Grassland, Wet Cold Highveld Grassland, Moist Upland Grassland
Assessed by expert?	Yes	Altitude (m a.m.s.l)	700 to 1500
PES Category Median	Moderately modified (Class C)	MAP (mm)	600 to 800
Mean Ecological Importance (EI) Class	High	Coefficient of Variation (% of MAP)	20 to 30
Mean Ecological Sensitivity (ES) Class	High	Rainfall concentration index	55 to 65
Stream Order	3	Rainfall seasonality	Mid-summer
Default Ecological Class (based on median PES and highest EI or ES mean)	Largely Natural (Class B)	Mean annual temp. (°C)	24 to 28
		Winter temperature (July)	2 to 22
		Summer temperature (Feb)	12 to 28
		Median annual simulated runoff (mm)	40 to 210
National Biodiversity Assessment (NBA) (2018): South African Inventory of Inland Aquatic Ecosystems (SAIIAE)(National Wetland Map 5 is included in the NBA) (Figure A3)			
According to the NBA 2018: SAIIAE there are two seep wetland features associated with the NGEPP study site. The seeps are considered largely modified (Class D) whilst the Ecosystem Threat Status (ETS) is critically endangered and the Ecosystem Protection Level (EPL) is not protected. In addition, the iNgagane River is situated approximately 2.3 km south of the NGEPP study site. The iNgagane River is considered largely modified according to the NBA and PES (1999) database and the ETS and EPL of the river is least threatened and poorly protected.			

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

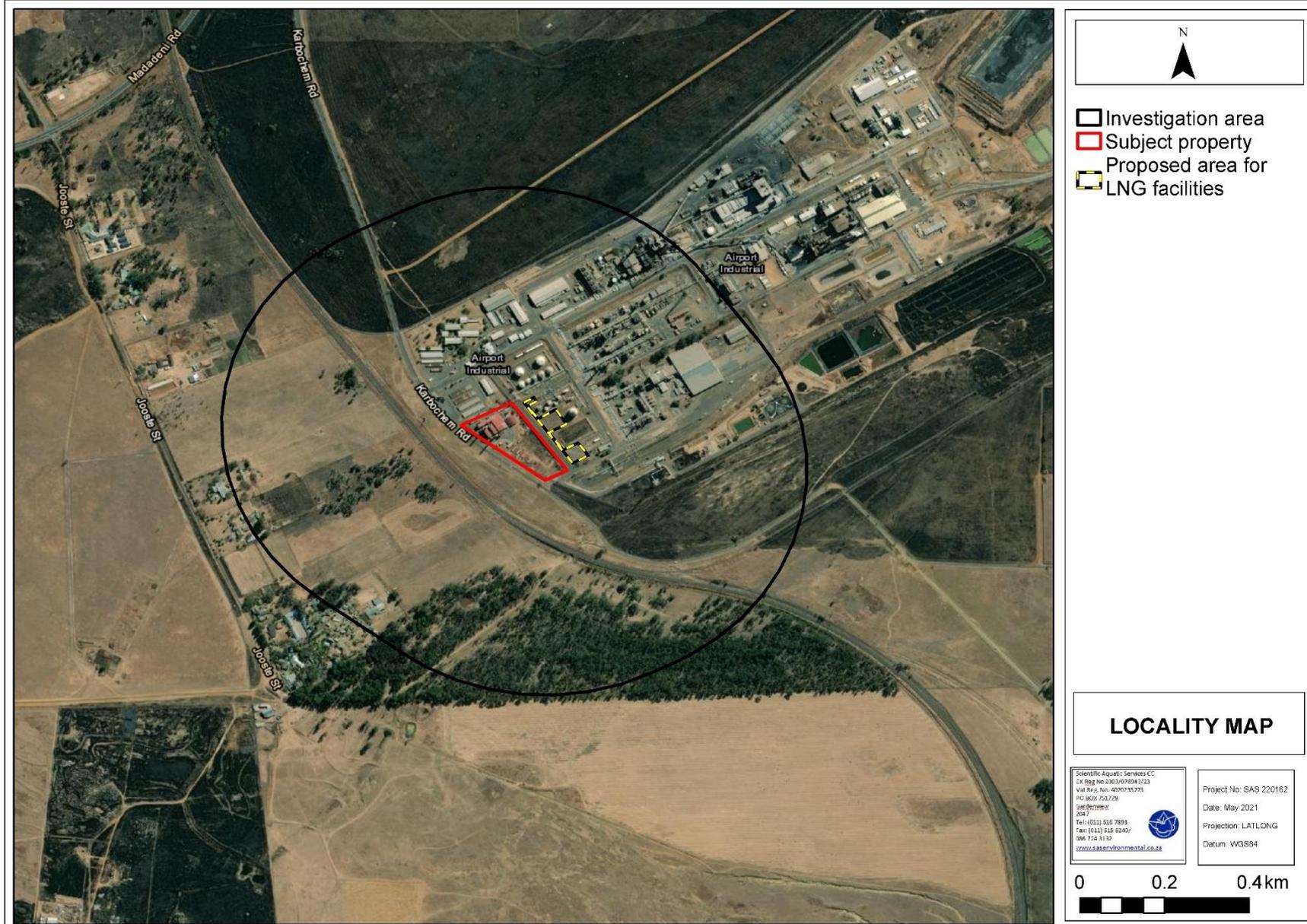


Figure A1: A digital satellite image depicting the location of the NGEPP study site and investigation area in relation to the surrounding area.

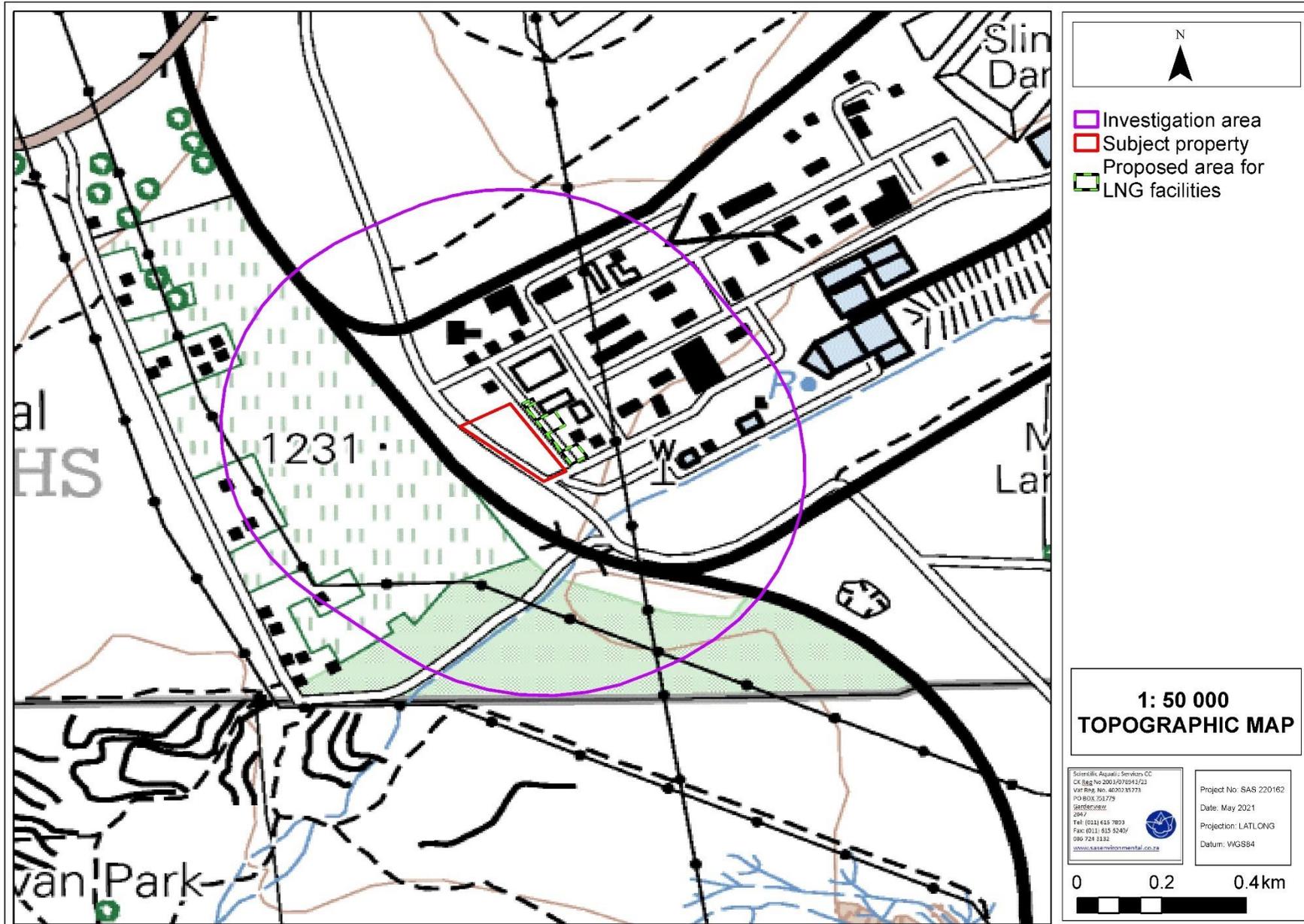


Figure A2: The NGEPP study site and investigation areas depicted on a 1:50 000 topographical map in relation to the surrounding area.

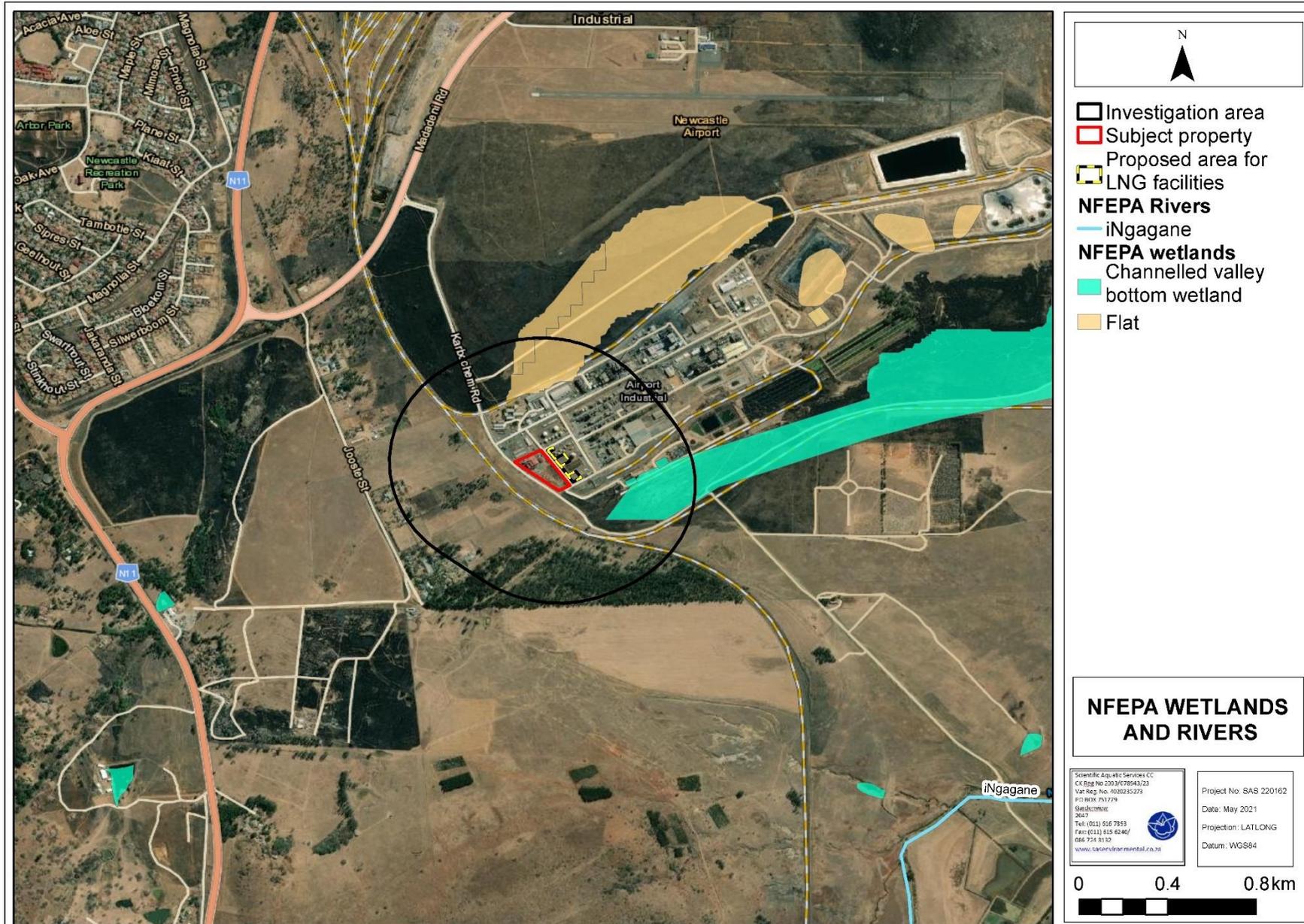


Figure A3: The wetlands and river features associated with the NGEPP study site and investigation areas according to the NFEPA (2011) database.

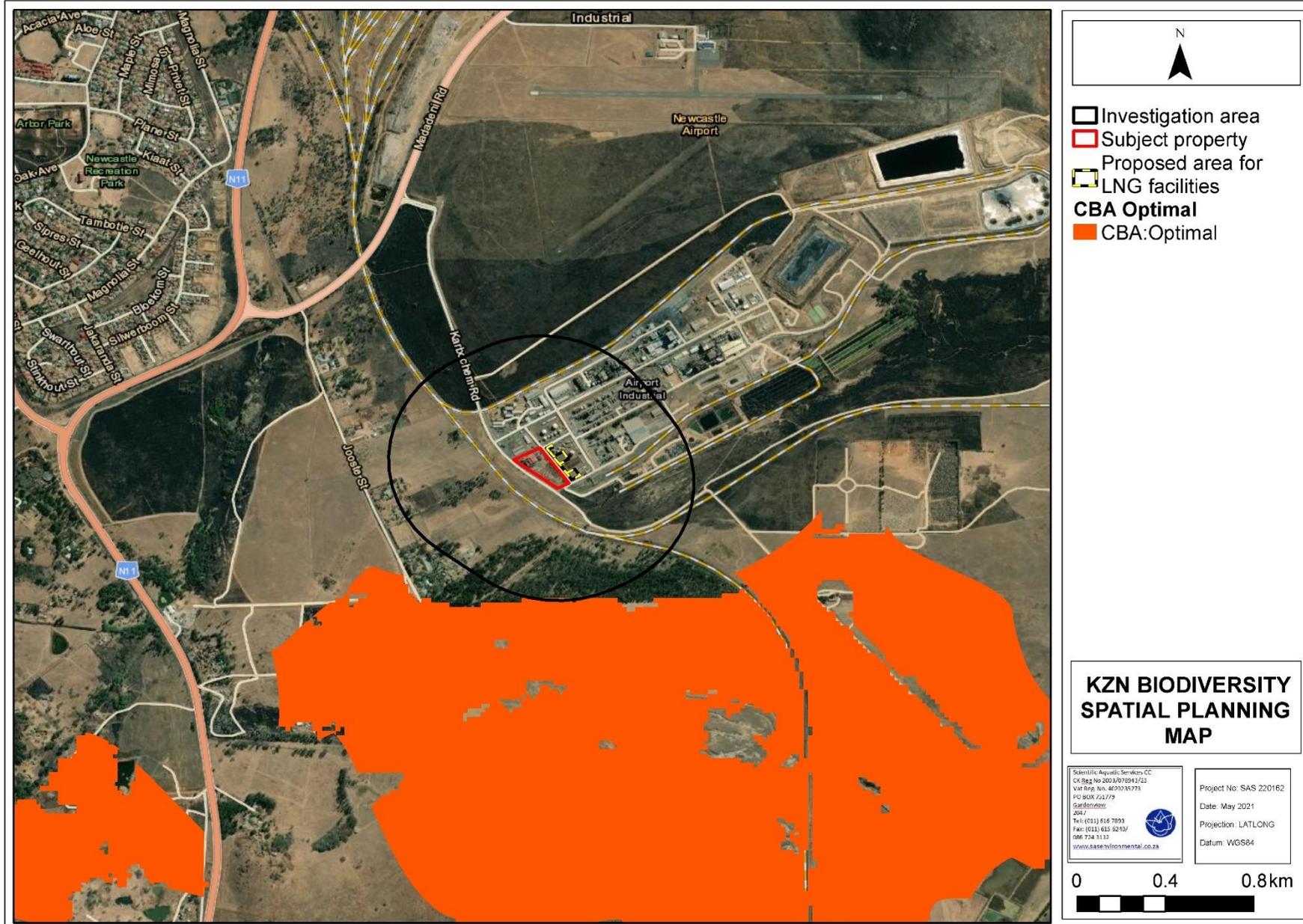


Figure A4: CBA’s associated with the NGEPP study site and investigation areas according to the KZN Biodiversity Spatial Planning (2016).

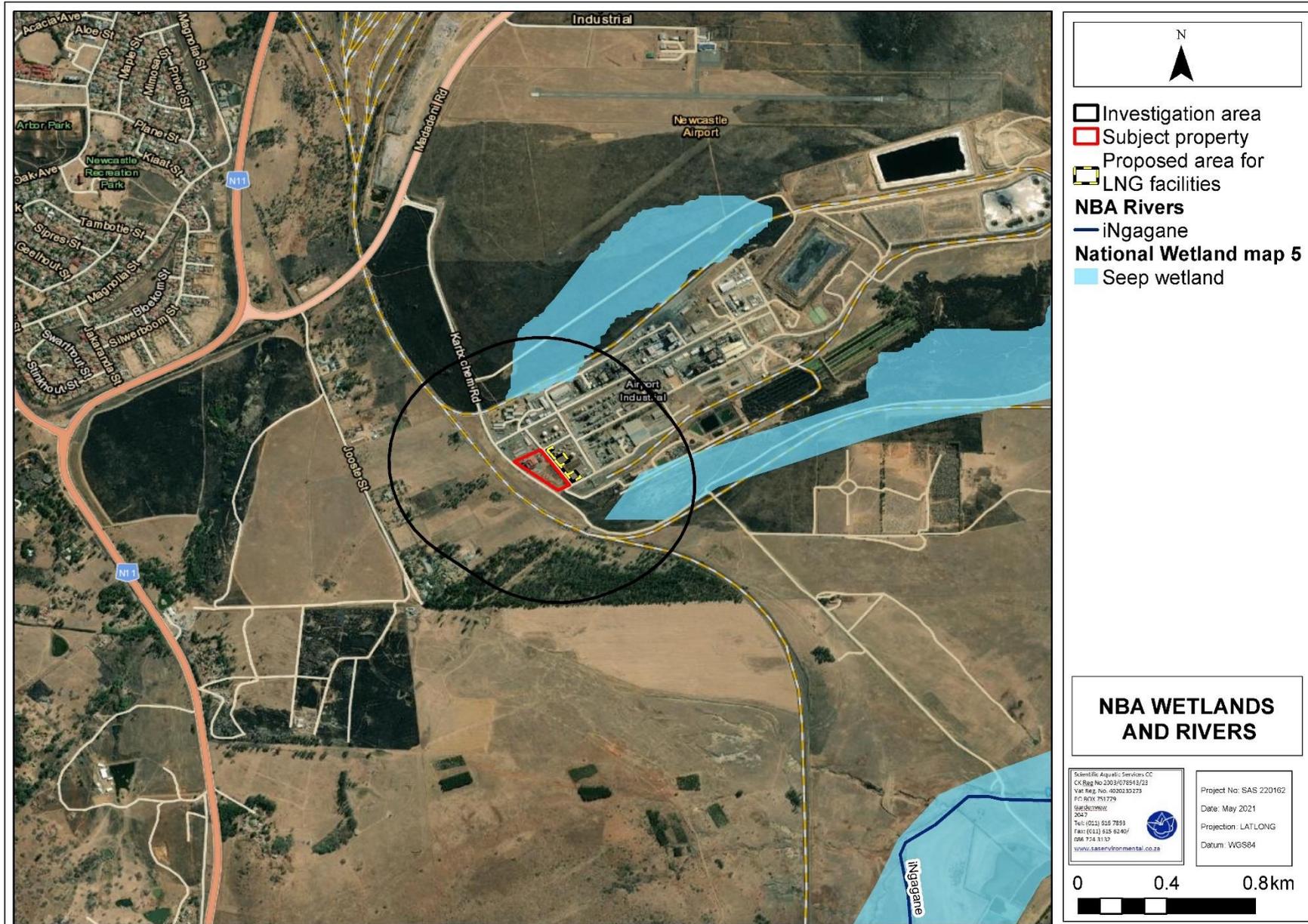


Figure A5: The National Biodiversity Assessment (2018) wetland and river features associated with the NGEPP study site and investigation area.

APPENDIX B - DECLARATION OF INDEPENDENCE

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)

Sashin Pillay BSc (Honours) (Biological Science) (University of KwaZulu Natal)

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

APPENDIX C- 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 **SASHIN PILLAY**

PERSONAL DETAILS

Position in Company	Junior Ecologist
Joined SAS Environmental Group of Companies	2019

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Gauteng Wetlands Forum
South African Wetland Society

EDUCATION

Qualifications

BSc (Hons) Biological Sciences (Aquatic Ecology) (University of KwaZulu-Natal)	2017
BSc (Environmental and Life Sciences) (University of KwaZulu-Natal)	2016

SHORT COURSES

Additional Training

Back-2-Basics wetland workshop presented by Piet-Loius Grundling	(2020)
Environmental management training course by Enaq Environmental Consulting	(2018)
Young-Leaders academy, leadership development programme	(2012)

AREAS OF WORK EXPERIENCE

South Africa – KwaZulu-Natal, Gauteng, Mpumalanga, Free-State, Limpopo

KEY SPECIALIST DISCIPLINES

Freshwater Assessments

- Desktop Freshwater Delineation
- Freshwater Verification Assessment
- Freshwater (wetland / riparian) Delineation and Assessment
- Freshwater Eco Service and Status Determination
- Rehabilitation Assessment / Planning

Aquatic Ecological Assessment and Water Quality Studies

- Habitat Assessment Indices (IHAS, IHIA)
- Toxicological Analysis
- Water quality Monitoring